Metropolitan Washington Council of Governments

COG/TPB Travel Forecasting Model

Version 2.1 D #50

User's Guide

November 17, 2004

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

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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 D #50 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. TPB staff has been developing the model during the past six months under the review of the TFS. The model contains a number of modeling improvements to the TPB's prior application model, Version 2.1/TP+/Release C model. The improvements were based on recommendations suggested by a recent expert panel review of the TPB's travel forecasting practice.

Copies of this report can be found on the MWCOG Web site: www.mwcog.org

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Chapter 1. Model Overview

This report describes the application of the COG/TPB Travel Forecasting Model, Version 2.1 D #50. The model is executed on a microcomputer, using the Citilabs TP+ transportation planning software (Version 3.2.0). The model has been in development over the past six months 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 D #50 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 6,800-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.

An overview of the Version 2.1 D #50 model structure and key improvements are discussed in this chapter. The implemented improvements were a direct result of recommendations made by a recent expert review panel of the TPB's current application model, Version 2.1/TP+/Release C. This chapter also presents the general procedure for applying the Version 2.1 D #50 model. Chapters 2 through 12 describe individual program steps in greater detail. The program steps currently exist as either TP+ scripts and/or compiled Microsoft FORTRAN (Version 5.1 and PowerStation) routines. The report also includes three appendices containing relevant listings. Appendix A contains a listing of TP+ scripts that are utilized in the model application. Appendix B contains listings of control files that are called in conjunction with FORTRAN procedures. Finally, Appendix C contains a listing of batch files that are used to invoke each step of the model chain.

The Version 2.1 D #50 model evolved from a series of models that began as the MINUTP-based Version 2 model (January 2000), and later as the Version 2.1/TP+ Release C model (December 2002). The model shares most of the structural characteristics of its predecessor models. The model employs demographic submodels to allocate the total number of households in a given zone among 64 cross-classes, defined as 4 income levels by 4 household size groupings by 4 vehicle availability groups. The trip generation and distribution models simulate daily person trips corresponding to four trip purposes: HBW, HBS, HBO, and NHB. The mode choice model apportions person trips for each of the four purposes among highway and transit modes. A time-of-day model is used to allocate daily vehicle trips among three time periods, a three-hour AM peak period, a three-hour PM peak period, and the remaining off-peak hours. The traffic assignment executions occur for each of the three time periods. Restrained speeds resulting from the AM peak and off-peak traffic assignments are recycled back to the generation and distribution steps.

[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.

The elements that distinguish the Version 2.1 D #50 model from prior travel models pertain to an assortment of parameter updates and procedural modifications. The updates are summarized below:

- The Volume-Delay Function (VDF) used in the traffic assignment process has been adjusted for freeways. Free-flow speeds and capacities expressed as a function of facility type and area type have also been updated. The equilibrium assignment process has also been changed from a *maximum* of 10 iterations (subject to default stopping criteria in the TP+) to a *fixed number* of 20 iterations. A great deal of testing was explored in the traffic assignment area testing various conical functional forms, altering the number of iterations in the equilibrium assignment, and examining various closure characteristics. This particular area is one that will continue to be refined with respect to research findings and improved software capabilities.

- A toll modeling capability has been added to the model so that monetary values are considered in the trip distribution and traffic assignment steps. The network link file now contains a toll value variable (TOLL) and a toll facility type variable (TOLLGRP) whereby tolls are specified as either a fixed fee or a per-mile rate. Three parameter files, TOLL.ESC, TOLL.INC and TOLL.SKM, are to be used to specify various toll policies. The capability involves converting monetary toll values to an equivalent time that is, in turn, added to the normal highway time and therefore affects highway pathbuilding. The added toll capability is a first step towards making the model sensitive to highway pricing policies.

- All cost components in the model previously developed in constant 1980 dollars are now developed in 1994 dollars. 1994 is the base year of the model calibration. These components include parking costs, highway tolls, and transit fares. All deflation factors in the model (i.e., in the highway building and transit fare building steps) are used to convert current-year costs into base-year 1994 costs.

- Zonal area type designations normally developed as a function of land activity density may now be optionally assigned an override value at the user's option. An override area type value may be deemed appropriate if special information about a zone's development is inconsistent with the automated code assigned on the basis of land use density (e.g., an aerial photograph of the zone). The override is specified in a zonal file used in network building.

- The model is now applied as a series of six iterations, i.e., the trip generation-to-traffic assignment 'loop' is executed six times so that reasonable equilibrium of the input speeds driving trip distribution and the output highway speeds resulting from the highway assignment process is attained. Moreover, the speed feedback process affects *both* trip distribution and *mode choice*. The rerunning of the mode choice model as a part of the speed feedback process had not been undertaken in previous TPB models.

- The NHB F-factors have been updated to account for a presumed under-estimation of commercial vehicle travel in the previous application model. The adjustment results in slightly larger NHB trip lengths than those developed previously.

- A parameter in the transit network build program (PATHSTYLE) has been revised from a value of '1' to a value of '0' to allow for more rigorous development of transit paths. The traditional specification of '1' is more computationally efficient but has recently been determined, in some cases, to produce inconsistent or illogical transit paths between closely competing alternatives. These types of problems have been largely reduced using the updated PATHSTYLE value. Transit pathbuilding has also been affected with an updated walk access link development process. The update was determined to be necessary based on a recent analysis of transit paths as a part of regional planning work. The WLKLNKTP program has been updated to more accurately reflect Metrorail station-to-bus-stop connections, particularly in the downtown area. Subsequent to these two transit pathbuilding updates, the mode choice model was re-estimated. The re-estimation also took into account recent FTA guidelines on ranges and characteristics of various mode choice coefficients.

- A methodology for reflecting the degradation of local bus speeds over time has been added to the model. The method involves reducing bus speeds on a service type and time-period basis in direct proportion to the expected reduction in arterial highway speeds. This type of modeling improvement had not been considered in previous TPB models.

- The number and magnitude of K-factors used in the trip distribution model have been reduced. Much of the reduction has been due to the implementation of the above technical improvements, such as the revised VDF function. Moreover, staff is comfortable that the remaining K-factors are justified and necessary to account for the fact that substantial regional travel patterns in the Washington region are not adequately captured using a traditional gravity model. In addition, aggregate adjustment factors used in the mode choice model have also been reduced.

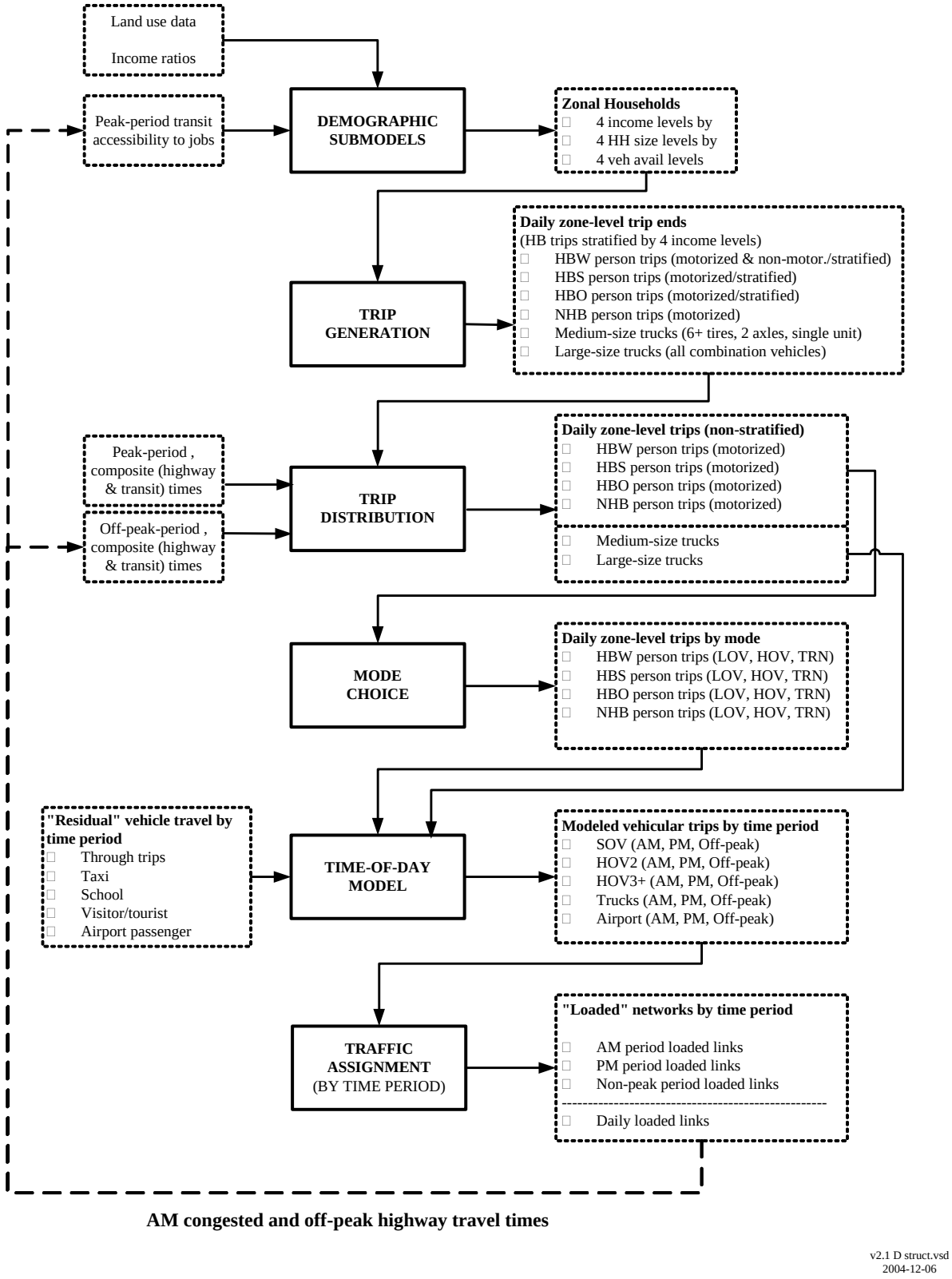
Further discussion on the model structure is provided in the next section.

1.1 Model Structure and Application

Exhibit 1-1 is a graphic depiction of the structure of the Version 2.1 D #50 modeling process. The exhibit indicates the elements that are generated from one step to the next. A more detailed discussion of the model structure follows.

The model requires three highway networks representing weekday operations occurring in the AM peak period (6:00-8:59 AM), the PM peak period (4:00-6:59 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

Exhibit 1-1 Version 2.1 D #50 Travel Model Structure



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 7:00-7:59 AM, and the off-peak defined as 10:00 AM-2:59 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, two axles, 6+ tires) 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.

The trip distribution model utilizes a 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

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

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 fixed 20-iteration equilibrium assignment algorithm.

Exhibit 1-2 shows the application steps of the model. The exhibit indicates that an initial (or pump-prime) iteration occurs where a first pass of the four-step process occurs using initial AM and off-peak highway speeds, and initial mode choice percentages. The highway network is built with initial speeds and 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 mode choice percentages, which are then assigned to the highway network.

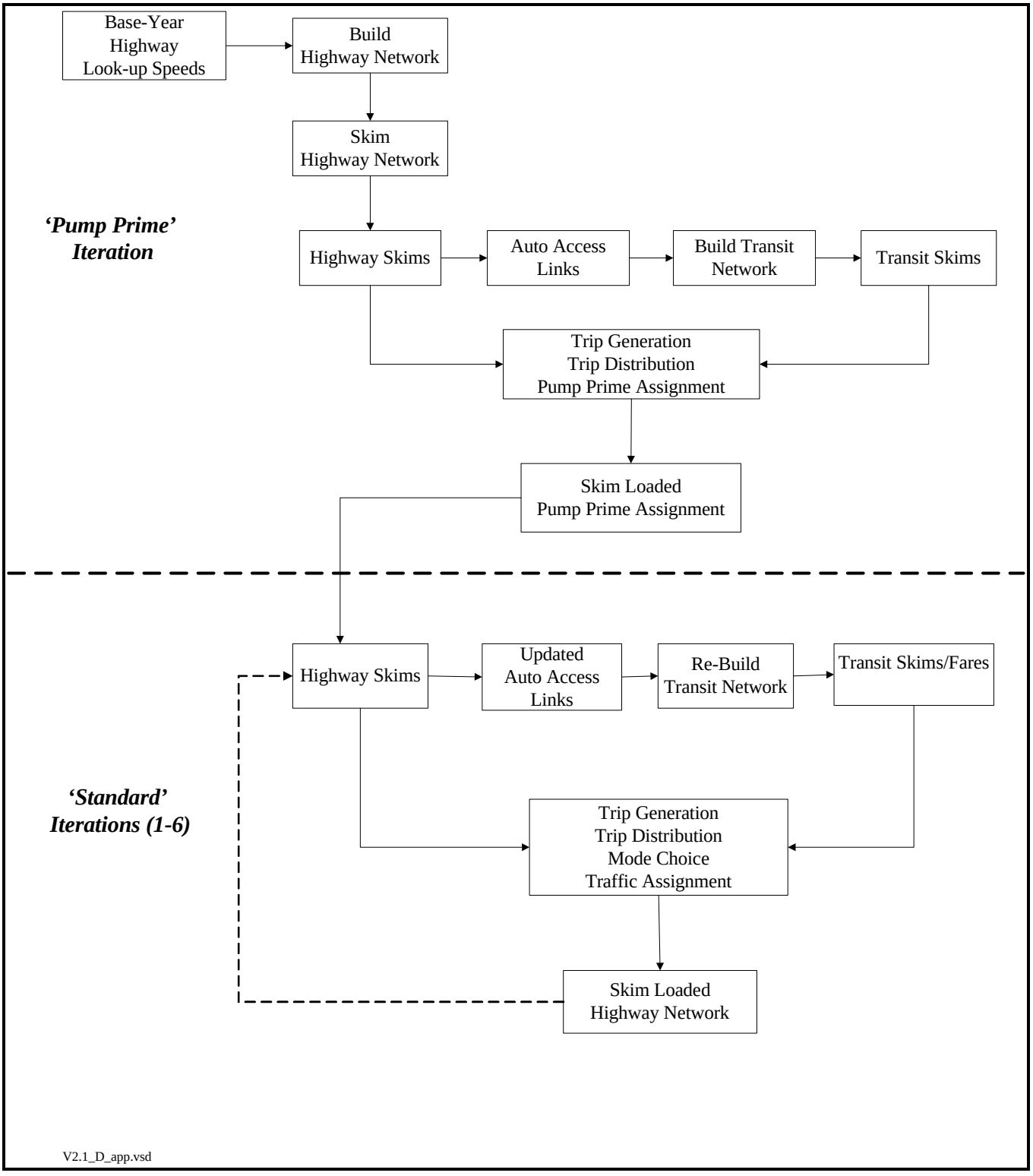
The next series of iterations (1 through 6) involve the execution of the complete four step model with recycled traffic assignment based speeds as input. The AM and Off-peak restrained highway times are next used to update the zone-to-PNR link speeds, the transit network must therefore be re-built to update transit Level-of Service matrices. 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 the next highway assignment step is executed. This four-step loop occurs for a full six iterations.

The Version 2.1 D #50 model uses a successive volume averaging process to force convergence of link volumes, and hence, link highway speeds. The averaging occurs individually for each of the three time periods at the link level, as follows:

- The 'final' first iteration link volumes are equal to the 'raw' assigned link volumes.
- The 'final' second iteration link volume equals the ½ of the first iteration link volume plus ½ of the second iteration assigned link volume.
- The 'final' third iteration link volume equals 2/3 of the 'final' second iteration link volume plus 1/3 of the third iteration assigned volume.
  :
- The 'final' sixth iteration link volume equals 5/6 of the 'final' fifth iteration link volume plus 1/6 of the sixth iteration assigned volume.

[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.

Exhibit 1-2 Version 2.1 D #50 Forecast Application Process



1.2 Computer Hardware, Software, and Execution

The Version 2.1 D #50 model functions in a PC/Windows environment. An Intel-based (or compatible) microcomputer with a minimum 3.0 GHz processing speed, and a minimum 60 GB of hard disk storage capacity is recommended. MWCOG has developed the Version 2.1 D #50 model on PCs running the Microsoft Windows 2000 operating system. On a 3.0 GHz Pentium 4 PC, the travel model takes about 15 to 17 hours to run. For example, the 2000 model run took about 15 hours and 45 minutes. By contrast, the 2030 model run took over 17 hours to run, since it uses an additional transit constraint procedure (for transit trips going through the regional core) that is not used for runs prior to 2005.

COG has designed the Version 2.1 D #50 application as a series of standardized batch files that are executed from a command prompt window, as opposed to a '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 shown graphically in Exhibit 1-3. 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, each scenario has its own scenario subdirectory, where specific outputs and reports are written. Below each scenario subdirectory is an *INPUTS* subdirectory where all necessary model inputs are kept (e.g., land use file, network files, etc.).

The batch files reside in the top-level subdirectory, known as the "root" (e.g., \cgv21d_50 on Exhibit 1-3). The batch files function to execute basic modeling steps (reading and writing files from appropriate subdirectories), making extensive use of "command line arguments" and "Windows environment variables." The batch files call TP+ programs or customized Fortran programs shown in Exhibit 1-4. The batch files may be executed one at a time, or alternatively, may be executed as a group (e.g., RUNALL_1994.BAT). The batch files also create standardized listings resulting from the various program steps (shown on Exhibit 1-5). Listing files are assigned *.RPT or *.TAB naming extensions. The former refers to TP+ listings while the latter refers to files containing trip table totals or jurisdictional summaries. Listings of the batch files developed thus far are shown in Appendix C. All batch files must be executed from the top-level subdirectory.

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 1-8.

Exhibit 1-3 Version 2.1 D #50 subdirectory structure for model execution

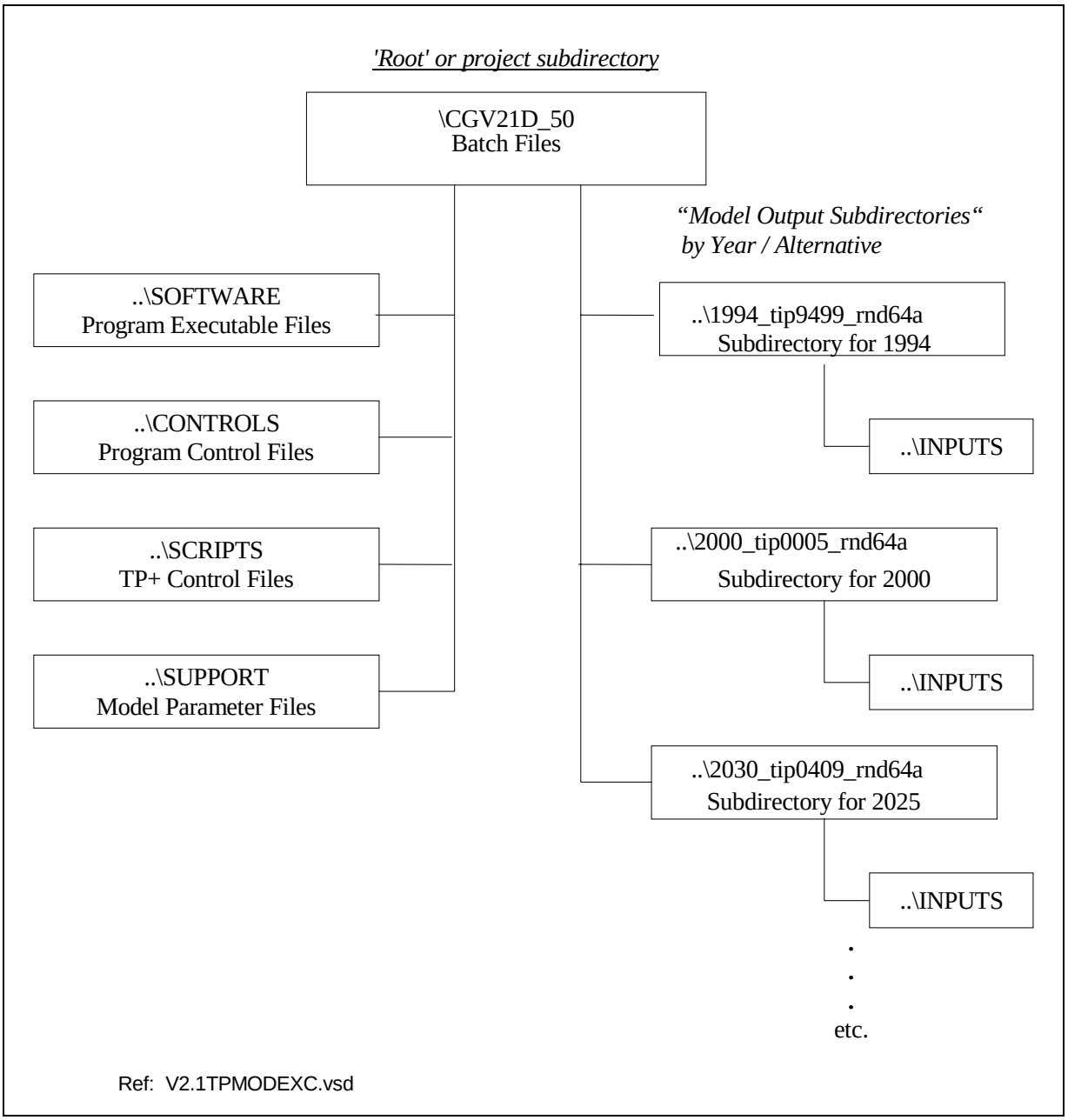


Exhibit 1-4 Version 2.1 D #50 Fortran Programs Called in Application

(Required in addition to TP+ software)

Executable Name	Size(bytes)	Date	Description	Comments	Control Files Needed? (Y/N)
STAPROTP.EXE	64,652	12/4/2002	Station/PNR lot Support File Generator	Creates TP+ transit network files from 'Station file'	Y
NETSW2.EXE	109,568	4/16/2001	Converts TRNPTH line files to TRNBUILD format	Executed 2X to process AM/Off-Pk transit lines	Y
NODESTB.EXE	105,472	4/9/2001	Reads TRNBUILD Line files creates formated stop node file	Executed 2X to process AM/Off-Pk transit lines	Y
SORTLINE.EXE	45,056	11/9/2001	Sorts the stop nodes file	Executed 2X to process AM/Off-Pk transit lines	N
CNTCONN2.EXE	129,024	9/27/2002	Creates walk access links (TAZs to transit stops)	Executed 2X to process AM/Off-Pk transit lines	Y
GIS_PROC.EXE	48,258	12/6/2002	Computes avg short/long walk times from GIS-based area files	Executed 2X to process AM/Off-Pk GIS 'Area' Files	Y
WLKLNKTP.EXE	122,864	5/24/2004	Creates 'final' walk-access files for transit network building	Executed 2X to process AM/Off-Pk transit lines	Y
PREFARTP.EXE	40,704	11/26/2002	Creates 'final' Zone file for MFARE2 programs		Y
HHSIZINC.EXE	54,894	6/19/2000	Creates HHs by size/income groups		N
VEHAVTP.EXE	66,402	12/4/2002	Creates HHs by size/income/ veh availability groups		Y
CGTGV2TP.EXE	397,968	12/3/2002	Trip Generation Model Application Prgm.	Executed 4X for each purpose	Y
COGMCA1.EXE	232,468	6/2/2004	Zone File (A1-deck) creator to Mode Choice Model	Executed 4X for each purpose	Y
COGMC.EXE	561,486	4/6/2001	Mode Choice Model Application pgm.	Executed 4X for each purpose	Y
MFARE1.EXE	59,748	6/28/1992	AM Peak station-to-station fare program		Y
MFARE1OP.EXE	55,176	1/22/1999	Off-Peak station-to-station fare program		Y
MTXIJTP.EXE	74,561	12/4/2002	Station-to-Station fare formating program		N
MFARE2TP.EXE	355,882	4/6/2001	Zone-to-Zone transit fare program	Executed 4X for by access type / time period	Y
EXTRTAB.EXE	24,663	7/26/2001	Utility pgm to extract text sections of TP+ report files.	Program is 'called' by many TP+ Scripts	N

Exhibit 1-5 Summary of Version 2.1 D #50 Model Steps and Associated Report Names

Iteration	Batch File Step	Model Step	Output	TP+ Script(s) / Executable programs(s)	Report File	Tab File
Pump-Prime	Set_Factors.bat	Preparation step	K-Factor / time penalty establishment	Set_Factors.s	Set_Factors.rpt	
	PP_Highway_Build.bat	Hwy. Network development	Highway network building	Highway_build_toll.s Closestp.exe Atypetp.exe Arealktp.exe Staprotp.exe	PP_Highway_Build.rpt staprotp.rpt	
	PP_Highway_PNR.bat	Transit network development	Auto access skims	pump_prime_skims.s	pp_Pump_prime_skims.rpt	
	PP_Transit_Prep.bat / CLRP_plus_pp_transit_prep.bat	Transit network development	Transit support link files	NETSW2.exe NODESTB.exe SORTLINE.exe CNTCONN2.exe GIS_PROC.exe WLKLNKTP.exe PREFARTP.exe	pp_nt_am.rpt pp_nt_op.rpt pp_ct2_am.rpt pp_ct2_op.rpt pp_gis_proc.rpt pp_walk_am.rpt pp_walk_op.rpt Update_Wklinks.rpt pp_prefartp.rpt	
	PP_Transit_Skim.bat	Transit network skimming	Transit Level-of-Service skim files using initial auto access skims	Transit_Skims.s	pp_TRANSIT_SKIMS.RPT	
	PP_Trip_Generation.bat	Demographic models/Trip Generation	Zonal HHs by socio-economic group and trip productions/attractions	HHSIZINC.exe VEHAVTP.exe CGTGV2TP.exe COGMCA1.exe	pp_hhsizinc.rpt pp_vehavtp.rpt pp_hbw_tg.rpt pp_hbs_tg.rpt pp_hbo_tg.rpt pp_nhb_tg.rpt pp_mtk_tg.rpt pp_htk_tg.rpt pp_cogmca1.rpt	
	PP_Trip_Distribution.bat	Trip Distribution	Person trip and truck trip matrices by purpose	Trip_Distribution.s	pp_TrpDst.rpt	pp_TrpDst.tab

Summary of Version 2.1 D #50 Model Steps and Associated Report Names -Continued

Iteration	Batch File Step	Model Step	Output	TP+ Script(s) / Executable programs(s)	Report File	Tab File
Pump-Prime	PP_Auto_Drivers.bat	'Initial' auto driver trip development	Auto driver trips by occupant level	PP_Auto_Drivers.s	pp_Auto_Drivers.rpt	PP_Auto_Drivers.tab
	Misc_Time-of-Day.bat	Non-modeled time of day	Non-modeled vehicle trips apportioned by time of day	Misc_Time-of-Day.s	Misc_Time-of-Day.rpt	Misc_Time-of-Day.tab
	PP_Time-of-Day.bat	Time of Day	Modeled vehicle trips by time of day	Time-of-Day.s	PP_Time-of-Day.rpt	PP_Time-of-Day.tab
	PP_Highway_Assignment.bat	Traffic assignment	Assign initial vehicle trips to the highway network by time period	Highway_Assignment.s	PP_Highway_Assignment.rpt	PP_Highway_Assignment.tab
	PP_Highway_Skims.bat	Highway network skimming	Highway skims, based on highway assignment loads	Pump_Prime_Highway_Skims.s	PP_Highway_Skims.rpt	
Iterations 1-6	Highway_PNR.bat	Transit network re-development	Auto-access skims based on previous iteration highway skims	Auto_Access.s	<***Iter***> Auto_Access.rpt	
	Transit_Skim.bat	Transit network skimming	Transit Level-of-Service skims using current iteration auto access skims	Transit_Skims.s	<***Iter***> Transit_Skims.rpt	
	Transit_Fare.bat	Transit Fares	Zone-to-zone transit fares based on skimmed transit path	Metrorail_Skims.s Export_Fares.s	<***Iter***> _metrorail_skims.rpt <***Iter***> _mf1_am.rpt <***Iter***> _mf1_op.rpt <***Iter***> _mf_am_wk.rpt <***Iter***> _mf_am_dr.rpt <***Iter***> _mf_op_wk.rpt <***Iter***> _mf_op_dr.rpt <***Iter***> _export_fares.rpt	

Summary of Version 2.1 D #50 Model Steps and Associated Report Names -Continued

Iteration	Batch File Step	Model Step	Output	TP+ Script(s) / Executable programs(s)	Report File	Tab File
Iterations 1-6	Trip_Generation.bat	Demographic models/Trip Generation	Zonal HHs by socio-economic group and trip productions/attractions		<***Iter***> _hhsizinc.rpt <***Iter***> _vehavtp.rpt <***Iter***> _hbw_tg.rpt <***Iter***> _hbs_tg.rpt <***Iter***> _hbo_tg.rpt <***Iter***> _nhb_tg.rpt <***Iter***> _mtk_tg.rpt <***Iter***> _htk_tg.rpt <***Iter***> _cogmca1.rpt	
	Trip_Distribution.bat	Trip Distribution	Person trip and truck trip matrices by purpose	Trip_Distribution.s	<***Iter***> _TrpDst.rpt	<***Iter***> _TrpDst.tab
	Mode_Choice.bat / Mode_choice_TC.bat	Mode Choice Model	Develop person trips by purpose and mode	MC_Summary.s	<***Iter***> _mc_summary.rpt <***Iter***> _mc_constraint.rpt <***Iter***> _mc_consummary.rpt	<***Iter***> _mc_summary.tab <***Iter***> _mc_constraint.tab <***Iter***> _mc_consummary.tab
	Auto_Driver.bat	Auto driver trip development	Auto driver trips by occupant level	Auto_Drivers.s	<***Iter***> _mc_Auto_Drivers.rpt	<***Iter***> _mc_Auto_Drivers.tab
	Time-of-Day.bat	Time of Day	Modeled vehicle trips by time of day	Time-of-Day.s	<***Iter***> _Time-of-Day.rpt	<***Iter***> _Time-of-Day.tab
	Highway_Assignment.bat	Traffic assignment	Assign initial vehicle trips to the highway network by time period	Highway_Assignment.s	<***Iter***> _Highway_Assignment.rpt	<***Iter***> _Highway_Assignment.tab
	Highway_Skims.bat	Highway network skimming	Highway skims, based on highway assignment loads	Highway_Skims.s	<***Iter***> _Highway_Skims.rpt	

Note: <Iter> refers to Iteration Code that is specified as "I1" to "I6"

Ref: runtable.xls

Exhibit 1-6 Travel Model Input Files, Part 1 of 2

	Input Type	Filename	Description	Text or Binary
1	Land use	ZONE.ASC	Zonal Land Use	Text
2	Land use	AREAOVER.ASC	Zone Area Type Override File	Text
3	Network, highway	LINK.ASC	Highway Links	Text
4	Network, highway	NODE.ASC	Highway Node File	Text
5	Network, highway	TAZAMSPD.LKP	AM TAZ/Facility Type Speed Look-up	Text
6	Network, highway	TAZOPSPD.LKP	Off-Peak TAZ/Facility Type Speed Look-up	Text
7	Network, highway	AMSPD.LKP	AM Facility/Area Type Speed Look-up	Text
8	Network, highway	OPSPD.LKP	Off-Peak Facility/Area Type Speed Look-up	Text
9	Network, highway	TOLL.ESC	Highway Toll Value / Deflator File	Text
10	Network, highway	TOLL.INC	Highway Toll /Time Equivalent by Income Grp.	Text
11	Network, highway	TOLL.SKM	Highway Toll/Time Equivalent by Veh. Type	Text
12	Network, transit	MODE1AM.TP	AM Mode 1 Transit Lines	Text
13	Network, transit	MODE1OP.TP	Off-Pk Mode 1 Transit Lines	Text
14	Network, transit	MODE2AM.TP	AM Mode 2 Transit Lines	Text
15	Network, transit	MODE2OP.TP	Off-Pk Mode 2 Transit Lines	Text
16	Network, transit	MODE3AM.TP	AM Mode 3 Transit Lines	Text
17	Network, transit	MODE3OP.TP	Off-Pk Mode 3 Transit Lines	Text
18	Network, transit	MODE4AM.TP	AM Mode 4 Transit Lines	Text
19	Network, transit	MODE4OP.TP	Off-Pk Mode 4 Transit Lines	Text
20	Network, transit	MODE6AM.TP	AM Mode 6 Transit Lines	Text
21	Network, transit	MODE6OP.TP	Off-Pk Mode 6 Transit Lines	Text
22	Network, transit	MODE7AM.TP	AM Mode 7 Transit Lines	Text
23	Network, transit	MODE7OP.TP	Off-Pk Mode 7 Transit Lines	Text
24	Network, transit	MODE8AM.TP	AM Mode 8 Transit Lines	Text
25	Network, transit	MODE8OP.TP	Off-Pk Mode 8 Transit Lines	Text
26	Network, transit	MODE9AM.TP	AM Mode 9 Transit Lines	Text
27	Network, transit	MODE9OP.TP	Off-Pk Mode 9 Transit Lines	Text
28	Network, transit	STA_TPP.BSE	Rail Station/PNR File	Text
29	Network, transit	RAIL_LNK.BSE	Rail Links	Text
30	Network, transit	TRNPEN.DAT	Metrorail Station Network Turn Penalty File	Text
31	Network, transit	GISWKAAM.ASC	GIS AM Zonal Walk Area File	Text
32	Network, transit	GISWKAOP.ASC	GIS Off-Peak Zonal Walk Area File	Text
33	Network, transit	GISWKLAM.ASC	GIS AM Walk Link File	Text
34	Network, transit	GISWKLOP.ASC	GIS Off-Peak Walk Link File	Text
35	Network, transit	LBUS_TIMFTRS.ASC	Local Bus Time Degradation Factors	Text
36	Network, transit	MFARE1.A1A	MFARE1 A1 Deck	Text
37	Network, transit	RIVERSTP.BNA	River Coordinate File	Text
38	Network, transit	TAZFRZN.ASC	TAZ/Bus Fare Zone Equivalency	Text
39	Network, transit	BUSFARAM.ASC	MFARE2 AM Bus Fare Zone Matrix	Text
40	Network, transit	BUSFAROP.ASC	MFARE2 Off-Peak Fare Zone Matrix	Text
41	Network, transit	HBOMC.OLD	Initial HBO Mode Choice Trips	Binary
42	Network, transit	HBSMC.OLD	Initial HBS Mode Choice Trips	Binary
43	Network, transit	HBWMC.OLD	Initial HBW Mode Choice Trips	Binary
44	Network, transit	NHBMC.OLD	Initial NHB Mode Choice Trips	Binary
45	Network, transit	WALK_AM.OLD	Previously developed AM Walk Link File - Optional	Text
46	Network, transit	WALK_OP.OLD	Previously developed Off-Pk Walk Link File - Optional	Text

Ref: v21d50_inputs.xls

Exhibit 1-7 Travel Model Input Files, Part 2 of 2

47	Trip table, misc.	AEXT.ASC	Zonal External Attractions	Text
48	Trip table, misc.	PEXT.ASC	Zonal External Productions	Text
49	Trip table, misc.	AIRPAX.ADR	Air Passenger Auto Dr. Trips	Binary
50	Trip table, misc.	SCHL.ADR	School Auto Dr. Trips	Binary
51	Trip table, misc.	TAXI.ADR	Taxi Auto Dr. Trips	Binary
52	Trip table, misc.	VISI.ADR	Visitor/Tourist Auto Dr. Trips	Binary
53	Trip table, misc.	XXAUT.VTT	Through Auto Drivers	Binary
54	Trip table, misc.	XXTRK.VTT	Through Trucks	Binary

Ref: v21d50_inputs.xls

Exhibit 1-8 Version 2.1 D #50 Support File List

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

1.3 Launching a Model Run

The model is normally launched from a command window or command prompt (prior to Windows 2000, this was known as a DOS window). The command window should be opened to the root directory (e.g., c:\user\cgv21d_50). This may be done expeditiously by opening Windows Explorer, navigating to the root directory, selecting the root subdirectory, and right-clicking the mouse, choosing "Command Prompt Here" in Windows 2000.[4] The command prompt should show something like this:

```
C:\user\cgv21d_50>
```

The basic syntax for running the model is

<runall batch file name> <name of the scenario specific subdirectory>

For example:

```
C:\user\cgv21d_50> runall_1994.bat 1994_tip9499_rnd64a
```

will run the "runall_1994.bat" batch file using the "1994_tip9499_rnd64a" subdirectory as the scenario subdirectory. While the model is running, it sends information to the screen (in the command window). For example, here is the beginning of the information sent for a year-2000 model run:

```
C:\user\cgv21d_50>set _year_=2000

C:\user\cgv21d_50>set _alt_=Base

C:\user\cgv21d_50>rem ====== Pump Prime Iteration ========================================

C:\user\cgv21d_50>set _iter_=pp

C:\user\cgv21d_50>set _prev_=pp

C:\user\cgv21d_50>call Set_Factors.bat 2000_tip0005_rnd64a

C:\user\cgv21d_50>cd support

C:\user\cgv21d_50\support>del tppl*.*

C:\user\cgv21d_50\support>del set_factors.rpt

C:\user\cgv21d_50\support>start /w TPPLUS.EXE ..\scripts\Set_Factors.s /start -Ptppl -S..\support

C:\user\cgv21d_50\support>if errorlevel 1 goto error

C:\user\cgv21d_50\support>copy tppl*.prn set_factors.rpt
tppl0001.PRN
        1 file(s) copied.
```

[4] In Windows XP, the "command prompt here" option is not available, unless you install the Windows XP Power Toy, Command Here application (http://www.microsoft.com/windowsxp/downloads/powertoys/xppowertoys.mspx).

This information includes both "standard output" and "standard error." "Standard error" includes any error messages that may be generated during the running of a model. For example, if a batch file tries to delete a file that does not exist, it will generate the error message "File not found," and this is sent to the screen, since standard error is sent to the screen by default. Standard output includes any non-error messages, such as "1 file copied."

Typically, due to the long run times, a model run is launched in the evening and is ready the next morning. When we launch a model run, we typically re-direct the standard error to a file. This allows us to review the file the next morning to make sure that there were no error messages (or at least, no critical error messages). Otherwise, the error messages would be simply sent to the screen, which has a limited number of lines it will store (The screen buffer may be controlled by the user. It is typically around 300 to 700 lines). The following command will launch a model run and re-direct standard error to a file:

```
C:\user\cgv21d_50> cmd /c runall_1994.bat 1994_tip9499_rnd64a 2> errs1994.txt
```

The "cmd /c" starts a new instance of the Windows 2000 command interpreter in the current command window. The "2>" ensures that only standard error, not standard output, is sent to the file.

A further enhancement on the run command is to use the "timethis.exe" utility from the Windows 2000 Resource Kit. This file is freely available on the Web. This utility will report the run time for a given command. Thus,

```
C:\user\cgv21d_50> timethis "cmd /c runall_1994.bat 1994_tip9499_rnd64a 2> errs1994.txt"
```

will result in the following report on the screen at the end of the model run:

```
TimeThis :  Command Line :  cmd /c runall_2000.bat    2000_tip0005_rnd64a  2> errs2000.txt
TimeThis :    Start Time :  Wed Sep 08 16:54:43 2004
TimeThis :      End Time :  Thu Sep 09 08:39:32 2004
TimeThis :  Elapsed Time :  15:44:48.772
```

The quotes around the command are necessary when re-direction is used.

The final enhancement is to re-direct the standard output to a file. In the past, if you redirected the standard output to a file, you would see nothing on the screen till the model run was done. Now, we use a free utility called "tee.exe" that splits the standard output into two copies, sending one to a file and one to the screen.[5] Thus, the final command is:

```
timethis "cmd /c runall_1994.bat    1994_tip9499_rnd64a  2> errs1994.txt" | tee scr_outp1994.txt
```

[5] http://www.csc.calpoly.edu/~bfriesen/software/console.shtml.

Chapter 2. Highway Network Building

Input(s):

Zonal Land Use File	ZONE.ASC	ASCII
Node Coordinate File	NODE.ASC	ASCII
Link File	LINK.ASC	ASCII
Station/PNR Lot File	STA_TPP.BSE	ASCII
Metrorail/Commuter Rail Link File	RAIL_LNK.BSE	ASCII
Initial Speed Lookup Files	TAZAMSPD.LKP, TAZOPSPD.LKP, AMSPD.LKP, OPSPD.LKP	ASCII
Area Type Override File	AREAOVER.ASC	ASCII
Toll Deflation File	TOLL.ESC	ASCII

Output(s):

Freeway Node File	TRN_FWYN.ASC	ASCII
AM, PM, Off-Peak Highway Network File	ZONEHWY.NET	Binary
TRNBUILD Station Node/Link Files	MET_NODE.TB, COM_NODE.TB, MET_LINK.TB, COM_LINK.TB	ASCII
TRNBUILD Walk Link File	WLKNET.TB	ASCII
TRNBUILD PNR Node/Link Files	MET_PNRN.TB, MET_PNRL.TB, COM_PNRN.TB, COM_PNRL.TB, BUS_PNRN.TB, BUS_PNRL.TB	ASCII
TRNBUILD Bus/Station Connect Link Files	MET_BUS.TB, COM_BUS.TB	ASCII
MFARE1 A1 Deck File	MFARE1.A1	ASCII
MFARE1 Metrorail Link File	METLNKM1.TB	ASCII
TAZ/PNR Equivalence table	TAZPNR.ASC	ASCII
Highway and Transit Coordinate (XY) File	TRN_NODE.ASC	ASCII
Zonal Highway Terminal Time File	ZTERMTM.ASC	ASCII
Station PNR Coordinate File	STAPNR.XYS	ASCII

Program File(s):

STAPROTP.EXE
TP+

Control/Support File(s):

STAPROTP.CTL (Control files for the STAPROTP Program)
HIGHWAY_BUILD_TOLL.S (TP+ script file for network 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 and several supporting files. The nodes file contains the x/y coordinate units of each highway node, based on the NAD83 system in whole feet. HIGHWAY_BUILD_TOLL.S is the TP+ script that is used. The script first determines the nearest zone centroid associated with each link in the highway network.[1] It then determines the area type of each zone in the region based on land activity density. The density measure is defined jointly by population and employment densities for a one-mile 'floating' radius about each zone as shown on Exhibit 2-1 :

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	5,001-15,000	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
10,001+	3	3	3	2	2	2	1

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.

The STAPROTP program is used to create transit link and node files in TRNBUILD format, on the basis of two user-prepared files. Exhibit 2-2 describes the control cards that are required for the program. One input file, called a 'station' file (sta_tpp.bse), 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.

[1] Each link is associated with one zone, but there is no guarantee that each zone is associated with a link.

Exhibits 2-5 through 2-9 show the input file format descriptions for the HIGHWAY_BUILD_TOLL.S and STAPROTP programs.

Exhibit 2-2 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

Highway Toll Modeling

Pathbuilding procedures in the Version 2.1 D #50 model are based on either highway time or a combination of highway time and transit time. The methodology for incorporating highway toll sensitivity into the model essentially involves converting link-coded highway *tolls* into *equivalent minutes.* The equivalent minutes are then added to the highway time during pathbuilding. This type of approach effectively reduces travel demand on tolled paths and increases demand on competing non-tolled paths for a given i/j. In developing highway toll-time equivalents, the nature of pathbuilding in trip distribution and highway assignment steps is considered. Trip distribution is applied using income stratification, while the traffic assignment distinguishes path by vehicle type. Therefore the toll modeling approach involves time-cost equivalent parameters that are provided on the basis of both income and vehicle types.

To apply the toll modeling procedure, the analyst: 1) codes highway tolls appropriately in the highway network, and 2) prepares three parameter files in the *INPUTS* subdirectory. The three files are relatively small text files generically named *TOLL.ESC, TOLL.INC,* and *TOLL.SKM*.

Toll coding in the highway network is reflected with two highway link attributes: *TOLL* and *TOLLGRP*. *TOLL* is the monetary value of the fee charged at the link location in current year cents. The current year should be consistent with the transit fare tariff year assumed in the MFARE2 program. *TOLLGRP* is a 1-digit facility type indicator that ranges from a value of '0' to '9'. The *TOLLGRP* value should be coded with a non-zero value if the *TOLL* value is non-zero. (If the *TOLL* value of a given link is non-zero and the *TOLLGRP* value equals zero, the highway network building process automatically imposes a *TOLLGRP* override value of '1'). If the analyst wishes to reflect a per-mile *TOLL* value on a link, there is no need to code a manually calculated *TOLL* value on the link. In this instance, the *TOLL* value should not be coded, but a unique *TOLLGRP* code should be assigned to the link and an associated per-mile rate should be specified in the *TOLL.ESC* file (described below). The highway building process ultimately creates time period-specific toll attributes: *AMTOLL, PMTOLL,* and *OPTOLL*. Under default conditions, all three attributes are assigned the *TOLL* value that is coded or automatically generated during network building.

The TOLL.ESC file is a TP+ script section that is called into the highway network building process. It contains three 'look-up tables' named *ESCFAC, DSTFAC, and TTFAC,* which contain user-specified parameters that vary by *TOLLGRP* codes. *ESCFAC* values are the deflation factors used to convert current year tolls into constant 1994 values. This parameter exists because the future pricing policies may vary between tolled facilities. These factors are directly analogous to the deflation parameter referenced in the MFARE2 program, i.e., UPARMS(2). The most recent model runs have been executed with consistent deflation assumptions between tolls and transit fares. *DSTFAC* values are optional per-mile rates (current-year cents per mile) that may be specified at the user's option as a special network coding expedient. During highway building, the *DSTFAC* factor is applied to the coded distance and the *TOLL* value is automatically assigned the result. If this option is not exercised, all *DSTFAC* values must be set to zero. The *TTFAC* are optional factors that may be used to alter the *AMTOLL, PMTOLL, or OPTOLL* values described above on a facility basis. The default *TTFAC* values are '1.0'. If, for example, the analyst wishes to set the off-peak toll to one-half of the coded *TOLL* value, then the off-peak *TTFAC* value would be set to '0.50' instead of '1.0'.

The time-cost equivalents by income level are specified in the *TOLL.INC* file. This is another TP+ script section that is called into the trip distribution process. The equivalent time values are reasonable average values, which should generally not be altered. The income-based time equivalents are shown on the table below. The hourly household wage rates were developed from the 2000 Census (Washington PMSA) income data, assuming 1,920 working hours per year and an average of 1.38 workers per household. The work equivalent values are based on a 50% average time valuation time while the non-work purpose is based on a 35% time valuation.

Work & Non-Work Time – Dollar Equivalents by Income Level

Annual Household Income Quartile	(a) Hourly Wage Rate (2000 $)	(b) Work Equivalent (minutes per 1994 $)	(c) Non-Work Equivalent (minutes per 1994 $)
1	$6.60	21.1	30.2
2	$17.93	7.8	11.1
3	$30.19	4.6	6.6
4	$60.39	2.3	3.3

The assumed time-toll equivalents by vehicle type are shown on the table below. These equivalents are specified in the *TOLL.SKM* file (this file is called by the traffic assignment and highway skimming programs). The equivalent minutes are based on an average 1994 household income of $62,500. Airport vehicle time equivalents are based on the 'full' average value of time for all time periods. The SOV time equivalents are based on a 50% and 35% time valuation in the peak and off-peak periods. The HOV time equivalents are based on a 40% and 30% time valuation in the peak and off-peak periods. Truck time equivalents are set to 2.5 times the prevailing SOV values. These values should generally not be altered.

Peak/Off-Peak Time – Dollar Equivalents (Minutes/Dollar) by Vehicle Type

Vehicle Type	Peak Period Equivalent (minutes per 1994 $)	Off-Peak Period Equivalent (minutes per 1994 $)
Airport Auto	2.5	2.5
Single Occupant Auto	5.1	7.3
Multi-Occupant Auto	6.4	8.5
Truck	12.8	18.3

The *TOLL.SKM* files also enable the analyst to specify time period-specific toll factors by vehicle type and tolled facility using *AM_TFAC, PM_TFAC*, and *OP_TFAC* lookup tables. These lookup tables are provided as an optional coding expedient. Default values of '1.0'should be maintained if this option is not used. Example listings of the *TOLL.ESC, TOLL.INC*, and *TOLL.SKM* files follow below.

```
;|/////////////////////////////////////////////////////////////////|
;|//     TOLL.ESC  -- Version 2.1/TP+ Toll Escaltion - by toll group |
;|/////////////////////////////////////////////////////////////////|
;    ============================================
;    = TOLL ESCALATION FACTORS by TOLL GROUP    =
;    = TABLE LOOKUP                             =
;    = For converting current year cents to     =
;    = 1994 cents  -updated 11/14/03 rjm        =
;    ============================================
; Use 2000 to 1994 deflation factor
 LOOKUP NAME= ESCFAC,
        LOOKUP[1] = 1, RESULT=2,
        FAIL= 0,0,0,INTERPOLATE=F,
;   Toll  Escalation Toll Rate
;   Grp   Factor
;   ---   ------
 R=" 1    0.86063     ",  ;
   " 2    0.86063     ",  ;
   " 3    0.86063     ",  ;
   " 4    0.86063     ",  ;
   " 5    0.86063     ",  ;
   " 6    0.86063     ",  ;
   " 7    0.86063     ",  ;
   " 8    0.86063     ",  ;
   " 9    0.86063     "   ;
; end of toll escalation lookup
;    ================================================
;    = TOLL Distance Rates by TOLL GROUP (optional)   =
;    = Factor for computing tolls based on distance   =
;    =  in current year cents per mile                =
;    ================================================
 LOOKUP NAME= DSTFAC,
        LOOKUP[1] = 1, RESULT=2,
        FAIL= 0,0,0,INTERPOLATE=F,
;   Toll  Toll Rate
;   Grp   Cents/mi (in current yr$)
;   ---   ------
 R=" 1    0.0000    ",  ;
   " 2    0.0000    ",  ;
   " 3    0.0000    ",  ;
   " 4    0.0000    ",  ;
   " 5    0.0000    ",  ;
   " 6    0.0000    ",  ;
   " 7    0.0000    ",  ;
   " 8    0.0000    ",  ;
   " 9    0.0000    "   ;
; end of toll distance rate lookup
;    ================================================
;    = TOLL Time of Day Factors by Toll Group         =
;    = Factor for converting link-coded toll to       =
;    = specific time periods by link group            =
;    ================================================
 LOOKUP NAME= TTFAC,
        LOOKUP[1] = 1, RESULT=2,  ; AM       Toll factor
        LOOKUP[2] = 1, RESULT=3,  ; PM       Toll factor
        LOOKUP[3] = 1, RESULT=4,  ; Off-Peak Toll factor
        FAIL= 0,0,0,INTERPOLATE=F,
;   Toll  AM Toll PM Toll  Off-Peak
;   Grp   Factor  Factor   Toll Factor
;   ---   ------  ------   ------
 R=" 1    1.0000  1.0000   1.0000   ",  ;
   " 2    1.0000  1.0000   1.0000   ",  ;
   " 3    1.0000  1.0000   1.0000   ",  ;
   " 4    1.0000  1.0000   1.0000   ",  ;
   " 5    1.0000  1.0000   1.0000   ",  ;
   " 6    1.0000  1.0000   1.0000   ",  ;
   " 7    1.0000  1.0000   1.0000   ",  ;
   " 8    1.0000  1.0000   1.0000   ",  ;
   " 9    1.0000  1.0000   1.0000   "   ;
; end of toll time adjustment factor lookup
```

```
;|/////////////////////////////////////////////////////////////////|
;|// TOLL.INC  - Version 2.1/TP+ Toll Income Params   (Extl Ctl File)|
;|/////////////////////////////////////////////////////////////////|
;|\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
;
;
;     ================================================================
;     = Equivalent Toll Minutes by Time Prd & Income Group           =
;     = in minutes per 1994 dollars    6/08/04 rm =
;     ================================================================
;    AM Peak         Off Peak
;---------------   ----------------
 i1PKEQM = 21.1     I1OPEQM = 30.2                ; <--- INC 1
 i2PKEQM =  7.8     I2OPEQM = 11.1                ; <--- INC 2
 i3PKEQM =  4.6     I3OPEQM =  6.6                ; <--- INC 3
 i4PKEQM =  2.3     I4OPEQM =  3.3                ; <--- INC 4
;
; END
```

```
;|\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
;|/////////////////////////////////////////////////////////////////////////////|
;|// TOLL.SKM  - Version 2.1/TP+ Toll Skim Params (TP+ Extl Ctl File)|
;|/////////////////////////////////////////////////////////////////////////////|
;|\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|

;     ===================================================================
;     = Equivalent Toll Minutes by Time Prd & Vehicle Type              =
;     = in minutes per 1994 dollar - rm 6/8/04                          =
;     ===================================================================
;    AM Peak         Off Peak           PM Peak
;---------------  ---------------      --------------
    SVAMEQM =  5.1     SVOPEQM =  7.3     SVPMEQM =  5.1 ; <--- SOVs
    H2AMEQM =  6.4     H2OPEQM =  8.5     H2PMEQM =  6.4 ; <--- HOVs-2 Occ
    H3AMEQM =  6.4     H3OPEQM =  8.5     H3PMEQM =  6.4 ; <--- HOVs-3+Occ
    TKAMEQM = 12.8     TKOPEQM = 18.3     TKPMEQM = 12.8 ; <--- Trucks
    APAMEQM =  2.5     APOPEQM =  2.5     APPMEQM =  2.5 ; <--- Apaxs

;     ===================================================================
;     = AM Peak Toll Adjustment Factor(AM_TFAC)                          =
;     =    by Toll Group & Vehicle Type                                  =
;     ===================================================================
 LOOKUP NAME= AM_TFAC,
        LOOKUP[1]  = 1, RESULT=2,   ; sov toll factor as f(toll group#)
        LOOKUP[2]  = 1, RESULT=3,   ; hv2 toll factor as f(toll group#)
        LOOKUP[3]  = 1, RESULT=4,   ; hv3+toll factor as f(toll group#)
        LOOKUP[4]  = 1, RESULT=5,   ; Trk toll factor as f(toll group#)
        LOOKUP[5]  = 1, RESULT=6,   ; Apx toll factor as f(toll group#)
        FAIL= 0,0,0,INTERPOLATE=F,
;   Toll   SOV  HOV2  HOV3+ Trk   APAX
;   Grp   TFtr  TFtr  TFtr  TFtr  TFtr
;   ---   ----  ----  ----  ----  ----
 R=" 1    1.0   1.0   1.0   1.0   1.0  ",
   " 2    1.0   1.0   1.0   1.0   1.0  ",
   " 3    1.0   1.0   1.0   1.0   1.0  ",
   " 4    1.0   1.0   1.0   1.0   1.0  ",
   " 5    1.0   1.0   1.0   1.0   1.0  ",
   " 6    1.0   1.0   1.0   1.0   1.0  ",
   " 7    1.0   1.0   1.0   1.0   1.0  ",
   " 8    1.0   1.0   1.0   1.0   1.0  ",
   " 9    1.0   1.0   1.0   1.0   1.0  "
; (END of AM toll adjustment factor lookup)

;     ===================================================================
;     = Off Peak Toll Adjustment Factor(OP_TFAC)                         =
;     =    by Toll Group & Vehicle Type                                  =
;     ===================================================================
 LOOKUP NAME= OP_TFAC,
        LOOKUP[1]  = 1, RESULT=2,   ; sov toll factor as f(toll group#)
        LOOKUP[2]  = 1, RESULT=3,   ; hv2 toll factor as f(toll group#)
        LOOKUP[3]  = 1, RESULT=4,   ; hv3+toll factor as f(toll group#)
        LOOKUP[4]  = 1, RESULT=5,   ; Trk toll factor as f(toll group#)
        LOOKUP[5]  = 1, RESULT=6,   ; Apx toll factor as f(toll group#)
        FAIL= 0,0,0,INTERPOLATE=F,
;
;   Toll   SOV  HOV2  HOV3+ Trk   APAX
;   Grp   TFtr  TFtr  TFtr  TFtr  TFtr
;   ---   ----  ----  ----  ----  ----
 R=" 1    1.0   1.0   1.0   1.0   1.0  ",
   " 2    1.0   1.0   1.0   1.0   1.0  ",
   " 3    1.0   1.0   1.0   1.0   1.0  ",
   " 4    1.0   1.0   1.0   1.0   1.0  ",
   " 5    1.0   1.0   1.0   1.0   1.0  ",
   " 6    1.0   1.0   1.0   1.0   1.0  ",
   " 7    1.0   1.0   1.0   1.0   1.0  ",
   " 8    1.0   1.0   1.0   1.0   1.0  ",
   " 9    1.0   1.0   1.0   1.0   1.0  "
; (END of Off peak toll adjustment factor lookup)
;
```

```
;     ===================================================================
;     =  PM Peak Toll Adjustment Factor(PM_TFAC)                        =
;     =    by Toll Group & Vehicle Type                                 =
;     ===================================================================
 LOOKUP NAME= PM_TFAC,
        LOOKUP[1]  = 1, RESULT=2,   ; sov toll factor as f(toll group#)
        LOOKUP[2]  = 1, RESULT=3,   ; hv2 toll factor as f(toll group#)
        LOOKUP[3]  = 1, RESULT=4,   ; hv3+toll factor as f(toll group#)
        LOOKUP[4]  = 1, RESULT=5,   ; Trk toll factor as f(toll group#)
        LOOKUP[5]  = 1, RESULT=6,   ; Apx toll factor as f(toll group#)
        FAIL= 0,0,0,INTERPOLATE=F,
;
;   Toll   SOV  HOV2  HOV3+ Trk   APAX
;   Grp   TFtr  TFtr  TFtr  TFtr  TFtr
;   ---   ----  ----  ----  ----  ----
 R=" 1    1.0   1.0   1.0   1.0   1.0  ",
   " 2    1.0   1.0   1.0   1.0   1.0  ",
   " 3    1.0   1.0   1.0   1.0   1.0  ",
   " 4    1.0   1.0   1.0   1.0   1.0  ",
   " 5    1.0   1.0   1.0   1.0   1.0  ",
   " 6    1.0   1.0   1.0   1.0   1.0  ",
   " 7    1.0   1.0   1.0   1.0   1.0  ",
   " 8    1.0   1.0   1.0   1.0   1.0  ",
   " 9    1.0   1.0   1.0   1.0   1.0  "
; (END of PM peak toll adjustment factor lookup)
```

Input File Descriptions and Formats:

1. Land Use File (zone.asc)

Exhibit 2-3 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 (node.asc)

Exhibit 2-4 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 (link.asc)

Exhibit 2-5 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	Unused (place marker for Speed Class)*
26-27	I2	Unused (place marker for Capacity Class)*
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	I4	Toll Value in current year dollars
67-67	I1	Toll Group Code (1-9)
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	Unused (place marker for TAZ)*
107-116	A/N	Project ID

Notes:

- *The mode choice model requires that all costs be in 1994 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).*
- ** The speed class, capacity class, and TAZ are added to the highway network during the highway network building phase, so they are not used in the ASCII input file link.asc.*

4. Consolidated Station / PNR lot file (sta_tpp.bse)

Exhibit 2-6 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 (rail_lnk.bse)

Exhibit 2-7 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)
37-37	I1	Rail Mode Number (3-5)

Chapter 3. Auto Access Link Development

Input(s):

Built Highway Network File	ZONEHWY.NET	ASCII
TAZ/PNR Equivalency File	TAZPNR.ASC	ASCII
Restrained Highway Skims	??_AM.SKM, ??_OP.SKM	Binary
Time / Toll Value Equivalent File	TOLL.SKM	ASCII
TAZ Coordinate File	BASEZON.DAT	ASCII

Output(s):

AM Peak/Off-Peak Auto Connect Link File, TRNBUILD Format	PNR_AM.TB, PNR_OP.TB	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):

Freeway Node File	TRN_FWYN.ASC	ASCII
Rivers Location File	RIVERSTP.BNA	ASCII
Peak & Off-Peak Transit Line Files, MINUTP/TRNPTH Format	MODE???.TP	ASCII
Peak & Off-Peak Walk Area Files (from GIS)	GISWKAAM.ASC, GISWKAOP.ASC	ASCII
Peak & Off-Peak Walk Link Files (from GIS)	GISWKLAM.ASC, GISWKLOP.ASC	ASCII
Transit Stop Node File	NT_AM.ASC, NT_OP.ASC	ASCII
Highway and Transit Coordinate (XY) File	TRN_NODE.ASC	ASCII
TAZ/Bus Fare Zone Equivalency File	TAZFRZN.ASC	ASCII

Output(s):

Off-Peak Walk Link File, TRNBUILD Format	WALK_AM.TB, WALK_OP.TB	ASCII
Peak and Off-Peak Transit line files, TRNBUILD Format	MODE???.TB	ASCII
A2 Deck for MFARE Process	FARE_A2.ASC	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). If a walk-access link to a rail station has a GIS-based distance that is longer than the area-based distance, then the access link is omitted from the final walk access file. 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 (GISWKA??.ASC)

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 (GISWKL??.ASC)

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 Format Description (TAZFRZN.ASC)

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):

Peak, Off-Peak Highway Networks	ZONEHWY.NET	Binary
Peak, Off-Peak Transit Line Files, TRNBUILD Format	MODE???.TB	ASCII
Peak and Off-Peak Walk Access Links, TRNBUILD Format	WALK_AM.TB, WALK_OP.TB	ASCII
Peak/Off-Peak Zonal Drive Access Links, TRNBUILD Format	PNR_AM.TB, PNR_OP.TB	ASCII
Walk Network Links, TRNBUILD Format	WLKNET.TB	ASCII
Rail Links File, TRNBUILD Format	MET_LINK.TB, COM_LINK.TB	ASCII
Rail Node File, TRNBUILD Format	MET_NODE.TB, COM_NODE.TB	ASCII
PNR/Bus, Station Connect Links/Nodes, TRNBUILD Format	BUS_PNRN.TB, BUS_PNRL.TB, MET_PNRN.TB, MET_PNRL.TB, COM_PNRN.TB, COM_PNRL.TB	ASCII
Station/Bus Connect Links, TRNBUILD Format	MET_BUS.TB, COM_BUS.TB	ASCII
Local Bus Time Factors	LBUS_TIMFTRS.ASC	ASCII

Output(s):

Peak/Off-Peak Walk Access Skims	??_AM_WK.SKM, ??_OP_WK.SKM	Binary
Peak/Off-Peak Drive Access Skims	??_AM_DR.SKM, ??_OP_DR.SKM	Binary
Peak/Off-Peak Walk Access Station-to-Station Tables	??_AM_WK.STA, ??_OP_WK.STA	Binary
Peak/Off-Peak Drive Access Station-to-Station Tables	??_AM_DR.STA, ??_OP_DR.STA	Binary
Transit Accessibility File	JOBACC.ASC	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 (SKM), the Metrorail on/off station file (STA), and the total transit time file (TTT). The mode choice skim file contains six tables:

1) Walk transfer time
2) Drive access time
3) Initial wait time
4) Transfer wait time

[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.

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 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.

The transit skimming script also reads a file containing local bus factors used to degrade local bus times skims to incorporate the effect of growing highway congestion.

Chapter 6. Transit Fare Development

Input(s):

Metro Station Link File	METLNKM1.TB	ASCII
Metro Station XY File	METNODM1.TB	ASCII
MFARE1 A1 (Coordinate) File	MFARE1.A1	ASCII
Peak/Off-Peak Station-to-Station Tables	??_AM_WK.STA, ??_OP_WK.STA	Binary
Peak / Off-Peak MFARE2 Bus Fare Matrix	BUSFARAM.ASC, BUSFAROP.ASC	ASCII
Peak /Off-Peak MFARE2 A2 File	FAREA2.ASC	ASCII

Output(s):

Peak/Off-Peak Transit Fare Files	MF_AM_WK.FAR, MF_OP_WK.FAR, MF_AM_DR.FAR, MF_OP_DR.FAR	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 (METLNKM1.TB)

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 (METNODM1.TB)

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 (BUSFAR??.ASC)

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 (FAR_A2.ASC)

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):

Zonal Land Use File	ZONE.ASC	ASCII
Zonal Area Type File	BASEZON.DAT	ASCII
Transit Accessibility File	JOBACC.ASC	ASCII
Zonal Households by Vehicle Ownership Levels	HH_VEH.DAT	ASCII
Zonal Short/Long Walk Access Time File	SHLG??.ASC	ASCII

Output(s):

Zonal HHs of Income Level 1, Stratified by Size and Vehicle Avail.	HHI1_SV.DAT	ASCII
Zonal HHs of Income Level 2, Stratified by Size and Vehicle Avail.	HHI2_SV.DAT	ASCII
Zonal HHs of Income Level 3, Stratified by Size and Vehicle Avail.	HHI3_SV.DAT	ASCII
Zonal HHs of Income Level 4, Stratified by Size and Vehicle Avail.	HHI4_SV.DAT	ASCII
Interim Output: Zonal Household Size, Income Level File	HHSIZINC.DAT	ASCII
Interim Output: Households by Number of Vehicles (0, 1, 2+)	HH_VEH.DAT	ASCII
HBW Zonal A1 Deck (for the Mode Choice Model)	HBWV2.A1F	ASCII
HBS Zonal A1 Deck (for the Mode Choice Model)	HBSV2.A1F	ASCII
HBO Zonal A1 Deck (for the Mode Choice Model)	HBOV2.A1F	ASCII
NHB Zonal A1 Deck (for the Mode Choice Model)	NHBV2.A1F	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, i.e., HH(1)VA(1), HH(1)VA(2), HH(1)VA(3), etc. See p. 8-4)
	Hhi2_sv	Zonal Inc. 2 HH file (HH stratified by size, veh. availability levels, i.e., HH(1)VA(1), HH(1)VA(2), HH(1)VA(3), etc. See p. 8-4)
	Hhi3_sv	Zonal Inc. 3 HH file (HH stratified by size, veh. availability levels, i.e., HH(1)VA(1), HH(1)VA(2), HH(1)VA(3), etc. See p. 8-4)
	Hhi4_sv	Zonal Inc. 4 HH file (HH stratified by size, veh. availability levels, i.e., HH(1)VA(1), HH(1)VA(2), HH(1)VA(3), etc. See p. 8-4)
	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 and Interim Output 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 (BASEZON.DAT)

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 (SHLG??.FIN)

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
33-37	F5.1	Avg. short walk time to Transit (in min.) / (ranging from 0 – 6.7)
38-42	F5.1	Avg. long walk time to Transit (in min.) / (ranging from 6.7 – 20.0)

Exhibit 7-5 Household Income, Household Size File (HHSIZINC.DAT)

Data Item	*Begin Col.*	*End Col.*	*Format*
TAZ	1	4	I4
HHs Income level 1 Size 1	30	35	I6
HHs Income level 1 Size 2	37	42	I6
HHs Income level 1 Size 3	44	49	I6
HHs Income level 1 Size 4+	51	56	I6
HHs Income level 2 Size 1	58	63	I6
HHs Income level 2 Size 2	65	70	I6
HHs Income level 2 Size 3	72	77	I6
HHs Income level 2 Size 4+	79	84	I6
HHs Income level 3 Size 1	86	91	I6
HHs Income level 3 Size 2	93	98	I6
HHs Income level 3 Size 3	100	105	I6
HHs Income level 3 Size 4+	107	112	I6
HHs Income level 4 Size 1	114	119	I6
HHs Income level 4 Size 2	121	126	I6
HHs Income level 4 Size 3	128	133	I6
HHs Income level 4 Size 4+	135	140	I6

Exhibit 7-6 Zonal Households by Vehicle Ownership Levels (HH_VEH.DAT)

Columns	*Format*	*Field Description*
1-5	I5	TAZ
6-11	I6	Households with 0 vehicles available
12-17	I6	Households with 1 vehicles available
18-23	I6	Households with 2+ vehicles available

Exhibit 7-7 Transit Accessibility File (`JOBACC.ASC`)

Columns	*Format*	*Field Description*
1-5	I5	TAZ
32-40	F9.0	AM transit accessibility via transit within 40 minutes

Chapter 8. Trip Generation

Input(s):

Zonal Land Use File	ZONE.ASC	ASCII
Zonal HHs of Income Level 1, Stratified by Size and Vehicle Avail.	HHI1_SV.DAT	ASCII
Zonal HHs of Income Level 2, Stratified by Size and Vehicle Avail.	HHI2_SV.DAT	ASCII
Zonal HHs of Income Level 3, Stratified by Size and Vehicle Avail.	HHI3_SV.DAT	ASCII
Zonal HHs of Income Level 4, Stratified by Size and Vehicle Avail.	HHI4_SV.DAT	ASCII
Zonal Adjustment File, Purpose-Specific: HBW, HBS, HBO, NHB, MEDTRK, HVYTRK	ADJZPAF7.UPW, ADJZPAF7.UPS, ADJZPAF7.UPO, ADJZPAF7.UPN, ADJZPAF7.UPM, ADJZPAF7.UPH	ASCII
External Production File	PEXT.ASC	ASCII
External Attraction File	AEXT.ASC	ASCII
Zonal Area Type File	BASEZON.DAT	ASCII

Output(s):

Trip End, Production-Attraction Files	HBW_PRO.I1, HBW_PRO.I2, HBW_PRO.I3, HBW_PRO.I4, HBW_PRO.ALL, HBW_ATT.I1, HBW_ATT.I2, HBW_ATT.I3, HBW_ATT.I4, HBW_ATT.ALL, HBS_PRO.I1, HBS_PRO.I2, HBS_PRO.I3, HBS_PRO.I4, HBS_PRO.ALL, HBS_ATT.I1, HBS_ATT.I2, HBS_ATT.I3, HBS_ATT.I4, HBS_ATT.ALL, HBO_PRO.I1, HBO_PRO.I2, HBO_PRO.I3, HBO_PRO.I4, HBO_PRO.ALL, HBO_ATT.I1, HBO_ATT.I2, HBO_ATT.I3, HBO_ATT.I4, HBO_ATT.ALL, NHB_PRO.I1, NHB_PRO.I2, NHB_PRO.I3, NHB_PRO.I4, NHB_PRO.ALL, NHB_ATT.I1, NHB_ATT.I2, NHB_ATT.I3, NHB_ATT.I4, NHB_ATT.ALL, MTK_PRO.ALL, MTK_ATT.ALL, HTK_PRO.ALL, HTK_ATT.ALL	ASCII
HBW Non-Motorized Trip Ends	HBWNMP_A.DAT	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 (HHI?_SV.DAT)

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 (ADJZPAF7.UP?)

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 (PEXT.ASC, AEXT.ASC)

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):

Trip End, Production-Attraction Files	HBW_PRO.I1, HBW_PRO.I2, HBW_PRO.I3, HBW_PRO.I4, HBW_PRO.ALL, HBW_ATT.I1, HBW_ATT.I2, HBW_ATT.I3, HBW_ATT.I4, HBW_ATT.ALL, HBS_PRO.I1, HBS_PRO.I2, HBS_PRO.I3, HBS_PRO.I4, HBS_PRO.ALL, HBS_ATT.I1, HBS_ATT.I2, HBS_ATT.I3, HBS_ATT.I4, HBS_ATT.ALL, HBO_PRO.I1, HBO_PRO.I2, HBO_PRO.I3, HBO_PRO.I4, HBO_PRO.ALL, HBO_ATT.I1, HBO_ATT.I2, HBO_ATT.I3, HBO_ATT.I4, HBO_ATT.ALL, NHB_PRO.I1, NHB_PRO.I2, NHB_PRO.I3, NHB_PRO.I4, NHB_PRO.ALL, NHB_ATT.I1, NHB_ATT.I2, NHB_ATT.I3, NHB_ATT.I4, NHB_ATT.ALL, MTK_PRO.ALL, MTK_ATT.ALL, HTK_PRO.ALL, HTK_ATT.ALL	ASCII
SOV Peak, Off-Peak Highway Skims	??_AM.SKM, ??_OP.SKM	Binary
Peak Transit Walk Access Skims	??_AM_WK.SKM	Binary
Off-Peak Transit Walk Access Skims	??_OP_WK.SKM	Binary
Peak Transit Drive Access Skims	??_AM_DR.SKM	Binary
Off-Peak Transit Drive Access Skims	??_OP_DR.SKM	Binary
Land Use File	ZONE.ASC	ASCII
Highway Terminal Time File	ZTERMTM.ASC	ASCII
F-Factor Files	HBWV2.FFS, HBSV2.FFS, HBOV2.FFS, N_TV2.FFS	ASCII
K-Factor Files	HBWK.DAT, HBSK.DAT, HBOK.DAT, NHBK.DAT, MTKK.DAT, HTKK.DAT	Binary
Time penalty Files	HBWPEN.DAT, HBSPEN.DAT, HBOPEN.DAT, NHBPEN.DAT	Binary
Income level Toll/Time Equivalent File	TOLL.INC	ASCII

Output(s):

6 Trip Tables (HBW, HBS, HBO, NHB, Med Truck, Heavy Truck)	HBWEST??.PTT, HBSEST??.PTT, HBOEST??.PTT, NHBEST??.PTT, MTKEST??.PTT, HTKEST??.PTT	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.

Input File Descriptions and Formats

1. Land Use File (See Chapter 2)

2. Highway Terminal Time File

Exhibit 9-1 Highway Terminal Time File (ZTERMTM.ASC)

Columns	*Format*	*Field Description*
1-4	I4	TAZ
27-28	I2	Highway terminal time (minutes)

Chapter 10. Mode Choice

Input(s):

Daily Person Trip Table	??_HBWMU.PTT, ??_HBSMU.PTT, ??_HBOMU.PTT, ??_NHBMU.PTT	Binary
Walk Access Transit Skims	??_AM_WK.SKM, ??_OP_WK.SKM	Binary
Drive Access Transit Skims	??_AM_DR.SKM, ??_OP_DR.SKM	Binary
Walk Access Transit Fares	??_AM_WK.FAR, ??_OP_WK.FAR	Binary
Drive Access Transit Fares	??_AM_DR.FAR, ??_OP_DR.FAR	Binary
SOV Highway Skims	SOV??AM.SKM, SOV??OP.SKM	Binary
HOV2 Highway Skims	HOV2??AM.SKM, HOV2??OP.SKM	Binary
HOV 3+ Highway Skims	HOV3??AM.SKM, HOV3??OP.SKM	Binary
Zonal (A1) File	HBWV2.A1F, HBSV2.A1F, HBOV2.A1F, NHBV2.A1F	ASCII
Transit Percentage Adjustment File	MCTF_HBW.ASC, MCTF_HBS.ASC, MCTF_HBO.ASC, MCTF_NHB.ASC	ASCII
Car Occupancy Adjustment Files	MCCF_HBW.ASC, MCCF_HBS.ASC, MCCF_HBO.ASC, MCCF_NHB.ASC	ASCII
Non-work Transit Factors File (unused)	MC_FAC.ASC	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	MC_HBW??.FIN, ETC.	MINUTP Binary

Program File(s):

COGMC.EXE, EXTRTAB.EXE

Control/Support File(s):

Control Files: HBWMC.SET, HBSMC.SET, HBOMC.SET, NHBMC.SET
Jurisdiction-level factor files: 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
Scripts: MC_SUMMARY.S, MC_CONSTRAINT.S, MC_CONSUMMARY.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 summary program MC_CONSUMMARY is used to produce summaries for when the mode choice constraint through the regional core is applied (typically for runs after 2005).

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.

Transit Constraint

Recent travel modeling at COG/TPB has added processing steps, generally referred to as the "transit constraint." The constraint was implemented to reflect the assumption that the core capacity of the transit system will not support expected passenger demand *beyond* projected 2005 levels. The transit constraint was therefore applied to impose a transit trip maximum on forecasted transit trips, as established by 2005 transit trip flows, for those trips destined *to or through* the regional core. The resulting *displaced* transit trips resulting from the constraining process were subsequently allocated among automobile modes. The transit constraint process is implemented with a special batch file (which takes the place of Mode_Choice.Bat) and two scripts:

1) MC_Constraint.S (TP+ script file residing in the ..\SCRIPTS subdirectory)
2) MC_ConSummary.S (TP+ script file residing in the ..\SCRIPTS subdirectory)

3) Mode_Choice_TC.bat (application batch file residing in the 'route' subdirectory)

Detailed information on each file is provided below.

MC_Constraint.S

The MC_Constraint.S script is used to work through the necessary matrix manipulations for applying Version 2.1 transit constraint process, specifically:

1) The program reads the constrained (2005) and forecasted/unconstrained zone level transit trips resulting from the mode choice model and calculates peak transit trips for both years;

2) Both sets of zone-level transit trips are compressed to determine the aggregate trip flows *to and through* the regional core, and aggregate factors are computed for constraining the forecasted transit trips;

3) The aggregate transit constraint factors are applied to the zone-level forecasted transit trips and automobile trips are adjusted to incorporate the displaced transit trips.

The above constraint process varies slightly from the Version 1 approach in that it includes a step to extract peak period trips from daily trips. Since Version 1 model produced HBW transit trips only, the transit constraint approach included the simplifying assumption that *all* such trips occur during the peak period. Therefore, the forecasted *daily* transit trips moving to or through the regional core were adjusted to match the constraining 2005 *daily* totals. Given that the Version 2.1/TP+ model now produces *both* work and non-work transit trips, a more detailed method to extract peak period transit trips from the daily travel was deemed necessary. Unlike work trips, the majority of non-work transit trips occurs outside of the peak period and is therefore irrelevant to system capacity issues. Exhibit 10-1 specifies temporal transit trip distributions (percentages) summarized on the basis of purpose and orientation. The distributions were developed previously from the COG/TPB 1994 Household Travel Survey and deemed reasonable for developing peak transit travel estimates more precisely. It is currently assumed that the temporal distributions will remain *constant* through time, as there is currently no observed basis for determining how hourly travel distributions will change.

Exhibit 10-1 Temporal Distribution (%) of Transit Trips by Orientation, Time Period, and Purpose

Trip Orientation	Time Period	Purpose			
		HBW	***HBS***	***HBO***	***NHB***
Home to Work	*AM (6:00-9:00 AM)*	70	24	38	14
	PM (4:00-7:00 PM)	5	15	13	31
	Off-Peak Hours	25	61	49	55
	Subtotal	100	100	100	100
Work to Home	*AM (6:00-9:00 AM)*	1	2	2	14
	PM (4:00-7:00 PM)	72	35	35	31
	Off-Peak Hours	27	63	63	55
	Subtotal	100	100	100	100

Source: 1994 COG HTS

Equation (1) shows the general form by which the temporal factors are applied to the 2005 and forecasted daily zonal transit trips to arrive at trip estimates for a specific time period (in step1).

(1) $PrdTrips_{ij} = [HWF * DayTrips_{ij} / 2.0] + [WHF * DayTrips_{ji} / 2.0]$

Where:

$PrdTrips_{ij}$ = estimated trips in a specific time period between zones i & j
HWF = Home-to-Work factor for period
WHF = Work-to-Home factor for period
$DayTrips_{ij}$ = Daily transit trips (P/A format) between zones i & j
$DayTrips_{ji}$ = Daily transit trips (P/A format) between zones j & i

Four files are written corresponding to each modeled purpose. Each file contains three zonal trip tables: 1) total peak period transit trips (*both* AM & PM, 2) off-peak transit trips, and 3) daily transit trips. A concise summary of the transit trip totals by time period is provided on an ASCII file named MC_Constraint.tab (see example listing in Attachment 1).

2005 and unconstrained peak period transit trips are each compressed from zone level to '3 by 3' superdistrict trip tables, by purpose, to allow for a computation of adjustment factors that will subsequently be applied to the unconstrained zonal transit trips (step 2). The 3 superdistricts are defined as: 1) Virgina, Non-Regional Core (including W. Virginia), 2) Virgina & DC Regional Core, and 3) Maryland & DC Non-Regional Core[1]. Adjustment factors representing the ratio of constrained to unconstrained transit trips are computed for interchanges representing trips to or through the regional core (1/2, 1/3, 3/1, and 3/2). Factors associated with all other interchanges are initialized to a value of 1.00. Daily constrained forecasted transit trips are computed by purpose and are defined as shown in equation (2):

(2) $DConFTrn_{ij} = DUncFTrn_{ij} - PUncFTrn_{ij} + P05Trn_{ij}$

[1] External stations intentionally not considered in the matrix compression.

Where:
$DConFTrn_{ij}$ = Daily Constrained Forecasted transit trips from superdistrict i to j
$DUncFTrn_{ij}$ = Daily Unconstrained Forecasted transit trips from superdistrict i to j
$PUncFTrn_{ij}$ = Peak period Unconstrained Forecasted transit trips from superdistrict i to j
$P05Trn_{ij}$ = Peak period 2005 transit trips from superdistrict i to j

The equation simply indicates that the resulting constrained forecasted transit trips are comprised of unconstrained off-peak trips plus 2005 peak period transit trips. Four small (9-record) ASCII files are written out for each purpose. The files are named TCONFTR.HBW, TCONFTR.HBS, TCONFTR.HBO, and TCONFTR.NHB. Each file contains interchange level totals at the 3 by 3 interchange level, for the interchanges of interest.

- Interchange as a two-digit number, eg '11' refers to origin 1, destination 1, etc.
- Constrained (2005) peak transit trips
- Constrained (2005) daily transit trips
- Unconstrained (forecasted) peak transit trips
- Unconstrained (forecasted) daily transit trips
- Final/constrained forecasted daily transit trips
- Adjustment factor (constrained / unconstrained forecasted daily transit trips)

The ASCII files containing the transit adjustment factors are read into the third and final step of the script (as lookup tables). Logically, the resulting adjustment factors *should* always be greater than zero and less than 1.00. The final (constrained) regional transit totals computed at the 3 by 3 level are also carried forward (via the TP+ LOG command) so that they can be checked against the zone level transit totals computed at the third step. During step 3, the unconstrained zone-level trip file resulting from the mode choice model is modified on an *interchange* basis to reflect the transit constraint. The standard set of tables on the file are shown below:

1) LOV Auto Drivers (including HOVs on general use facilities)
2) LOV Auto Persons (including HOV persons on general use facilities)
3) Walk Access Transit
4) Drive Access Transit
5) HOV 2-Occ Auto Drivers (on Priority Facilities/HBW only)
6) HOV Auto Person (on Priority Facilities/HBW only)
7) HOV3+-Occ. Auto Drivers (on Priority Facilities/HBW only)

The constraint factors are first applied uniformly to both walk-access and drive-access transit trips. Next, the transit residual is computed as the difference between unconstrained and constrained transit trips. If HOV persons (t6) exist, the transit residual is apportioned and added to the existing LOV and HOV persons based upon the existing proportion, otherwise the transit residual is added to the LOV persons (t2). Finally, the residual LOV/HOV auto drivers are computed and added to the existing auto driver tables (t1,t7) from the associated residual auto persons based on the existing auto driver percentage in the cell. For cases where displaced transit trips exist but no auto persons exist, a default auto driver percentage is used. The default percentages are based on the 1994 HTS and are shown below:

Default Auto Driver Percentages

Purpose	Default Value	Implied Car Occupancy
HBW	90.09%	1.11
HBS	81.30%	1.23
HBO	68.97%	1.45
NHB	80.00%	1.25

A concise summary of the constrained and unconstrained transit trip totals by mode is provided on an ASCII file named MC_Constraint.tab. This file should be reviewed for reasonability. Note that regional input and output person trip totals will not match perfectly because the TP+ 'bucket-rounding' function is invoked after the calculations are made for all interchanges.

MC_ConSummary.S

This script is used to generate jurisdictional trip summaries of the modified mode choice output file. An ASCII listing file named MC_ConSummary.tab is ultimately generated. This file may be compared to MC_Summary.tab which contains a jurisdictional summary of the unconstrained trips which is normally generated after the mode choice model is executed.

Mode_Choice_TC.bat

The Mode_Choice_TC.bat file *replaces* the standard batch file used to execute the mode choice model (Mode_Choice.bat). The file resides in the top-level subdirectory along with the pre-existing application batch files. Prior to running batch file, 2005 transit trip tables *must* exist on the machine of execution. The user also *must* specify the path of the pre-existing 2005 transit trip tables produced by the mode choice model. The path of the 2005 mode choice files is normally defined in the 'RUNALL' batch file as an environment variable near the top of the batch file, as shown on the example line below:

```
set _path05_=\cgv2tp\cg2005\
```

A section of the "runall" batch file checks that the 'standard' mode choice output files do, in fact, exist in the user-specified path. If the files are not detected the batch operation will exit to a 'pause' statement, thus halting the process execution. Beyond defining the _path05_ variable, the user will normally apply the batch file as is.

Irrespective of whether the constrained batch file (Mode_Choice_TC.bat) or the unconstrained batch file (Mode_Choice.bat) is used, the resultant mode choice output files produced will be named, MC_HBW.FIN, MC_HBS.FIN, MC_HBO.FIN, and MC_NHB.FIN.

Input File Descriptions and Formats

Exhibit 10-2 Zonal File, or "A1 Deck," Format Description (???v2.a1f)

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 1994 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 10-3 Transit and Car Occupancy Adjustment Factor File Format Description (mc?f_???.asc)

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 10-4 Mode Choice Parameter Listing, Values which may be changed by user

COG/TPB Model, Version 2.1D #50

Keyword	Type	Purpose				Description
		HBW	HBS	HBO	NHB	
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	9.1	9.1	9.1	9.1	Auto operating cost in cents per mile (1994 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) **NOT USED**
UPARMS(14)	R	82.5	82.5	82.5	82.5	Forecast year consumer price index (CPI-U) **NOT USED**
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				Description
		HBW	HBS	HBO	NHB	
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: mcUparmsV21d19.xls
Type: I = integers; R = decimal value; L = logical (true or false)

Exhibit 10-5 Mode Choice Parameter Listing, Values which should not be changed by user

COG/TPB Model, Version 2.1D #50

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	0.075	0.02432	0.04991	0.06695	Coefficient on transit walk time
UPARMS(32)	R	0.075	0.02432	0.04991	0.06695	Coefficient on transit initial wait time ("wait 1")
UPARMS(33)	R	0.075	0.02432	0.04991	0.06695	Coefficient on transfer time ("wait 2")
UPARMS(34)	R	0.03	0.00912	0.01902	0.03242	Coefficient on transit non-Metrorail IVTT
UPARMS(35)	R	0.03	0.00912	0.01902	0.03242	Coefficient on transit Metrorail IVTT
UPARMS(36)	R	0	-2.627E-05	-2.585E-05	-1.369E-05	Drive alone coefficient on land-use mix index variable at production zone
UPARMS(37)	R	2.518E-05	-2.438E-05	-2.171E-05	-1.300E-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	0.00425	0.00416	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	0.03	0.00912	0.01902	0.03242	Coefficient on transit auto-connect time
UPARMS(43)	R	2.0499	2.9	2.9	1.4	Transit auto-connect bias coefficient for 0-auto households
UPARMS(44)	R	0.5876	0	1.1	0	Transit auto-connect bias coefficient for 1-auto households
UPARMS(45)	R	0.3571	-2	0.65	0	Transit auto-connect bias coefficient for 2+auto households
UPARMS(46)	R	-4.449E-05	0	-5.194E-05	0	Transit coefficient on land-use mix index variable at production zone
UPARMS(47)	R	0.03	0.00912	0.01902	0.03242	Coefficient on drive alone highway terminal (excess) time
UPARMS(48)	R	0.03	0.00912	0.01902	0.03242	Coefficient on drive alone highway IVTT
UPARMS(49)	R	0.00425	0.00416	0	0	Coefficient on drive alone highway operating cost

Keyword	Type	Purpose				Description
		HBW	HBS	HBO	NHB	
UPARMS(50)	R	0.00425	0.00416	0	0	Coefficient on drive alone highway parking cost
UPARMS(51)	R	0.00425	0.00416	0	0	Coefficient on drive alone highway toll
UPARMS(52)	R	0	0	0	0	Coefficient on drive alone highway distance
UPARMS(53)	R	4.831	3.037	4.3573	-0.8541	Drive alone bias coefficient for 0-auto households
UPARMS(54)	R	0.8546	-2.272	-0.0047	0	Drive alone bias coefficient for 1-auto households
UPARMS(55)	R	-0.0824	-3.751	-0.3111	0	Drive alone bias coefficient for 2+ auto households
UPARMS(56)	R	0	-4.869E-05	-2.307E-05	-1.659E-05	Transit coefficient on land-use mix index variable at attraction zone
UPARMS(57)	R	0.03	0.00912	0.01902	0.03242	Coefficient on group ride highway terminal (excess) time
UPARMS(58)	R	0.03	0.00912	0.01902	0.03242	Coefficient on group ride highway IVTT
UPARMS(59)	R	0.00425	0.00416	0	0	Coefficient on group ride highway operating cost
UPARMS(60)	R	0.00425	0.00416	0	0	Coefficient on group ride highway parking cost
UPARMS(61)	R	0.00425	0.00416	0	0	Coefficient on group ride highway toll
UPARMS(62)	R	0	0	0	0	Coefficient on group ride highway distance
UPARMS(63)	R	4.6175	0.888	3.1938	0.076	Group ride bias coefficient for 0-auto households
UPARMS(64)	R	2.4071	-1.929	0.5041	0	Group ride bias coefficient for 1-auto households
UPARMS(65)	R	1.8979	-3.507	-0.0499	0	Group ride bias coefficient for 2+ auto households
UPARMS(66)	R	0	0	0.78384	0.86043	Natural log of highway cost for drive alone and group ride in the mode choice model
UPARMS(67)	R	0	0.45633	0.6853	0.00709	Coefficient on 2 persons: Auto highway terminal (excess) time
UPARMS(68)	R	0	0.45633	0.6853	0.00709	Coefficient on 2 persons: Auto highway IVTT
UPARMS(69)	R	0.01124	0	0	0	Coefficient on 2 persons: Auto highway operating cost
UPARMS(70)	R	0.02318	0	0	0	Coefficient on 2 persons: Auto parking cost
UPARMS(71)	R	0.05077	0	0	0	Coefficient on 2 persons: Auto highway toll
UPARMS(72)	R	0	0	0	0.00187	Coefficient on 2 persons: Auto highway distance
UPARMS(73)	R	0	0.45633	0.6853	0.00709	Coefficient on 3 persons: Auto highway terminal (excess) time

Keyword	Type	Purpose				Description
		HBW	HBS	HBO	NHB	
UPARMS(74)	R	0	0.45633	0.6853	0.00709	Coefficient on 3 persons: Auto highway IVTT
UPARMS(75)	R	0.01124	0	0	0	Coefficient on 3 persons: Auto highway operating cost
UPARMS(76)	R	0.02318	0	0	0	Coefficient on 3 persons: Auto parking cost
UPARMS(77)	R	0.05077	0	0	0	Coefficient on 3 persons: Auto highway toll
UPARMS(78)	R	0	0	0	0.00187	Coefficient on 3 persons: Auto highway distance
UPARMS(79)	R	0	0	0	0.92477	3-person auto bias coefficient for 0-auto households
UPARMS(80)	R	1.47162	0.92201	0.31756	0	3-person auto bias coefficient for 1-auto households
UPARMS(81)	R	1.88085	0.48966	0.15151	0	3-person auto bias coefficient for 2+ auto households
UPARMS(82)	R	0	0	0.78384	0.86043	Natural log of transit fare for transit mode in the mode choice model
UPARMS(83)	R	0	0.45633	0.6853	0.00709	Coefficient on 4+ persons: Auto highway terminal (excess) time
UPARMS(84)	R	0	0.45633	0.6853	0.00709	Coefficient on 4+ persons: Auto highway IVTT
UPARMS(85)	R	0.01124	0	0	0	Coefficient on 4+ persons: Auto highway operating cost
UPARMS(86)	R	0.02318	0	0	0	Coefficient on 4+ persons: Auto parking cost
UPARMS(87)	R	0.05077	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	1.41003	4+person auto bias coefficient for 0-auto households
UPARMS(90)	R	3.04973	1.51854	0	0	4+person auto bias coefficient for 1-auto households
UPARMS(91)	R	2.54494	0.84071	-0.21854	0	4+person auto bias coefficient for 2+ auto households
UPARMS(92)	R	0	0	-0.41346	-0.76998	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

Keyword	Type	Purpose				Description
		HBW	HBS	HBO	NHB	
UPARMS(97)	R	0	0	0	0	Transit bias coefficient for drive access to short (or single) walk access market
UPARMS(98)	R	-0.03611	0	0	0	Coefficient on HOV highway time savings (compared to normal highway network) for 3- & 4+occ.
UPARMS(99)	R	0	-0.84404	-0.69708	-1.47447	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
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: mcUparmsV21d19.xls

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

Chapter 11. Time-of-Day Processing

Input(s):

Daily Auto Driver Trips, by Occupancy Levels	`HBW??.ADR, HBS??.ADR, HBO??.ADR, NHB??.ADR`	Binary
Daily Miscellaneous and Truck Trips	`VISI.ADR, TAXI.ADR, SCHL.ADR, AIRPAX.ADR, XXTRK.VTT, XXAUT.VTT, MTKEST??.VTT, HTKEST??.VTT`	Binary
Time of Day Percent File by Purpose, Mode, and Direction	`V2TODTPP.PAR`	ASCII / TP+ script

Output(s):

Trip Tables by Time Period	`AM??.ADR, PM??.ADR, OP??.ADR`	Binary
Miscellaneous Time-of-Day Files	`MISCAM.TT, MISCPM.TT, MISCOP.TT`	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):

Modeled vehicle trip tables by occupant level and time period	`AM??.ADR, PM??.ADR, OP??.ADR`	Binary
Non-modeled vehicle and truck trip tables by time period	`MISCAM.TT, MISCPM.TT, MISCOP.TT`	Binary
Network File	`ZONEHWY.NET, PPHWY.NET, I1HWY.NET, ETC., I5HWY.NET`	Binary

Output(s):

Loaded Links Files by Time Period	`I6HWY.NET`	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 seven times: pump prime, first, second, third, fourth, fifth, and sixth iteration. Each assignment run utilizes a user equilibrium algorithm that is run for 20 fixed 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 for any given iteration is executed for each time period. After the three time-period-specific assignments, a summary routine follows to compute daily (24-hour) statistics. The traffic assignment process produces an output (or 'loaded links') file corresponding to each iteration of the travel model. The succession of loaded links files produced during a model execution is as follows:

PPHWY.NET (Loaded Links file resulting from the 'pump-prime' iteration)
I1HWY.NET (Loaded Links file resulting from standard iteration 1)
I2HWY.NET (Loaded Links file resulting from standard iteration 2)
.
.
.
I6HWY.NET (Loaded Links file resulting from standard iteration 6)

There are 14 network link variables produced from each assignment execution, including the time period-specific volume, VC ratio, volume-day value, and restrained speed, as well as the daily volume and daily VMT. The general form of the variable naming is as follows:

<AA> <BB><CCC>

Where *<AA>* refers to the iteration (PP, I1, I2,…I6), *<BB>* refers to the time period (AM, PM, OP, 24), and *<CCC>* refers to the variable type (VOL, VC, VDF, SPD, VMT). The results of each assignment execution are preserved, so the number of loaded link attributes generally increases with each model iteration. The 'final' assignment results are associated with the 6th (and final) iteration, namely: I6AMVOL, I6AMVC, I6AMVDF, I6AMSPD, …, I6OPSPD, I624VOL, and I624VMT. A comprehensive listing of the link attributes that normally result from a complete model execution is shown as Exhibit 12-1.

Exhibit 12-1 Link variables on the loaded-link highway network from the final speed feedback iteration (i6hwy.net)

Variable	Format	Description
A	5	A node
B	5	B node
DISTANCE	5.2	Link distance (miles)
SPDCLASS	2	Speed class
CAPCLASS	2	Capacity class
COUNT	3	Daily ground count in thousands (AAWT)
JUR	2	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
SCREEN	2	Screenline code (1-20, 22-28, 31-38)
FTYPE	1	Link Facility Type Code (0-6): 0/centroids, 1/Freeways, 2/Major Art., 3/Minor Art, 4/Collector, 5/Expressway, 6/Ramp (future use)
TOLL	3	Toll Value in current year dollars
TOLLGRP	1	Toll Group Code (1-9)
AMLANE	1	AM Peak No. of Lanes
AMLIMIT	1	AM Peak Limit Code (0-9) See note #1
PMLANE	1	PM Peak No. of Lanes
PMLIMIT	1	PM Peak Limit Code (0-9) See note #1
OPLANE	1	Off-Peak No. of Lanes
OPLIMIT	1	Off-Peak Limit Code (0-9) See note #1
PROJ_ID	Alpha	Project ID
TAZ	4	Transportation Analysis Zone associated with the link
AREATP	1	Area type (1-7)
AMTOLL	9.5	Final AM period toll value derived from TOLL & TOLLGRP
PMTOLL	9.5	Final PM period toll value derived from TOLL & TOLLGRP
OPTOLL	9.5	Final OP period toll value derived from TOLL & TOLLGRP
PPAMSPD	8.5	Pump prime iteration, AM speed
PPOPSPD	2	Pump prime iteration, off-peak speed
PPPMSPD	2	Pump prime iteration, PM speed
AMHTIME	8.5	Highway link time in minutes, computed from the pump-prime speeds, AM
PMHTIME	8.5	Highway link time in minutes, computed from the pump-prime speeds, PM
OPHTIME	8.5	Highway link time in minutes, computed from the pump-prime speeds, OP
PPAMVOL	11.5	Pump prime iteration, AM estimated volume
PPAMVC	7.5	Pump prime iteration, AM estimated volume-to-capacity ratio
PPAMVDF	7.5	Pump prime iteration, AM volume-delay function value for the corresponding VC ratio
PPPMVOL	11.5	Pump prime iteration, PM estimated volume
PPPMVC	8.5	Pump prime iteration, PM estimated volume-to-capacity ratio
PPPMVDF	7.5	Pump prime iteration, PM volume-delay function value for the corresponding VC ratio
PPOPVOL	11.5	Pump prime iteration, off-peak estimated volume
PPOPVC	7.5	Pump prime iteration, off-peak estimated volume-to-capacity ratio
PPOPVDF	7.5	Pump prime iteration, off-peak volume-delay function value for the corresponding VC ratio
PP24VOL	12.5	Pump prime iteration, daily (24-hour) estimated volume (AAWT)
PP24VMT	12.5	Pump prime iteration, daily (24-hour) estimated vehicle miles of travel

Variable	Format	Description
TVOL00	3	Interim variable, can be disregarded
TVMT00	6.2	Interim variable, can be disregarded
TVOLEST	3	Interim variable, can be disregarded
TVOLOBS	3	Interim variable, can be disregarded
TVMTEST	6.2	Interim variable, can be disregarded
TVMTOBS	6.2	Interim variable, can be disregarded
I1AMVOL	11.5	First iteration, AM estimated volume
I1AMVC	7.5	First iteration, AM estimated volume-to-capacity ratio
I1AMVDF	7.5	First iteration, AM volume-delay function value for the corresponding VC ratio
I1AMSPD	8.5	First iteration, AM speed
I1PMVOL	11.5	First iteration, PM estimated volume
I1PMVC	7.5	First iteration, PM estimated volume-to-capacity ratio
I1PMVDF	7.5	First iteration, PM volume-delay function value for the corresponding VC ratio
I1PMSPD	8.5	First iteration, PM speed
I1OPVOL	11.5	First iteration, OP estimated volume
I1OPVC	7.5	First iteration, OP estimated volume-to-capacity ratio
I1OPVDF	7.5	First iteration, OP volume-delay function value for the corresponding VC ratio
I1OPSPD	8.5	First iteration, OP speed
I124VOL	12.5	First iteration, daily (24-hour) estimated volume (AAWT)
I124VMT	12.5	First iteration, daily (24-hour) estimated vehicle miles of travel
* * *	* * *	* * * Etc. * * *
I6AMVOL	5	Sixth iteration, AM estimated volume
I6AMVC	7.5	Sixth iteration, AM estimated volume-to-capacity ratio
I6AMVDF	7.5	Sixth iteration, AM volume-delay function value for the corresponding VC ratio
I6AMSPD	8.5	Sixth iteration, AM speed
I6PMVOL	5	Sixth iteration, PM estimated volume
I6PMVC	7.5	Sixth iteration, PM estimated volume-to-capacity ratio
I6PMVDF	7.5	Sixth iteration, PM volume-delay function value for the corresponding VC ratio
I6PMSPD	8.5	Sixth iteration, PM speed
I6OPVOL	5	Sixth iteration, OP estimated volume
I6OPVC	7.5	Sixth iteration, OP estimated volume-to-capacity ratio
I6OPVDF	7.5	Sixth iteration, OP volume-delay function value for the corresponding VC ratio
I6OPSPD	8.5	Sixth iteration, OP speed
I624VOL	6	Sixth iteration, daily (24-hour) estimated volume (AAWT)
I624VMT	12.5	Sixth iteration, daily (24-hour) estimated vehicle miles of travel
ATYPE	1	Interim variable, can be disregarded
COMP	1	Interim variable, can be disregarded

Notes:

1. 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).

Appendix A. Version 2.1 D #50 Scripts

ADr_Update.s A-1
Auto_Access.s A-3
Export_Fares.s A-4
Highway_Assignment.s A-5
Highway_Build_Toll.s A-13
Highway_Skims.s A-19
MC_Auto_Drivers.s A-21
MC_Constraint.s A-23
MC_Consummary.s A-29
MC_Summary.s A-32
Metrorail_skims.s A-36
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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
;
; Environment variables:  _prev_  Previous iteration (PP,i1...i6)
;
;   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

 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]=SOV%_prev_%@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   ;
```

Export_Fares.s

```
;-------------------------------------------------------------------------
; Export_Fares.s
; MWCOG Version 2 Model.
;
; Export Fare Data on Selected Interchanges
;
; Global Variable: _iter_ (= pp,i1,-i6)
;
;
; Input Files:
;  Fare Matrix Files = MF_pp_mm.SKM (pp=AM/OP, MM=WK/DR)
; Output Files:
;  Selected Fare Data = %_iter_%_PP_MM.ASC
;  MINUTP Fare Matrix = %_iter_%_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] = %_iter_%_AM_WK.FAR, MO=1, FORMAT=MINUTP
 MATO[2] = %_iter_%_AM_DR.FAR, MO=2, FORMAT=MINUTP
 MATO[3] = %_iter_%_OP_WK.FAR, MO=3, FORMAT=MINUTP
 MATO[4] = %_iter_%_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  - Version 2.1/C Assignment with ICC changes(JPark) and
;       - improved toll modeling.   Toll Model changes in ';$' blocks
;       - Toll-related Scripting in the assignment revised per Citilabs
;         comments 6/8/04
;$      - No. of iterations in assignment changed from 10 to 20
;  MWCOG Version 2.1D 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
;  Note (6/15/04)  MAXITERS set to 20 and GAP,AAD,RMSE, & RAAD set to zero to
;  MAXITERS iterations are fully executed.
;  Note (8/12/04)  Successive averaging updated. rm
:  09/01/04 msm Exclude= statement updated to have 3 new vars: cspd_1,vdt_1,vht_1
;

;   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','i1' - 'i6')
;
;
;---------------------------------------------------------------
;   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 previous Iteration network

IF     (itr      = 'pp')
   INPNET = 'ZONEHWY.NET'
 ELSE
   INPNET = '%_prev_%HWY.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)


;$
in_tskm = 'inputs\toll.skm'   ; read in toll param file
;$

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.
  ;
  ;===============================================================
  ; CAP & SPEED CLASS 71 ADJUSTED FOR I-270 FROM I-370 & SPUR
  ; JCPARK 5/2/03
  ; CAP REVISED JCPARK 5/20/03 TO 1500
  ; CAPACITY & SPEED OF MAJOR & MINOR ARTERIAL REVISED
  ; SPEED OF COLLECTOR REVISED   JCPARK 6/17/03
  ; CAPACITY OF I-95 ADJUSTED: 1900 -> 1800 VPHPL
  ; I-270 & I-95 OVERRIDES REMOVED 6/23/03 JCPARK
  ; THE OVERRIDES ACTIVATED 6/25/03 JCPARK
  ; START ------>
  ;===============================================================
  ;*************************************************************
  ;**  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 1800 1800 2000 2000 2100  ; fwy REVISED 7/20/03
  SPDCAP CAPACITY[21]= 800  800  960  960 1260 1260 1260  ; maj REVISED 6/19/03
  SPDCAP CAPACITY[31]= 500  600  700  840 1000 1000 1000  ; min REVISED 6/30/03
  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 1800 1800 2000 2000 2100  ; rmp (fwy)
  SPDCAP CAPACITY[71]=1600 1800 1800    ; JCPARK I-270 CAP 7/20/03 ICC CAP 11/18/03
  SPDCAP CAPACITY[91]=2400 2100         ; JCPARK 7/24/03 I-495 CAP
  ;
  ;  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]= 55   55   60   60   67   67   67    ; fwy
  SPDCAP    SPEED[21]= 25   25   35   35   40   45   45    ; maj REVISED 6/18/03
  SPDCAP    SPEED[31]= 20   20   30   30   35   40   40    ; min REVISED 6/18/03
  SPDCAP    SPEED[41]= 15   15   20   20   25   30   30    ; col REVISED 6/18/03
  SPDCAP    SPEED[51]= 45   45   50   50   50   55   55    ; xwy
  SPDCAP    SPEED[61]= 55   55   60   60   67   67   67    ; Rmp (fwy)
  SPDCAP    SPEED[71]= 55   60   50 ; JCPARK I-270 SPD 7/20/03 ICC SPD 10/30/03

;$
  ;-------------------------------------------------------$
  ;    Read in Toll Parameters:                           $
  ;-------------------------------------------------------$
  READ FILE = @in_tskm@

;$  ;

  ;===============================================================
  ; CAP & SPEED CLASS 71 55mph ADJUSTED FOR I-270 FROM I-370 & SPUR
  ; JCPARK 5/5/03
  ; REMOVED 6/23/03 JCPARK
  ; ACTIVATED 6/25/03 JCPARK
  ; ALL THE OVERRIDES WERE REMOVED EXCEPT FOR I-495 7/20/03
  ; <------ END
  ;===============================================================
  ;
  ;-------------------------------------------------------$
  ;    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: REVISED JCPARK 6/27/03
LOOKUP NAME=VCRV2,FAIL=1.00,5.000,INTERPOLATE=T,
    R="1.000   0.00",
      "1.001   0.10",
      "1.003   0.30",
      "1.007   0.50",
      "1.014   0.70",
      "1.040   0.80",
      "1.519   0.90",
      "1.998   1.00",
      "3.851   1.10",
      "5.000   1.17",
      "5.000   1.30",
      "5.000   1.50",
      "5.000  99.99"
;
; major arterial VDF lookup curve:
LOOKUP NAME=VCRV3,FAIL=1.00,6.22,INTERPOLATE=T,
    R="1.000   0.00",
      "1.020   0.10",
      "1.070   0.30",
      "1.150   0.50",
      "1.310   0.70",
      "1.490   0.80",
      "1.670   0.90",
      "2.255   1.00",
      "2.840   1.10",
      "3.394   1.17",
      "4.420   1.30",
      "6.220   1.50",
      "6.220  99.99"
;
; minor arterial VDF lookup curve:
LOOKUP NAME=VCRV4,FAIL=1.00,6.35,INTERPOLATE=T,
    R="1.000   0.00",
      "1.030   0.10",
      "1.090   0.30",
      "1.200   0.50",
      "1.390   0.70",
      "1.565   0.80",
      "1.740   0.90",
      "2.370   1.00",
      "3.000   1.10",
      "3.555   1.17",
      "4.580   1.30",
      "6.350   1.50",
      "6.350  99.99"
;
; collector  VDF lookup curve:
LOOKUP NAME=VCRV5,FAIL=1.00,2.30,INTERPOLATE=T,
    R="1.000   0.00",
      "1.030   0.10",
      "1.040   0.30",
      "1.060   0.50",
      "1.100   0.70",
      "1.140   0.80",
      "1.180   0.90",
      "1.260   1.00",
      "1.340   1.10",
      "1.453   1.17",
      "1.660   1.30",
      "2.300   1.50",
      "2.300  99.99"
;
; expressway VDF lookup curve:
LOOKUP NAME=VCRV6,FAIL=1.00,7.59,INTERPOLATE=T,
    R="1.000   0.00",
      "1.010   0.10",
      "1.040   0.30",
      "1.090   0.50",
      "1.190   0.70",
      "1.360   0.80",
      "1.530   0.90",
      "2.180   1.00",
      "2.830   1.10",
      "3.630   1.17",
      "5.090   1.30",
      "7.590   1.50",
      "7.590  99.99"

  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@  ;
  ; 10 iterations changed to 20 (RM) 3/09/04 / GAP,AAD, RMSE,&RAAD params set to
zero
  ;  to ensure 'maxiters' iterations are completely executed (RM) 6/15/04 .
  MAXITERS=20     ;
  GAP  = 0.0      ; ** To ensure Max iterations are fully executed **
  AAD  = 0.0      ; ** To ensure Max iterations are fully executed **
  RMSE = 0.0      ; ** To ensure Max iterations are fully executed **
  RAAD = 0.0      ; ** To ensure Max iterations are fully executed **


PHASE=LINKREAD
      C     = CAPACITYFOR(LI.@PRD@LANE,LI.CAPCLASS) * @CAPFAC@
      SPEED = SPEEDFOR(LI.@PRD@LANE,LI.SPDCLASS)
      T0    = (LI.DISTANCE/SPEED)*60.0


   IF (ITERATION = 0)
     ; Define AM /OP link level tolls by vehicle type here:
       LW.SOV@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(1,LI.TOLLGRP) ; SOV       TOLLS
in 1980 cents
       LW.HV2@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(2,LI.TOLLGRP) ; HOV 2 occ TOLLS
in 1980 cents
       LW.HV3@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(3,LI.TOLLGRP) ; HOV 3+occ TOLLS
in 1980 cents
       LW.TRK@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(4,LI.TOLLGRP) ; Truck     TOLLS
in 1980 cents
       LW.APX@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(5,LI.TOLLGRP) ; AP Pax    TOLLS
in 1980 cents

     ; Initial Iteration LINK IMPEDANCE (HIGHWAY TIME + Equiv.Toll/Time) by vehicle
type here:
        LW.SOV@PRD@IMP = T0    + (LW.SOV@PRD@TOLL/100.0)* SV@PRD@EQM ;SOV   IMP
        LW.HV2@PRD@IMP = T0    + (LW.HV2@PRD@TOLL/100.0)* H2@PRD@EQM ;HOV 2 IMP
        LW.HV3@PRD@IMP = T0    + (LW.HV3@PRD@TOLL/100.0)* H3@PRD@EQM ;HOV 3+IMP
        LW.TRK@PRD@IMP = T0    + (LW.TRK@PRD@TOLL/100.0)* TK@PRD@EQM ;Truck IMP
        LW.APX@PRD@IMP = T0    + (LW.APX@PRD@TOLL/100.0)* AP@PRD@EQM ;APAX  IMP

        IF (LI.@PRD@TOLL > 0)
           PRINT LIST = 'iteration: ',iteration(3),' A: ',A(7),' B: ',B(7),
          ' DISTANCE: ',LI.DISTANCE(6.2),
          ' LI.@PRD@TOLL: ',                        LI.@PRD@TOLL(5.2),
          ' FFSPEED: ',                                  SPEED(5.2),
          ' @PRD@_TFAC(1,LI.TOLLGRP): ',@PRD@_TFAC(1,LI.TOLLGRP)(5.1),
          ' SV@PRD@EQM: ',                            SV@PRD@EQM(5.1),
```

```
          ' LW.SOV@PRD@TOLL: ',                  LW.SOV@PRD@TOLL(5.2),
          ' T0: ',                                            T0(5.2),
          ' LW.SOV@PRD@IMP',                      LW.SOV@PRD@IMP(5.2),
           file = @prd@CHK.LKREAD
        ENDIF

    ENDIF



;$
    ;
    ;   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

   IF (I=1)
     LINKLOOP
       ; Initial Iteration LINK IMPEDANCE (HIGHWAY TIME + Equiv.Toll/Time) by
vehicle type here:
         LW.SOV@PRD@IMP = TIME    + (LW.SOV@PRD@TOLL/100.0)* SV@PRD@EQM ;SOV   IMP
         LW.HV2@PRD@IMP = TIME    + (LW.HV2@PRD@TOLL/100.0)* H2@PRD@EQM ;HOV 2 IMP
         LW.HV3@PRD@IMP = TIME    + (LW.HV3@PRD@TOLL/100.0)* H3@PRD@EQM ;HOV 3+IMP
         LW.TRK@PRD@IMP = TIME    + (LW.TRK@PRD@TOLL/100.0)* TK@PRD@EQM ;Truck IMP
         LW.APX@PRD@IMP = TIME    + (LW.APX@PRD@TOLL/100.0)* AP@PRD@EQM ;APAX  IMP

          IF (LI.@PRD@TOLL > 0)
```

```
              PRINT LIST = 'iteration: ',iteration(3),' A: ',A(7),' B: ',B(7),
             ' DISTANCE: ',LI.DISTANCE(6.2),
             ' LI.@PRD@TOLL: ',                        LI.@PRD@TOLL(5.2),
             ' FFSPEED: ',                                   SPEED(5.2),
             ' @PRD@_TFAC(1,LI.TOLLGRP): ',@PRD@_TFAC(1,LI.TOLLGRP)(5.1),
             ' SV@PRD@EQM: ',                             SV@PRD@EQM(5.1),
             ' LW.SOV@PRD@TOLL: ',                 LW.SOV@PRD@TOLL(5.2),
             ' T0: ',                                          T0(5.2),
             ' TIME: ',                                      TIME(5.2),
             ' LW.SOV@PRD@IMP',                     LW.SOV@PRD@IMP(5.2),
              file = @prd@CHK.LKLOOP
          ENDIF
      ENDLINKLOOP

   ENDIF


    PATH=LW.SOV@PRD@IMP,
      EXCLUDEGRP=2,3,5,6,7,   ; prohibitions for free SOV veh
      VOL[1]=MI.1.1
    PATH=LW.HV2@PRD@IMP,
      EXCLUDEGRP=3,5,6,7,     ; prohibitions for HOV2 veh
      VOL[2]=MI.1.2
    PATH=LW.HV3@PRD@IMP,
      EXCLUDEGRP=5,6,7,       ; prohibitions for HOV3 veh
      VOL[3]=MI.1.3
    PATH=LW.TRK@PRD@IMP,
      EXCLUDEGRP=2,3,4,5,6,7, ; prohibitions for trucks
      VOL[4]=MI.1.4
    PATH=LW.APX@PRD@IMP,
      EXCLUDEGRP=6,7,         ; prohibitions for Airport pass.veh trips
      VOL[5]=MI.1.5

;$

ENDPHASE

PHASE = ADJUST

ENDPHASE

ENDRUN



;-------------------------------------------------------------------------
;Step 3
;Calculate Restrained Speed/Perform MSA Volume/Speed Averaging
;
;-------------------------------------------------------------------------
if      (itr = 'pp' )
           itrno  = 0
 elseif (itr = 'i1')
           itrno  = 1
 elseif (itr = 'i2')
           itrno  = 2
 elseif (itr = 'i3')
           itrno  = 3
 elseif (itr = 'i4')
           itrno  = 4
 elseif (itr = 'i5')
           itrno  = 5
 elseif (itr = 'i6')
           itrno  = 6
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,HRLKCAP,HRLNCAP,DCD,NEWSPD,ATYPE,
       VMT,EVDF,WOSPD,WNSPD,WFSPD,SPDDIFF,COMP,%_iter_%@prd@VMT,
       cspd_1,vdt_1,vht_1

  _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@  = 2  )                                            ;
              OLDSPD        = %_prev_%@prd@spd                        ;
              OLDVOL        = %_prev_%@prd@VOL                        ;
              @itr@@prd@VOL = ROUND((OLDVOL*1/2)+(NEWVOL*1/2))        ;
   ELSEIF (@itrno@  = 3  )                                            ;
              OLDSPD        = %_prev_%@prd@spd                        ;
              OLDVOL        = %_prev_%@prd@VOL                        ;
              @itr@@prd@VOL = ROUND((OLDVOL*2/3)+(NEWVOL*1/3))        ;
   ELSEIF (@itrno@  = 4  )                                            ;
              OLDSPD        = %_prev_%@prd@spd                        ;
              OLDVOL        = %_prev_%@prd@VOL                        ;
              @itr@@prd@VOL = ROUND((OLDVOL*3/4)+(NEWVOL*1/4))        ;
   ELSEIF (@itrno@  = 5  )                                            ;
              OLDSPD        = %_prev_%@prd@spd                        ;
              OLDVOL        = %_prev_%@prd@VOL                        ;
              @itr@@prd@VOL = ROUND((OLDVOL*4/5)+(NEWVOL*1/5))        ;
   ELSEIF (@itrno@  = 6  )                                            ;
              OLDSPD        = %_prev_%@prd@spd                        ;
              OLDVOL        = %_prev_%@prd@VOL                        ;
              @itr@@prd@VOL = ROUND((OLDVOL*5/6)+(NEWVOL*1/6))        ;
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, 1.000, 1.000, 1.000, 1.000, 1.000",
            " 0.10,    1.001, 1.020, 1.030, 1.030, 1.010, 1.001",
            " 0.30,    1.003, 1.070, 1.090, 1.040, 1.040, 1.003",
            " 0.50,    1.007, 1.150, 1.200, 1.060, 1.090, 1.007",
            " 0.70,    1.014, 1.310, 1.390, 1.100, 1.190, 1.014",
            " 0.80,    1.040, 1.490, 1.565, 1.140, 1.360, 1.040",
            " 0.90,    1.519, 1.670, 1.740, 1.180, 1.530, 1.519",
            " 1.00,    1.998, 2.255, 2.370, 1.260, 2.180, 1.998",
            " 1.10,    3.851, 2.840, 3.000, 1.340, 2.830, 3.851",
            " 1.17,    5.000, 3.394, 3.555, 1.453, 3.630, 5.000",
            " 1.30,    5.000, 4.420, 4.580, 1.660, 5.090, 5.000",
            " 1.50,    5.000, 6.220, 6.350, 2.300, 7.590, 5.000",
            "99.99,    5.000, 6.220, 6.350, 2.300, 7.590, 5.000"


  ; 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
       ELSEIF (FTYPE= 1,6)
        %_iter_%@prd@VDF= VDFA(FTYPE,%_iter_%@prd@VC)
       ELSEIF (FTYPE= 2  )
        %_iter_%@prd@VDF= VDFA(FTYPE,%_iter_%@prd@VC)
       ELSEIF (FTYPE= 3  )
        %_iter_%@prd@VDF= VDFA(FTYPE,%_iter_%@prd@VC)
       ELSEIF (FTYPE= 4  )
        %_iter_%@prd@VDF= VDFA(FTYPE,%_iter_%@prd@VC)
       ELSEIF (FTYPE= 5  )
        %_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_Toll.s

```
;=================================================================
;  HIGHWAY_BUILD_TOLL.S
;  MWCOG Version 2.1D Model
;  Highway Building
;  This program includes the functions of the closestp, atypetp,
;  and arealktp programs in Version 2.1/TP+ Release C.
;  NOTE: Step 1.4 (Highway network build) updated on 3/28/04
;        to ensure TOLLGRP is coded with a value of '1' for
;        the condition: TOLL > 0 and TOLLGRP = 0.
;
;
;  STEP 1.1 - 1.5 BUILD BASE HIGHWAY NETWORK
;         INPUT:  node.asc, link.asc, zone.asc, areaover.asc,
;                 amspd.lkp, opspd.lkp, tazamspd.lkp,tazopspd.lkp,
;                 atype.asc
;
;        OUTPUTS:  zonehwy.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
;
;=================================================================



;
; PARAMETERS / Files DEFINED in TP MAIN:
;

  LINKSIZE  = 30000                ; Max. Highway Node No.   (Param)
  ZONESIZE  =  2191                ; Max. TAZ No.            (Param)
  LSTITAZ   =  2144                ; Last Internal Zone No.  (Param)

  NODEFILE  = 'INPUTS\NODE.ASC'     ; Node X/Y File           (I/P file)
  LINKFILE  = 'INPUTS\LINK.ASC'     ; Node X/Y File           (I/P file)
  ZONEFILE  = 'INPUTS\ZONE.ASC'     ; Zonal Land Use File     (I/P file)

  AT_OVR    = 'INPUTS\AREAOVER.ASC' ; Area Type Override file (I/P file)

  AMSPD     = 'inputs\AMSPD.LKP'    ; AM Speed lookup ATxFT   (I/P file)
  OPSPD     = 'inputs\OPSPD.LKP'    ; OP Speed lookup ATxFT   (I/P file)
  AMSPDTF   = 'inputs\TAZAMSPD.LKP' ; AM Speed lookup TAZxFT  (I/P file)
  OPSPDTF   = 'inputs\TAZOPSPD.LKP' ; OP Speed lookup TAZxFT  (I/P file)

  IN_TESC   = 'INPUTS\TOLL.ESC'     ; INPUT Toll Escalation Param file

  TCRDFILE  = 'TAZCRD.ASC'          ; TAZ X/Y File            Temp. File
  ATYPFILE  = 'ATYPE.ASC'           ; Zonal Area Type file    (O/P file)
  OU_BSNET  = 'ZONEHWY.NET'         ; OUTPUT BUILT network FILE

;---------------------------------------------------------------------
; STEP 1.1: Create TAZ Coordinate File from 'full' Network Node
;           Coordinate File.  Put results in TAZCRD.ASC file
;---------------------------------------------------------------------


RUN PGM=MATRIX
ZONES=@LINKSIZE@
ARRAY TAZX=@ZONESIZE@,TAZY=@ZONESIZE@
ZDATI[1] = @NODEFILE@ ,z=1-6,XCRD= 7-14,YCRD= 15-22

; In this program 'zones' are really nodes, Begin node loop

;
; If current node is within the TAZ number range, store XYs in arrays
;

 IF (I = 1- @ZONESIZE@)
    TAZX[I] = ZI.1.XCRD   TAZY[I]= ZI.1.YCRD
 ENDIF


;
; If at the last node, write out TAZ XYs, that's it.
;

 IF (I = ZONES)
   LOOP IDX = 1,@ZONESIZE@
     PRINT LIST=IDX(5),XCRD[IDX](10),YCRD[IDX](10),FILE=TAZCRD.ASC
   ENDLOOP
 ENDIF

ENDRUN


;---------------------------------------------------------------------
; STEP 1.2:  Find the Closest TAZ to each Highway node in the system.
;            Put results in NODCRDZN.ASC file
;---------------------------------------------------------------------

RUN PGM=MATRIX
ZONES=@LINKSIZE@

; In this program 'zones' are really nodes, Begin node loop
;
; Read in the highway NODE XY file in Zfile...
;

ZDATI[1] = @NODEFILE@ ,z=1-6,XCRD= 7-14,YCRD= 15-22

;
; Read in TAZ XY file as a lookup...
;
LOOKUP NAME=TAZCRD,
       LOOKUP[1] = 1, RESULT=2,     ; X Crd of (TAZ)
       LOOKUP[2] = 1, RESULT=3,     ; Y Crd of (TAZ)
       INTERPOLATE=N, FAIL= 0,0,0, FILE=TAZCRD.ASC

;
; If current node is a TAZ and XYs are non-zero then
; the closest TAZ is itself.  Write it out.
;
;
IF     (I <= @ZONESIZE@ && XCRD[I] > 0 && YCRD[I] > 0 )
             NODE_TAZ = I
             PRINT LIST=I(6),XCRD[I](8) ,YCRD[I](8),
                        NODE_TAZ(8),MINDIST(8.2),FILE=NODCRDZN.ASC

;
; Else if current node is a non-TAZ and XYs are non-zero then
; loop through each TAZ, compute the node-TAZ distance and
; determine which TAZ is closest. Write it out.
;

ELSEIF (I > @ZONESIZE@ && XCRD[I] > 0 && YCRD[I] > 0 )

    MINDIST =9999999.      ; initialize minimum distance to large no.

     LOOP IDX=1,@ZONESIZE@
```

```
            CURDIST=  SQRT((XCRD[I] - TAZCRD(1,IDX))**2 +
                           (YCRD[I] - TAZCRD(2,IDX))**2)/5280.

               IF (CURDIST    < MINDIST)
                   MINDIST    = CURDIST
                   NODE_TAZ      = IDX
               ENDIF

     ENDLOOP
          PRINT LIST=I(6),XCRD[I](8) ,YCRD[I](8),
                NODE_TAZ(8),MINDIST(8.2),FILE=NODCRDZN.ASC

ENDIF

ENDRUN

;
;--------------------------------------------------------------------
; STEP 1.3:  Determine the Area Type of each TAZ based on the 1-mile
;      'floating' pop and emp density.  Put results in AREATP.ASC file.
;--------------------------------------------------------------------

RUN PGM=MATRIX
ZONES=@ZONESIZE@

; Keep zone arrays for the 'floating' pop, emp, area, pop. density,
; emp. density, pop den class, emp den class, 'standard' area type,
; & 'final' (override) areatype

ARRAY CUMPOP  = @ZONESIZE@, CUMEMP = @ZONESIZE@, CUMAREA  = @ZONESIZE@,
      POPDEN  = @ZONESIZE@, EMPDEN = @ZONESIZE@, POPDCL   = @ZONESIZE@,
      EMPDCL  = @ZONESIZE@, AREATP = @ZONESIZE@, F_AREATP = @ZONESIZE@

;
; read land use file into lookup table
;

ZDATI[1] = @ZONEFILE@ ,Z       =  1- 4,
                      HH       =  8-15,
                      HHPOP    = 16-23,
                      GQPOP    = 24-31,
                      TOTPOP   = 32-39,
                      TOTEMP   = 40-47,
                      INDEMP   = 48-55,
                      RETEMP   = 56-63,
                      OFFEMP   = 64-71,
                      OTHEMP   = 72-79,
                      JURCODE  = 80-81,
                      AREA     = 83-92
;
; read TAZ XY file into lookup table
;

ZDATI[2] = @TCRDFILE@ ,Z       =  1- 5,
                      X        =  6-15,
                      Y        = 16-25



;
; Define Area Type codes based on pop/emp classes in lookup table
;

LOOKUP NAME=ATL,
       LOOKUP[1] = 1, RESULT=2,
       LOOKUP[2] = 1, RESULT=3,
       LOOKUP[3] = 1, RESULT=4,
       LOOKUP[4] = 1, RESULT=5,
       LOOKUP[5] = 1, RESULT=6,
       LOOKUP[6] = 1, RESULT=7,
       LOOKUP[7] = 1, RESULT=8,
       INTERPOLATE=N, FAIL= 0,0,0,
;
;    POP    Emp    Emp    Emp    Emp    Emp    Emp    Emp
;  Density  Den.   Den.   Den.   Den.   Den.   Den.   Den.
;   Class   Class1 Class2 Class3 Class4 Class5 Class6 Class7
;  ------   ------ ------ ------ ------ ------ ------ ------
     R=" 1,   7,     7,     5,     5,     2,     2,     2   ",
       " 2,   7,     5,     5,     5,     2,     2,     2   ",
       " 3,   6,     6,     5,     5,     2,     2,     2   ",
       " 4,   6,     6,     4,     3,     2,     2,     2   ",
       " 5,   4,     4,     3,     3,     2,     2,     1   ",
       " 6,   4,     3,     3,     3,     2,     2,     1   ",
       " 7,   3,     3,     3,     2,     2,     2,     1   "


;
; Zonal Area Type Overrides
;

LOOKUP NAME=ATOVR,
       LOOKUP[1] = 1, RESULT=2,    ;  AREA TYPE (1-7) Override
       INTERPOLATE=N, FAIL= 0,0,0,  FILE=@AT_OVR@
;
;

;
; Accumulate 1-mi 'floating' pop & emp & area here, for each TAZ
;
;
 LOOP IDX=1,@ZONESIZE@
  CURDIST=
   SQRT((X[I] - X[IDX])**2 + (Y[I]-Y[IDX])**2)/ 5280.


  IF (CURDIST < 1.00 && X[I] > 0 && X[IDX] > 0)
      CUMPOP[I]  = CUMPOP[I]  + TOTPOP[IDX]
      CUMEMP[I]  = CUMEMP[I]  + TOTEMP[IDX]
      CUMAREA[I] = CUMAREA[I] + AREA[IDX]
  ENDIF
 ENDLOOP

;
; Now that we have the floating pop & emp & area, compute the
; floating population / employment density
;

IF (CUMAREA[I]   = 0)
       POPDEN[I]    =  0
       EMPDEN[I]    =  0
ELSE
       POPDEN[I] =  CUMPOP[I] / CUMAREA[I]
       EMPDEN[I] =  CUMEMP[I] / CUMAREA[I]
ENDIF

;
; Use the floating pop & emp density to determine the
; population density class, employment density class
-
;


IF     (POPDEN[I]  <     100. )
        POPDCL[I]  =       1
ELSEIF (POPDEN[I]  <     350. )
        POPDCL[I]  =       2
```

```
ELSEIF (POPDEN[I]  <    1500. )
        POPDCL[I]  =       3
ELSEIF (POPDEN[I]  <    3500. )
        POPDCL[I]  =       4
ELSEIF (POPDEN[I]  <    6500. )
        POPDCL[I]  =       5
ELSEIF (POPDEN[I]  <   10000. )
        POPDCL[I]  =       6
ELSE
        POPDCL[I]  =       7
ENDIF



IF     (EMPDEN[I]  <     100. )
        EMPDCL[I]  =       1
ELSEIF (EMPDEN[I]  <     500. )
        EMPDCL[I]  =       2
ELSEIF (EMPDEN[I]  <    1500. )
        EMPDCL[I]  =       3
ELSEIF (EMPDEN[I]  <    5000. )
        EMPDCL[I]  =       4
ELSEIF (EMPDEN[I]  <   15000. )
        EMPDCL[I]  =       5
ELSEIF (EMPDEN[I]  <   35000. )
        EMPDCL[I]  =       6
ELSE
        EMPDCL[I]  =       7
ENDIF

;
; The pop den class, emp den class are then used to determine
; the area type
;

AREATP[I] = ATL(EMPDCL[I],POPDCL[I])

;
; Impose null overrides for external zones
;

IF    (I > @LSTITAZ@ )
      CUMPOP[I]  =  0
      CUMEMP[I]  =  0
      CUMAREA[I] =  0
      POPDEN[I]  =  0
      EMPDEN[I]  =  0
      POPDCL[I]  =  1
      EMPDCL[I]  =  1
      AREATP[I]  =  7
ENDIF



;
; The Final area-type equals standard area type...
;
       F_AREATP[I]   = AREATP[I]    ;  Final Area Type = 'Standard' AT

;
; ...unless a non-zero area-type override code exists
;
      IF (ATOVR(1,I)  >  0)          ;
        F_AREATP[I]   = ATOVR(1,I)
      ENDIF

; all done
; ---------------------------------------------------------------------
; ---------------------------------------------------------------------
;  If at the last zone, print out results and compute basic stats
;

LOOP IDX=1,@ZONESIZE@
  IF (I =  @ZONESIZE@)
;
;  Accumulate Final Area Type Frequencies for listing
;
   IF (F_AREATP[IDX] = 1)
    AT1_CNT = AT1_CNT + 1
    TPOP1=TPOP1+TOTPOP[IDX]
    TEMP1=TEMP1+TOTEMP[IDX]
   ENDIF
   IF (F_AREATP[IDX] = 2)
    AT2_CNT = AT2_CNT + 1
    TPOP2=TPOP2+TOTPOP[IDX]
    TEMP2=TEMP2+TOTEMP[IDX]
   ENDIF
   IF (F_AREATP[IDX] = 3)
    AT3_CNT = AT3_CNT + 1
    TPOP3=TPOP3+TOTPOP[IDX]
    TEMP3=TEMP3+TOTEMP[IDX]
   ENDIF
   IF (F_AREATP[IDX] = 4)
    AT4_CNT = AT4_CNT + 1
    TPOP4=TPOP4+TOTPOP[IDX]
    TEMP4=TEMP4+TOTEMP[IDX]
   ENDIF
   IF (F_AREATP[IDX] = 5)
    AT5_CNT = AT5_CNT + 1
    TPOP5=TPOP5+TOTPOP[IDX]
    TEMP5=TEMP5+TOTEMP[IDX]
   ENDIF
   IF (F_AREATP[IDX] = 6)
    AT6_CNT = AT6_CNT + 1
    TPOP6=TPOP6+TOTPOP[IDX]
    TEMP6=TEMP6+TOTEMP[IDX]
   ENDIF
   IF (F_AREATP[IDX] = 7)
    AT7_CNT = AT7_CNT + 1
    TPOP7=TPOP7+TOTPOP[IDX]
    TEMP7=TEMP7+TOTEMP[IDX]
   ENDIF

   IF (F_AREATP[IDX] < 1)   ERR_CNT = ERR_CNT+1
   IF (F_AREATP[IDX] > 7)   ERR_CNT = ERR_CNT+1

   TOT_CNT = TOT_CNT+1 TPOP =TPOP +TOTPOP[IDX]  TEMP =TEMP +TOTEMP[IDX]

   IF (ATOVR(1,IDX)  > 0 )
    PRINT LIST= IDX(5),TOTPOP[IDX](8),TOTEMP[IDX](8),AREA[IDX](8.2),
          CUMPOP[IDX](8),CUMEMP[IDX](8),CUMAREA[IDX](8.2),
          POPDCL[IDX](4),EMPDCL[IDX](4),AREATP[IDX](4),
          F_AREATP[IDX](4),'   ; * (Override) ',
          FILE=ATYPE.ASC
    ELSE
    PRINT LIST= IDX(5),TOTPOP[IDX](8),TOTEMP[IDX](8),AREA[IDX](8.2),
          CUMPOP[IDX](8),CUMEMP[IDX](8),CUMAREA[IDX](8.2),
          POPDCL[IDX](4),EMPDCL[IDX](4),AREATP[IDX](4),
          F_AREATP[IDX](4),'   ;            ',
          FILE=ATYPE.ASC
   ENDIF

;  PRINT VARIANT ZONAL FILE FOR PUMP_PRIME_SKIMS.S AND TRIP GEN PROGRAM
    PRINT LIST= IDX(5),' ',X[IDX](8),Y[IDX](8),
          TOTPOP[IDX](5),' ',TOTEMP[IDX](5),' ',AREA[IDX](8.4),
          CUMPOP[IDX](6),' ',CUMEMP[IDX](6),'   ',
```

```
         F_AREATP[IDX](1),
         FILE = BASEZON.DAT


  ENDIF



ENDLOOP

;
;  Compute Final Area Type Percentages for listing
;


 IF (I = @ZONESIZE@)
  AT1_PCT= AT1_CNT / TOT_CNT * 100.
  AT2_PCT= AT2_CNT / TOT_CNT * 100.
  AT3_PCT= AT3_CNT / TOT_CNT * 100.
  AT4_PCT= AT4_CNT / TOT_CNT * 100.
  AT5_PCT= AT5_CNT / TOT_CNT * 100.
  AT6_PCT= AT6_CNT / TOT_CNT * 100.
  AT7_PCT= AT7_CNT / TOT_CNT * 100.
  TOT_PCT= TOT_CNT / TOT_CNT * 100.
  ERR_PCT= ERR_CNT / TOT_CNT * 100.

  TPOP1PT= TPOP1 / TPOP * 100.
  TPOP2PT= TPOP2 / TPOP * 100.
  TPOP3PT= TPOP3 / TPOP * 100.
  TPOP4PT= TPOP4 / TPOP * 100.
  TPOP5PT= TPOP5 / TPOP * 100.
  TPOP6PT= TPOP6 / TPOP * 100.
  TPOP7PT= TPOP7 / TPOP * 100.
  TPOP_PT= TPOP  / TPOP * 100.

  TEMP1PT= TEMP1 / TEMP * 100.
  TEMP2PT= TEMP2 / TEMP * 100.
  TEMP3PT= TEMP3 / TEMP * 100.
  TEMP4PT= TEMP4 / TEMP * 100.
  TEMP5PT= TEMP5 / TEMP * 100.
  TEMP6PT= TEMP6 / TEMP * 100.
  TEMP7PT= TEMP7 / TEMP * 100.
  TEMP_PT= TEMP  / TEMP * 100.


    PRINT LIST= ' Area Type Statistics '
    PRINT LIST= '----------------------'
    PRINT LIST= '                '
    PRINT LIST= '              TAZ Count '  ,'    ',' TAZ Pct.   ','    ','
POPULATION ','    ',' POP Pct.   ','    ',' EMPLOYMENT ','    ',' EMP Pct.   '
    PRINT LIST= '             -----------'  ,'    ','------------','    ','---------
---','    ','------------','    ','------------','    ','------------'
    PRINT LIST= 'Area Type 1: ', AT1_CNT(11),'    ',AT1_PCT(11.2) ,'    ',
TPOP1(11)   ,'    ',TPOP1PT(11.2) ,'    ',  TEMP1(11)   ,'    ',TEMP1PT(11.2)
    PRINT LIST= 'Area Type 2: ', AT2_CNT(11),'    ',AT2_PCT(11.2) ,'    ',
TPOP2(11)   ,'    ',TPOP2PT(11.2) ,'    ',  TEMP2(11)   ,'    ',TEMP2PT(11.2)
    PRINT LIST= 'Area Type 3: ', AT3_CNT(11),'    ',AT3_PCT(11.2) ,'    ',
TPOP3(11)   ,'    ',TPOP3PT(11.2) ,'    ',  TEMP3(11)   ,'    ',TEMP3PT(11.2)
    PRINT LIST= 'Area Type 4: ', AT4_CNT(11),'    ',AT4_PCT(11.2) ,'    ',
TPOP4(11)   ,'    ',TPOP4PT(11.2) ,'    ',  TEMP4(11)   ,'    ',TEMP4PT(11.2)
    PRINT LIST= 'Area Type 5: ', AT5_CNT(11),'    ',AT5_PCT(11.2) ,'    ',
TPOP5(11)   ,'    ',TPOP5PT(11.2) ,'    ',  TEMP5(11)   ,'    ',TEMP5PT(11.2)
    PRINT LIST= 'Area Type 6: ', AT6_CNT(11),'    ',AT6_PCT(11.2) ,'    ',
TPOP6(11)   ,'    ',TPOP6PT(11.2) ,'    ',  TEMP6(11)   ,'    ',TEMP6PT(11.2)
    PRINT LIST= 'Area Type 7: ', AT7_CNT(11),'    ',AT7_PCT(11.2) ,'    ',
TPOP7(11)   ,'    ',TPOP7PT(11.2) ,'    ',  TEMP7(11)   ,'    ',TEMP7PT(11.2)
    PRINT LIST= '  '
    PRINT LIST= '- Total ---- ', TOT_CNT(11),'    ',TOT_PCT(11.2) ,'    ',
TPOP(11)   ,'    ',TPOP_PT(11.2) ,'    ',   TEMP(11)   ,'    ',TEMP_PT(11.2)
    PRINT LIST= '  '
    PRINT LIST= '  '
    PRINT LIST= '  '
    PRINT LIST= 'Error Count  ', Err_CNT(11),'    ',Err_PCT(11.2)
  ENDIF

ENDRUN


;=============================================================
;  Step 1.4.
;  Highway Building  - Part 1,
;                      Develop Area type, Spdclass/CapClass Vars
;
;=============================================================
;
;
;

RUN PGM = HWYNET
ZONES=@ZONESIZE@

; Node Coordinate File
; XY Units are NAD83 (in whole feet)
FILEI NODEI=NODCRDZN.ASC,
        VAR=N,01-06,   ; Node
        VAR=X,07-14,   ; X Crd
        VAR=Y,15-22,   ; Y Crd
        VAR=TZ,27-30,  ; Nearest TAZ associated with node
        VAR=DS,33-38   ; Distance from node to nearest taz

; Highway Links
FILEI LINKI=@LINKFILE@,
        VAR=A,01-05,         ; A-Node Number
        VAR=B,06-10,         ; B-Node Number
        VAR=DISTANCE,13-17,  ; Distance in whole miles (xx.xx)
        VAR=SPDCLASS,23-24,  ; Speed Class(optional)
        VAR=CAPCLASS,26-27,  ; Capacity Class(optional)
        VAR=COUNT,30-33,     ; Observed AAWDT 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)
        VAR=TOLL,61-64,      ; Current year Toll Value in cents
        VAR=TOLLGRP,67-67,   ; Toll Group code (1-9)
        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=PROJ_ID,TYP=A,BEG=107,LEN=10; Project ID String

;   Note:
;   The Standard SPDCLASS(1-67), CAPCLASS(1-67),& TAZ defined below
;

; WRITE TEMPORARY NETWORK TO BE PASSED ONTO NEXT STEP
NETO=TEMP.NET


;-------------------------------------------------------------
; Develop Link Area type/ Spdclass/ Capclass Attributes      -
;-------------------------------------------------------------

;
```

```
; Zonal Area Type Lookup (produced above)
;

LOOKUP NAME=ZNAT,
       LOOKUP[1] = 1, RESULT=11,   ; ZONAL AREA TYPE (1-7)
       INTERPOLATE=N, FAIL= 0,0,0, LIST=N, FILE=@ATYPFILE@


;
; The TAZ designated for the link is that with the minimum distance
; to either the A-node or the B-node
;

           TAZ=A.TZ
           IF (B.DS < A.DS)
              TAZ=B.TZ
           ENDIF
;
; With the TAZ designated, now the speed/capacity class is defined as
; a two-digit code-- facility type & areatype
;
          SPDCLASS =  FTYPE*10 + ZNAT(1,TAZ) ;  Speed Class
          CAPCLASS =  FTYPE*10 + ZNAT(1,TAZ) ;  Capacity Class
          AREATP   =  ZNAT(1,TAZ)            ;  Area Type
;
;
; Check that TOLLGRP is coded for any link coded with a TOLL value-
;  IF TOLLGRP is not coded with non-zero value, then give it a default
;  value of '1.0'
;
         IF (TOLL > 0.0 && TOLLGRP = 0.0)
             TOLLGRP = 1.0
         ENDIF
;
ENDRUN


;===============================================================
; Step 1.5:
;  Highway Building  - Part 2, compute initial highway speed,
;                               write out support files
;===============================================================
;
;

RUN PGM = HWYNET

ZONES=@ZONESIZE@

NETI=TEMP.NET
; output network in TP+ format
NETO=@OU_BSNET@

READ FILE=@IN_TESC@

;
; Compute AM, PM, Off-Peak Tolls
;

AMTOLL=(TOLL+(DSTFAC(1,tollgrp)*DISTANCE))*TTFAC(1,tollgrp)*escfac(1,tollgrp)
PMTOLL=(TOLL+(DSTFAC(1,tollgrp)*DISTANCE))*TTFAC(2,tollgrp)*escfac(1,tollgrp)
OPTOLL=(TOLL+(DSTFAC(1,tollgrp)*DISTANCE))*TTFAC(3,tollgrp)*escfac(1,tollgrp)

; AM and Off-peak Initial Speed Lookup Tables...
;
; Two sets of initial AM/Opk speeds are used, one by TAZ and Fac. Type,
;     and one by Facility type and Area type.  The more detailed TAZ
;     fac. type table will be used unless it returns a value of zero.
;     In that case, the less detailed atype/ftype value will be used.
;
lookup name = tazamspd,         ; AM Initial Speeds TAZ x Fac.Type
       lookup[1] = 1,result=2,  ; AM CentConn Speeds (mph)
       lookup[2] = 1,result=3,  ; AM Freeway  Speeds (mph)
       lookup[3] = 1,result=4,  ; AM Maj Art  Speeds (mph)
       lookup[4] = 1,result=5,  ; AM Min Art  Speeds (mph)
       lookup[5] = 1,result=6,  ; AM Collect  Speeds (mph)
       lookup[6] = 1,result=7,  ; AM Exprway  Speeds (mph)
       lookup[7] = 1,result=8,  ; AM Ramp     Speeds (mph)
       interpolate=N,fail=0,0,0,file=@AMSPDTF@

lookup name = tazopspd,         ; Off-pk Initial Speeds TAZ x Fac.Type
       lookup[1] = 1,result=2,  ; Off-pk CentConn Speeds (mph)
       lookup[2] = 1,result=3,  ; Off-pk Freeway  Speeds (mph)
       lookup[3] = 1,result=4,  ; Off-pk Maj Art  Speeds (mph)
       lookup[4] = 1,result=5,  ; Off-pk Min Art  Speeds (mph)
       lookup[5] = 1,result=6,  ; Off-pk Collect  Speeds (mph)
       lookup[6] = 1,result=7,  ; Off-pk Exprway  Speeds (mph)
       lookup[7] = 1,result=8,  ; Off-pk Ramp     Speeds (mph)
       interpolate=N,fail=0,0,0,file=@OPSPDTF@

lookup name = amspd,            ;   AM Initial Speeds Atype x Ftype
       lookup[1] = 1,result=2,  ; AM CentConn Speeds (mph)
       lookup[2] = 1,result=3,  ; AM Freeway  Speeds (mph)
       lookup[3] = 1,result=4,  ; AM Maj Art  Speeds (mph)
       lookup[4] = 1,result=5,  ; AM Min Art  Speeds (mph)
       lookup[5] = 1,result=6,  ; AM Collect  Speeds (mph)
       lookup[6] = 1,result=7,  ; AM Exprway  Speeds (mph)
       lookup[7] = 1,result=8,  ; AM Ramp     Speeds (mph)
       interpolate=N,fail=0,0,0,file=@AMSPD@

lookup name = opspd,            ; Off-Pk Initial Speeds Atype x Ftype
       lookup[1] = 1,result=2,  ; Off-pk CentConn Speeds (mph)
       lookup[2] = 1,result=3,  ; Off-pk Freeway  Speeds (mph)
       lookup[3] = 1,result=4,  ; Off-pk Maj Art  Speeds (mph)
       lookup[4] = 1,result=5,  ; Off-pk Min Art  Speeds (mph)
       lookup[5] = 1,result=6,  ; Off-pk Collect  Speeds (mph)
       lookup[6] = 1,result=7,  ; Off-pk Exprway  Speeds (mph)
       lookup[7] = 1,result=8,  ; Off-pk Ramp     Speeds (mph)
       interpolate=N,fail=0,0,0,file=@OPSPD@

_IDX    =  FTYPE + 1
PPAMSPD =  TAZAMSPD(_IDX,TAZ)
PPOPSPD =  TAZOPSPD(_IDX,TAZ)

IF (PPAMSPD = 0)
       PPAMSPD= AMSPD(_IDX,AREATP)
ENDIF
IF (PPOPSPD = 0)
       PPOPSPD= OPSPD(_IDX,AREATP)
ENDIF

;
; ESTABLISH  AM/PM/OFF-PEAK Highway Times (for the transit Network)
;
PPPMSPD =  PPAMSPD                  ; assume PM spd is equal to AM
IF (PPAMSPD != 0 )
  AMHTIME    =  (DISTANCE/PPAMSPD)*60.00
  PMHTIME    =  (DISTANCE/PPPMSPD)*60.00
 ELSE
  AMHTIME    =  0
  PMHTIME    =  0
ENDIF

IF (PPOPSPD != 0 )
  OPHTIME    =  (DISTANCE/PPOPSPD)*60.00
 ELSE
```

```
  OPHTIME    =  0
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
```

```
;---------------------------------------------------------------------
; STEP 2:
; HIGHWAY TERMINAL TIME DEVELOPMENT
; Input File:  ZONE.ASC (Standard Land Use File)
;
; Output File: ZTERMTM.ASC   ZONAL TERMINAL TIME FILE
;
;
;---------------------------------------------------------------

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

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


; CREATE ZONAL ARRAY FOR EMPLOYMENT DENSITY

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


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

           IF (INDEX>@LSTITAZ@)
                    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=@ZONESIZE@)
   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)                    //;
;
; 6/30/03 MODIFICATIONS FOR IMPROVED TOLL MODELING MADE  rjm
;
;
;/////////////////////////////////////////////////////////;
;
;
;   Environment Variables:
;     _iter_  (Iteration indicator = 'pp','i1'-'i6')
;
;

NETIN    = '%_iter_%hwy.net'

LOOP Period=1,2         ;  We are looping through the skimming process
                        ;  twice: (1) for the AM Peak & (2) the Off-Peak

in_tskm = 'inputs\toll.skm'  ; read in toll param file

  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@
;-
  READ FILE = @in_tskm@
;-

  PHASE=LINKREAD
       SPEED        =  LI.%_iter_%@PRD@SPD ;Restrained speed (min)
       IF (SPEED = 0)
          T1 = 0
       ELSE
          T1 = LI.DISTANCE / SPEED * 60.0
       ENDIF
;-
   ; Define AM /OP link level tolls by vehicle type here:
       LW.SOV@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(1,LI.TOLLGRP)          ;  SOV
TOLLS in 1980 cents
       LW.HV2@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(2,LI.TOLLGRP)          ;  HOV 2
occ TOLLS in 1980 cents
       LW.HV3@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(3,LI.TOLLGRP)          ;  HOV
3+occ TOLLS in 1980 cents
       LW.TRK@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(4,LI.TOLLGRP)          ;  Truck
TOLLS in 1980 cents
       LW.APX@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(5,LI.TOLLGRP)          ;  AP Pax
TOLLS in 1980 cents

   ; Define AM /OP IMPEDANCE by vehicle type here:
      LW.SOV@PRD@IMP= T1 + ((LW.SOV@PRD@TOLL/100.0)*   SV@PRD@EQM);SOV   IMP
      LW.HV2@PRD@IMP= T1 + ((LW.HV2@PRD@TOLL/100.0)*   H2@PRD@EQM);HOV 2 IMP
      LW.HV3@PRD@IMP= T1 + ((LW.HV3@PRD@TOLL/100.0)*   H3@PRD@EQM);HOV 3+IMP
      LW.TRK@PRD@IMP= T1 + ((LW.TRK@PRD@TOLL/100.0)*   TK@PRD@EQM);Truck IMP
      LW.APX@PRD@IMP= T1 + ((LW.APX@PRD@TOLL/100.0)*   AP@PRD@EQM);APAX  IMP

;
;  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=LW.SOV@PRD@IMP, 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.@PRD@TOLL), NOACCESS=0  ;
    PATHLOAD PATH=LW.HV2@PRD@IMP, 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.@PRD@TOLL), NOACCESS=0  ;
    PATHLOAD PATH=LW.HV3@PRD@IMP, 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.@PRD@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])                    ; ROUND TOLL
     mw[6] = ROUND(MW[6])                    ; SKIMS TO 1980
     mw[9] = ROUND(MW[9])                    ; 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_Auto_Drivers.s

```
; ===================================================================
;  MC_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%_iter_%.fin'   ; HBW Mode Choice file               (Input)
 MC123OCC = '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)
 MC123OCC = '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)
 MC123OCC = '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)
 MC123OCC = '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@',' 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=@MC123OCC@,MO=41,42,43 ; output file designation

ENDRUN
ENDLOOP
```

MC_Constraint.s

```
;/////////////////////////////////////////////////////////////////
; ===============================================================
; Transit Constraint Process -Applied to modeled mode choice output
;         file for forecast years beyond the year 2005.
;         The process constrains Peak Period Transit trips heading
;         TO or THROUGH the regional core to be constrained to
;         2005 levels and adjusts auto person/driver trips accordingly.
;
; The process consists of 3 Steps:
; Step 1. 2005 & future year peak/off-peak transit trips are calculated
;         for each purpose using 1994 HTS time period factors.
;         (2 Loops for constr./unconstr. mode choice output files)
;
; Step 2. 2005 & Future year peak & total transit trips are squeezed to
;          a 3x3 (core/va/dc,md).  Factors for scaling unconstrained
;          transit trips to constrained transit trips are computed, on
;          an i/j basis.  A 'lookup' of constraint factors is produced.
;
; Step 3.  Future year constrained zonal trips are computed by applying
;          the constraint factors to the zonal trip tables.
;          constrained transit trips are produced (i.e., residual auto
;          persons are generated. and LOV,HOV auto person/driver trips
;          are computed using existing distributions on a cell by cell
;          basis.
;         (4 Loops for each Purpose)
;
;-------------------------------------------------------------------------
; Step 1.
;         2005 & future year peak/off-peak transit trips are calculated
;         for each purpose using 1994 HTS time period factors.
;-------------------------------------------------------------------------
LOOP Time  = 1, 2            ; Time '1' = 2005/ Time '2' = Future year

 IF (Time = 1)
  PATHSPECHBW = '%_path05HBW_%'    ; path specification of 2005 HBW transit trips
  PATHSPECHBS = '%_path05HBS_%'    ; path specification of 2005 HBS transit trips
  PATHSPECHBO = '%_path05HBO_%'    ; path specification of 2005 HBO transit trips
  PATHSPECNHB = '%_path05NHB_%'    ; path specification of 2005 NHB transit trips
  YR       = 'con'           ; constraint indicator    (for file naming)
  title    = ' 2005 Constrained Transit Summary by Time Period '

 ELSE
  PATHSPECHBW = 'mc_HBW%_iter_%.FIN'   ; forecast year should be in current subdir
  PATHSPECHBS = 'mc_HBS%_iter_%.FIN'   ; forecast year should be in current subdir
  PATHSPECHBO = 'mc_HBO%_iter_%.FIN'   ; forecast year should be in current subdir
  PATHSPECNHB = 'mc_NHB%_iter_%.FIN'   ; forecast year should be in current subdir
  YR       = 'ucn'           ; unconstrained indicator (for file naming)
  title    = ' Future Year (Post 2005) UnConstrained Transit Summary by Time Period
'

 ENDIF
;
;  Factors for distributing Daily Transit Trips
;  (HBW,HBS,HBO,NHB) Among 3 Time Periods:
;
;             -  AM peak  (6:00 - 9:00 AM)
;             -  PM peak  (4:00 - 7:00 PM)
;             -  Off-peak (All Other hrs )
;
; ===================================================================
;
;  Transit Time-of-Day Factors (Pcts) Follow:
;
;                     Period       Purpose   Mode        Direction
;                     --------     -------   ----        ---------
; Start of HBW
AMWTRHNP =  70.00     ; AM  Pk Prd    HBW     Transit  H -> NH
PMWTRHNP =   5.00     ; PM  Pk Prd    HBW     Transit  H -> NH
OPWTRHNP =  25.00     ; NON Pk Prd    HBW     Transit  H -> NH

AMWTRNHP =   1.00     ; AM  Pk Prd    HBW     Transit  NH -> H
PMWTRNHP =  72.00     ; PM  Pk Prd    HBW     Transit  NH -> H
OPWTRNHP =  27.00     ; NON Pk Prd    HBW     Transit  NH -> H
;
; End of HBW
;
; Start of HBS
AMSTRHNP =  24.00     ; AM  Pk Prd    HBS     Transit  H -> NH
PMSTRHNP =  15.00     ; PM  Pk Prd    HBS     Transit  H -> NH
OPSTRHNP =  61.00     ; NON Pk Prd    HBS     Transit  H -> NH

AMSTRNHP =   2.00     ; AM  Pk Prd    HBS     Transit  NH -> H
PMSTRNHP =  35.00     ; PM  Pk Prd    HBS     Transit  NH -> H
OPSTRNHP =  63.00     ; NON Pk Prd    HBS     Transit  NH -> H
;
; End of HBS
;
; Start of HBO
AMOTRHNP =  38.00     ; AM  Pk Prd    HBO     Transit  H -> NH
PMOTRHNP =  13.00     ; PM  Pk Prd    HBO     Transit  H -> NH
OPOTRHNP =  49.00     ; NON Pk Prd    HBO     Transit  H -> NH

AMOTRNHP =   2.00     ; AM  Pk Prd    HBO     Transit  NH -> H
PMOTRNHP =  35.00     ; PM  Pk Prd    HBO     Transit  NH -> H
OPOTRNHP =  63.00     ; NON Pk Prd    HBO     Transit  NH -> H
;
; End of HBO
;
; Start of NHB
AMNTRHNP =  14.00     ; AM  Pk Prd    NHB     Transit  H -> NH
PMNTRHNP =  31.00     ; PM  Pk Prd    NHB     Transit  H -> NH
OPNTRHNP =  55.00     ; NON Pk Prd    NHB     Transit  H -> NH

AMNTRNHP =  14.00     ; AM  Pk Prd    NHB     Transit  NH -> H
PMNTRNHP =  31.00     ; PM  Pk Prd    NHB     Transit  NH -> H
OPNTRNHP =  55.00     ; NON Pk Prd    NHB     Transit  NH -> H
;
; End of NHB

;/////////////////////////////////////////////////////////////////
;
; Begin Step 1 TP+ WORK
;
;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

RUN PGM=MATRIX
; Read input Mode Choice Model Output (Transit in tabs 3,4)
    MATI[1] = @PATHSPECHBW@ ; HBW Wk,Dr Access Trn Trips (T3-4)
    MATI[2] = @PATHSPECHBS@ ; HBS Wk,Dr Access Trn Trips (T3-4)
    MATI[3] = @PATHSPECHBO@ ; HBO Wk,Dr Access Trn Trips (T3-4)
    MATI[4] = @PATHSPECNHB@ ; NHB Wk,Dr Access Trn Trips (T3-4)

;  Specify output Pk, Offpk transit Total Transit trips (t1-3) by purpose
;               Peak trips consist of AM & PM Trips
   MATO[1] = TRNWPKOP.@yr@, MO=51,41,1 ;HBW Pk,Off-Pk,total Transit Trips
   MATO[2] = TRNSPKOP.@yr@, MO=52,42,2 ;HBS Pk,Off-Pk,total Transit Trips
   MATO[3] = TRNOPKOP.@yr@, MO=53,43,3 ;HBO Pk,Off-Pk,total Transit Trips
   MATO[4] = TRNNPKOP.@yr@, MO=54,44,4 ;NHB Pk,Off-Pk,total Transit Trips

;
; Put HBW  Total (Walk, Drive Access) Transit Trips in MW  1
; Put HBS  Total (Walk, Drive Access) Transit Trips in MW  2
```

```
; Put HBO  Total (Walk, Drive Access) Transit Trips in MW  3
; Put NHB  Total (Walk, Drive Access) Transit Trips in MW  4

;  These are in P/A format and represent the Home-to-NonHome direction

      MW[01]  = MI.1.3 + MI.1.4   ; Work  transit P/A fmt
      MW[02]  = MI.2.3 + MI.2.4   ; Shop  transit P/A fmt
      MW[03]  = MI.3.3 + MI.3.4   ; Othr  transit P/A fmt
      MW[04]  = MI.4.3 + MI.4.4   ; NHB   transit P/A fmt

; Put Transpose of the above
; HBW, HBS, HBO, and NHB trip tables in Work Mats 5 -8
; The transpose represents the NonHome-to-Home direction

     MW[11]=MI.1.3.T, MW[12]=MI.1.4.T   ; Work wk,dr transit A/P fmt
     MW[13]=MI.2.3.T, MW[14]=MI.2.4.T   ; Shop wk,dr transit A/P fmt
     MW[15]=MI.3.3.T, MW[16]=MI.3.4.T   ; Othr wk,dr transit A/P fmt
     MW[17]=MI.4.3.T, MW[18]=MI.4.4.T   ; NHB  wk,dr transit A/P fmt

     MW[05]=MW[11] + MW[12]             ; Work total transit A/P fmt
     MW[06]=MW[13] + MW[14]             ; Shop total transit A/P fmt
     MW[07]=MW[15] + MW[16]             ; Othe total transit A/P fmt
     MW[08]=MW[17] + MW[18]             ; NonH total transit A/P fmt
; Now we're ready to apply apply TOD factors
;
;
 JLOOP

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

; AM Peak Period Transit Trips (MWs 21-24)
;    HBW Transit Trips:
MW[21]=(( MW[1]*(@AMWTRHNP@/100.0))+(MW[05]*(@AMWTRNHP@/100.0)))/2.0;
;    HBS Transit Trips:
MW[22]=(( MW[2]*(@AMSTRHNP@/100.0))+(MW[06]*(@AMSTRNHP@/100.0)))/2.0;
;    HBO Transit Trips:
MW[23]=(( MW[3]*(@AMOTRHNP@/100.0))+(MW[07]*(@AMOTRNHP@/100.0)))/2.0;
;    NHB Transit Trips:
MW[24]=(( MW[4]*(@AMNTRHNP@/100.0))+(MW[08]*(@AMNTRNHP@/100.0)))/2.0;
;

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

; PM Peak Period Transit Trips (MWs 31-34)
;    HBW Transit Trips:
MW[31]=(( MW[1]*(@PMWTRHNP@/100.0))+(MW[05]*(@PMWTRNHP@/100.0)))/2.0;
;    HBS Transit Trips:
MW[32]=(( MW[2]*(@PMSTRHNP@/100.0))+(MW[06]*(@PMSTRNHP@/100.0)))/2.0;
;    HBO Transit Trips:
MW[33]=(( MW[3]*(@PMOTRHNP@/100.0))+(MW[07]*(@PMOTRNHP@/100.0)))/2.0;
;    NHB Transit Trips:
MW[34]=(( MW[4]*(@PMNTRHNP@/100.0))+(MW[08]*(@PMNTRNHP@/100.0)))/2.0;
;
;

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

; Off-Peak Period Transit Trips (MWs 41-44)
;    HBW Transit Trips:
MW[41]=(( MW[1]*(@OPWTRHNP@/100.0))+(MW[05]*(@OPWTRNHP@/100.0)))/2.0;
;    HBS Transit Trips:
MW[42]=(( MW[2]*(@OPSTRHNP@/100.0))+(MW[06]*(@OPSTRNHP@/100.0)))/2.0;
;    HBO Transit Trips:
MW[43]=(( MW[3]*(@OPOTRHNP@/100.0))+(MW[07]*(@OPOTRNHP@/100.0)))/2.0;
;    NHB Transit Trips:
MW[44]=(( MW[4]*(@OPNTRHNP@/100.0))+(MW[08]*(@OPNTRNHP@/100.0)))/2.0;
;
;
ENDJLOOP

;  bucket round

   DUMMY = ROWFIX(21) ; FINAL AM hbw  transit Trips
   DUMMY = ROWFIX(22) ; FINAL AM hbs  transit Trips
   DUMMY = ROWFIX(23) ; FINAL AM hbo  transit Trips
   DUMMY = ROWFIX(24) ; FINAL AM nhb  transit Trips

   DUMMY = ROWFIX(31) ; FINAL PM hbw  transit Trips
   DUMMY = ROWFIX(32) ; FINAL PM hbs  transit Trips
   DUMMY = ROWFIX(33) ; FINAL PM hbo  transit Trips
   DUMMY = ROWFIX(34) ; FINAL PM nhb  transit Trips

   DUMMY = ROWFIX(41) ; FINAL OP hbw  transit Trips
   DUMMY = ROWFIX(42) ; FINAL OP hbs  transit Trips
   DUMMY = ROWFIX(43) ; FINAL OP hbo  transit Trips
   DUMMY = ROWFIX(44) ; FINAL OP nhb  transit Trips

;-----------------------------------------------------------------------
; Summarize Output / Allocated Transit Trips by purpose for checking;
; Total HBW:
 MW[101] = MW[21] + MW[31] + MW[41]
; Total HBS:
 MW[102] = MW[22] + MW[32] + MW[42]
; Total HBO:
 MW[103] = MW[23] + MW[33] + MW[43]
; Total NHB:
 MW[104] = MW[24] + MW[34] + MW[44]
;
;-----------------------------------------------------------------------
; Summarize by purpose & Pk time periods(AM+PM) - put in MWs 51-54

; HBW PK(AM&PM):
 MW[51]= MW[21]+MW[31] ; Peak (AM+PM) HBW Transit Trips
 MW[52]= MW[22]+MW[32] ; Peak (AM+PM) HBS Transit Trips
 MW[53]= MW[23]+MW[33] ; Peak (AM+PM) HBO Transit Trips
 MW[54]= MW[24]+MW[34] ; Peak (AM+PM) NHB Transit Trips

;
;
; Now get regional totals to summarize neatly
Jloop
; accumulate trips by period(a,p,o), purpose(w,s,o,n)
; e.g. 'aw' refers to period 'a',  and purp 'w'


aw=aw+mw[21] as=as+mw[22] ao=ao+mw[23] an=an+mw[24]
pw=pw+mw[31] ps=ps+mw[32] po=po+mw[33] pn=pn+mw[34]
ow=ow+mw[41] os=os+mw[42] oo=oo+mw[43] on=on+mw[44]



; accumulate total output trips by time period
 oam =oam     + MW[21] + MW[22] + MW[23] + MW[24]

 opm =opm     + MW[31] + MW[32] + MW[33] + MW[34]

 oop =oop     + MW[41] + MW[42] + MW[43] + MW[44]

; accumulate total input trips by purpose, total
 ihbw=ihbw + MW[1]                    ; Total Input HBW Transit Trips
```

```
 ihbs=ihbs + MW[2]                   ; Total Input HBS Transit Trips
 ihbo=ihbo + MW[3]                   ; Total Input HBO Transit Trips
 inhb=inhb + MW[4]                   ; Total Input NHB Transit Trips
 itot=itot + MW[1]+MW[2]+MW[3]+MW[4]  ; Total Input     Transit Trips


; accumulate total output trips by purpose, total
 ohbw=ohbw + MW[101]
 ohbs=ohbs + MW[102]
 ohbo=ohbo + MW[103]
 onhb=onhb + MW[104]
 otot=otot + MW[101] + MW[102] + MW[103] + MW[104]

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;
dftot = otot - itot;

LIST = '/bt     '
LIST = '@title@','\n'
LIST = '     '
list = 'TIME PERIOD  HBW     HBS     HBO     NHB     Sum '
list = '-----------  ---     ---     ---     ---     --- '
list = 'AM       ',aw(8.0),  as(8.0),  ao(8.0),  an(8.0),  oam(8.0)
list = 'PM       ',pw(8.0),  ps(8.0),  po(8.0),  pn(8.0),  opm(8.0)
list = 'OP       ',ow(8.0),  os(8.0),  oo(8.0),  on(8.0),  oop(8.0)
list = '  '
list = 'Total    ',ohbw(8.0),ohbs(8.0),ohbo(8.0),onhb(8.0),otot(8.0)
list = '  '
list = '  '
list = 'I/P Totls',ihbw(8.0),ihbs(8.0),ihbo(8.0),inhb(8.0),itot(8.0)
list = '  '
list = 'Diff.    ',dfhbw(8.0),dfhbs(8.0),dfhbo(8.0),dfnhb(8.0),dftot(8.0)

list = '/et       '
endif

;
;-------------------------------------------------------------
;---  END of TRANSIT Time-of-Day Process             ----------
;---                                                 ----------
;-------------------------------------------------------------
ENDRUN
ENDLOOP ; End  of time-of -day loop

;/////////////////////////////////////////////////////////////////
;
;   Step 2
;         2005 & Future year peak & total transit trips are squeezed to
;          a 3x3 (core/va/dc,md).  Factors for scaling unconstrained
;          transit trips to constrained transit trips are computed, on
;          an i/j basis FOR ijS TO AND THROUGH the regional core.
;
;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
; create zone, state equiv table (Note: Internal TAZs ONLY)
COPY FILE = three.eqv
; Beginning of 3x3 Equivalency Table
D 1=1239-2144       ;  VA    - Non-Regional Core
D 2=1-88,1230-1238  ;  DC&VA -     Regional Core
D 3=89-1229         ;  DC&MD - Non-Regional Core
;       End of 3x3 Equivalency Table
ENDCOPY
```

```
RUN PGM=MATRIX
; Read input Files

 ; Input Year 2005 / Constraining Transit Trips:
  MATI[01] = TRNWPKOP.con             ; HBW Pk,OffPk, Total Transit
  MATI[02] = TRNSPKOP.con             ; HBS Pk,OffPk, Total Transit
  MATI[03] = TRNOPKOP.con             ; HBO Pk,OffPk, Total Transit
  MATI[04] = TRNNPKOP.con             ; NHB Pk,OffPk, Total Transit

 ; Input Forecast Year /Unconstrained Transit Trips:
  MATI[05] = TRNWPKOP.ucn             ; HBW Pk,OffPk, Total Transit
  MATI[06] = TRNSPKOP.ucn             ; HBS Pk,OffPk, Total Transit
  MATI[07] = TRNOPKOP.ucn             ; HBO Pk,OffPk, Total Transit
  MATI[08] = TRNNPKOP.ucn             ; NHB Pk,OffPk, Total Transit

 ; Output 3x3 tables
   FILEO MATO[1] = tempsqz.dat, MO=1-8,11-18
         ;  sequence of squeezed (3x3) output trip tables
         ;  1- 4 ->> 2005     Peak  HBW,HBS,HBO,NHB Transit trips
         ;  5- 8 ->> 2005     Daily HBW,HBS,HBO,NHB Transit trips
         ; 11-14 ->> Forecast Peak  HBW,HBS,HBO,NHB Transit trips
         ; 15-18 ->> Forecast Daily HBW,HBS,HBO,NHB Transit trips


  ; Read in Constraining Transit Trips for each purpose (mw 1-8)
  MW[1] = MI.1.1       MW[5]=MI.1.3  ; HBW Pk,Total Trn Trips (MW1,5)
  MW[2] = MI.2.1       MW[6]=MI.2.3  ; HBS Pk,Total Trn Trips (MW2,6)
  MW[3] = MI.3.1       MW[7]=MI.3.3  ; HBO Pk,Total Trn Trips (MW3,7)
  MW[4] = MI.4.1       MW[8]=MI.4.3  ; NHB Pk,Total Trn Trips (MW4,8)

  ; Read in Forecasted Transit Trips for each purpose  (mw 11-18)
  MW[11] = MI.5.1      MW[15]=MI.5.3  ; HBW Pk,Total Trn Trips (MW11,15)
  MW[12] = MI.6.1      MW[16]=MI.6.3  ; HBS Pk,Total Trn Trips (MW12,16)
  MW[13] = MI.7.1      MW[17]=MI.7.3  ; HBO Pk,Total Trn Trips (MW13,17)
  MW[14] = MI.8.1      MW[18]=MI.8.3  ; NHB Pk,Total Trn Trips (MW14,18)

 RENUMBER FILE=three.eqv, MISSINGZI=M, MISSINGZO=W
ENDRUN

RUN PGM=MATRIX
; Read input Squeezed
ZONES=3
    MATI[1] = tempsqz.dat
  ; Read in Constraining Transit Trips for each purpose (mw 1-8)
  MW[1] = MI.1.1       MW[5]=MI.1.5  ; HBW Pk,Total Trn Trips (MW1,5)
  MW[2] = MI.1.2       MW[6]=MI.1.6  ; HBS Pk,Total Trn Trips (MW2,6)
  MW[3] = MI.1.3       MW[7]=MI.1.7  ; HBO Pk,Total Trn Trips (MW3,7)
  MW[4] = MI.1.4       MW[8]=MI.1.8  ; NHB Pk,Total Trn Trips (MW4,8)

  ; Read in Forecasted Transit Trips for each purpose  (mw 11-18)
  MW[11] = MI.1.9      MW[15]=MI.1.13 ; HBW Pk,Total Trn Trips (MW11,15)
  MW[12] = MI.1.10     MW[16]=MI.1.14 ; HBS Pk,Total Trn Trips (MW12,16)
  MW[13] = MI.1.11     MW[17]=MI.1.15 ; HBO Pk,Total Trn Trips (MW13,17)
  MW[14] = MI.1.12     MW[18]=MI.1.16 ; NHB Pk,Total Trn Trips (MW14,18)

;      Now calculate constrained factors on an ij basis
 JLOOP                ; Initialize transit constraint factors
    WConFtr = 1.000  ; HBW ftr
    SConFtr = 1.000  ; HBS Ftr
    OConFtr = 1.000  ; HBO Ftr
    NConFtr = 1.000  ; NHB Ftr
     IF ((I = 1 && J = 2) || ; IF from VA nonCore   to Regional Core
         (I = 1 && J = 3) || ; or from VA nonCore   to DC/MD Non Reg Core
         (I = 3 && J = 1) || ; or from MD/DCnonCore to VA    Non Reg Core
         (I = 3 && J = 2))   ; or from MD/DCnonCore to Regional Core
         ; THEN calculate peak constraint factor, by purpose
         ; Constrained Transit trips =
```

```
         ; UnCon. Daily trips - UnCon. Pk Trips + Constrained Pk Trips
          MW[21] = (MW[15]-MW[11])+MW[1] ; Constrained HBW Daily Trn Trips
          MW[22] = (MW[16]-MW[12])+MW[2] ; Constrained HBS Daily Trn Trips
          MW[23] = (MW[17]-MW[13])+MW[3] ; Constrained HBO Daily Trn Trips
          MW[24] = (MW[18]-MW[14])+MW[4] ; Constrained NHB Daily Trn Trips

           IF (MW[15]=0)
               WConFtr = 0   ;
             ELSE
               WConFtr = MW[21] / MW[15]  ;
           ENDIF

           IF (MW[16]=0)
               SConFtr = 0   ;
             ELSE
               SConFtr = MW[22] / MW[16]  ;
           ENDIF

           IF (MW[17]=0)
               OConFtr = 0   ;
             ELSE
               OConFtr = MW[23] / MW[17]  ;
           ENDIF

           IF (MW[18]=0)
               NConFtr = 0   ;
             ELSE
               NConFtr = MW[24] / MW[18]  ;
           ENDIF
                    ; Accumulate Final Costrained Transit
          HBW_FCT  = HBW_FCT + ((MW[15]-MW[11])+MW[1]) ; Constrained HBW Daily Trn
Trips
        HBS_FCT  = HBS_FCT + ((MW[16]-MW[12])+MW[2]) ; Constrained HBS Daily Trn
Trips
        HBO_FCT  = HBO_FCT + ((MW[17]-MW[13])+MW[3]) ; Constrained HBO Daily Trn
Trips
        NHB_FCT  = NHB_FCT + ((MW[18]-MW[14])+MW[4]) ; Constrained NHB Daily Trn
Trips

     ELSE

          HBW_FCT  = HBW_FCT + MW[15] ;                  Constrained HBW Daily Trn
Trips
        HBS_FCT  = HBS_FCT + MW[16] ;                 Constrained HBS Daily Trn
Trips
        HBO_FCT  = HBO_FCT + MW[17] ;                 Constrained HBO Daily Trn
Trips
        NHB_FCT  = NHB_FCT + MW[18] ;                 Constrained NHB Daily Trn
Trips

     ENDIF



     IJ = I*10+j         ; create two digit no where 1st digit=i,2nd=j

; print ij, const pk&total,unconstr pk/total, final total trn trips,ftr
;  --one file for each purpose

  Print LIST = ij(4),MW[1](8),MW[5](8),MW[11](8),MW[15](8),MW[21](8),
               WConFtr(6.3),File=tconftr.HBW
  Print LIST = ij(4),MW[2](8),MW[6](8),MW[12](8),MW[16](8),MW[22](8),
               SConFtr(6.3),File=tconftr.HBS
  Print LIST = ij(4),MW[3](8),MW[7](8),MW[13](8),MW[17](8),MW[23](8),
               OConFtr(6.3),File=tconftr.HBO
  Print LIST = ij(4),MW[4](8),MW[8](8),MW[14](8),MW[18](8),MW[24](8),
               NConFtr(6.3),File=tconftr.NHB
 ENDJLOOP
```

```
IF (I=ZONES)
  Print LIST = ' Control Total HBW Constrained Transit Trips: ',HBW_FCT(10)
  Print LIST = ' Control Total HBS Constrained Transit Trips: ',HBS_FCT(10)
  Print LIST = ' Control Total HBO Constrained Transit Trips: ',HBO_FCT(10)
  Print LIST = ' Control Total NHB Constrained Transit Trips: ',NHB_FCT(10)
endif
; Now, Let's carry the control totals with us so we can compare with the
; zonal totals, top be computed in the next step
LOG PREFIX = MATRIX, VAR = HBW_FCT, HBS_FCT, HBO_FCT, NHB_FCT
;
;
ENDRUN

;/////////////////////////////////////////////////////////////////
;
; Begin Step 3
;          future year constrained trips are computed by applying
;          the constraint factors to the zonal trip tables.
;          constrained transit trips are produced (i.e., residual auto
;          persons are generated. and LOV,HOV auto person/driver trips
;          are computed using existing distributions on a cell by cell
;          basis.
;
;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
LOOP TIME = 1,4    ; Loop through for each purpose
   IF     (TIME=1)
      PRP     = 'HBW'                                ; Purpose code
      INTAB   = 'FILLMW MW[1]=MI.1.1,2,3,4,5,6,7' ; Input table spec
      DADRPCT =  0.9009                              ; LOV Default Adr %
      HADRPCT =  0.2857                              ; HOV Default Adr %
      Control = MATRIX.HBW_FCT    ; Transit Control Total
   ELSEIF (TIME=2)
      PRP   = 'HBS'                                  ; Purpose Code
      INTAB = 'FILLMW MW[1]=MI.1.1,2,3,4'         ; Input table spec
      DADRPCT =  0.8130                              ; Default Adr %
      HADRPCT =  0.2857                              ; HOV Default Adr %
      Control = MATRIX.HBS_FCT     ; Transit Control Total
   ELSEIF (TIME=3)
      PRP   = 'HBO'      ; Purpose code
      INTAB = 'FILLMW MW[1]=MI.1.1,2,3,4'   ; Input table spec
      DADRPCT =  0.6897                              ; Default Adr %
      HADRPCT =  0.2857                              ; HOV Default Adr %
      Control = MATRIX.HBO_FCT     ; Transit Control Total
   ELSEIF (TIME=4)
      PRP   = 'NHB'      ; Purpose code
      INTAB = 'FILLMW MW[1]=MI.1.1,2,3,4'   ; Input table spec
      DADRPCT =  0.8000                              ; Default Adr %
      HADRPCT =  0.2857                              ; HOV Default Adr %
      Control = MATRIX.NHB_FCT     ; Transit Control Total
   ENDIF

RUN PGM=MATRIX
ZONES = 2191
; DEFINE INPUT/OUTPUT  FILES HERE:
  MATI[1] = MC_@prp@%_iter_%.FIN                          ; UNCONST. MODE CH TRIPS
  MATO[1] = MC_@prp@%_iter_%.CON,MO=17,15,10,11,5,14,18  ; CONSTR.  MODE CH TRIPS
  MW[5]  = 0             ; initialize HOV tabs (5-7) to 0
  MW[6]  = 0             ; they exist for HBW purpose but do not exist
  MW[7]  = 0             ; for non-work purposes
  @INTAB@                ; Read in 'Final' Mode Choice Model tables
   ;  Trip tables read in are:
   ; 1/SOVadr, 2/SOVapn, 3/WlkTrn, 4/DrvTrn, 5/Hv2adr, 6/Hvapn, 7/Hv3adr

  LOOKUP NAME=TCONFTR,
  LOOKUP[1]=1,RESULT=7,INTERPOLATE=N,LIST=T,FAIL=0,0,0,FILE=TCONFTR.@prp@
```

```
  IF (I = 1239-2144)      MW[30] =  11, INCLUDE=1239-2144
  IF (I = 1239-2144)      MW[30] =  12, INCLUDE=1-88,1230-1238
  IF (I = 1239-2144)      MW[30] =  13, INCLUDE=89-1229

  IF (I = 1-88,1230-1238) MW[30] =  21, INCLUDE=1239-2144
  IF (I = 1-88,1230-1238) MW[30] =  22, INCLUDE=1-88,1230-1238
  IF (I = 1-88,1230-1238) MW[30] =  23, INCLUDE=89-1229

  IF (I = 89-1229)        MW[30] =  31, INCLUDE=1239-2144
  IF (I = 89-1229)        MW[30] =  32, INCLUDE=1-88,1230-1238
  IF (I = 89-1229)        MW[30] =  33, INCLUDE=89-1229
;
; Now Factor transit tables
;
 JLOOP
    MW[8] = MW[3] + MW[4]                 ; Initial/Unconstr. Total Trn
    MW[9] = MW[2] + MW[3] + MW[4] + MW[6]  ; Initial Total Person

    MW[10] = MW[3] * tconftr(1,MW[30])    ; Constrained Walk  transit
    MW[11] = MW[4] * tconftr(1,MW[30])    ; Constrained Drive transit
    MW[12] = MW[10] + MW[11]              ; Constrained Total transit

    MW[13] = MW[8] - MW[12]               ; Transit 'Residual'
      IF (MW[13] < 0)                     ; - Make sure the residual is
          MW[13] = 0                      ;   NOT negative
      ENDIF                               ;

  IF (MW[6]= 0)
    MW[14] = MW[6]
   ELSE
    MW[14] = MW[6] + (MW[13] * (MW[6]/(MW[2]+MW[6]))) ; Updated HOV Psn
  ENDIF

  MW[15] = MW[9] - (MW[14] + MW[12])               ; Updated LOV Psn
                                                   ; Updated LOV Adr:
 IF (MW[2] = 0 && MW[6] =0)
    MW[17] = MW[1]+(@DADRPCT@ * MW[13])
   ELSEIF (MW[2] > 0)
    MW[17] = MW[1]+((MW[1]/MW[2]) * (MW[13]-(MW[13]*(MW[6]/(MW[2]+MW[6])))))
   ELSE
    MW[17] = MW[1]+ (@DADRPCT@ * (MW[13]-(MW[13]*(MW[6]/(MW[2]+MW[6])))))
 ENDIF

 IF (MW[14] = 0)
   MW[18] = MW[7]
  ELSE
   MW[18] = MW[7]+((@HADRPCT@) * (MW[13]*(MW[6]/(MW[2]+MW[6]))))
 ENDIF
ENDJLOOP
;

;Bucket Round

DUMMY=ROWFIX(17)
DUMMY=ROWFIX(15)
DUMMY=ROWFIX(10)
DUMMY=ROWFIX(11)
DUMMY=ROWFIX(05)
DUMMY=ROWFIX(14)
DUMMY=ROWFIX(18)
;
;
;
;
JLOOP
;
; Now Accumulate Initial and Updated Totals /RATES Here:       ; OLD|NEW
;                                                              ; -------
```

```
   INISOVAD = INISOVAD + MW[01]    UPDSOVAD = UPDSOVAD + MW[17]  ; SOV ADRs
   INISOVAP = INISOVAP + MW[02]    UPDSOVAP = UPDSOVAP + MW[15]  ; SOV APns
   INITRNWK = INITRNWK + MW[03]    UPDTRNWK = UPDTRNWK + MW[10]  ; Trn Wk
   INITRNDR = INITRNDR + MW[04]    UPDTRNDR = UPDTRNDR + MW[11]  ; Trn Dr
   INIHV2AD = INIHV2AD + MW[05]    UPDHV2AD = UPDHV2AD + MW[05]  ; HV2 Adrs
   INIHOVAP = INIHOVAP + MW[06]    UPDHOVAP = UPDHOVAP + MW[14]  ; HOV APns
   INIHV3AD = INIHV3AD + MW[07]    UPDHV3AD = UPDHV3AD + MW[18]  ; HV3 Adrs

   INI_PSN  = INI_PSN  + MW[02] + MW[03] + MW[04] + MW[06]       ; OLD Psns
   UPD_PSN  = UPD_PSN  + MW[15] + MW[10] + MW[11] + MW[14]       ; NEW Psns

   INI_TRN  = INI_TRN  + MW[03] + MW[04]                         ; OLD TRN
   UPD_TRN  = UPD_TRN  + MW[10] + MW[11]                         ; NEW TRN

   INI_APN  = INI_APN  + MW[02] + MW[06]                         ; OLD APSN
   UPD_APN  = UPD_APN  + MW[15] + MW[14]                         ; NEW APSN

   INI_ADR  = INI_ADR  + MW[01] + MW[05] + MW[07]                ; OLD APSN
   UPD_ADR  = UPD_ADR  + MW[17] + MW[05] + MW[18]                ; NEW APSN


  ENDJLOOP


  ; If at end,  Get Global Mode differences and regional rates

  if (i=zones)

  ; get differences by purpose (output - Input)

   DIFSOVAD =    UPDSOVAD - INISOVAD
   DIFSOVAP =    UPDSOVAP - INISOVAP
   DIFTRNWK =    UPDTRNWK - INITRNWK
   DIFTRNDR =    UPDTRNDR - INITRNDR
   DIFHV2AD =    UPDHV2AD - INIHV2AD
   DIFHOVAP =    UPDHOVAP - INIHOVAP
   DIFHV3AD =    UPDHV3AD - INIHV3AD
   DIF_PSN  =    UPD_PSN  - INI_PSN
   DIF_TRN  =    UPD_TRN  - INI_TRN
   DIF_APN  =    UPD_APN  - INI_APN

  ; Calculate final car occupancy and transit percentage

  IF (INI_ADR = 0)
    INI_OCC  =   0                                               ; OLD OCC
   ELSE
    INI_OCC  = INI_APN/INI_ADR                                   ; OLD OCC
  ENDIF

  IF (UPD_ADR = 0)
    UPD_OCC   = 0                                                ; NEW OCC
   ELSE
    UPD_OCC  = UPD_APN/UPD_ADR                                   ; NEW OCC
  ENDIF

  IF (INI_PSN = 0)
   INI_TPCT   = 0                                                ; OLD %TRN
    ELSE
   INI_TPCT = INI_TRN/INI_PSN * 100.00                           ; OLD %TRN
  ENDIF

  IF (UPD_PSN = 0)
   UPD_TPCT   = 0                                                ; NEW %tRN
    ELSE
   UPD_TPCT = UPD_TRN/UPD_PSN * 100.00                           ; NEW %tRN
  ENDIF

   DIF_OCC  =    UPD_OCC  - INI_OCC
```

```
 DIF_TPCT =    UPD_TPCT - INI_TPCT


 CONTOTAL  = @control@ ; control total from previous step
LIST = '/bt     '
LIST = ' @prp@ TRANSIT CONSTRAINT RESULTS- Zonal Totals by Mode'
LIST = '       Initial and Final Totals by Mode','\n'
LIST = '    '
list = 'MODE         ','  INITIAL ','  UPDATED ','DIFFERENCE'
list = '------------ ','  ------- ','  ------- ',' -------- '
LIST='  '
LIST = 'SOV_AD:      ',   INISOVAD(10),   UPDSOVAD(10),  DIFSOVAD(10)
LIST = 'SOV_AP:      ',   INISOVAP(10),   UPDSOVAP(10),  DIFSOVAP(10)
LIST = 'TRN_WK:      ',   INITRNWK(10),   UPDTRNWK(10),  DIFTRNWK(10)
LIST = 'TRN_DR:      ',   INITRNDR(10),   UPDTRNDR(10),  DIFTRNDR(10)
LIST = 'HV2_AD:      ',   INIHV2AD(10),   UPDHV2AD(10),  DIFHV2AD(10)
LIST = 'HOV_AP:      ',   INIHOVAP(10),   UPDHOVAP(10),  DIFHOVAP(10)
LIST = 'HV3_AD:      ',   INIHV3AD(10),   UPDHV3AD(10),  DIFHV3AD(10)
LIST='  '
LIST = 'TOTAL PERSON:',    INI_PSN(10),    UPD_PSN(10),  DIF_PSN(10)
LIST='  '
LIST = 'TRANSIT:     ',    INI_TRN(10),    UPD_TRN(10),  DIF_TRN(10)
LIST = 'TRANSIT Control Total  ', CONTOTAL(10),'            <-- Based on Squeezed
3x3 Trips'
LIST='  '
LIST = 'AUTO PSN:    ',    INI_APN(10),    UPD_APN(10),  DIF_APN(10)
LIST='  '
LIST = 'Transit %:   ',    INI_TPCT(10.3), UPD_TPCT(10.3), DIF_TPCT(10.3)
LIST = 'AUTO OCCUP.: ',    INI_OCC(10.3),  UPD_OCC(10.3),  DIF_OCC(10.3)
list = '/et       '
endif

ENDRUN
ENDLOOP
```

MC_Consummary.s

```
; ---------------------------------------------------------------
; MC_ConSummary.s - Juris. Summary of constrained transit trips
;               by Purpose and Mode
;
;
; 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_% Alt: %_alt_%  Iter. %_iter_% *
W/Tran.Constraint *'
LOOP PURP=1,5  ; Outer Loop for Each Purpose (HBW,HBS,HBO,NHB,Total)
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
```

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@%_iter_%.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%_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_%   Iteration: %_iter_% '
LOOP PURP=1,5  ; Outer Loop for Each Purpose (HBW,HBS,HBO,NHB,Total)
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
;
; 6/30/03 MODIFICATIONS FOR IMPROVED TOLL MODELING MADE  rjm
; 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
;-
;
in_tskm = 'inputs\toll.skm'  ; read in toll param file

 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
;-
  READ FILE = @in_tskm@

   ; Define AM /OP link level tolls by vehicle type here:
       LW.SOV@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(1,LI.TOLLGRP)           ;  SOV
TOLLS in 1980 cents
       LW.HV2@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(2,LI.TOLLGRP)           ;  HOV 2
occ TOLLS in 1980 cents
       LW.HV3@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(3,LI.TOLLGRP)           ;  HOV
3+occ TOLLS in 1980 cents
       LW.TRK@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(4,LI.TOLLGRP)           ;  Truck
TOLLS in 1980 cents
       LW.APX@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(5,LI.TOLLGRP)           ;  AP Pax
TOLLS in 1980 cents

   ; Define AM /OP Equivalent 'toll minutes' by vehicle type here:
       LW.SOV@PRD@_tm = (LW.SOV@PRD@TOLL / 100.0) *    SV@PRD@EQM  ;  SOV
Time(min) equiv. of toll value in 1980$
       LW.HV2@PRD@_tm = (LW.HV2@PRD@TOLL / 100.0) *    H2@PRD@EQM  ;  HOV 2 occ
Time(min) equiv. of toll value in 1980$
       LW.HV3@PRD@_tm = (LW.HV3@PRD@TOLL / 100.0) *    H3@PRD@EQM  ;  HOV 3+occ
Time(min) equiv. of toll value in 1980$
       LW.TRK@PRD@_tm = (LW.TRK@PRD@TOLL / 100.0) *    TK@PRD@EQM  ;  Truck
Time(min) equiv. of toll value in 1980$
       LW.APX@PRD@_tm = (LW.APX@PRD@TOLL / 100.0) *    AP@PRD@EQM  ;  APAX
Time(min) equiv. of toll value in 1980$

   ; Define AM /OP IMPEDANCE (HIGHWAY TIME + EQV.TIME) by vehicle type here:
       LW.SOV@PRD@IMP  = LW.SOV@PRD@_tm + LI.@PRD@HTIME            ; SOV  IMPEDANCE
       LW.HV2@PRD@IMP  = LW.HV2@PRD@_tm + LI.@PRD@HTIME            ; HOV 2
IMPEDANCE
       LW.HV3@PRD@IMP  = LW.HV3@PRD@_tm + LI.@PRD@HTIME            ; HOV 3+
IMPEDANCE
       LW.TRK@PRD@IMP  = LW.TRK@PRD@_tm + LI.@PRD@HTIME            ; TRUCK
IMPEDANCE
       LW.APX@PRD@IMP  = LW.APX@PRD@_tm + LI.@PRD@HTIME            ; APPAX
IMPEDANCE


; 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=LW.SOV@PRD@IMP, 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.@PRD@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])                    ; 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    8/13/04  Used in cgv21d_46
;
; MWCOG Version 2.1D 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
;   Non-work penalties were updated by JC
;
  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] = 2000,  INCLUDE=     1-   88 ; dc cr - dc cr
  MW[1] = 2200,  INCLUDE=    89-  319 ; dc cr - dcncr
ELSEIF (I =   89-  319)
```

```
  MW[1] = 1800,  INCLUDE=     1-   88 ; dcncr - dc cr
  MW[1] = 1000,  INCLUDE=    89-  319 ; dcncr - dcncr
  MW[1] = 1000,  INCLUDE=  2145- 2191 ; dcncr - extls
ELSEIF (I =  320-  627)
  MW[1] = 2000,  INCLUDE=     1-   88 ; mtg- dc cr
  MW[1] = 1700,  INCLUDE=    89-  319 ; mtg- dcncr
  MW[1] = 2000,  INCLUDE=   320-  627 ; mtg- mtg
  MW[1] =  500,  INCLUDE=  1080- 1099 ; mtg- how
  MW[1] =  200,  INCLUDE=  1110- 1142 ; mtg- aar
ELSEIF (I =  640- 1020)
  MW[1] = 1400,  INCLUDE=     1-   88 ; pg - dc cr
  MW[1] = 1400,  INCLUDE=    89-  319 ; pg - dcncr
  MW[1] = 1000,  INCLUDE=   320-  627 ; pg - mtg
  MW[1] = 1500,  INCLUDE=   640- 1020 ; pg - pg
  MW[1] =  500,  INCLUDE=  1080- 1099 ; pg - how
  MW[1] =  500,  INCLUDE=  1110- 1142 ; pg - aar
  MW[1] = 1000,  INCLUDE=  2145- 2191 ; pg - ext
ELSEIF (I = 1230- 1238)
  MW[1] = 2500,  INCLUDE=     1-   88 ; arl cr- dc cr
  MW[1] = 1800,  INCLUDE=    89-  319 ; arl cr- dcncr
ELSEIF (I = 1239- 1311)
  MW[1] = 2400,  INCLUDE=     1-   88 ; arlncr- dc cr
ELSEIF (I = 1330- 1389)
  MW[1] = 1900,  INCLUDE=     1-   88 ; alx   - dc cr
ELSEIF (I = 1080- 1099)
  MW[1] = 2200,  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] = 2200,  INCLUDE=     1-   88 ; ffx- dccr
  MW[1] = 1300,  INCLUDE=    89-  319 ; ffx- dcncr
  MW[1] =  900,  INCLUDE=  1400- 1755 ; ffx- ffx
  MW[1] = 1300,  INCLUDE=  1239- 1311 ; ffx- arlnc
ELSEIF (I = 1920- 2061)
  MW[1] = 2800,  INCLUDE=     1-   88 ; pw - dccr
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] = 2000,  INCLUDE=   640- 1020 ; chs - pg
ENDIF

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

IF     (I =   89-  319)
  MW[2] = 1000,  INCLUDE=    89-  319 ; dcncr - dcncr
  MW[2] = 1000,  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] = 1000,  INCLUDE=   320-  627 ; pg - mtg
  MW[2] = 1700,  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] = 1000,  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] = 1000,  INCLUDE=     1-   88 ; dcncr - dc cr
  MW[3] = 1000,  INCLUDE=    89-  319 ; dcncr - dcncr
  MW[3] = 1000,  INCLUDE=  1400- 1755 ; dcncr - ffx
ELSEIF (I =  320-  627)
  MW[3] = 2000,  INCLUDE=     1-   88 ; mtg -dc cr
  MW[3] = 2000,  INCLUDE=   320-  627 ; mtg- mtg
  MW[3] = 1000,  INCLUDE=  1080- 1099 ; mtg- how
ELSEIF (I =  640- 1020)
  MW[3] = 1800,  INCLUDE=     1-   88 ; pg -dc cr
  MW[3] = 1000,  INCLUDE=   320-  627 ; pg - mtg
  MW[3] = 1900,  INCLUDE=   640- 1020 ; pg - pg
ELSEIF (I = 1080- 1099)
  MW[3] = 1000,  INCLUDE=   320-  627 ; how - mtg
ELSEIF (I =1110- 1142)
  MW[3] = 1800,  INCLUDE=  1110- 1142 ;  aa -  aa
  MW[3] = 0700,  INCLUDE=   640- 1020 ;  aa -  pg
ELSEIF (I = 1239- 1311)
  MW[3] = 1000,  INCLUDE=  1239- 1311 ; arlncr- arlncr
ELSEIF (I = 1330- 1389)
  MW[3] = 1600,  INCLUDE=  1330- 1389 ; alx - alx
ELSEIF (I = 1400- 1755)
  MW[3] = 1600,  INCLUDE=     1-   88 ; ffx - dc cr
  MW[3] = 1000,  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] = 2400,  INCLUDE=  1200- 1223 ; chs - chs **  ;
ENDIF

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

IF     (I =  320-  627)
  MW[4] = 1900,  INCLUDE=   320-  627 ; mtg- mtg
  MW[4] = 0200,  INCLUDE=  1080- 1099 ; mtg- how

ELSEIF (I =  640- 1020)
  MW[4] = 1000,  INCLUDE=   320-  627 ; pg - mtg
  MW[4] = 1900,  INCLUDE=   640- 1020 ; pg - pg
  MW[4] = 0300,  INCLUDE=  1110- 1142 ; pg - aa

ELSEIF (I = 1239- 1311)
  MW[4] = 1000,  INCLUDE=  1239- 1311 ; arlncr- arlncr
ELSEIF (I = 1330- 1389)
  MW[4] = 1700,  INCLUDE=  1330- 1389 ; alx - alx
ELSEIF (I = 1400- 1755)
  MW[4] = 1000,  INCLUDE=  1400- 1755 ; ffx - ffx

ELSEIF (I = 1030- 1053)                           ; added
  MW[4] = 1000,  INCLUDE=  1030- 1053 ; frd - frd **  ; 3/12/02
ELSEIF (I = 1200- 1223)                           ;
  MW[4] = 1000,  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
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','i1'-'i6'
; ===================================================================
;
;
;////////////////////////////////////////////////////////////////
;                                                                //
; 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 2.1D Model
;             - PATHSTYLE changed from 1 to 0 on 3.9.04 (RM)
;             - iteration (_iter_) global variables used
;             - 7/13/04
;               Non-Metrorail output time matrix is now altered
;               to reflect the fact that degrading Hwy arterial speeds over time
;               will also affect local bus speeds.  A time factor file
;               in the \INPUTS subdirectory named: LBus_TimFTRS.ASC
;               will be read in.
;               The time factors are applied to the local bus IVT's.
;               The Non-Metrorail IVT matrix was stored in MW[5].  It is now
;               developed as three matrices for Modes 1,6/'inner' Local bus;
;                                                 Mode    8/outer local bus;
;                                                 Modes 2,4,5,7,9/X bus & commuter
rail.
;               The Three Matrices are collapsed into one matrix in the following
MATRIX
;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  = %_iter_%_pp_aa.SKM
;  Walk and Drive Station Data  = %_iter_%_pp_aa.STA
;  Walk and Drive Travel Time   = %_iter_%_pp_aa.TTT
;  Transit Access to Employment = JOBACC.ASC
;
; Step 1: AM Peak Walk Skims
;  Input Files: ZONEHWY.NET, MODE?_AM.TB, *.TB
;  Output Files: TRANSIT.SKM
; Step 2: Split Skims into Multiple Files
;  Input Files: TRANSIT.SKM
;  Output Files: %_iter_%_AM_WK.SKM, %_iter_%_AM_WK.STA, %_iter_%_AM_WK.TTT
; Step 3: AM Peak Drive Skims
;  Input Files: ZONEHWY.NET, MODE?_AM.TB, *.TB
;  Output Files: TRANSIT.SKM
; Step 4: Split Skims into Multiple Files
;  Input Files: TRANSIT.SKM
;  Output Files: %_iter_%_AM_DR.SKM, %_iter_%_AM_DR.STA, %_iter_%_AM_DR.TTT
; Step 5: Off Peak Walk Skims
;  Input Files: ZONEHWY.NET, MODE?_OP.TB, *.TB
;  Output Files: TRANSIT.SKM
; Step 6: Split Skims into Multiple Files
;  Input Files: TRANSIT.SKM
;  Output Files: %_iter_%_OP_WK.SKM, %_iter_%_OP_WK.STA, %_iter_%_OP_WK.TTT
; Step 7: Off Peak Drive Skims
;  Input Files: ZONEHWY.NET, MODE?_OP.TB, *.TB
;  Output Files: TRANSIT.SKM
; Step 8: Split Skims into Multiple Files
;  Input Files: TRANSIT.SKM
;  Output Files: %_iter_%_OP_DR.SKM, %_iter_%_OP_DR.STA, %_iter_%_OP_DR.TTT
; Step 9: Sum the Jobs by Transit Travel Time
;  Input Files: %_iter_%_AM_WK.TTT, %_iter_%_AM_DR.TTT
;  Output Files: JOBACC.ASC
;
;-------------------------------------------------------------------------
;
; Global Variables
;
;        _iter_ (= PP,i1-i6)
;
;-------------------------------------------------------------------------
;         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  = 0
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

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, IVTIL, IVTOL, IVTNL, IVMT, TOTT, ISTOS,
JSTOS, ZWLK,
 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(1,6)*0.01,                     ;---- ivt-nonmetrorail/'Inner' Juris
Local Bus Modes (min)
 MW[6] = TIME(8)*0.01,                       ;---- ivt-nonmetrorail/'Outer' Juris
Local Bus Modes (min)
 MW[7] = TIME(2,4,5,7,9,10)*0.01,            ;---- ivt-nonmetrorail/Non-Local Bus
Modes (min)

 MW[8] = TIME(3)*0.01,                        ;---- ivt-metrorail    (min)
 MW[9] = (IWAIT + TIME (0) + XWAIT (0))*0.01, ;---- total time       (min)
 MW[10] = NODE0(3) - 7300.0,                  ;---- metro board  sta (1-116)
 MW[11] = NODEL(3) - 7300.0,                  ;---- metro alight sta (1-116)
 MW[12] = TIME(16)*0.01                       ; Zonal Acces/Egress Time

;---- 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)
REPORT LINES = NAME, MODE  ; added by rm 4/09/04 to ensure line listings
                           ; with or without 'RT=' commands in transit line files
ENDRUN

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

RUN PGM=MATRIX
 MATI[1]=TRANSIT.SKM
 MATO[1]=%_iter_%_@TIME_PERIOD@_@ACCESS_MODE@.SKM, MO = 1-4,20,8,
  FORMAT = MINUTP
; NAME = WLKT, DACCT, INIT, XFERT, IVNMT, IVMT
 MATO[2]=%_iter_%_@TIME_PERIOD@_@ACCESS_MODE@.STA, MO = 10-11,
  FORMAT = MINUTP,
 NAME = ISTOS, JSTOS
MATO[3]=%_iter_%_@TIME_PERIOD@_@ACCESS_MODE@.TTT, MO = 30,
;FORMAT = MINUTP
 NAME = TOTT

;
;  Read in time factors to increase local bus times
;  based on increasing arterial hwy congestion

READ FILE=INPUTS\LBus_TimFTRS.ASC   ; Local Bus Time Factors

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) Modes 1,6
MW[6] = MI.1.6  ;   ivt-nonmetrorail (min) Modes 8
MW[7] = MI.1.7  ;   ivt-nonmetrorail (min) Modes 2,4,5,7,9,10

MW[8] = MI.1.8   ;   ivt-metrorail    (min)
MW[9] = MI.1.9   ;   total time       (min)

MW[10] = MI.1.10   ;   metro board  sta (1-116)
MW[11] = MI.1.11   ;   metro alight sta (1-116)

MW[12] = MI.1.12   ;   Walk Acc/Egr time (min)

; Factor The Local Bus Time Here
MW[20] = (MW[5] * @TIME_PERIOD@IBFTR) + (MW[6] * @TIME_PERIOD@OBFTR) + MW[7]

; Recompute total transit time, given the local bus adjustment
MW[30] = MW[1] + MW[2] +MW[3] +MW[4] + MW[20] + MW[8] + MW[12]

 JLOOP
 IF (MW[10] < 0 || MW[10] > 116 ) MW[10] = 0
 IF (MW[11] < 0 || MW[11] > 116 ) MW[11] = 0
 ENDJLOOP

ENDRUN


ENDLOOP ;---- ACCESS ----
ENDLOOP ;---- PERIOD ----
;
;-------------------------------------------------------------------------
;         Step 7: Sum the Jobs by Transit Travel Time
;-------------------------------------------------------------------------
;
RUN PGM=MATRIX
 MATI[1] = %_iter_%_AM_WK.TTT
 MATI[2] = %_iter_%_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 - V2.1C Model with ICC changes (JPark) and
;    improved toll modeling changes (RMilone) - Toll changes in ';$' Blocks
;$
; MWCOG  Version 2 Trip Distribution
; Update 8/28/02 rjm
; Note:  Corrected misspecified MAXITERS (was MAXITRS) key word  11/05/02
;        9/8/04 Updated Post-Distribution External adjustments for all purposes
;        to handle 6-figure external Ps/As. rm
;--------------------------------------------------------------------
;
;
;
;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 = '%_prev_%_am.skm'                 ;  AM  HWY TIME SKIMS
OPSOVSKM = '%_prev_%_op.skm'                 ;  OP  HWY TIME SKIMS

itr = '%_iter_%'
 IF (itr = 'pp' )

   AWTRNSKM = 'pp_am_wk.ttt'               ;  AM WK ACC TRN TIME SKIMS /pump prime
itr
   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
  ENDIF

 IF (itr = 'i1' || itr = 'i2' || itr= 'i3')

   AWTRNSKM = 'i1_am_wk.ttt'               ;  AM WK ACC TRN TIME SKIMS / Itr 1- 3
Cycle
   ADTRNSKM = 'i1_am_dr.ttt'               ;  AM DR ACC TRN TIME SKIMS

   OWTRNSKM = 'i1_op_wk.ttt'               ;  OP WK ACC TRN TIME SKIMS
   ODTRNSKM = 'i1_op_dr.ttt'               ;  OP DR ACC TRN TIME SKIMS
  ENDIF

 IF (itr = 'i4' || itr= 'i5'|| itr= 'i6' )

   AWTRNSKM = 'i4_am_wk.ttt'               ;  AM WK ACC TRN TIME SKIMS / Itr 4- 6
Cycle
   ADTRNSKM = 'i4_am_dr.ttt'               ;  AM DR ACC TRN TIME SKIMS

   OWTRNSKM = 'i4_op_wk.ttt'               ;  OP WK ACC TRN TIME SKIMS
   ODTRNSKM = 'i4_op_dr.ttt'               ;  OP DR ACC TRN TIME SKIMS
  ENDIF

;
; --------------------------------------------------------------------
; 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)
;
;$
; ---------------------------------------------------------------------
; Equivalent minutes (min/'80$) by income level (for toll modeling)
;
toll_inc   = 'inputs\toll.inc'    ;
;
; ---------------------------------------------------------------------
;$
; ---------------------------------------------------------------------
; 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
; IMPOSE MAX INTRAZONAL TRAVEL TIME JCPARK 6/18/03
; NO INTRAZONAL TT OVERRIDES FOR RUN 12B2 JCPARK 6/24/03

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))
;      OLDAMIT = MW[3]
;      OLDOPIT = MW[4]
;
;      MW[3]=MIN(MW[3],10.0); IMPOSE MAX INTRAZONAL TT 10 MIN. AM
;      MW[4]=MIN(MW[4],10.0); IMPOSE MAX INTRAZONAL TT 10 MIN. OP
;
;      IF(I=320-627)        ; MONT. CO FOR RUN 12D
;       MW[3]=MIN(MW[3],5.0); IMPOSE MAX INTRAZONAL TT 5 MIN. AM
;       MW[4]=MIN(MW[4],5.0); IMPOSE MAX INTRAZONAL TT 5 MIN. OP
;      ENDIF
;
;      IF(I=1030-1053)     ; FRD. CO FOR RUN 12D
;       MW[3]=MIN(MW[3],5.0); IMPOSE MAX INTRAZONAL TT 5 MIN. AM
;       MW[4]=MIN(MW[4],5.0); IMPOSE MAX INTRAZONAL TT 5 MIN. OP
;      ENDIF
;
;      IF(I=1060-1073)      ; CARROLL CO FOR RUN 12D
;       MW[3]=MIN(MW[3],5.0); IMPOSE MAX INTRAZONAL TT 5 MIN. AM
;       MW[4]=MIN(MW[4],5.0); IMPOSE MAX INTRAZONAL TT 5 MIN. OP
;      ENDIF
;
;      IF(I=1110-1142)        ; MONT. CO FOR RUN 12D
;       MW[3]=MIN(MW[3],5.0); IMPOSE MAX INTRAZONAL TT 5 MIN. AM
;       MW[4]=MIN(MW[4],5.0); IMPOSE MAX INTRAZONAL TT 5 MIN. OP
;      ENDIF
```

```
;
;      NEWAMIT = MW[3]
;      NEWOPIT = MW[4]
;
; PRINT LIST=I(5), OLDAMIT(5), OLDOPIT(5), NEWAMIT(5), NEWOPIT(5),
;       FILE=%_ITER_%INTRATT.LST

 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

;$
MATI[7] = @AMSOVSKM@   ;  INPUT AM PK  tolls in 80 cents (on table 3)
MATI[8] = @OPSOVSKM@   ;  INPUT OFF-PK tolls in 80 cents (on table 3)
;
 READ FILE =@TOLL_INC@  ;  READ in equivalent min/80$ by income group
;
;$

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

;; OLD Code Begin

;;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
;; END OLD Code
;$
;-
; add equivalent 'tolled' AM/OP highway time to normal times by income level
; AM pk normal + equivalent hwy time in work tables 61-64
; Offpk normal + equivalent hwy time in work tables 71-74

      MW[61] = Round(MW[1] + ((MI.7.3/100.0) * i1PKEQM)) ;i1 AM hwy time w/eqv
      MW[62] = Round(MW[1] + ((MI.7.3/100.0) * i2PKEQM)) ;i2 AM hwy time w/eqv
      MW[63] = Round(MW[1] + ((MI.7.3/100.0) * i3PKEQM)) ;i3 AM hwy time w/eqv
      MW[64] = Round(MW[1] + ((MI.7.3/100.0) * i4PKEQM)) ;i4 AM hwy time w/eqv

      MW[71] = Round(MW[2] + ((MI.8.3/100.0) * i1OPEQM)) ;i1 OP hwy time w/eqv
      MW[72] = Round(MW[2] + ((MI.8.3/100.0) * i2OPEQM)) ;i2 OP hwy time w/eqv
      MW[73] = Round(MW[2] + ((MI.8.3/100.0) * i3OPEQM)) ;i3 OP hwy time w/eqv
      MW[74] = Round(MW[2] + ((MI.8.3/100.0) * i4OPEQM)) ;i4 OP hwy time w/eqv
;
;
;
;
;
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[61]
   MW[16] = MW[62]
   MW[17] = MW[63]
   MW[18] = MW[64]
 ELSE
   MW[15] = ROUND (1.0/((1.0/MW[61])+(0.2572/MW[11]))) ; HBW -INC 1 CI MTX
   MW[16] = ROUND (1.0/((1.0/MW[62])+(0.1484/MW[11]))) ; HBW -INC 2 CI MTX
   MW[17] = ROUND (1.0/((1.0/MW[63])+(0.1365/MW[11]))) ; HBW -INC 3 CI MTX
   MW[18] = ROUND (1.0/((1.0/MW[64])+(0.1402/MW[11]))) ; HBW -INC 4 CI MTX
 ENDIF

 IF (MW[12] = 0 || I = J)
   MW[20] =  MW[71]
   MW[21] =  MW[72]
   MW[22] =  MW[73]
   MW[23] =  MW[74]

   MW[25] =  MW[71]
   MW[26] =  MW[72]
   MW[27] =  MW[73]
   MW[28] =  MW[74]

   MW[30] =  MW[72]
 ELSE
   MW[20] = ROUND (1.0/((1.0/MW[71])+(0.0518/MW[12]))) ; HBS -INC 1 CI MTX
   MW[21] = ROUND (1.0/((1.0/MW[72])+(0.0235/MW[12]))) ; HBS -INC 2 CI MTX
   MW[22] = ROUND (1.0/((1.0/MW[73])+(0.0093/MW[12]))) ; HBS -INC 3 CI MTX
   MW[23] = ROUND (1.0/((1.0/MW[74])+(0.0075/MW[12]))) ; HBS -INC 4 CI MTX

   MW[25] = ROUND (1.0/((1.0/MW[71])+(0.0755/MW[12]))) ; HBO -INC 1 CI MTX
   MW[26] = ROUND (1.0/((1.0/MW[72])+(0.0311/MW[12]))) ; HBO -INC 2 CI MTX
   MW[27] = ROUND (1.0/((1.0/MW[73])+(0.0186/MW[12]))) ; HBO -INC 3 CI MTX
   MW[28] = ROUND (1.0/((1.0/MW[74])+(0.0244/MW[12]))) ; HBO -INC 4 CI MTX

   MW[30] = ROUND (1.0/((1.0/MW[72])+(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=8,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=1-4,RCNTL=5-10     ; total trip gen. prod.totals
  ZDATI[2]=@ATTHBWAL@, Z=1-4,CCNTL=5-10     ; 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](8),' ',CCNTL[INDEX](8),
                            FCOLTOT[INDEX](8),' ',coladj[INDEX](8.3),
             FILE=xcolHBW.asc
   ENDLOOP



   LIST = ' TAZ   inital  contrl   final  adjftr ',FILE=xrowHBW.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](8),RCNTL[INDEX](8),
                            FROWTOT[INDEX](8),rowadj[INDEX](8.3),
             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=8,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=1-4,RCNTL=5-10     ; total trip gen. prod.totals
  ZDATI[2]=@ATTHBSAL@, Z=1-4,CCNTL=5-10     ; 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](8),' ',CCNTL[INDEX](8),
                            FCOLTOT[INDEX](8),' ',coladj[INDEX](8.3),
             FILE=xcolHBS.asc
   ENDLOOP



   LIST = ' TAZ  inital  contrl   final  adjftr ',FILE=xrowHBS.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](8),RCNTL[INDEX](8),
                            FROWTOT[INDEX](8),rowadj[INDEX](8.3),
             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=8,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=1-4,RCNTL=5-10     ; total trip gen. prod.totals
  ZDATI[2]=@ATTHBOAL@, Z=1-4,CCNTL=5-10     ; 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](8),' ',CCNTL[INDEX](8),
                            FCOLTOT[INDEX](8),' ',coladj[INDEX](8.3),
             FILE=xcolHBO.asc
   ENDLOOP



   LIST = ' TAZ inital contrl  final adjftr ',FILE=xrowHBO.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](8),RCNTL[INDEX](8),
                            FROWTOT[INDEX](8),rowadj[INDEX](8.3),
```

```
            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=8,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=1-4,RCNTL=5-10  ; NHB Trip Production Controls
  ZDATI[2] = @ATTNHBAL@, Z=1-4,CCNTL=5-10  ; 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](8),' ',CCNTL[INDEX](8),
                            FCOLTOT[INDEX](8),' ',coladj[INDEX](8.3),
```

```
            FILE=xcolNHB.asc
   ENDLOOP



   LIST = ' TAZ  inital  contrl   final  adjftr ',FILE=xrowNHB.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](8),RCNTL[INDEX](8),
                            FROWTOT[INDEX](8),rowadj[INDEX](8.3),
            FILE=xROWNHB.asc
   ENDLOOP
ENDIF
;--------------------------------------------------------------------
RUN PGM=MATRIX    ; Adjust Medium Truck Externals
  MATI[1]= EXT.TEM
  MATI[2]= EST.TEM
  ZDATI[1] = @PROMTKAL@, Z=1-4,RCNTL=5-10  ; MTK Trip Production Controls
  ZDATI[2] = @ATTMTKAL@, Z=1-4,CCNTL=5-10  ; 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](8),' ',CCNTL[INDEX](8),
                            FCOLTOT[INDEX](8),' ',coladj[INDEX](8.3),
            FILE=xcolMTK.asc
   ENDLOOP



   LIST = ' TAZ inital contrl  final adjftr ',FILE=xrowMTK.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](8),RCNTL[INDEX](8),
                            FROWTOT[INDEX](8),rowadj[INDEX](8.3),
            FILE=xrowMTK.asc
   ENDLOOP
ENDIF


;--------------------------------------------------------------------
RUN PGM=MATRIX    ; Adjust Heavy Truck Externals
  MATI[1]= EXT.TEM
  MATI[2]= EST.TEM
  ZDATI[1] = @PROHTKAL@, Z=1-4,RCNTL=5-10  ; HTK Trip Production Controls
  ZDATI[2] = @ATTHTKAL@, Z=1-4,CCNTL=5-10  ; 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](8),' ',CCNTL[INDEX](8),
                            FCOLTOT[INDEX](8),' ',coladj[INDEX](8.3),
             FILE=xcolHTK.asc
   ENDLOOP



   LIST = ' TAZ  inital  contrl   final  adjftr ',FILE=xrowHTK.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](8),RCNTL[INDEX](8),
                            FROWTOT[INDEX](8),rowadj[INDEX](8.3),
             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 D #50 Control Files

cogmca1.ctl B-1
ct2_am.ctl B-1
ct2_op.ctl B-1
GIS.ctl B-1
HBO_TG.ctl B-2
HBS_TG.ctl B-3
HBW_TG.ctl B-4
HTK_TG.ctl B-5
MC_HBO00.ctl B-6
MC_HBO05.ctl B-7
MC_HBO25.ctl B-9
MC_HBO30.ctl B-11
MC_HBO94.ctl B-13
MC_HBS00.ctl B-15
MC_HBS05.ctl B-17
MC_HBS25.ctl B-18
MC_HBS30.ctl B-20
MC_HBS94.ctl B-22
MC_HBW00.ctl B-24
MC_HBW05.ctl B-26
MC_HBW25.ctl B-27
MC_HBW30.ctl B-29
MC_HBW94.ctl B-31
MC_NHB00.ctl B-33
MC_NHB05.ctl B-35
MC_NHB25.ctl B-37
MC_NHB30.ctl B-38
MC_NHB94.ctl B-40
mf1am00.ctl B-42
mf1am05.ctl B-42
mf1am94.ctl B-43
mf1op00.ctl B-43
mf1op05.ctl B-43
mf1op94.ctl B-44
mfamdr00.ctl B-44
mfamdr05.ctl B-45
mfamdr94.ctl B-45
mfamwk00.ctl B-45
mfamwk05.ctl B-46

mfamwk94.ctl B-46
mfopdr00.ctl B-46
mfopdr05.ctl B-47
mfopdr94.ctl B-47
mfopwk00.ctl B-47
mfopwk05.ctl B-48
mfopwk94.ctl B-48
mtk_tg.ctl B-48
Netswam.ctl B-49
Netswop.ctl B-50
NHB_TG.ctl B-50
NT_AM.ctl B-51
NT_OP.ctl B-51
Prefartp.ctl B-51
staprotp.ctl B-51
VEHAVTP.CTL B-52
Walk_AM.CTL B-52
Walk_OP.CTL B-53

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  =1.50
  /
```

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
 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.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  =1.50
  /
```

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,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00

      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_hbo.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBO    Year: 1994
              Auto Operating Cost (UPARM(12)): 8.5 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4,5 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3 stop

Set file names:

&FILES
 J1=  'hbomu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop .skm',
 HOVA='hov2op .skm',
 HOVB='hov3op .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) = 8.5
 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) = 0.04991
 uparms(32) = 0.04991
 uparms(33) = 0.04991
 uparms(34) = 0.01902
 uparms(35) = 0.01902
 uparms(36) = -2.585e-5
 uparms(37) = -2.171e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.01902
 uparms(43) = 2.9
 uparms(44) = 1.1
 uparms(45) = 0.65
 uparms(46) = -5.194e-5
 uparms(47) = 0.01902
 uparms(48) = 0.01902
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = 4.3573
 uparms(54) = -0.0047
 uparms(55) = -0.3111
 uparms(56) = -2.307e-5
 uparms(57) = 0.01902
 uparms(58) = 0.01902
```

```
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 3.1938
 uparms(64) = 0.5041
 uparms(65) = -0.0499
 uparms(66) = 0.78384
 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) = 0.78384
 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) = -0.41346
 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) = -0.69708
 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_HBO05.ctl

```
mc_hbo.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBO    Year: 2005
              Auto Operating Cost (UPARM(12)): 8.3 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
       operating
          cost
```

```
          1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4,5 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3 stop

Set file names:

&FILES
 J1=  'hbomu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop .skm',
 HOVA='hov2op .skm',
 HOVB='hov3op .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) = 8.3
 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) = 0.04991
 uparms(32) = 0.04991
 uparms(33) = 0.04991
 uparms(34) = 0.01902
 uparms(35) = 0.01902
 uparms(36) = -2.585e-5
 uparms(37) = -2.171e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.01902
 uparms(43) = 2.9
 uparms(44) = 1.1
 uparms(45) = 0.65
 uparms(46) = -5.194e-5
 uparms(47) = 0.01902
 uparms(48) = 0.01902
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = 4.3573
 uparms(54) = -0.0047
 uparms(55) = -0.3111
 uparms(56) = -2.307e-5
 uparms(57) = 0.01902
 uparms(58) = 0.01902
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 3.1938
 uparms(64) = 0.5041
 uparms(65) = -0.0499
 uparms(66) = 0.78384
 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) = 0.78384
 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) = -0.41346
 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) = -0.69708
 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_hbo.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBO    Year: 1994
              Auto Operating Cost (UPARM(12)): 7.9 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4,5 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3 stop

Set file names:

&FILES
 J1=  'hbomu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
```

```
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop .skm',
 HOVA='hov2op .skm',
 HOVB='hov3op .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) = 7.9
 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) = 0.04991
 uparms(32) = 0.04991
 uparms(33) = 0.04991
 uparms(34) = 0.01902
 uparms(35) = 0.01902
 uparms(36) = -2.585e-5
 uparms(37) = -2.171e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.01902
 uparms(43) = 2.9
 uparms(44) = 1.1
 uparms(45) = 0.65
 uparms(46) = -5.194e-5
 uparms(47) = 0.01902
 uparms(48) = 0.01902
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = 4.3573
 uparms(54) = -0.0047
 uparms(55) = -0.3111
 uparms(56) = -2.307e-5
 uparms(57) = 0.01902
 uparms(58) = 0.01902
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 3.1938
 uparms(64) = 0.5041
 uparms(65) = -0.0499
 uparms(66) = 0.78384
 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) = 0.78384
 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) = -0.41346
 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) = -0.69708
 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_HBO30.ctl

```
mc_hbo.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBO    Year: 1994
              Auto Operating Cost (UPARM(12)): 7.8 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4,5 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3 stop

Set file names:

&FILES
 J1=  'hbomu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop .skm',
 HOVA='hov2op .skm',
 HOVB='hov3op .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) = 7.8
 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) = 0.04991
 uparms(32) = 0.04991
 uparms(33) = 0.04991
 uparms(34) = 0.01902
 uparms(35) = 0.01902
 uparms(36) = -2.585e-5
 uparms(37) = -2.171e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.01902
 uparms(43) = 2.9
 uparms(44) = 1.1
 uparms(45) = 0.65
 uparms(46) = -5.194e-5
 uparms(47) = 0.01902
 uparms(48) = 0.01902
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = 4.3573
 uparms(54) = -0.0047
 uparms(55) = -0.3111
 uparms(56) = -2.307e-5
 uparms(57) = 0.01902
 uparms(58) = 0.01902
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 3.1938
 uparms(64) = 0.5041
 uparms(65) = -0.0499
 uparms(66) = 0.78384
 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) = 0.78384
 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) = -0.41346
 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) = -0.69708
 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_hbo.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
               Purpose:   HBO    Year: 1994
               Auto Operating Cost (UPARM(12)): 9.1 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4,5 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3 stop

Set file names:

&FILES
 J1=  'hbomu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop .skm',
 HOVA='hov2op .skm',
 HOVB='hov3op .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) = 9.1
 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) = 0.04991
uparms(32) = 0.04991
uparms(33) = 0.04991
uparms(34) = 0.01902
uparms(35) = 0.01902
uparms(36) = -2.585e-5
uparms(37) = -2.171e-5
uparms(38) = 0.0
uparms(39) = 0.0
uparms(40) = 0.0
uparms(41) = 0.0
uparms(42) = 0.01902
uparms(43) = 2.9
uparms(44) = 1.1
uparms(45) = 0.65
uparms(46) = -5.194e-5
uparms(47) = 0.01902
uparms(48) = 0.01902
uparms(49) = 0.0
uparms(50) = 0.0
uparms(51) = 0.0
uparms(52) = 0.0
uparms(53) = 4.3573
uparms(54) = -0.0047
uparms(55) = -0.3111
uparms(56) = -2.307e-5
uparms(57) = 0.01902
uparms(58) = 0.01902
uparms(59) = 0.0
uparms(60) = 0.0
uparms(61) = 0.0
uparms(62) = 0.0
uparms(63) = 3.1938
uparms(64) = 0.5041
uparms(65) = -0.0499
uparms(66) = 0.78384
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) = 0.78384
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) = -0.41346
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) = -0.69708
 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_hbs.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBS    Year: 1994
              Auto Operating Cost (UPARM(12)): 8.5 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3,4,5
   06/04/04 msm db  uparms 43-45         iter 0 (values from 2002),1,2 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 7,8

Set file names:

&FILES
 J1=  'hbsmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 8.5
 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) = 0.02432
 uparms(32) = 0.02432
 uparms(33) = 0.02432
 uparms(34) = 0.00912
 uparms(35) = 0.00912
 uparms(36) = -2.627e-5
 uparms(37) = -2.438e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00416
 uparms(41) = 0.0
 uparms(42) = 0.00912
 uparms(43) = 2.9
 uparms(44) = 0.0
 uparms(45) = -2.0
 uparms(46) = 0.0
 uparms(47) = 0.00912
 uparms(48) = 0.00912
 uparms(49) = 0.00416
```

```
 uparms(50) = 0.00416
 uparms(51) = 0.00416
 uparms(52) = 0.0
 uparms(53) = 3.037
 uparms(54) = -2.272
 uparms(55) = -3.751
 uparms(56) = -4.869e-5
 uparms(57) = 0.00912
 uparms(58) = 0.00912
 uparms(59) = 0.00416
 uparms(60) = 0.00416
 uparms(61) = 0.00416
 uparms(62) = 0.0
 uparms(63) = 0.888
 uparms(64) = -1.929
 uparms(65) = -3.507
 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) = -0.84404
 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_HBS05.ctl

```
mc_hbs.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBS    Year: 2005
              Auto Operating Cost (UPARM(12)): 8.3 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3,4,5
   06/04/04 msm db  uparms 43-45         iter 0 (values from 2002),1,2 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 7,8

Set file names:

&FILES
 J1=  'hbsmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 8.3
 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) = 0.02432
 uparms(32) = 0.02432
 uparms(33) = 0.02432
 uparms(34) = 0.00912
 uparms(35) = 0.00912
 uparms(36) = -2.627e-5
 uparms(37) = -2.438e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00416
 uparms(41) = 0.0
 uparms(42) = 0.00912
 uparms(43) = 2.9
 uparms(44) = 0.0
 uparms(45) = -2.0
 uparms(46) = 0.0
 uparms(47) = 0.00912
 uparms(48) = 0.00912
 uparms(49) = 0.00416
 uparms(50) = 0.00416
 uparms(51) = 0.00416
 uparms(52) = 0.0
 uparms(53) = 3.037
 uparms(54) = -2.272
 uparms(55) = -3.751
 uparms(56) = -4.869e-5
 uparms(57) = 0.00912
 uparms(58) = 0.00912
 uparms(59) = 0.00416
 uparms(60) = 0.00416
 uparms(61) = 0.00416
 uparms(62) = 0.0
 uparms(63) = 0.888
 uparms(64) = -1.929
 uparms(65) = -3.507
 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) = -0.84404
 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_hbs.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBS    Year: 1994
              Auto Operating Cost (UPARM(12)): 7.9 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8
```

```
Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3,4,5
   06/04/04 msm db  uparms 43-45         iter 0 (values from 2002),1,2 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 7,8

Set file names:

&FILES
 J1=  'hbsmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 7.9
 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) = 0.02432
 uparms(32) = 0.02432
 uparms(33) = 0.02432
 uparms(34) = 0.00912
 uparms(35) = 0.00912
 uparms(36) = -2.627e-5
 uparms(37) = -2.438e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00416
 uparms(41) = 0.0
 uparms(42) = 0.00912
 uparms(43) = 2.9
 uparms(44) = 0.0
 uparms(45) = -2.0
 uparms(46) = 0.0
 uparms(47) = 0.00912
 uparms(48) = 0.00912
 uparms(49) = 0.00416
 uparms(50) = 0.00416
 uparms(51) = 0.00416
 uparms(52) = 0.0
 uparms(53) = 3.037
 uparms(54) = -2.272
 uparms(55) = -3.751
 uparms(56) = -4.869e-5
 uparms(57) = 0.00912
 uparms(58) = 0.00912
 uparms(59) = 0.00416
 uparms(60) = 0.00416
 uparms(61) = 0.00416
 uparms(62) = 0.0
 uparms(63) = 0.888
 uparms(64) = -1.929
 uparms(65) = -3.507
 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) = -0.84404
 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_HBS30.ctl

```
mc_hbs.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBS    Year: 1994
              Auto Operating Cost (UPARM(12)): 7.8 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3,4,5
   06/04/04 msm db  uparms 43-45         iter 0 (values from 2002),1,2 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 7,8

Set file names:

&FILES
 J1=  'hbsmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 7.8
 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) = 0.02432
 uparms(32) = 0.02432
 uparms(33) = 0.02432
 uparms(34) = 0.00912
 uparms(35) = 0.00912
 uparms(36) = -2.627e-5
 uparms(37) = -2.438e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00416
 uparms(41) = 0.0
 uparms(42) = 0.00912
 uparms(43) = 2.9
 uparms(44) = 0.0
 uparms(45) = -2.0
 uparms(46) = 0.0
 uparms(47) = 0.00912
 uparms(48) = 0.00912
 uparms(49) = 0.00416
 uparms(50) = 0.00416
 uparms(51) = 0.00416
 uparms(52) = 0.0
 uparms(53) = 3.037
 uparms(54) = -2.272
 uparms(55) = -3.751
 uparms(56) = -4.869e-5
 uparms(57) = 0.00912
 uparms(58) = 0.00912
 uparms(59) = 0.00416
 uparms(60) = 0.00416
 uparms(61) = 0.00416
 uparms(62) = 0.0
 uparms(63) = 0.888
 uparms(64) = -1.929
 uparms(65) = -3.507
 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) = -0.84404
 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_hbs.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBS    Year: 1994

               Auto Operating Cost (UPARM(12)): 9.1 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2,3,4 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2,3,4,5
   06/04/04 msm db  uparms 43-45         iter 0 (values from 2002),1,2 stop
   06/03/04 msm mb  uparms 53-55,63-65   iter 7,8

Set file names:

&FILES
 J1=  'hbsmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 9.1
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) = 0.02432
uparms(32) = 0.02432
uparms(33) = 0.02432
uparms(34) = 0.00912
uparms(35) = 0.00912
uparms(36) = -2.627e-5
uparms(37) = -2.438e-5
uparms(38) = 0.0
uparms(39) = 0.0
uparms(40) = 0.00416
uparms(41) = 0.0
uparms(42) = 0.00912
uparms(43) = 2.9
uparms(44) = 0.0
uparms(45) = -2.0
uparms(46) = 0.0
uparms(47) = 0.00912
uparms(48) = 0.00912
uparms(49) = 0.00416
uparms(50) = 0.00416
uparms(51) = 0.00416
uparms(52) = 0.0
uparms(53) = 3.037
uparms(54) = -2.272
uparms(55) = -3.751
uparms(56) = -4.869e-5
uparms(57) = 0.00912
uparms(58) = 0.00912
uparms(59) = 0.00416
uparms(60) = 0.00416
uparms(61) = 0.00416
uparms(62) = 0.0
uparms(63) = 0.888
uparms(64) = -1.929
uparms(65) = -3.507
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) = -0.84404
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_hbw.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
               Purpose:   HBW    Year: 1994
               Auto Operating Cost (UPARM(12)): 8.5 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2

Set file names:

&FILES
 J1=  'hbwmu.ptt',
 J3=  'am_wk.skm',
 J4=  'mf_am_wk.far',
 J5=  'am_dr.skm',
 J6=  'mf_am_dr.far',
 J7=  'sovam.skm ',
 HOVA='hov2am.skm ',
 HOVB='hov3am.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) = 8.5
 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) = 0.075
uparms(32) = 0.075
uparms(33) = 0.075
uparms(34) = 0.03
uparms(35) = 0.03
uparms(36) = 0.0
uparms(37) = 2.518e-5
uparms(38) = 0.0
uparms(39) = 0.0
uparms(40) = 0.00425
uparms(41) = 0.0
uparms(42) = 0.03
uparms(43) = 2.0499
uparms(44) = 0.5876
uparms(45) = 0.3571
uparms(46) = -4.449e-5
uparms(47) = 0.03
uparms(48) = 0.03
uparms(49) = 0.00425
uparms(50) = 0.00425
uparms(51) = 0.00425
uparms(52) = 0.0
uparms(53) = 4.8310
uparms(54) =  0.8546
uparms(55) = -0.0824
uparms(56) = 0.0
uparms(57) = 0.03
uparms(58) = 0.03
uparms(59) = 0.00425
uparms(60) = 0.00425
uparms(61) = 0.00425
uparms(62) = 0.0
uparms(63) = 4.6175
uparms(64) = 2.4071
uparms(65) = 1.8979
uparms(66) = 0.0
uparms(67) = 0.0
uparms(68) = 0.0
uparms(69) = 0.01124
uparms(70) = 0.02318
uparms(71) = 0.05077
uparms(72) = 0.0
uparms(73) = 0.0
uparms(74) = 0.0
uparms(75) = 0.01124
uparms(76) = 0.02318
uparms(77) = 0.05077
uparms(78) = 0.0
uparms(79) = 0.0
uparms(80) = 1.47162
uparms(81) = 1.88085
uparms(82) = 0.0
uparms(83) = 0.0
uparms(84) = 0.0
uparms(85) = 0.01124
uparms(86) = 0.02318
uparms(87) = 0.05077
uparms(88) = 0.0
uparms(89) = 0.0
uparms(90) = 3.04973
uparms(91) = 2.54494
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) = -0.03611
 uparms(99) = 0.
 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_HBW05.ctl

```
mc_hbw.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBW    Year: 2005
              Auto Operating Cost (UPARM(12)): 8.3 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2

Set file names:

&FILES
 J1=  'hbwmu.ptt',
 J3=  'am_wk.skm',
 J4=  'mf_am_wk.far',
 J5=  'am_dr.skm',
 J6=  'mf_am_dr.far',
 J7=  'sovam.skm ',
 HOVA='hov2am.skm ',
 HOVB='hov3am.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) = 8.3
 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) = 0.075
 uparms(32) = 0.075
 uparms(33) = 0.075
 uparms(34) = 0.03
 uparms(35) = 0.03
 uparms(36) = 0.0
 uparms(37) = 2.518e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00425
 uparms(41) = 0.0
 uparms(42) = 0.03
 uparms(43) = 2.0499
 uparms(44) = 0.5876
 uparms(45) = 0.3571
 uparms(46) = -4.449e-5
 uparms(47) = 0.03
 uparms(48) = 0.03
 uparms(49) = 0.00425
 uparms(50) = 0.00425
 uparms(51) = 0.00425
 uparms(52) = 0.0
 uparms(53) = 4.8310
 uparms(54) =  0.8546
```

```
 uparms(55) = -0.0824
 uparms(56) = 0.0
 uparms(57) = 0.03
 uparms(58) = 0.03
 uparms(59) = 0.00425
 uparms(60) = 0.00425
 uparms(61) = 0.00425
 uparms(62) = 0.0
 uparms(63) = 4.6175
 uparms(64) = 2.4071
 uparms(65) = 1.8979
 uparms(66) = 0.0
 uparms(67) = 0.0
 uparms(68) = 0.0
 uparms(69) = 0.01124
 uparms(70) = 0.02318
 uparms(71) = 0.05077
 uparms(72) = 0.0
 uparms(73) = 0.0
 uparms(74) = 0.0
 uparms(75) = 0.01124
 uparms(76) = 0.02318
 uparms(77) = 0.05077
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 1.47162
 uparms(81) = 1.88085
 uparms(82) = 0.0
 uparms(83) = 0.0
 uparms(84) = 0.0
 uparms(85) = 0.01124
 uparms(86) = 0.02318
 uparms(87) = 0.05077
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 3.04973
 uparms(91) = 2.54494
 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) = -0.03611
 uparms(99) = 0.
 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_hbw.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBW    Year: 1994
              Auto Operating Cost (UPARM(12)): 7.9 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model
```

```
Year       Auto
       operating
          cost
          1994
       cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2

Set file names:

&FILES
 J1=  'hbwmu.ptt',
 J3=  'am_wk.skm',
 J4=  'mf_am_wk.far',
 J5=  'am_dr.skm',
 J6=  'mf_am_dr.far',
 J7=  'sovam.skm ',
 HOVA='hov2am.skm ',
 HOVB='hov3am.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) = 7.9
 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) = 0.075
 uparms(32) = 0.075
 uparms(33) = 0.075
 uparms(34) = 0.03
 uparms(35) = 0.03
 uparms(36) = 0.0
 uparms(37) = 2.518e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00425
 uparms(41) = 0.0
 uparms(42) = 0.03
 uparms(43) = 2.0499
 uparms(44) = 0.5876
 uparms(45) = 0.3571
 uparms(46) = -4.449e-5
 uparms(47) = 0.03
 uparms(48) = 0.03
 uparms(49) = 0.00425
 uparms(50) = 0.00425
 uparms(51) = 0.00425
 uparms(52) = 0.0
 uparms(53) = 4.8310
 uparms(54) =  0.8546
 uparms(55) = -0.0824
 uparms(56) = 0.0
 uparms(57) = 0.03
 uparms(58) = 0.03
 uparms(59) = 0.00425
 uparms(60) = 0.00425
 uparms(61) = 0.00425
 uparms(62) = 0.0
 uparms(63) = 4.6175
 uparms(64) = 2.4071
 uparms(65) = 1.8979
 uparms(66) = 0.0
 uparms(67) = 0.0
 uparms(68) = 0.0
 uparms(69) = 0.01124
 uparms(70) = 0.02318
 uparms(71) = 0.05077
 uparms(72) = 0.0
 uparms(73) = 0.0
 uparms(74) = 0.0
 uparms(75) = 0.01124
 uparms(76) = 0.02318
 uparms(77) = 0.05077
 uparms(78) = 0.0
```

```
 uparms(79) = 0.0
 uparms(80) = 1.47162
 uparms(81) = 1.88085
 uparms(82) = 0.0
 uparms(83) = 0.0
 uparms(84) = 0.0
 uparms(85) = 0.01124
 uparms(86) = 0.02318
 uparms(87) = 0.05077
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 3.04973
 uparms(91) = 2.54494
 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) = -0.03611
 uparms(99) = 0.
 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_HBW30.ctl

```
mc_hbw.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBW    Year: 1994
              Auto Operating Cost (UPARM(12)): 7.8 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2

Set file names:
```

```
&FILES
 J1=  'hbwmu.ptt',
 J3=  'am_wk.skm',
 J4=  'mf_am_wk.far',
 J5=  'am_dr.skm',
 J6=  'mf_am_dr.far',
 J7=  'sovam.skm ',
 HOVA='hov2am.skm ',
 HOVB='hov3am.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) = 7.8
 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) = 0.075
 uparms(32) = 0.075
 uparms(33) = 0.075
 uparms(34) = 0.03
 uparms(35) = 0.03
 uparms(36) = 0.0
 uparms(37) = 2.518e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00425
 uparms(41) = 0.0
 uparms(42) = 0.03
 uparms(43) = 2.0499
 uparms(44) = 0.5876
 uparms(45) = 0.3571
 uparms(46) = -4.449e-5
 uparms(47) = 0.03
 uparms(48) = 0.03
 uparms(49) = 0.00425
 uparms(50) = 0.00425
 uparms(51) = 0.00425
 uparms(52) = 0.0
 uparms(53) = 4.8310
 uparms(54) =  0.8546
 uparms(55) = -0.0824
 uparms(56) = 0.0
 uparms(57) = 0.03
 uparms(58) = 0.03
 uparms(59) = 0.00425
 uparms(60) = 0.00425
 uparms(61) = 0.00425
 uparms(62) = 0.0
 uparms(63) = 4.6175
 uparms(64) = 2.4071
 uparms(65) = 1.8979
 uparms(66) = 0.0
 uparms(67) = 0.0
 uparms(68) = 0.0
 uparms(69) = 0.01124
 uparms(70) = 0.02318
 uparms(71) = 0.05077
 uparms(72) = 0.0
 uparms(73) = 0.0
 uparms(74) = 0.0
 uparms(75) = 0.01124
 uparms(76) = 0.02318
 uparms(77) = 0.05077
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 1.47162
 uparms(81) = 1.88085
 uparms(82) = 0.0
 uparms(83) = 0.0
 uparms(84) = 0.0
 uparms(85) = 0.01124
 uparms(86) = 0.02318
 uparms(87) = 0.05077
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 3.04973
 uparms(91) = 2.54494
 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) = -0.03611
 uparms(99) = 0.
 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_hbw.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   HBW    Year: 1994
              Auto Operating Cost (UPARM(12)): 9.1 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
       operating
          cost
          1994
       cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/03/04 msm db  uparms 43-45         iter 0,1,2
   06/03/04 msm mb  uparms 53-55,63-65   iter 0 (no new run)
   06/03/04 msm mb  uparms 53-55,63-65   iter 1,2

Set file names:

&FILES
 J1=  'hbwmu.ptt',
 J3=  'am_wk.skm',
 J4=  'mf_am_wk.far',
 J5=  'am_dr.skm',
 J6=  'mf_am_dr.far',
 J7=  'sovam.skm ',
 HOVA='hov2am.skm ',
 HOVB='hov3am.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) = 9.1
 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) = 0.075
 uparms(32) = 0.075
 uparms(33) = 0.075
 uparms(34) = 0.03
 uparms(35) = 0.03
 uparms(36) = 0.0
 uparms(37) = 2.518e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00425
 uparms(41) = 0.0
 uparms(42) = 0.03
 uparms(43) = 2.0499
 uparms(44) = 0.5876
 uparms(45) = 0.3571
 uparms(46) = -4.449e-5
 uparms(47) = 0.03
 uparms(48) = 0.03
 uparms(49) = 0.00425
 uparms(50) = 0.00425
 uparms(51) = 0.00425
 uparms(52) = 0.0
 uparms(53) = 4.8310
 uparms(54) =  0.8546
 uparms(55) = -0.0824
 uparms(56) = 0.0
 uparms(57) = 0.03
 uparms(58) = 0.03
 uparms(59) = 0.00425
 uparms(60) = 0.00425
 uparms(61) = 0.00425
 uparms(62) = 0.0
 uparms(63) = 4.6175
 uparms(64) = 2.4071
 uparms(65) = 1.8979
 uparms(66) = 0.0
 uparms(67) = 0.0
 uparms(68) = 0.0
 uparms(69) = 0.01124
 uparms(70) = 0.02318
 uparms(71) = 0.05077
 uparms(72) = 0.0
 uparms(73) = 0.0
 uparms(74) = 0.0
 uparms(75) = 0.01124
 uparms(76) = 0.02318
 uparms(77) = 0.05077
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 1.47162
 uparms(81) = 1.88085
 uparms(82) = 0.0
 uparms(83) = 0.0
 uparms(84) = 0.0
 uparms(85) = 0.01124
 uparms(86) = 0.02318
 uparms(87) = 0.05077
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 3.04973
 uparms(91) = 2.54494
 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) = -0.03611
 uparms(99) = 0.
 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_nhb.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
               Purpose:   NHB    Year: 1994
               Auto Operating Cost (UPARM(12)): 8.5 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/04/04 msm db  uparms 43        iter 0 (started w/ value of 0.85)
   06/04/04 msm db  uparms 43        iter 1,2 stop
   06/04/04 msm mb  uparms 53,63     iter 0 (no new run),1,2 stop

Set file names:

&FILES
 J1=  'nhbmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 8.5
 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) = 0.06695
uparms(32) = 0.06695
uparms(33) = 0.06695
uparms(34) = 0.03242
uparms(35) = 0.03242
uparms(36) = -1.369e-5
uparms(37) = -1.300e-5
uparms(38) = 0.0
uparms(39) = 0.0
uparms(40) = 0.0
uparms(41) = 0.0
uparms(42) = 0.03242
uparms(43) = 1.4
uparms(44) = 0.0
uparms(45) = 0.0
uparms(46) = 0.0
uparms(47) = 0.03242
uparms(48) = 0.03242
uparms(49) = 0.0
uparms(50) = 0.0
uparms(51) = 0.0
uparms(52) = 0.0
uparms(53) = -0.8541
uparms(54) = 0.0
uparms(55) = 0.0
uparms(56) = -1.659e-5
uparms(57) = 0.03242
uparms(58) = 0.03242
uparms(59) = 0.0
uparms(60) = 0.0
uparms(61) = 0.0
uparms(62) = 0.0
uparms(63) = 0.0760
uparms(64) = 0.0
uparms(65) = 0.0
uparms(66) = 0.86043
uparms(67) = 0.00709
uparms(68) = 0.00709
uparms(69) = 0.0
uparms(70) = 0.0
uparms(71) = 0.0
uparms(72) = 0.00187
uparms(73) = 0.00709
uparms(74) = 0.00709
uparms(75) = 0.0
uparms(76) = 0.0
uparms(77) = 0.0
uparms(78) = 0.00187
uparms(79) = 0.92477
uparms(80) = 0.0
uparms(81) = 0.0
uparms(82) = 0.86043
uparms(83) = 0.00709
uparms(84) = 0.00709
uparms(85) = 0.0
uparms(86) = 0.0
uparms(87) = 0.0
uparms(88) = 0.0
uparms(89) = 1.41003
uparms(90) = 0.0
uparms(91) = 0.0
uparms(92) = -0.76998
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) = -1.47447
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_NHB05.ctl

```
mc_nhb.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
               Purpose:   NHB    Year: 2005
               Auto Operating Cost (UPARM(12)): 8.3 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/04/04 msm db  uparms 43        iter 0 (started w/ value of 0.85)
   06/04/04 msm db  uparms 43        iter 1,2 stop
   06/04/04 msm mb  uparms 53,63     iter 0 (no new run),1,2 stop

Set file names:

&FILES
 J1=  'nhbmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 8.3
 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) = 0.06695
 uparms(32) = 0.06695
 uparms(33) = 0.06695
 uparms(34) = 0.03242
 uparms(35) = 0.03242
 uparms(36) = -1.369e-5
 uparms(37) = -1.300e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.03242
 uparms(43) = 1.4
```

```
 uparms(44) = 0.0
 uparms(45) = 0.0
 uparms(46) = 0.0
 uparms(47) = 0.03242
 uparms(48) = 0.03242
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = -0.8541
 uparms(54) = 0.0
 uparms(55) = 0.0
 uparms(56) = -1.659e-5
 uparms(57) = 0.03242
 uparms(58) = 0.03242
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 0.0760
 uparms(64) = 0.0
 uparms(65) = 0.0
 uparms(66) = 0.86043
 uparms(67) = 0.00709
 uparms(68) = 0.00709
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.00187
 uparms(73) = 0.00709
 uparms(74) = 0.00709
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.00187
 uparms(79) = 0.92477
 uparms(80) = 0.0
 uparms(81) = 0.0
 uparms(82) = 0.86043
 uparms(83) = 0.00709
 uparms(84) = 0.00709
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 1.41003
 uparms(90) = 0.0
 uparms(91) = 0.0
 uparms(92) = -0.76998
 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) = -1.47447
 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_nhb.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   NHB    Year: 1994
              Auto Operating Cost (UPARM(12)): 7.9 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/04/04 msm db  uparms 43        iter 0 (started w/ value of 0.85)
   06/04/04 msm db  uparms 43        iter 1,2 stop
   06/04/04 msm mb  uparms 53,63     iter 0 (no new run),1,2 stop

Set file names:

&FILES
 J1=  'nhbmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 7.9
 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) = 0.06695
 uparms(32) = 0.06695
 uparms(33) = 0.06695
 uparms(34) = 0.03242
 uparms(35) = 0.03242
 uparms(36) = -1.369e-5
 uparms(37) = -1.300e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.03242
 uparms(43) = 1.4
 uparms(44) = 0.0
 uparms(45) = 0.0
 uparms(46) = 0.0
 uparms(47) = 0.03242
 uparms(48) = 0.03242
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = -0.8541
 uparms(54) = 0.0
 uparms(55) = 0.0
 uparms(56) = -1.659e-5
 uparms(57) = 0.03242
 uparms(58) = 0.03242
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 0.0760
 uparms(64) = 0.0
 uparms(65) = 0.0
 uparms(66) = 0.86043
 uparms(67) = 0.00709
 uparms(68) = 0.00709
 uparms(69) = 0.0
```

```
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.00187
 uparms(73) = 0.00709
 uparms(74) = 0.00709
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.00187
 uparms(79) = 0.92477
 uparms(80) = 0.0
 uparms(81) = 0.0
 uparms(82) = 0.86043
 uparms(83) = 0.00709
 uparms(84) = 0.00709
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 1.41003
 uparms(90) = 0.0
 uparms(91) = 0.0
 uparms(92) = -0.76998
 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) = -1.47447
 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_NHB30.ctl

```
mc_nhb.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
               Purpose:   NHB    Year: 1994
               Auto Operating Cost (UPARM(12)): 7.8 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
       operating
          cost
          1994
       cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
```

```
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/04/04 msm db  uparms 43        iter 0 (started w/ value of 0.85)
   06/04/04 msm db  uparms 43        iter 1,2 stop
   06/04/04 msm mb  uparms 53,63     iter 0 (no new run),1,2 stop

Set file names:

&FILES
 J1=  'nhbmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 7.8
 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) = 0.06695
 uparms(32) = 0.06695
 uparms(33) = 0.06695
 uparms(34) = 0.03242
 uparms(35) = 0.03242
 uparms(36) = -1.369e-5
 uparms(37) = -1.300e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.03242
 uparms(43) = 1.4
 uparms(44) = 0.0
 uparms(45) = 0.0
 uparms(46) = 0.0
 uparms(47) = 0.03242
 uparms(48) = 0.03242
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = -0.8541
 uparms(54) = 0.0
 uparms(55) = 0.0
 uparms(56) = -1.659e-5
 uparms(57) = 0.03242
 uparms(58) = 0.03242
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 0.0760
 uparms(64) = 0.0
 uparms(65) = 0.0
 uparms(66) = 0.86043
 uparms(67) = 0.00709
 uparms(68) = 0.00709
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.00187
 uparms(73) = 0.00709
 uparms(74) = 0.00709
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.00187
 uparms(79) = 0.92477
 uparms(80) = 0.0
 uparms(81) = 0.0
 uparms(82) = 0.86043
 uparms(83) = 0.00709
 uparms(84) = 0.00709
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 1.41003
 uparms(90) = 0.0
 uparms(91) = 0.0
 uparms(92) = -0.76998
 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) = -1.47447
 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_nhb.ctl - Version 2.1D_19 Mode Choice Model Control File 6/2/04
              Purpose:   NHB    Year: 1994
              Auto Operating Cost (UPARM(12)): 9.1 cents/mi in 1994$

Auto operating costs to be used in Version 2.1D, 19 Travel Model

Year       Auto
        operating
           cost
           1994
        cents/mile

year     aoc1994

1994        9.1
2000        8.5
2005        8.3
2010        8.2
2015        8.1
2020        8.0
2025        7.9
2030        7.8

Record of revisions:
   Date     Psn Adj Description of change
   06/04/04 msm db  uparms 43        iter 0 (started w/ value of 0.85)
   06/04/04 msm db  uparms 43        iter 1,2 stop
   06/04/04 msm mb  uparms 53,63     iter 0 (no new run),1,2 stop

Set file names:

&FILES
 J1=  'nhbmu.ptt',
 J3=  'op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovop.skm',
 HOVA='hov2op.skm',
 HOVB='hov3op.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) = 9.1
 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) = 0.06695
 uparms(32) = 0.06695
 uparms(33) = 0.06695
 uparms(34) = 0.03242
 uparms(35) = 0.03242
 uparms(36) = -1.369e-5
 uparms(37) = -1.300e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.03242
 uparms(43) = 1.4
 uparms(44) = 0.0
 uparms(45) = 0.0
 uparms(46) = 0.0
 uparms(47) = 0.03242
 uparms(48) = 0.03242
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = -0.8541
 uparms(54) = 0.0
 uparms(55) = 0.0
 uparms(56) = -1.659e-5
 uparms(57) = 0.03242
 uparms(58) = 0.03242
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 0.0760
 uparms(64) = 0.0
 uparms(65) = 0.0
 uparms(66) = 0.86043
 uparms(67) = 0.00709
 uparms(68) = 0.00709
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.00187
 uparms(73) = 0.00709
 uparms(74) = 0.00709
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.00187
 uparms(79) = 0.92477
 uparms(80) = 0.0
 uparms(81) = 0.0
 uparms(82) = 0.86043
 uparms(83) = 0.00709
 uparms(84) = 0.00709
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 1.41003
 uparms(90) = 0.0
 uparms(91) = 0.0
 uparms(92) = -0.76998
 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) = -1.47447
 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  /
```

mf1am05.ctl

```
MF1AM05.CTL - AM PEAK Fare 1 control file / VERSION 2 MODELS
(7/1/04)

METRORAIL STATION-TO-STATION FARE MATRIX REFLECTING WMATA
TARIFF #22, EFFECTIVE 6/27/04.  All fares in 2004 cents.

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)=135.,
 UPARMS(2)=22.0,
 UPARMS(3)=390.0,
 UPARMS(4)=0.6,
```

```
 UPARMS(5)=0,
 UPARMS(6)=0,
 UPARMS(7)=3.0,
 UPARMS(8)=3.0,
 UPARMS(9)=19.5 /
```

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  /
```

mf1op05.ctl

```
MF1OP05.CTL - OFF-PEAK Fare 1 control file / VERSION 2 MODELS
(7/1/04)

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 No. 22, FFECTIVE 6/27/04.  All fares in 2004 cents.

specifics of  WMATA Tariff No. 22:
 boarding fare(cents):         UPARMS(1)=135.0,
 flat secondry fare increment: UPARMS(2)=50.0,
 max fare:                     UPARMS(3)=235.0,
 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)=135.0,
 UPARMS(2)=50.0,
 UPARMS(3)=235.0,
 UPARMS(4)=0.6,
 UPARMS(5)=0,
 UPARMS(6)=0,
 UPARMS(7)=7.0,
 UPARMS(8)=3.0,
 UPARMS(9)=50.0  /
```

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

Year: 2000
BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.19
OF 6/99

Deflator - based on Base Year: 1994 (148.2/172.2 = 0.860627)


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   = '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)=0.860627,
 uparms(4)=85.0,
 uparms(5)=85.0,
 uparms(6)=85.0,
 uparms(7)=85.0,
 uparms(8)=1.0,   /
```

mfamdr05.ctl

```
MFAMDR05.CTL - AM PEAK DRIVE ACCESS Fare2 Control (7/1/04)


MFARE2 2191-ZONE TRANSIT NETWORK-AUTO ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.22
EFFECTIVE 6/27/04.  All fares in 2004 cents.

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   = '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
 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)=0.78998,
 uparms(3)=0.0,
 uparms(4)=90.0,
 uparms(5)=90.0,
 uparms(6)=90.0,
 uparms(7)=90.0,
 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   = '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) = 1.0000,
 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

Year: 2000
BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.19,
6/99

Deflator - based on Base Year: 1994 (148.2/172.2 = 0.860627)


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   = '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)=0.860627,
 uparms(4)=85.0,
 uparms(5)=85.0,
```

```
 uparms(6)=85.0,
 uparms(7)=85.0,
 uparms(8)=1.0,   /
```

mfamwk05.ctl

```
MFAMWK05.CTL - AM PEAK WALK ACCESS Fare2 Control (7/1/04)

MFARE2 2191-ZONE TRANSIT NETWORK-WALK ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.22,
EFFECTIVE 6/27/04.  All fares in 2004 cents.

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   = '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
 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)=0.78998,
 uparms(3)=0.0,
 uparms(4)=90.0,
 uparms(5)=90.0,
 uparms(6)=90.0,
 uparms(7)=90.0,
 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   = '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) = 1.00000,
 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

Year: 2000
BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.19
OF 6/99

Deflator - based on Base Year: 1994 (148.2/172.2 = 0.860627)


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   = '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)=0.860627,
 uparms(4)=85.0,
 uparms(5)=85.0,
 uparms(6)=85.0,
 uparms(7)=85.0,
 uparms(8)=1.0,   /
```

mfopdr05.ctl

```
MFOPDR05.CTL - OFF-PEAK DRIVE ACCESS Fare2 Control (7/1/04)

MFARE2 2191-ZONE TRANSIT NETWORK-AUTO ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.22
EFFECTIVE 6/27/04.  All fares in 2004 cents.

NOTE: BUS FARE MATRIX USED IS SAME AS THAT USED FOR AM PEAK.

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   = 'op_dr.sta',
 J2   = 'MF_OP_DR.SKM',
 LIST = 'MF_OP_DR.RPT'  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix from MFARE1.
 A2       Zone/Station data file
 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)=0.78998,
 uparms(3)=0.0,
 uparms(4)=90.0,
 uparms(5)=90.0,
 uparms(6)=90.0,
 uparms(7)=90.0,
 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   = '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) = 1.00000,
 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

Year: 2000

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 Base Year: 1994 (148.2/172.2 = 0.860627)



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   = '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)=0.860627,
 uparms(4)=85.0,
 uparms(5)=85.0,
 uparms(6)=85.0,
 uparms(7)=85.0,
 uparms(8)=1.0,   /
```

mfopwk05.ctl

```
MFOPWK05.CTL - OFF-PEAK WALK ACCESS Fare2 Control (7/1/04)

MFARE2 2191-ZONE TRANSIT NETWORK-WALK ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.22,
EFFECTIVE 6/27/04.  All fares in 2004 cents.

NOTE: BUS FARE MATRIX USED IS SAME AS THAT USED FOR AM PEAK.

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   = '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
 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)=0.78998,
 uparms(3)=0.0,
 uparms(4)=90.0,
 uparms(5)=90.0,
 uparms(6)=90.0,
 uparms(7)=90.0,
 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   = '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) = 1.00000,
 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  =1.50
  /
```

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 D #50 Batch Files

runall_1994.bat C-1
runall_2000.bat C-3
runall_2030_tc.bat C-5
SetFactors.bat C-7
'Pump-Prime' Iterations C-7
PP_Highway_Build.bat C-7
PP_Highway_PNR.bat C-7
PP_Transit_Prep.bat C-7
CLRP_PLUS_pp_Transit_Prep.bat C-8
PP_Transit_Skim.bat C-9
PP_Trip_Generation.bat C-9
PP_Trip_Distribution.bat C-9
PP_Auto_Drivers.bat C-10
Misc_Time-of-Day.bat C-10
PP_Time-of-Day.bat C-10
PP_Highway_Assignment.bat C-10
PP_Highway_Skims.bat C-10
'Standard' Iterations (1-6) C-11
Highway_PNR.bat C-11
Transit_Skim.bat C-11
Transit_Fare.bat C-11
Trip_Generation.bat C-12
Trip_Distribution.bat C-12
Mode_Choice.bat C-12
Mode_Choice_tc.bat C-13
Auto_Driver.bat C-14
Time-of-Day.bat C-14
Highway_Assignment.bat C-14
Highway_Skims.bat C-14

runall_1994.bat

```
:: runall_1994.bat

:: TPB Travel Model, Version 2.1D 50

set _year_=1994
set _alt_=Base

rem ====== Pump Prime Iteration ========================================

set _iter_=pp
set _prev_=pp


call Set_Factors.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call PP_Transit_Skim.bat %1

call PP_Trip_Generation.bat %1

call PP_Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Misc_Time-of-Day.bat %1

call PP_Time-of-Day.bat %1

call PP_Highway_Assignment.bat %1

call PP_Highway_Skims.bat %1


rem ====== Iteration 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

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

set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 2 ================================================

set _iter_=i2
set _prev_=i1

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 3 ================================================

set _iter_=i3
set _prev_=i2

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1
```

```
call Highway_Skims.bat %1


rem ====== Iteration 4 ===================================================

set _iter_=i4
set _prev_=i3

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 5 ===================================================

set _iter_=i5
set _prev_=i4

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 6 ===================================================

set _iter_=i6
set _prev_=i5

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== End of batch file ============================================

set _year_=
set _alt_=
set _iter_=
set _prev_=
```

runall_2000.bat

```
:: runall_2000.bat

:: TPB Travel Model, Version 2.1D 50

set _year_=2000
set _alt_=Base

rem ====== Pump Prime Iteration ========================================

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call PP_Transit_Skim.bat %1

call PP_Trip_Generation.bat %1

call PP_Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Misc_Time-of-Day.bat %1

call PP_Time-of-Day.bat %1

call PP_Highway_Assignment.bat %1

call PP_Highway_Skims.bat %1


rem ====== Iteration 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

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

set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 2 ===================================================

set _iter_=i2
set _prev_=i1

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 3 ===================================================

set _iter_=i3
set _prev_=i2

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1
```

```
rem ====== Iteration 4 ===================================================

set _iter_=i4
set _prev_=i3

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 5 ===================================================

set _iter_=i5
set _prev_=i4

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 6 ===================================================

set _iter_=i6
set _prev_=i5

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== End of batch file ============================================

set _year_=
set _alt_=
set _iter_=
set _prev_=
```

runall_2030_tc.bat

```
:: runall_2030_tc.bat Transit Constraint

:: TPB Travel Model, Version 2.1D 50

set _year_=2030
set _alt_=CLRP

::  Enter the name of the path and file of pre-existing 2005 MC run
set _path05_=C:\user\cgv21d_50\2005base

if not exist    %_path05_%\mc_hbw.fin goto err
set _path05hbw_=%_path05_%\mc_hbw.fin
set _path05hbs_=%_path05_%\mc_hbs.fin
set _path05hbo_=%_path05_%\mc_hbo.fin
set _path05nhb_=%_path05_%\mc_nhb.fin

rem ====== Pump Prime Iteration ==========================================

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call PP_Transit_Skim.bat %1

call PP_Trip_Generation.bat %1

call PP_Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Misc_Time-of-Day.bat %1

call PP_Time-of-Day.bat %1

call PP_Highway_Assignment.bat %1

call PP_Highway_Skims.bat %1


rem ====== Iteration 1 ===================================================

REM (Copy year/alt specific mfare program controls to generic names)
copy controls\mf1am05.ctl  controls\mf1_am.ctl
copy controls\mf1op05.ctl  controls\mf1_op.ctl
copy controls\mfamwk05.ctl controls\mf_am_wk.ctl
copy controls\mfamdr05.ctl controls\mf_am_dr.ctl
copy controls\mfopwk05.ctl controls\mf_op_wk.ctl
copy controls\mfopdr05.ctl controls\mf_op_dr.ctl

REM (copy year/alt specific mode ch. controls to generic filenames)
copy controls\mc_hbw30.ctl controls\mc_hbw.ctl
copy controls\mc_hbs30.ctl controls\mc_hbs.ctl
copy controls\mc_hbo30.ctl controls\mc_hbo.ctl
copy controls\mc_nhb30.ctl controls\mc_nhb.ctl

set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice_TC.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 2 ===================================================

set _iter_=i2
set _prev_=i1

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice_TC.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 3 ===================================================

set _iter_=i3
set _prev_=i2

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1
```

```
call Mode_Choice_TC.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1


rem ====== Iteration 4 ===================================================

set _iter_=i4
set _prev_=i3

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice_TC.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 5 ===================================================

set _iter_=i5
set _prev_=i4

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice_TC.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== Iteration 6 ===================================================

set _iter_=i6

set _prev_=i5

call Highway_PNR.bat %1

:: Transit_Prep.bat    This has already been run in the PP iteration

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call Mode_Choice_TC.bat %1

call Auto_Driver.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

rem ====== End of batch file ============================================

set _year_=
set _alt_=
set _iter_=
set _prev_=
set _path05_=
set _path05hbw_=
set _path05hbs_=
set _path05hbo_=
set _path05nhb_=

goto end
:err
echo ***** Path for 2005 mode choice trip tables incorrect! *****
:end
```

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..
```

'Pump-Prime' Iterations

PP_Highway_Build.bat

```
cd %1

REM  Highway Network Building


..\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


del tppl*.*
        del highway_build.rpt
start /w TPPLUS.EXE  ..\scripts\highway_build_toll.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
        copy tppl*.prn %_iter_%_highway_build.rpt
goto end

:error
REM  Processing Error.....
PAUSE
:end
cd..
```

PP_Highway_PNR.bat

```
CD %1
REM  Auto Access PNR Link Updating (Based on previous iter Assignment)

del tppl*.*
del             %_iter_%_Auto_Access.rpt
start /w TPPLUS.EXE  ..\scripts\Auto_Access.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn  %_iter_%_Auto_Access.rpt
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

PP_Transit_Prep.bat

```
CD %1


REM  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

copy nt_am.rpt %_iter_%_nt_am.rpt
del  nt_am.rpt

..\software\NODESTB  ..\controls\nt_op.ctl
        if errorlevel 1 goto error
..\software\SORTLINE nt_op.asc

copy nt_op.rpt %_iter_%_nt_op.rpt
del  nt_op.rpt

del nodestb.tem

..\software\CNTCONN2  ..\controls\ct2_am.ctl
        if errorlevel 1 goto error

copy ct2_am.rpt %_iter_%_ct2_am.rpt
del  ct2_am.rpt

..\software\CNTCONN2  ..\controls\ct2_op.ctl
        if errorlevel 1 goto error

copy ct2_op.rpt %_iter_%_ct2_op.rpt
```

```
del  ct2_op.rpt

..\software\GIS_PROC  ..\controls\gis.ctl
if errorlevel 1 goto error
del gis_proc.tem

copy gis_proc.rpt %_iter_%_gis_proc.rpt
del  gis_proc.rpt

del  wlklnktp.rpt
del  walk_am.rpt
..\software\WLKLNKTP  ..\controls\walk_am.ctl
        if errorlevel 1 goto error
copy wlklnktp.rpt %_iter_%_walk_am.rpt
del  wlklnktp.rpt

del  wlklnktp.rpt
del  walk_op.rpt
..\software\WLKLNKTP  ..\controls\walk_op.ctl
        if errorlevel 1 goto error
copy wlklnktp.rpt %_iter_%_walk_op.rpt
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
copy prefartp.rpt %_iter_%_prefartp.rpt
del  prefartp.rpt

goto end
:error
REM  Processing Error.....
PAUSE
:end
CD..
```

CLRP_PLUS_pp_Transit_Prep.bat

```
CD %1


REM  Transit Network Building (Initial)

REM ** NOTE: Modified for Special CLRP+ model run -

REM **  Special *.TB transit line files in the \INPUTS subdir. with
REM **  'SPEED='  commands will overwrite the standard *.TB that are
REM **  normally created.  The NODESTB program can not handle this
REM **  type of coding.
        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

copy nt_am.rpt %_iter_%_nt_am.rpt
del  nt_am.rpt

..\software\NODESTB  ..\controls\nt_op.ctl
        if errorlevel 1 goto error
..\software\SORTLINE nt_op.asc

copy nt_op.rpt %_iter_%_nt_op.rpt
del  nt_op.rpt

del nodestb.tem

..\software\CNTCONN2  ..\controls\ct2_am.ctl
        if errorlevel 1 goto error

copy ct2_am.rpt %_iter_%_ct2_am.rpt
del  ct2_am.rpt

..\software\CNTCONN2  ..\controls\ct2_op.ctl
        if errorlevel 1 goto error

copy ct2_op.rpt %_iter_%_ct2_op.rpt
del  ct2_op.rpt

..\software\GIS_PROC  ..\controls\gis.ctl
if errorlevel 1 goto error
del gis_proc.tem

copy gis_proc.rpt %_iter_%_gis_proc.rpt
del  gis_proc.rpt

del  wlklnktp.rpt
del  walk_am.rpt
..\software\WLKLNKTP  ..\controls\walk_am.ctl
        if errorlevel 1 goto error
copy wlklnktp.rpt %_iter_%_walk_am.rpt
del  wlklnktp.rpt

del  wlklnktp.rpt
del  walk_op.rpt
..\software\WLKLNKTP  ..\controls\walk_op.ctl
        if errorlevel 1 goto error
copy wlklnktp.rpt %_iter_%_walk_op.rpt
del  wlklnktp.rpt
```

```
REM **  Overwrite Std. *.TB files here

copy inputs\MODE*.TB

REM **

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
copy prefartp.rpt %_iter_%_prefartp.rpt
del  prefartp.rpt

goto end
:error
REM  Processing Error.....
PAUSE
:end
CD..
```

PP_Transit_Skim.bat

```
CD %1

REM  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  %_iter_%_TRANSIT_SKIMS.RPT
goto end
:error
REM  Processing Error......
PAUSE
:end
CD..
```

PP_Trip_Generation.bat

```
CD %1

REM  Pump Prime Trip Generation

..\software\HHSIZINC  inputs\zone.asc
if errorlevel 1 goto error

copy hhsizinc.rpt %_iter_%_hhsizinc.rpt
del  hhsizinc.rpt

..\software\VEHAVTP  ..\controls\vehavtp.ctl
if errorlevel 1 goto error

copy vehavtp.rpt  %_iter_%_vehavtp.rpt
del  vehavtp.rpt

..\software\CGTGV2TP   ..\controls\hbw_tg.ctl
if errorlevel 1 goto error
del               %_iter_%_hbw_tg.rpt
ren cgtgv2tp.rpt  %_iter_%_hbw_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\hbs_tg.ctl
if errorlevel 1 goto error
del               %_iter_%_hbs_tg.rpt
ren cgtgv2tp.rpt  %_iter_%_hbs_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\hbo_tg.ctl
if errorlevel 1 goto error
del               %_iter_%_hbo_tg.rpt
ren cgtgv2tp.rpt  %_iter_%_hbo_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\nhb_tg.ctl
if errorlevel 1 goto error
del               %_iter_%_nhb_tg.rpt
ren cgtgv2tp.rpt  %_iter_%_nhb_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\mtk_tg.ctl
if errorlevel 1 goto error
del               %_iter_%_mtk_tg.rpt
ren cgtgv2tp.rpt  %_iter_%_mtk_tg.rpt
del cgtgv2tp.*

..\software\CGTGV2TP   ..\controls\htk_tg.ctl
if errorlevel 1 goto error
del               %_iter_%_htk_tg.rpt
ren cgtgv2tp.rpt  %_iter_%_htk_tg.rpt
del cgtgv2tp.*


..\software\COGMCA1  ..\controls\COGMCA1.CTL
if errorlevel 1 goto error

copy cogmca1.rpt  %_iter_%_cogmca1.rpt
del  cogmca1.rpt

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

PP_Trip_Distribution.bat

```
CD %1

REM  Pump Prime Trip Distribution

del tppl*.*
del                %_iter_%_TrpDst.rpt
start /w TPPLUS.EXE  ..\scripts\trip_distribution.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      %_iter_%_TrpDst.rpt
copy                %_iter_%_TrpDst.rpt temp.rpt
..\software\extrtab                     temp.rpt
copy extrtab.out    %_iter_%_TrpDst.tab
del  extrtab.out
del  temp.rpt
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

PP_Auto_Drivers.bat

```
CD %1

REM  Pump Prime Auto Driver Trips

del tppl*.*
del           %_iter_%_Auto_Drivers.rpt
start /w TPPLUS.EXE  ..\scripts\PP_Auto_Drivers.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn %_iter_%_Auto_Drivers.rpt
copy           %_iter_%_Auto_Drivers.rpt temp.dat
..\software\extrtab    temp.dat
copy extrtab.out       %_iter_%_Auto_Drivers.tab
del  extrtab.out
del  temp.out

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Misc_Time-of-Day.bat

```
CD %1

REM  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..
```

PP_Time-of-Day.bat

```
CD %1

REM  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..
```

PP_Highway_Assignment.bat

```
CD %1

REM  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..
```

PP_Highway_Skims.bat

```
CD %1

REM  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..
```

'Standard' Iterations (1-6)

Highway_PNR.bat

```
CD %1
REM  Auto Access PNR Link Updating (Based on previous iter Assignment)


del tppl*.*
del             %_iter_%_Auto_Access.rpt
start /w TPPLUS.EXE  ..\scripts\Auto_Access.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn  %_iter_%_Auto_Access.rpt
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Transit_Skim.bat

```
CD %1

REM  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  %_iter_%_TRANSIT_SKIMS.RPT
goto end
:error
REM  Processing Error......
PAUSE
:end
CD..
```

Transit_Fare.bat

```
CD %1

REM  Transit Fares

:: Copy iteration-specific USTOS files to generic file names for MFARE2
copy %_iter_%_am_wk.sta am_wk.sta
copy %_iter_%_am_dr.sta am_dr.sta
copy %_iter_%_op_wk.sta op_wk.sta
copy %_iter_%_op_dr.sta op_dr.sta

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    %_iter_%_metrorail_skims.rpt

del mf1_am.*
..\software\MFARE1  ..\controls\mf1_am.ctl
if errorlevel 1 goto error

copy mf1_am.rpt   %_iter_%_mf1_am.rpt
del  mf1_am.rpt

del mf1_op.*
..\software\MFARE1OP  ..\controls\mf1_op.ctl
if errorlevel 1 goto error

copy mf1_op.rpt   %_iter_%_mf1_op.rpt
del  mf1_op.rpt

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

copy mf_am_wk.rpt %_iter_%_mf_am_wk.rpt
del  mf_am_wk.rpt

del mf_am_dr.*
..\software\MFARE2TP  ..\controls\mf_am_dr.ctl
if errorlevel 1 goto error

copy mf_am_dr.rpt %_iter_%_mf_am_dr.rpt
del  mf_am_dr.rpt

del mf_op_wk.*
..\software\MFARE2TP  ..\controls\mf_op_wk.ctl
if errorlevel 1 goto error

copy mf_op_wk.rpt %_iter_%_mf_op_wk.rpt
del  mf_op_wk.rpt

del mf_op_dr.*
..\software\MFARE2TP  ..\controls\mf_op_dr.ctl
if errorlevel 1 goto error
```

```
copy mf_op_dr.rpt %_iter_%_mf_op_dr.rpt
del  mf_op_dr.rpt

del tppl*.*
start /w TPPLUS.EXE  ..\scripts\export_fares.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn    %_iter_%_export_fares.rpt

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Trip_Generation.bat

```
CD %1

REM  Trip Generation

..\software\HHSIZINC  inputs\zone.asc
if errorlevel 1 goto error

copy hhsizinc.rpt                %_iter_%_hhsizinc.rpt
del  hhsizinc.rpt

..\software\VEHAVTP  ..\controls\vehavtp.ctl
if errorlevel 1 goto error

copy vehavtp.rpt                 %_iter_%_vehavtp.rpt
del  vehavtp.rpt

..\software\CGTGV2TP   ..\controls\hbw_tg.ctl
if errorlevel 1 goto error
del                              %_iter_%_hbw_tg.rpt
ren cgtgv2tp.rpt                 %_iter_%_hbw_tg.rpt


..\software\CGTGV2TP   ..\controls\hbs_tg.ctl
if errorlevel 1 goto error
del                              %_iter_%_hbs_tg.rpt
ren cgtgv2tp.rpt                 %_iter_%_hbs_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\hbo_tg.ctl
if errorlevel 1 goto error
del                              %_iter_%_hbo_tg.rpt
ren cgtgv2tp.rpt                 %_iter_%_hbo_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\nhb_tg.ctl
if errorlevel 1 goto error
del                              %_iter_%_nhb_tg.rpt
ren cgtgv2tp.rpt                 %_iter_%_nhb_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\mtk_tg.ctl
if errorlevel 1 goto error
del                              %_iter_%_mtk_tg.rpt
ren cgtgv2tp.rpt                 %_iter_%_mtk_tg.rpt
del cgtgv2tp.*

..\software\CGTGV2TP   ..\controls\htk_tg.ctl
if errorlevel 1 goto error
del                              %_iter_%_htk_tg.rpt
ren cgtgv2tp.rpt                 %_iter_%_htk_tg.rpt
del cgtgv2tp.*


..\software\COGMCA1  ..\controls\COGMCA1.CTL
if errorlevel 1 goto error

copy cogmca1.rpt                 %_iter_%_cogmca1.rpt

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Trip_Distribution.bat

```
REM Trip Distribution

CD %1

copy sov%_prev_%am.skm %_prev_%_am.skm
copy sov%_prev_%op.skm %_prev_%_op.skm

del tppl*.*
del                 %_iter_%_TrpDst.rpt
start /w TPPLUS.EXE  ..\scripts\trip_distribution.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      %_iter_%_TrpDst.rpt
copy                %_iter_%_TrpDst.rpt temp.rpt
..\software\extrtab                     temp.rpt
copy extrtab.out    %_iter_%_TrpDst.tab
del  extrtab.out
del  temp.rpt
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Mode_Choice.bat

```
REM  Mode Choice Model Application

CD %1

copy %_iter_%_hbwmu.ptt hbwmu.ptt
copy %_iter_%_hbsmu.ptt hbsmu.ptt
copy %_iter_%_hbomu.ptt hbomu.ptt
copy %_iter_%_nhbmu.ptt nhbmu.ptt
```

```
copy %_iter_%_am_wk.skm am_wk.skm
copy %_iter_%_am_dr.skm am_dr.skm
copy %_iter_%_op_wk.skm op_wk.skm
copy %_iter_%_op_dr.skm op_dr.skm

copy %_iter_%_am_wk.far mf_am_wk.far
copy %_iter_%_am_dr.far mf_am_dr.far
copy %_iter_%_op_wk.far mf_op_wk.far
copy %_iter_%_op_dr.far mf_op_dr.far

copy sov%_prev_%am.skm  sovam.skm
copy hov2%_prev_%am.skm hov2am.skm
copy hov3%_prev_%am.skm hov3am.skm

copy sov%_prev_%op.skm  sovop.skm
copy hov2%_prev_%op.skm hov2op.skm
copy hov3%_prev_%op.skm hov3op.skm


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      %_iter_%_mc_summary.rpt
copy tppl*.prn      temp.rpt
..\software\extrtab temp.rpt
copy extrtab.out    %_iter_%_mc_summary.tab
del  extrtab.out
del  temp.rpt
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Mode_Choice_tc.bat

```
REM GET MODE CHOICE INPUT FILES FROM 2005

CD %1


copy %_iter_%_hbwmu.ptt hbwmu.ptt
copy %_iter_%_hbsmu.ptt hbsmu.ptt
copy %_iter_%_hbomu.ptt hbomu.ptt
copy %_iter_%_nhbmu.ptt nhbmu.ptt

copy %_iter_%_am_wk.skm am_wk.skm
copy %_iter_%_am_dr.skm am_dr.skm
copy %_iter_%_op_wk.skm op_wk.skm
copy %_iter_%_op_dr.skm op_dr.skm

copy %_iter_%_am_wk.far mf_am_wk.far
copy %_iter_%_am_dr.far mf_am_dr.far
copy %_iter_%_op_wk.far mf_op_wk.far
copy %_iter_%_op_dr.far mf_op_dr.far

copy sov%_prev_%am.skm  sovam.skm
copy hov2%_prev_%am.skm hov2am.skm
copy hov3%_prev_%am.skm hov3am.skm

copy sov%_prev_%op.skm  sovop.skm
copy hov2%_prev_%op.skm hov2op.skm
copy hov3%_prev_%op.skm hov3op.skm


REM  Step 17TC: Mode Choice Model Application w/ Transit Constraint
REM  This Batch file REPLACES Step17.Mode_Choice.bat if the transit
REM  constraint process is utilized


REM  Check that the 2005 mode ch. model output files are correctly spec'd
if not exist %_path05hbw_% goto error
if not exist %_path05hbs_% goto error
if not exist %_path05hbo_% goto error
if not exist %_path05nhb_% goto error

REM Run Mode Choice Model to get unconstrained transit trips
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 %_iter_%mc_summary.rpt
start /w TPPLUS.EXE  ..\scripts\mc_summary.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      %_iter_%_mc_summary.rpt
copy tppl*.prn      temp.rpt
..\software\extrtab temp.rpt
copy extrtab.out    %_iter_%_mc_summary.tab
del  extrtab.out
del  temp.rpt

REM End of Mode Choice Model
REM Execute Transit Constraint process
del tppl*.prn
del %_iter_%mc_constraint.rpt
start /w TPPLUS.EXE  ..\scripts\mc_constraint.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      %_iter_%_mc_constraint.rpt
copy tppl*.prn      temp.rpt
..\software\extrtab temp.rpt
copy extrtab.out    %_iter_%_mc_constraint.tab
```

```
del  extrtab.out
del  temp.rpt

REM Delete unconstrained Mode Choice Output files
REM & replace with constrained versions, and summarize

del  mc_hbw%_iter_%.fin
del  mc_hbs%_iter_%.fin
del  mc_hbo%_iter_%.fin
del  mc_nhb%_iter_%.fin

copy mc_hbw%_iter_%.con  mc_hbw%_iter_%.fin
copy mc_hbs%_iter_%.con  mc_hbs%_iter_%.fin
copy mc_hbo%_iter_%.con  mc_hbo%_iter_%.fin
copy mc_nhb%_iter_%.con  mc_nhb%_iter_%.fin

REM Execute Summary of Constrained Transit Trips
del tppl*.prn
del %_iter_%mc_consummary.rpt
start /w TPPLUS.EXE  ..\scripts\mc_consummary.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      %_iter_%_mc_consummary.rpt
copy tppl*.prn      temp.rpt
..\software\extrtab temp.rpt
copy extrtab.out    %_iter_%_mc_consummary.tab
del  extrtab.out
del  temp.rpt


goto end

:error
REM  Processing Error or Misspecified 2005 transit file path....
PAUSE
:end
CD..
```

Auto_Driver.bat

```
CD %1

REM  Auto Driver Trips

del tppl*.*
        del            %_iter_%_mc_Auto_Drivers.rpt
start /w TPPLUS.EXE  ..\scripts\mc_Auto_Drivers.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
        copy tppl*.prn %_iter_%_mc_Auto_Drivers.rpt
copy                   %_iter_%_mc_Auto_Drivers.rpt temp.dat
..\software\extrtab    temp.dat
copy extrtab.out       %_iter_%_mc_Auto_Drivers.tab
del  extrtab.out
del  temp.out

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Time-of-Day.bat

```
CD %1

REM  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..
```

Highway_Assignment.bat

```
CD %1

REM  Highway Assignment

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..
```

Highway_Skims.bat

```
CD %1

REM  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..
```