Metropolitan Washington Council of Governments
National Capital Region Transportation Planning Board

COG/TPB Travel Forecasting Model, Version 2.2

Specification, Validation, and User's Guide

DRAFT

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

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

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Abstract: This report describes the latest version of the regional travel model, Version 2.2, for the Washington, D.C. area including the model specification, the model validation, and a user's guide. This work represents a continuation of an ongoing models development plan that was formulated in FY-93 by the Travel Forecasting Subcommittee (TFS), a subcommittee of the TPB's Technical Committee. Previous models included the Version 2.1D #50 and 2.1/TP+ Release C. The Version 2.2 model incorporates many changes that were recommended as a result of a formal review of 2.1/TP+ Release C model by a TRB-based expert review panel.

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Table of Contents: Model Specification and Validation

Table of Contents: User's Guide

Appendices

List of Figures

List of Tables

List of Equations

List of Exhibits

Chapter 1 Introduction

The Metropolitan Washington Council of Governments (COG) serves as the regional planning organization for the Washington, D.C. metropolitan area. The National Capital Region Transportation Planning Board (TPB) is the designated Metropolitan Planning Organization (MPO) which functions to coordinate transportation planning among the various federal, state, and local agencies in the Washington region. Like most major MPOs in the United States, the TPB maintains a four-step transportation planning model that is used to evaluate transportation plans and programs, including air quality planning, in accordance with federal requirements. The TPB's travel model is periodically refined as new data is collected, as new questions arise from local decision-makers, and as more advanced methods emerge from the research community. This report documents the TPB's most recently developed travel model, Version 2.2. The Version 2.2 model supplants the previous Version 2.1D #50 travel model which was released in November 2004 (COG/TPB 2004.11.17A, B).

The Version 2.2 model was developed as part of the TPB's Models Development program which functions to promote both short- and long-term improvements to the travel forecasting methods used in the Washington, D.C. region. The program operates under the review and guidance of the Travel Forecasting Subcommittee (TFS) - a subcommittee of the Transportation Planning Board's Technical Committee that is comprised of representatives from state and local transportation agencies, local transportation consultants, and interested citizens. Many TFS members have a stake in the TPB's technical methods because the regional model is commonly used or adapted by the local agencies for local project planning. The TFS closely monitored the Version 2.2 development and testing during FY-2007 and the beginning of FY-2008.

The TPB's approach to models development is one that favors incremental change to currently adopted application methods. Consequently, the Version 2.2 model is very similar in structure and operation to the previous Version 2.1D#50 model. The Version 2.2 model was not exhaustively re-estimated with new survey data, but some adjustments were nonetheless made to several modeling steps based on the 2000 Census Transportation Planning Package (CTPP). Model adjustments were also implemented on the basis of 2005 Highway Performance Monitoring System (HPMS) information.

The remainder of this chapter details the major refinements of the Version 2.2 model (Sections 1.1 and 1.2), followed by an overview of the model (Section 1.3). This report subsequently addresses the specification of the model (Chapters 2 through 8), the model validation results (Chapter 9), and a description of the model application (Chapters 10 through 21). The validation section also describes a number of sensitivity tests that were undertaken by TPB staff during FY-2007 as a means for assessing the model's reasonability. Finally, a series of technical appendices follow at the end of this document, including jurisdictional travel summaries, program scripts, and flowcharts which graphically depict the modeling process.

1.1 *Summary of Refinements in Version 2.2 Model*

The Version 2.2 model refinements were implemented in two developmental phases. The first phase was completed in January 2007 and included the majority of refinements featured in the model. A summary of the refinements are listed below:

- An explicit commercial vehicle model has been integrated into the four-step model. This particular improvement was one of several recommendations made by an expert review panel following a formal review of TPB's past travel forecasting procedures. Previously, the commercial vehicle travel market was accounted for in the non-home-based (NHB) purpose, as is the case with many regional travel models. This is not desirable, however, since commercial travel is quite different from resident NHB travel in terms of trip generation, and travel lengths, and mode usage. The Version 2.2 model now simulates commercial travel using explicit trip generation, trip distribution, and time-of-day models. The final trip tables are further modified with an adjustment matrix to enable closer matches of estimated and observed commercial counts at the assignment step. Section 1.2 (below) provides additional detail on the commercial vehicle model development.
- Base and future year external and through trips are basic inputs to the travel model that are developed on a year-by-year basis. The traffic growth assumption at each external station has, in recent years, been assumed to be 3% per year. This growth assumption has recently been revisited based on an analysis of the future capacity at individual external stations, historical traffic growth at individual stations, and projected socio-economic growth trends between 2000 and 2030. Based on this analysis, the growth assumption has been revised on a station-by-station basis. The growth now varies from 1.1% to 2.7% per year. Thus, external traffic forecasts now generated in the Version 2.2 model over 30 years is substantially lower than that assumed in the Version 2.1D model. Additionally, the process for developing external and through travel files has been updated so that the commercial vehicle travel at external stations is explicitly developed.
- The volume-delay functions used in the user equilibrium highway assignment step have been revised. One result of the revision is that freeway speeds in the model may now congest down to 2 mph under extreme congested conditions, compared to a minimum speed of 11 to 13 mph that was used in the Version 2.1D model. Furthermore, a queuing delay function has been added to freeway and ramp links. The function imposes additional time on freeways links to represent queuing based on the V/C ratio. The queuing delay ranges from 0 minutes, at V/Cs of 0.8 or less, to 14 minutes at V/Cs of 1.4 or higher. Both the revised volume-delay curves and the queuing time were developed to eliminate a limited number of hyper-loaded links, i.e., links with simulated volumes that exceed the daily capacity of the link.
- Many of the adjustment factors historically used in TPB models, such as K-factors and geographic mode choice adjustments, have been removed in the Version 2.2 model. During the last formal review of the TPB models, it was indicated that staff should be more judicious about using such factors because they could potentially undermine the consistency and explanatory logic of the model. Many of the model adjustments used in the Version

2.1D model have been excluded from Version 2.2, including bridge penalties, non-work K-factors in trip distribution, and all non-work geographic transit and car occupancy adjustments used in the mode choice model. Some HBW K-factors were deemed necessary and maintained in Version 2.2 based on a comparison of estimated trips and Census trip estimates at the jurisdictional level. The overall number of HBW K-factors in the Version 2.2 model is less than that used in the Version 2.1D model. It is important to point out, however, that the removal of such factors has resulted in somewhat diminished model performance for some metrics, particularly at finer levels of geography.

- The demographic models, which are used to disaggregate the total number of households in a zone among joint income, size, and vehicle ownership classes, have been re-estimated using the 2000 Census data. It is important to note that the zonal income index that is maintained in the standard zonal land use file (ZONE.ASC) has been reformulated in accordance with the 2000 Census re-estimation.
- Several legacy Fortran programs have been converted into TP+ scripts. These include programs historically used for computing zonal transit fares (MFARE1 and MFARE2) and for applying the trip generation model (CGTGV2TP). These programs have been converted to TP+ scripts to facilitate transparency and to allow for flexibility in the implementation of future program modifications. The transit fares scripts are named MFARE1.S and MFARE2.S. The trip generation script is named Trip_Generation.S.
- A new TP+ script named Set_CPI.S has been added to the model chain to develop base deflation factors for converting transit and highway costs from current-year to base-/constant-year values. This capability will facilitate the consistency in cost deflation across modes, and will also enable the analyst to quickly specify alternative cost escalation policies.
- Exogenous airport trip forecasts have been updated using the 2000 Regional Air Passenger Survey. Prior forecasts were developed from the 1998 Air Passenger Survey.
- Prior TPB model versions have required that transit line files be provided in the older MINUTP TRNPTH format. Transit line files developed for the Version 2.2 model now reflect the newer TP+ TRNBUILD format. This newer format will allow for more accurate and consistent coding of transit lines over time. For example, using the newer format, one can designate bus stops as board-only or alight-only (useful for accurately coding express bus service). Similarly, one can code run times for sub-sections of a route, not just for the entire route, a feature useful for the accurate depiction of transit lines that undergo extensions or cutbacks.
- Several minor mechanical changes have also been made to scripts and batch files to streamline the application process, or to comply with the latest TP+ versions that are now released.

The second phase of model development occurred between January 2007 and October 2007. The refinements made during this period were related to minor mechanical corrections to the model application and to modifications that were deemed necessary after various tests of the model where evaluated. These refinements are detailed below.

- The number of user equilibrium iterations (UEIs) used in the highway assignment process was increased from 20 to 60 iterations. Realistically, a more fully converged condition would require more than 60 UEIs, but the increase from 20 to 60 was determined to strike a reasonable balance between substantially reducing the amount of 'noise' detected in comparisons between highway alternatives and yet enabling a reasonable turn-around time within the existing computational environment.

- The annual traffic growth rate assumption at the I-95 external station in Virginia (station 2149) was increased from 2.7% to 3.0%. The increased growth rate was used to better reflect the expected effect of planned HOT lanes on I-95 facility that are now included in the 2007 CLRP, including increased road capacity and spurred development in that area.
- Staff investigations into the development of HOT lane tolls uncovered problems with the queuing delay function described above. The highway network contains numerous freeway segments that *could* be represented by a single highway link, but instead, are represented by multiple links. It became apparent to TPB staff that the application of the queuing delay function to these types of freeway links resulted in unrealistically large delay times, for two reasons. First, the queuing function should realistically be applied on links associated with an intersection (i.e., on links forming the junction of two facilities) and not on links that happen to subdivide a single freeway section (these are sometimes referred to as 'dummy links'). Second, these dummy links are typically very short in distance, which, in turn, causes the queuing delay time to be very large as it is currently applied. Consequently, a link coding device was implemented to disable the queuing function from being applied to dummy links. The automatic generation of a special network link attribute named AllowQue was added to the highway network building routine. The attribute is now used to identify dummy links (i.e., where AllowQue equals 0) and to disable the queuing delay process. AllowQue is set to a value of 1 for non-dummy links, which enables the application of the queuing delay function as previously developed.
- The NHB F-factor was adjusted slightly as a means of fine-tuning the 2005 estimated and observed VMT match at the regional level.

1.2 *Commercial Vehicle Model*

The inclusion of an explicit commercial vehicle model is one of the major improvements of the TPB's Version 2.2 model, and some additional background information is provided in this section. The model was developed on the basis of a commercial vehicle survey that was conducted during the spring and summer of 2005. Commercial vehicle counts were collected at 144 locations throughout the region. The locations selected for the commercial vehicle survey were deemed to be representative of facility types and area classifications that are distinguished in the regional model.

The model was developed using an innovative and cost-effective approach that has been successfully implemented at other metropolitan areas (including Baltimore). The calibration approach has been characterized as one that starts with the answer and works backward. The calibration steps undertaken to develop the model were as follows (Allen, 2005A):

1) After the survey data were cleaned, a model was developed to develop daily commercial vehicle volumes for the universe of highway links. The "synthetic" commercial counts were developed using a model developed from the sampled counts.

2) With the counts assigned to network links, an 'observed' trip table was derived. Methods for building a trip table from network link volumes are commonly available. The observed trip table was used as the basis for a model calibration.
3) A borrowed trip generation and distribution model was used to develop a starting trip table. A 'single-unit truck' F-factor from the Transportation Modeling Improvement Program (TMIP) Quick Response Freight Manual was ultimately selected for the proposed distribution model. The trip-ends of the starting trip table were compared to those of the observed trip table and assessed. Trip-generation adjustments were made iteratively so as to eliminate biases attributable to zonal characteristics or special generators.
4) After trip-end biases were eliminated, a comparison of the starting trip table and the observed trip table yielded, for the most part, random differences. These differences were then addressed with the development of an adjustment matrix (or a "delta table") used to correct the starting table to match the observed trip table, at the interchange level. Delta tables may be either additive or multiplicative. The latter type was ultimately selected. Separate delta tables were developed for internal and external commercial trips.
5) A time of day model was then developed to apportion commercial trips to the three time-of-day periods used in the TPB model.

The final parameters used in the trip generation, trip distribution, and time of day models are detailed in the appropriate sections of this report. It is important to point out that, with the provision of the commercial model, a measured reduction in the NHB trip generation rate was necessary to avoid double counting. It is also important to understand that the delta table, itself, is an integral component of the commercial model application in addition to the generation, distribution, and time of day components. The delta table is used uniformly for base and forecast years.

1.3 *Overview of Version 2.2 Model*

The Version 2.2 travel model, like its predecessors, Version 2.1D #50 and Version 2.1 C, is an aggregate, trip-based, four-step model that uses the TPB's existing 2,191 transportation analysis zone (TAZ) system. The study area is comprised of 22 jurisdictions in all, extending over the District of Columbia and three states: the Maryland, Virginia, and West Virginia as shown on Figure 1-1. It is important to note that this study area extends well beyond the COG member area, as well as, beyond the non-attainment area that is used in air quality planning work. A graphic showing the essential inputs and outputs of the Version 2.2 modeling process is shown on Figure 1-2.

The demographic models are used to disaggregate the total number of zonal households across 64 cross-classes: 4 household income groups[1] by 4 household size groups (1, 2, 3, 4+ persons) by 4 vehicle availability groups (0, 1, 2, and 3+ vehicles available). The allocation of households to each cross-class is made at traffic analysis zone (TAZ) level. The figure indicates that peak-hour transit accessibility measures are used as part of the demographic (vehicle availability) submodel step.

[1] The income levels used approximate household income quartiles, based on the 2000 CTPP.

The trip generation models are next applied to compute daily person trip productions and attractions by purpose. The modeled purposes include four resident travel types (home-based work [HBW], home-based shop [HBS], home-based other [HBO], and non-home-based [NHB]), a commercial vehicle purpose (consisting of both autos and light duty trucks), and two truck types, Medium and Heavy. Medium trucks are those with two axles and 6 or more tires. Heavy trucks comprise all combination vehicles.

Trip generation involves the application of daily trip rates to the number of households in each of the 64 classes and to jobs. The HBW trip rates reflect both motorized (i.e., transit and automobile) and non-motorized (i.e., bicycle and walk) person travel. Trip rates associated with the remaining modeled purposes represent motorized (i.e., transit and automobile) person travel only. The non-motorized component of HBW trip-ends generated is subsequently extracted from the total trip-ends prior to trip distribution. Trip attractions are computed by purpose as a function of gross land use categories. External (i.e., external-to-internal, X/I, and internal-to-external, I/X) productions and attractions are entered as an exogenous input, by purpose, into the trip generation process. External travel relates to auto person, commercial vehicle and truck travel only. External transit travel is not represented in the external trip inputs and is not estimated in the travel model. The trip generation process yields productions and attractions, which are stratified by the four income levels for the home-based purposes, and non-stratified for the NHB, commercial vehicle, and truck-related purposes.

The trip distribution model uses the standard gravity model formulation and makes use of a composite time function that represents a blending of transit and highway travel times. The distribution step involves separate gravity model runs for 27 travel markets, given that home-based purposes are income stratified, and external travel is modeled separately by purpose and facility type (interstate travel vs. non-interstate). However, the trip distribution process ultimately results in seven daily trip tables corresponding to the basic motorized person, commercial, and truck purposes.

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

The time-of-day model apportions daily resident travel among three time periods: AM peak period (6:00 AM - 9:00 AM), PM peak period (4:00 PM - 7:00 PM) and off-peak period (all remaining hours). The model consists of survey-based factors that are applied on the basis of purpose, mode, and directionality, i.e. home-to-non-home or non-home-to-home. This step also includes provisions for apportioning daily residual travel[2] and truck travel among the three time periods. The time-of-day process ultimately produces three 'total vehicle' trip tables, one for each of the three time periods.

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

Figure 1-1 Modeled area: 2,191 TAZ, 22 jurisdictions

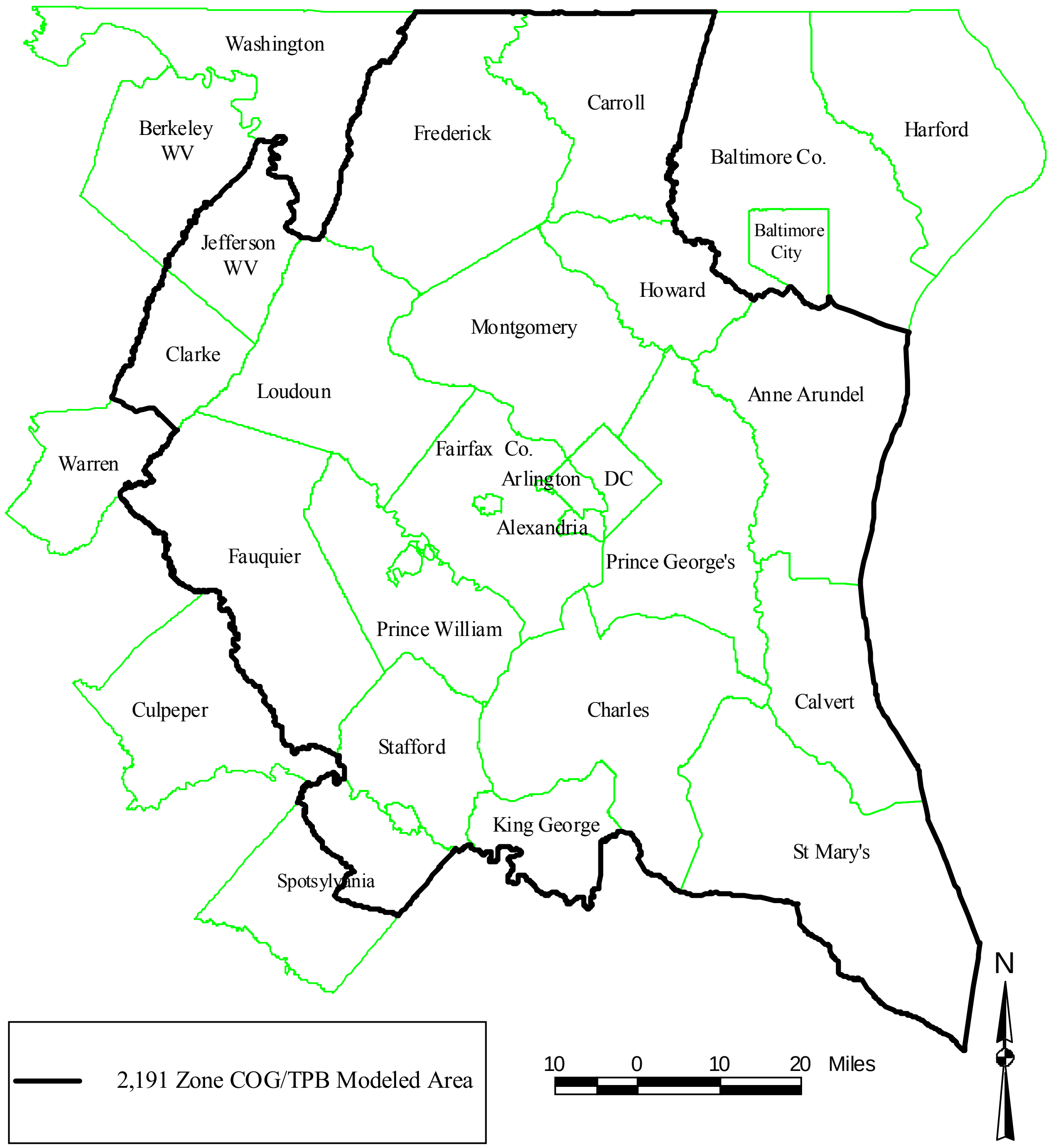
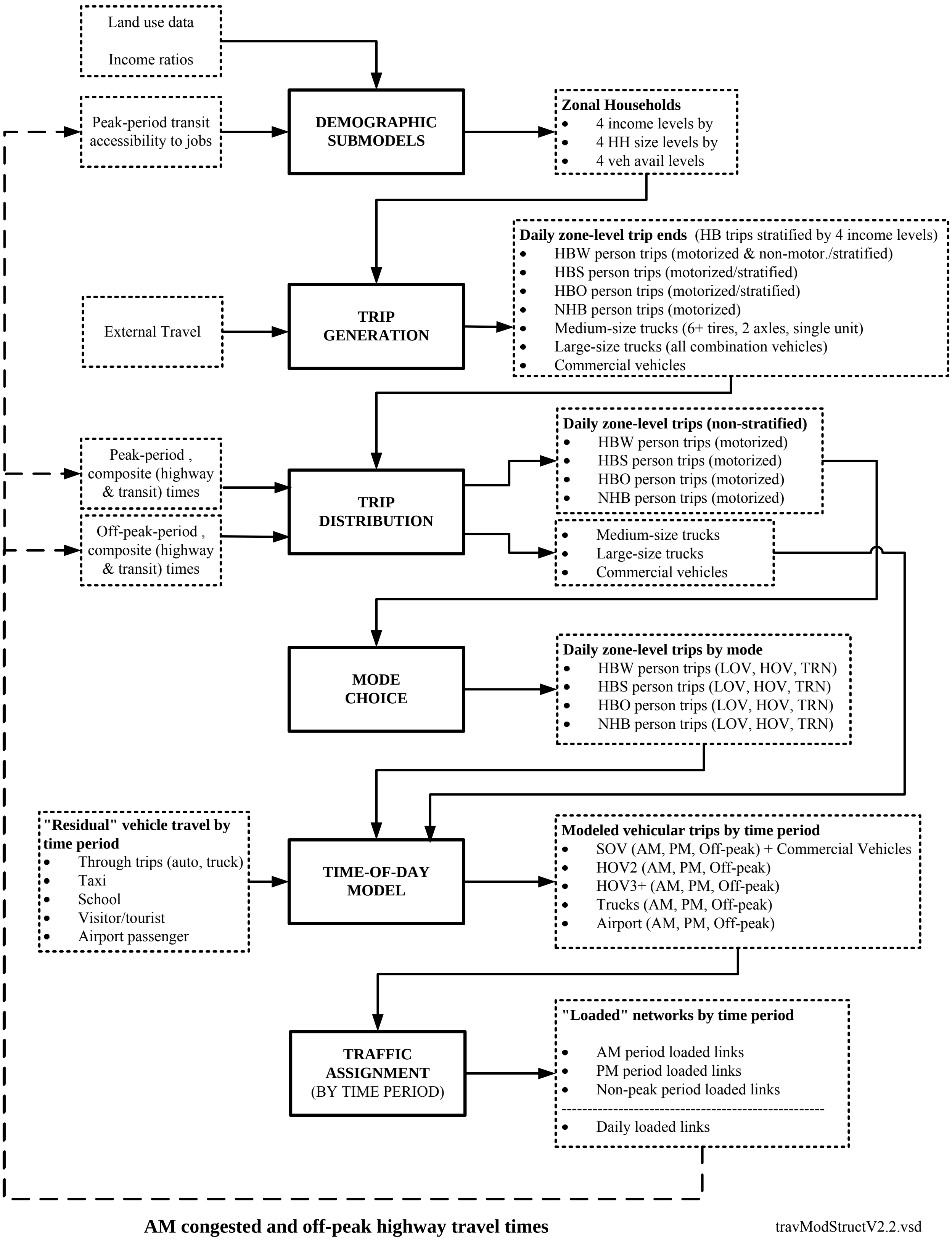


Figure 1-2 Version 2.2 Travel Model Structure



The Version 2.2 traffic assignment process consists of three separate assignment executions corresponding to the above mentioned time periods. Each traffic assignment execution consists of 60 fixed user equilibrium iterations (or UEIs). To respect the various highway path options and prohibitions in the Washington region, five separate markets (trip tables) are loaded during each assignment execution: single-occupant vehicles (including commercial vehicles), 2-occupant vehicles, 3+occupant vehicles, trucks (Medium and Heavy), and airport passenger vehicles. Although separate link volumes are developed for each of the five markets, the final loaded links file ultimately contains a total volumes, speeds, and V/C ratios for each time period. The highway assignment report file includes a number of equilibrium closure statistics, the newest of which is the "relative gap" (RELGAP)[3].

Figure 1-2 also indicates that the modeling process includes a speed feedback loop. The AM and off-peak SOV restrained times resulting from the traffic assignment step are fed back into trip generation (via transit accessibility), trip distribution, and mode choice steps. In standard application, the four-step process is executed a total of seven times, including an initial pass which uses 'synthetic' highway speed inputs and exogenous mode choice percentages, and six subsequent passes where traffic assignment-based highway speeds are used and the mode choice model is executed. A link-level method of successive averaging (MSA) process is applied after each successive highway assignment process to ensure that highway volumes (and hence speeds) will stabilize. The MSA averaging is performed on the basis of total (non-segmented) link volumes, and is performed individually for each time period.

The model is sometimes applied with modified or added procedures in order to reflect special operating policies or conditions. In recent years, some of the TPB forecasts have been subject to a Metrorail-related capacity limitation in core regional core. It is currently assumed that transit trips to and through the core beyond the year 2010 will not exceed 2010 levels. Consequently, procedures have been added to the post-2010 model executions to compare the modeled transit trip table with a pre-existing 2010 transit trip table and to ensure that appropriate modeled transit movements do not exceed 2010 levels (transit ridership exceeding constrained levels are converted to back auto trips).

Planned HOT (High Occupancy Toll) lanes in Northern Virginia have proven to be especially challenging to model given the special operating nature of the HOT lane facility, and given the legal stipulation in Virginia which will require SOV's to pay for HOT lane use, while 3+ occupant HOVs will be allowed access to HOT lanes free of charge and suffer no service degradation. A central objective in HOT lane modeling is to specify of variable toll rates that will result in optimum demand levels on the HOT lane facility— levels that do not degrade the prevailing speed on the facility. Another object is to model the HOT facility such that the HOV service levels are maintained. To achieve these two objectives, the following four steps are currently undertaken to simulating HOT lanes in Virginia.

1) The travel model is fully executed whereby all Virginia HOT lanes in the highway network are coded as HOV 3+-priority lanes. The resulting HOV LOS skim files

[3] The relative gap closure statistic was added to TP+ in Version 4.0.

corresponding to each iteration (pump-prime, iteration 1,…, iteration 6) are preserved for later use.

2) The travel model is fully executed again. This time, the Virgina HOT lanes are coded as mixed use lanes (i.e., allowing access by both SOVs and HOVs). The HOT lanes are assigned a beginning toll level of 20 cents per mile during the peak periods and 15 cents per mile during the off-peak. The toll is included into the overall highway impedance during path building in the traffic assignment step. Therefore, the toll level impacts the loading in the HOT lane facility.
3) The final (iteration 6) highway assignment step (including three traffic assignments for each time period) is run iteratively in order to identify HOT lane toll rates (cents/mile) which result in optimum speeds on the facility. The toll rates are developed on a freeway segment by segment basis. The queuing delay function is disabled on the HOT lane facility during this particular step as such delay will presumably be minimal given the special operating conditions of the facility. At the end of each assignment the segment level volume and speed is evaluated and the toll rate is adjusted incrementally. The toll level is increased when the desired segment speed is too low. The result of this process is a file containing 'final' toll rates for each HOT lane freeway segment, by time period.
4) The model is executed such that: 1) the final HOT lane toll rates developed in step 3 are invoked and 2) the HOV skims developed in step 1 are used as 'overrides' to the HOV skims that would be normally developed as part of the modeling process.

TPB has determined that above steps enable the Version 2.2 model to depict the conditions and policies associated with the planned Virginia HOT lanes.

Chapter 2 Inputs to the Travel Model

This chapter describes the land use and exogenous travel files that have been prepared for the Version 2.2 model application. The land use files are developed from COG's Cooperative Forecasting program. Non-modeled trip files used in the Version 2.2 model represent special travel markets that need to be accounted for in the regional forecast. Such markets include external trip-ends, through trips, airport passengers trips, and 'miscellaneous' (or taxi, school, and visitor/ tourist) trips. These are detailed below.

2.1 *Round 7.1 Land Use*

The Version 2.2 model requires a zonal land use file be provided in a standard format for each simulated year. Land use forecasts are periodically updated through COG's Cooperative Forecast program. The most recent set of land use forecasts in known as Round 7.1 Cooperative Forecasts, released in August 2007. The Cooperative Forecast files consist of zonal forecasts of households, household population, group quarters population, and employment by category (retail, office, industrial, and other). The files also include a jurisdiction code that is utilized by the travel model, ranging from 0 to 23. The Cooperative Forecasting program's Round 7.1 land use forecasts were provided in five-year increments, from 2000 to 2030.

Procedures to prepare standardized land use files supporting the TPB travel model have, in recent years, included a provision to factor employment on a jurisdictional basis to account for definitional differences between planning agencies. These employment adjustments were applied to the Round 7.1 files (COG/TPB 2007.08.27), but the adjustments were made only to jurisdictions outside of the COG member area. In addition to land use data, the standard zonal land use file requires additional zonal data that do not vary by year, including the zonal area, a zonal household income index (the ratio of the zonal median income to the regional median income), and the airline distance to the nearest external station. Given that the household income submodel was recently updated, the zonal income index defined previously (from the 1990 CTPP) was recently updated based on the 2000 CTPP (COG/TPB 2006.08.11).

The Round 7.1 land use totals over time are listed on Table 2-1. The totals shown in between the five-year increments have been linearly interpolated. (Intermediate years are typically required for air quality planning work, and so files are generally prepared for all years between the base and horizon year in a given land use round).

Table 2-1 Round 7.1 Land Use Forecasts for Version 2.2 Modeling (w/ CTPP Employment Adjustments)

Year	HH	HHPOP	GQPop	TotPop	TotEMP(1,2)	OffEMP	RetEMP	IndEMP	OthEMP
2000	2,143,451	5,632,014	116,105	5,748,119	3,441,381	1,630,149	628,912	459,906	722,414
2001	2,186,197	5,737,713	119,668	5,857,403	3,494,997	1,654,026	638,140	471,719	731,144
2002	2,228,949	5,843,440	123,244	5,966,696	3,548,630	1,677,886	647,362	483,533	739,902
2003	2,271,740	5,949,100	126,863	6,075,951	3,602,284	1,701,726	656,573	495,275	748,657
2004	2,314,492	6,054,827	130,439	6,185,244	3,655,917	1,725,586	665,795	507,089	757,415
2005	2,357,238	6,160,526	134,002	6,294,528	3,709,533	1,749,463	675,023	518,902	766,145
2006	2,399,015	6,262,725	134,639	6,397,389	3,782,185	1,789,143	687,011	527,266	778,735
2007	2,440,792	6,364,933	135,301	6,500,236	3,854,849	1,828,871	699,005	535,604	791,360
2008	2,482,578	6,467,172	135,966	6,603,136	3,927,538	1,868,563	711,001	543,962	804,021
2009	2,524,355	6,569,380	136,628	6,705,983	4,000,202	1,908,291	722,995	552,300	816,646
2010	2,566,132	6,671,579	137,265	6,808,844	4,072,854	1,947,971	734,983	560,664	829,236
2011	2,605,822	6,761,365	137,755	6,899,125	4,133,475	1,981,003	744,821	568,523	839,049
2012	2,645,490	6,851,197	138,245	6,989,465	4,194,092	2,014,020	754,692	576,407	848,893
2013	2,685,233	6,941,005	138,795	7,079,777	4,254,748	2,047,081	764,628	584,336	858,783
2014	2,724,901	7,030,837	139,285	7,170,117	4,315,365	2,080,098	774,499	592,220	868,627
2015	2,764,591	7,120,623	139,775	7,260,398	4,375,986	2,113,130	784,337	600,079	878,440
2016	2,798,787	7,201,940	140,165	7,342,114	4,434,370	2,144,237	794,157	607,441	888,528
2017	2,833,031	7,283,227	140,562	7,423,813	4,492,772	2,175,337	803,969	614,806	898,609
2018	2,867,273	7,364,519	141,012	7,505,507	4,551,188	2,206,497	813,828	622,173	908,741
2019	2,901,517	7,445,806	141,409	7,587,206	4,609,590	2,237,597	823,640	629,538	918,822
2020	2,935,713	7,527,123	141,799	7,668,922	4,667,974	2,268,704	833,460	636,900	928,910
2021	2,964,737	7,593,499	142,396	7,735,893	4,720,353	2,296,094	841,147	644,028	939,011
2022	2,993,788	7,659,857	142,998	7,802,857	4,772,760	2,323,505	848,885	651,187	949,141
2023	3,022,842	7,726,221	143,619	7,869,838	4,825,216	2,350,939	856,635	658,369	959,315
2024	3,051,893	7,792,579	144,221	7,936,802	4,877,623	2,378,350	864,373	665,528	969,445
2025	3,080,917	7,858,955	144,818	8,003,773	4,930,002	2,405,740	872,060	672,656	979,546
2026	3,104,706	7,913,911	145,593	8,059,505	4,975,299	2,428,268	879,594	678,768	988,585
2027	3,128,522	7,968,819	146,384	8,115,193	5,020,598	2,450,796	887,174	684,894	997,668
2028	3,152,377	8,023,763	147,175	8,170,948	5,065,971	2,473,400	894,737	691,044	1,006,856
2029	3,176,193	8,078,671	147,966	8,226,636	5,111,270	2,495,928	902,317	697,170	1,015,939
2030	3,199,982	8,133,627	148,741	8,282,368	5,156,567	2,518,456	909,851	703,282	1,024,978

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Ref: Rnd71_70a_Comparison.xls

2.2 *External and Through Forecasts*

External and through travel files are geographically referenced to 46 external stations which identify the entry and exit points of the highway network located at the periphery of the modeled study area. The stations are numbered from 2145 to 2191. The Version 2.2 model requires six files relating to external (I-X and X-I) and through (X-X) travel, for a given simulation year. These include:

1. a through auto driver trip table (excluding commercial vehicle trips);
2. a through truck (medium/heavy) trip table;
3. a through commercial vehicle trip table;
4. a file containing external commercial vehicle trip-ends, at the external station level;
5. a file containing external auto-person and truck productions by purpose (excluding commercial trips), at the external station level;
6. a file containing external auto-person and truck attractions by purpose (excluding commercial trips), at the external station level;

External and through trips are generally developed using an assumed growth rate at each external station, and an observed traffic 'profile' at each external station, indicating the proportion of through and external travel and the proportions of travel modes and purposes (the proportions were developed from the external surveys). The external traffic forecasts are currently based on varying growth rates depending on the station location, from 1.1% to 3.0% depending on location (the average annual growth rate across all stations is now 1.8%). Previous documents detail the development of the external traffic rates (COG/TPB 2006.06.30, Chapter 2).

A summary of the revised external and through trips are shown on Table 2-2. The projected total level of external travel between 2000 and 2030 is shown to grow from 1,215,800 to 2,063,800, which reflects an average annual growth rate of about 1.8%. External productions and attractions are shown by travel mode and purpose, in Table 2-3 and Table 2-4, respectively.

Table 2-2 External and Through Auto/Truck Trips by Year

Year	AAWDT	Auto Dr. Control	Trucks Control	Auto XX Trip-Ends	ComVeh XX Trip-Ends	Auto Driver X-I Trips	Auto Driver I-X Trips	Truck XX Trip-Ends	Truck XI Trips	Truck IX Trips
2000	1,215,783	1,003,776	114,016	70,027	5,318	486,084	442,347	59,702	27,157	27,157
2001	1,242,112	1,025,791	116,675	71,652	5,444	496,868	451,827	61,119	27,778	27,778
2002	1,268,838	1,048,138	119,374	73,301	5,572	507,815	461,450	62,557	28,408	28,408
2003	1,295,968	1,070,823	122,114	74,976	5,702	518,927	471,218	64,017	29,048	29,048
2004	1,323,510	1,093,852	124,895	76,675	5,834	530,208	481,135	65,499	29,698	29,698
2005	1,351,466	1,117,228	127,719	78,401	5,968	541,659	491,201	67,003	30,358	30,358
2006	1,386,887	1,146,845	131,296	80,587	6,137	556,167	503,954	68,909	31,193	31,193
2007	1,422,976	1,177,022	134,940	82,814	6,310	570,949	516,948	70,851	32,045	32,045
2008	1,459,746	1,207,767	138,654	85,084	6,486	586,010	530,187	72,830	32,912	32,912
2009	1,497,210	1,239,093	142,437	87,396	6,665	601,355	543,676	74,846	33,796	33,796
2010	1,535,381	1,271,009	146,292	89,752	6,848	616,990	557,420	76,900	34,696	34,696
2011	1,565,186	1,295,930	149,302	91,591	6,991	629,197	568,151	78,504	35,399	35,399
2012	1,595,422	1,321,212	152,356	93,457	7,136	641,582	579,038	80,131	36,113	36,113
2013	1,626,094	1,346,859	155,454	95,350	7,282	654,145	590,082	81,781	36,836	36,836
2014	1,657,211	1,372,878	158,596	97,271	7,431	666,891	601,285	83,456	37,570	37,570
2015	1,688,778	1,399,273	161,784	99,219	7,582	679,820	612,651	85,154	38,315	38,315
2016	1,717,575	1,423,351	164,692	100,996	7,720	691,615	623,020	86,704	38,994	38,994
2017	1,746,746	1,447,743	167,638	102,797	7,860	703,564	633,523	88,274	39,682	39,682
2018	1,776,297	1,472,452	170,623	104,620	8,001	715,668	644,163	89,864	40,379	40,379
2019	1,806,232	1,497,482	173,646	106,468	8,145	727,929	654,941	91,475	41,086	41,086
2020	1,836,557	1,522,838	176,708	108,339	8,290	740,350	665,860	93,107	41,801	41,801
2021	1,862,500	1,544,531	179,329	109,941	8,414	750,976	675,201	94,503	42,413	42,413
2022	1,888,728	1,566,462	181,977	111,559	8,540	761,719	684,644	95,914	43,032	43,032
2023	1,915,245	1,588,634	184,655	113,196	8,666	772,580	694,191	97,341	43,657	43,657
2024	1,942,052	1,611,049	187,363	114,850	8,795	783,560	703,844	98,783	44,290	44,290
2025	1,969,153	1,633,710	190,100	116,523	8,925	794,661	713,602	100,242	44,929	44,929
2026	1,991,679	1,652,545	192,375	117,913	9,032	803,887	721,712	101,454	45,460	45,460
2027	2,014,408	1,671,550	194,670	119,316	9,141	813,197	729,896	102,677	45,996	45,996
2028	2,037,342	1,690,726	196,986	120,731	9,251	822,590	738,153	103,911	46,537	46,537
2029	2,060,484	1,710,076	199,323	122,160	9,362	832,069	746,485	105,156	47,083	47,083
2030	2,083,834	1,729,600	201,681	123,601	9,473	841,633	754,893	106,413	47,634	47,634

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Ref : External_Summary.xls

Table 2-3 External Auto/Truck Productions by Year

Year	HBWXI AutoDrv	HBSXI AutoDrv	HBOXI AutoDrv	NHBXI AutoDrv	ComvXI Vehs	HBWXI AutoPsn	HBSXI AutoPsn	HBOXI AutoPsn	NHBXI AutoPsn	ComVeh XI Psn	Med XI	Hvy XI	Auto XI Drv	TruckXI Total
2000	236,559	42,352	117,778	56,408	32,987	272,043	69,457	189,623	72,203	42,223	3,637	23,520	486,084	27,157
2001	241,902	43,183	120,471	57,549	33,736	278,187	70,821	193,959	73,662	43,182	3,718	24,047	496,841	27,765
2002	247,332	44,029	123,208	58,708	34,497	284,432	72,207	198,365	75,146	44,156	3,802	24,583	507,774	28,384
2003	252,850	44,888	125,989	59,886	35,271	290,777	73,616	202,843	76,654	45,146	3,886	25,127	518,883	29,013
2004	258,455	45,760	128,815	61,082	36,057	297,223	75,047	207,392	78,185	46,152	3,972	25,679	530,169	29,651
2005	264,131	46,644	131,675	62,294	36,852	303,750	76,496	211,997	79,736	47,171	4,059	26,239	541,596	30,298
2006	271,716	47,825	135,498	63,913	37,916	312,473	78,432	218,152	81,808	48,532	4,175	26,987	556,867	31,162
2007	279,440	49,027	139,392	65,562	38,999	321,357	80,405	224,421	83,919	49,918	4,293	27,748	572,420	32,042
2008	287,323	50,254	143,365	67,244	40,104	330,422	82,417	230,818	86,072	51,333	4,414	28,526	588,291	32,940
2009	295,363	51,506	147,418	68,960	41,231	339,668	84,470	237,343	88,269	52,776	4,537	29,318	604,479	33,856
2010	303,579	52,785	151,559	70,714	42,383	349,116	86,567	244,010	90,514	54,250	4,663	30,128	621,019	34,791
2011	309,447	53,699	154,517	71,967	43,206	355,864	88,066	248,772	92,117	55,303	4,753	30,707	632,834	35,460
2012	315,420	54,628	157,527	73,242	44,043	362,733	89,591	253,619	93,749	56,375	4,844	31,296	644,861	36,140
2013	321,464	55,569	160,573	74,532	44,890	369,683	91,134	258,523	95,400	57,460	4,937	31,892	657,028	36,829
2014	327,595	56,524	163,664	75,840	45,750	376,734	92,699	263,498	97,076	58,560	5,031	32,496	669,372	37,527
2015	333,831	57,495	166,807	77,171	46,624	383,905	94,291	268,559	98,779	59,679	5,126	33,111	681,927	38,238
2016	339,208	58,332	169,517	78,319	47,378	390,089	95,664	272,923	100,249	60,644	5,209	33,641	692,755	38,850
2017	344,674	59,183	172,272	79,486	48,144	396,375	97,059	277,358	101,742	61,625	5,293	34,180	703,758	39,473
2018	350,191	60,042	175,053	80,664	48,918	402,720	98,468	281,836	103,250	62,615	5,377	34,724	714,868	40,101
2019	355,779	60,911	177,870	81,856	49,701	409,146	99,895	286,370	104,776	63,618	5,463	35,275	726,118	40,738
2020	361,437	61,792	180,722	83,064	50,495	415,653	101,339	290,962	106,322	64,633	5,549	35,833	737,510	41,383
2021	366,517	62,583	183,282	84,149	51,207	421,495	102,636	295,084	107,710	65,545	5,627	36,334	747,738	41,961
2022	371,667	63,385	185,878	85,248	51,929	427,417	103,951	299,263	109,117	66,469	5,706	36,842	758,106	42,548
2023	376,852	64,192	188,491	86,355	52,656	433,380	105,275	303,471	110,534	67,399	5,785	37,353	768,546	43,139
2024	382,107	65,010	191,140	87,476	53,393	439,423	106,617	307,735	111,970	68,342	5,866	37,871	779,126	43,737
2025	387,415	65,836	193,815	88,609	54,137	445,527	107,972	312,043	113,420	69,295	5,947	38,395	789,812	44,342
2026	392,179	66,578	196,217	89,626	54,805	451,006	109,188	315,909	114,722	70,150	6,020	38,864	799,405	44,885
2027	396,997	67,328	198,645	90,655	55,480	456,546	110,418	319,818	116,038	71,014	6,094	39,339	809,104	45,433
2028	401,866	68,086	201,099	91,694	56,163	462,146	111,661	323,770	117,368	71,888	6,169	39,820	818,909	45,988
2029	406,771	68,850	203,572	92,741	56,850	467,787	112,914	327,750	118,708	72,769	6,244	40,303	828,784	46,547
2030	411,728	69,622	206,070	93,799	57,545	473,488	114,179	331,773	120,063	73,658	6,320	40,792	838,765	47,111

Ref: ExtXIpurp_CV.txt, extrnalPsAs.xls

Table 2-4 External Auto/Truck Attractions by Year

Year	HBWXI AutoDrv	HBSXI AutoDrv	HBOXI AutoDrv	NHBXI AutoDrv	ComvXI Vehs	HBWXI AutoPsn	HBSXI AutoPsn	HBOXI AutoPsn	NHBXI AutoPsn	ComVeh XI Psn	Med XI	Hvy XI	Auto XI Drv	TruckXI Total
2000	146,581	41,644	164,738	56,400	32,983	168,568	68,297	265,229	72,193	42,219	3,637	23,520	442,347	27,157
2001	149,570	42,509	168,383	57,541	33,732	172,006	69,715	271,097	73,652	43,177	3,718	24,047	451,736	27,765
2002	152,609	43,388	172,088	58,700	34,494	175,501	71,157	277,062	75,136	44,152	3,802	24,583	461,279	28,384
2003	155,697	44,281	175,853	59,877	35,267	179,052	72,621	283,123	76,643	45,142	3,886	25,127	470,976	29,013
2004	158,834	45,189	179,677	61,074	36,053	182,659	74,109	289,281	78,174	46,147	3,972	25,679	480,827	29,651
2005	162,010	46,107	183,550	62,285	36,848	186,312	75,616	295,515	79,725	47,166	4,059	26,239	490,801	30,298
2006	166,255	47,335	188,725	63,904	37,911	191,193	77,630	303,846	81,797	48,527	4,175	26,987	504,130	31,162
2007	170,578	48,586	193,995	65,553	38,994	196,164	79,681	312,332	83,908	49,913	4,293	27,748	517,706	32,042
2008	174,989	49,862	199,373	67,235	40,099	201,237	81,773	320,991	86,061	51,327	4,414	28,526	531,558	32,940
2009	179,488	51,163	204,859	68,951	41,226	206,412	83,908	329,822	88,258	52,770	4,537	29,318	545,688	33,856
2010	184,086	52,493	210,464	70,705	42,378	211,699	86,089	338,847	90,502	54,244	4,663	30,128	560,125	34,791
2011	187,370	53,443	214,468	71,957	43,200	215,475	87,647	345,293	92,105	55,296	4,753	30,707	570,438	35,460
2012	190,713	54,410	218,543	73,232	44,038	219,319	89,232	351,854	93,737	56,368	4,844	31,296	580,935	36,140
2013	194,094	55,388	222,666	74,522	44,885	223,209	90,837	358,492	95,388	57,452	4,937	31,892	591,556	36,829
2014	197,525	56,381	226,849	75,831	45,744	227,154	92,464	365,227	97,063	58,552	5,031	32,496	602,330	37,527
2015	201,015	57,390	231,104	77,162	46,618	231,168	94,120	372,077	98,767	59,671	5,126	33,111	613,289	38,238
2016	204,025	58,261	234,773	78,309	47,372	234,628	95,547	377,984	100,236	60,636	5,209	33,641	622,739	38,850
2017	207,083	59,145	238,501	79,476	48,138	238,146	96,998	383,987	101,729	61,617	5,293	34,180	632,344	39,473
2018	210,171	60,039	242,266	80,654	48,912	241,697	98,463	390,048	103,237	62,607	5,377	34,724	642,041	40,101
2019	213,298	60,943	246,079	81,846	49,695	245,293	99,947	396,186	104,763	63,609	5,463	35,275	651,861	40,738
2020	216,464	61,859	249,939	83,054	50,488	248,934	101,449	402,402	106,309	64,625	5,549	35,833	661,804	41,383
2021	219,307	62,681	253,405	84,138	51,200	252,203	102,797	407,982	107,697	65,536	5,627	36,334	670,731	41,961
2022	222,189	63,515	256,918	85,237	51,922	255,517	104,165	413,639	109,104	66,460	5,706	36,842	679,782	42,548
2023	225,091	64,354	260,456	86,344	52,649	258,854	105,541	419,334	110,520	67,390	5,785	37,353	688,894	43,139
2024	228,032	65,205	264,041	87,466	53,385	262,236	106,936	425,107	111,956	68,333	5,866	37,871	698,129	43,737
2025	231,002	66,064	267,663	88,598	54,129	265,652	108,345	430,937	113,406	69,286	5,947	38,395	707,456	44,342
2026	233,668	66,835	270,913	89,615	54,797	268,718	109,610	436,170	114,708	70,140	6,020	38,864	715,829	44,885
2027	236,364	67,615	274,200	90,643	55,472	271,818	110,889	441,462	116,024	71,005	6,094	39,339	724,295	45,433
2028	239,089	68,403	277,522	91,683	56,155	274,952	112,182	446,811	117,354	71,878	6,169	39,820	732,853	45,988
2029	241,834	69,197	280,869	92,730	56,843	278,109	113,484	452,199	118,694	72,758	6,244	40,303	741,472	46,547
2030	244,608	70,000	284,251	93,788	57,537	281,299	114,800	457,644	120,048	73,648	6,320	40,792	750,184	47,111

Ref: ExtIXpurp_CV.txt, extrnalPsAs.xls

2.3 *Miscellaneous and Airport Passenger Trip Forecasts*

The remaining exogenous travel markets consist of taxis, school, and visitor/tourist auto driver trips (also collectively referred to as 'miscellaneous trips') and airport passenger auto driver trips. The miscellaneous trip totals, shown by year on Table 2-5, are based on surveyed travel patterns that have been growth factored through time. The airport passenger forecasts are shown on Table 2-6. The airport trips have been recently updated using the 2000 COG Air Passenger Survey (COG/TPB 2006.06.30, Chapter 6). The trip tables represent auto travel to each of the three major airports serving the Washington/Baltimore area.

Table 2-5 Miscellaneous Auto Driver Forecasts

Year	School	Taxi	Visitor/ Tourist
2000	250,448	111,246	222,227
2001	255,129	113,337	226,490
2002	259,809	115,428	230,753
2003	264,490	117,518	235,016
2004	269,170	119,609	239,279
2005	273,851	121,700	243,542
2006	278,407	123,715	247,527
2007	282,964	125,730	251,512
2008	287,520	127,746	255,496
2009	292,077	129,761	259,481
2010	296,633	131,776	263,466
2011	300,347	134,043	267,660
2012	304,060	136,310	271,853
2013	307,774	138,578	276,047
2014	311,487	140,845	280,240
2015	315,201	143,112	284,434
2016	318,127	144,191	286,834
2017	321,053	145,270	289,234
2018	323,979	146,350	291,633
2019	326,905	147,429	294,033
2020	329,831	148,508	296,433
2021	332,552	149,544	298,480
2022	335,273	150,580	300,527
2023	337,994	151,616	302,574
2024	340,715	152,652	304,621
2025	343,436	153,688	306,668
2026	346,932	155,598	309,981
2027	350,429	157,508	313,294
2028	353,925	159,418	316,607
2029	357,422	161,328	319,920
2030	360,918	163,238	323,233

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Table 2-6 Air Passenger Auto Driver Trips by Year and Airport

	Airport			
Year	National	Dulles	BWI	Total
2000	18,746	16,585	14,486	49,817
2001	18,339	16,595	14,810	49,744
2002	17,933	16,603	15,134	49,670
2003	17,526	16,612	15,459	49,597
2004	17,119	16,620	15,783	49,522
2005	16,713	16,630	16,107	49,450
2006	17,199	18,405	17,333	52,937
2007	17,687	20,180	18,559	56,426
2008	18,174	21,956	19,785	59,915
2009	18,662	23,731	21,011	63,404
2010	19,149	25,506	22,237	66,892
2011	19,346	27,459	23,126	69,931
2012	19,543	29,412	24,014	72,969
2013	19,740	31,365	24,903	76,008
2014	19,937	33,319	25,792	79,048
2015	20,135	35,272	26,681	82,088
2016	20,331	36,754	27,341	84,426
2017	20,528	38,237	28,001	86,766
2018	20,725	39,720	28,662	89,107
2019	20,921	41,203	29,322	91,446
2020	21,118	42,685	29,982	93,785
2021	21,314	43,657	30,375	95,346
2022	21,511	44,630	30,767	96,908
2023	21,711	45,603	31,161	98,475
2024	21,908	46,576	31,553	100,037
2025	22,104	47,548	31,945	101,597
2026	22,299	48,630	32,337	103,266
2027	22,495	49,713	32,729	104,937
2028	22,695	50,796	33,121	106,612
2029	22,891	51,879	33,513	108,283
2030	23,086	52,961	33,905	109,952

Subdirectory: I:\ateam\mod_inputs\airport\2007-08-24_Rnd71Based

Ref: Airport_Summary.xls

Chapter 3 Demographic models

This chapter describes the specification of demographic modeling process used within the Version 2.2 model. The models were recently re-estimated using the 2000 CTPP and a more detailed discussion of the model development can be found in earlier work (COG/TPB 2006.06.30, Chapter 2).

3.1 *Demographic Sub-models*

The demographic models are used to distribute the total number of households in a given zone among 64 classes. The classes are established by three dimensions:

- Household size (1, 2, 3, or 4+ persons per household);
- Household income (Income "quartile" 1, 2, 3, or 4); and
- Vehicle ownership/availability (0, 1, 2, or 3+ vehicles per household).

According to the 2000 CTPP, the median household income for the TPB modeled area is approximately $63,800 in 1999 dollars. The household income quartiles based on the 2000 CTPP and are defined as discrete ranges shown on Table 3-1.

Table 3-1 2000 CTPP Household Income Quartile Ranges

Quartile	Income range (1999 dollars)
First	Less than $36,199
Second	$36,100 to $63,799
Third	$63,800 to $100,699
Fourth	$100,700 or more

It is important to point out that the number of households in each income range, as tabulated from the Census, does not equal 25% precisely as one might expect. This is because the Census data does not provide individual household incomes, but rather, reports household income tabulations *at zone level* in terms of the number of households falling in 26 discrete income ranges (for reasons of confidentiality). The reported income ranges at zone level do not conform neatly to the regional quartile ranges shown above, and so, there is some degree of approximation in the tabulation of the number of zonal households in each quartile group.

A submodel was developed for each of the three socio-economic dimensions. The household size sub-model uses Census-based relationships to estimate the percent of households in each integer class of household size, given the zone's average household size. The household income sub-model uses similar Census-based relationships to estimate the percent of households in each income class, given the zone's median household income. Lastly, the vehicle ownership model uses a disaggregate logit formulation to estimate the percentage of households in each of the four vehicle-availability classes. The logit model makes use of the household size and income information developed in prior steps. The model specifications are detailed below.

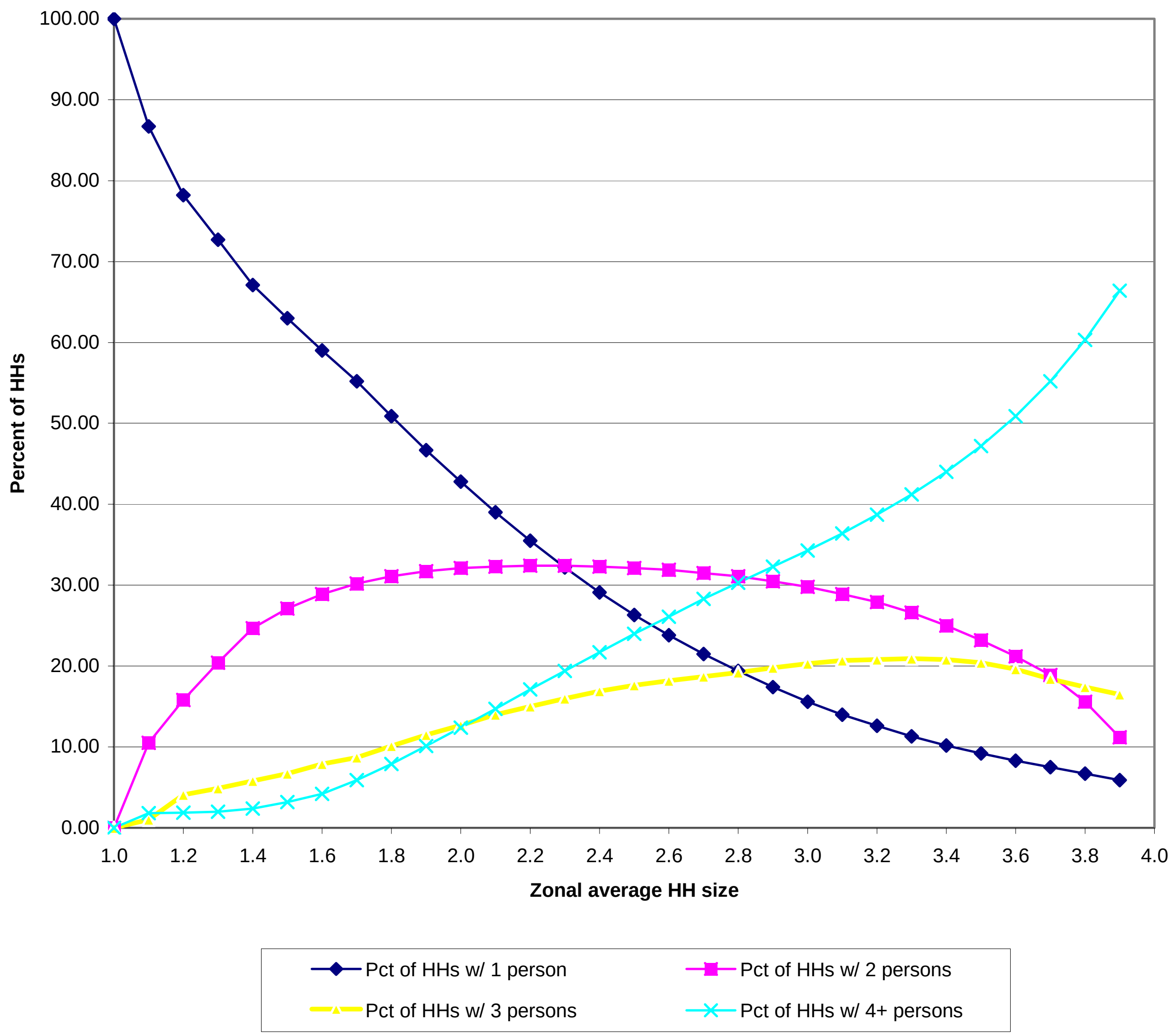
3.2 Household Size Sub-model

The household size sub-model is an "aggregate share" model. The model is essentially a family of four curves used to allocate the total number of households among integer size levels, based on the average household size of a given zone. Each curve uses the same independent variable:

Curve	Dependent variable	Independent variable
1	Percent of HHs with 1 person	Average zonal household size
2	Percent of HHs with 2 persons	Average zonal household size
3	Percent of HHs with 3 persons	Average zonal household size
4	Percent of HHs with 4+ persons	Average zonal household size

The final model is shown in graphical form in Figure 3-1 and in tabular form in Table 3-2.

Figure 3-1 Household size sub-model: Graphical form



Ref: Demographic_v22.xls HHsizg

Table 3-2 Household size sub-model: Tabular form

Ave zonal HH size	Pct of HHs with 1-pers.	Pct of HHs with 2-pers.	Pct of HHs with 3-pers.	Pct of HHs with 4+pers.	Total percent
1.0	100.00%	0.00%	0.00%	0.00%	100.00%
1.1	86.70%	10.50%	1.00%	1.80%	100.00%
1.2	78.20%	15.80%	4.10%	1.90%	100.00%
1.3	72.70%	20.40%	4.90%	2.00%	100.00%
1.4	67.10%	24.70%	5.80%	2.40%	100.00%
1.5	63.00%	27.10%	6.70%	3.20%	100.00%
1.6	59.00%	28.90%	7.90%	4.20%	100.00%
1.7	55.20%	30.20%	8.70%	5.90%	100.00%
1.8	50.90%	31.10%	10.10%	7.90%	100.00%
1.9	46.70%	31.70%	11.50%	10.10%	100.00%
2.0	42.80%	32.10%	12.70%	12.40%	100.00%
2.1	39.00%	32.30%	14.00%	14.70%	100.00%
2.2	35.50%	32.40%	15.00%	17.10%	100.00%
2.3	32.20%	32.40%	16.00%	19.40%	100.00%
2.4	29.10%	32.30%	16.90%	21.70%	100.00%
2.5	26.30%	32.10%	17.60%	24.00%	100.00%
2.6	23.80%	31.90%	18.20%	26.10%	100.00%
2.7	21.50%	31.50%	18.70%	28.30%	100.00%
2.8	19.40%	31.10%	19.20%	30.30%	100.00%
2.9	17.40%	30.50%	19.80%	32.30%	100.00%
3.0	15.60%	29.80%	20.30%	34.30%	100.00%
3.1	14.00%	28.90%	20.70%	36.40%	100.00%
3.2	12.60%	27.90%	20.80%	38.70%	100.00%
3.3	11.30%	26.60%	20.90%	41.20%	100.00%
3.4	10.20%	25.00%	20.80%	44.00%	100.00%
3.5	9.20%	23.20%	20.40%	47.20%	100.00%
3.6	8.30%	21.20%	19.60%	50.90%	100.00%
3.7	7.50%	18.90%	18.40%	55.20%	100.00%
3.8	6.70%	15.60%	17.40%	60.30%	100.00%
3.9	5.90%	11.20%	16.50%	66.40%	100.00%

Ref: **:** Demographic_v22.xls *HhsizT*

3.2 *Household Income Sub-model*

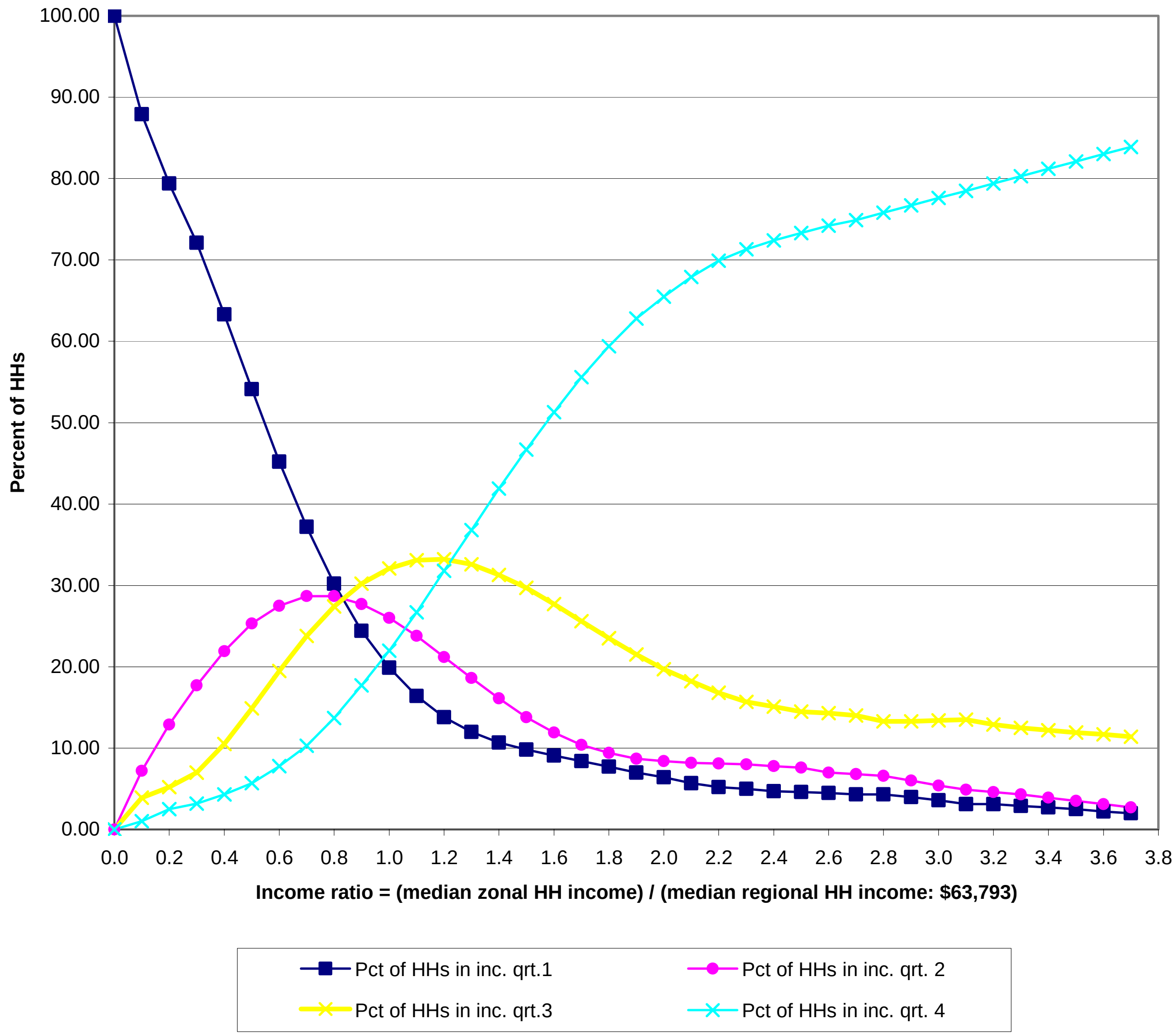
The household income sub-model is also an "aggregate share" model and is, therefore, similar in form to the household size sub-model. The household income sub-model is used to estimate the share of households in each of the four income quartiles in each zone, given the median household income for the zone. As a surrogate for the median zonal household income, the following normalized variable was used as the independent variable for the model:

Equation 3-1 Income ratio equation

Income ratio = (zonal median HH income in 1999) / (regional median HH income in 1999)

The final model is shown in graphical form in Figure 3-2 and in tabular form in Table 3-3.

Figure 3-2 Household income sub-model: Graphical form



Ref: Demographic_v22.xls HHIncG

Table 3-3 Household income sub-model: Tabular form

Income ratio	Pct of HHs in inc. qrt.1	Pct of HHs in inc. qrt. 2	Pct of HHs in inc. qrt.3	Pct of HHs in inc. qrt. 4	Total percent
0.0	100.00%	0.00%	0.00%	0.00%	100.00%
0.1	87.90%	7.20%	3.90%	1.00%	100.00%
0.2	79.40%	12.90%	5.20%	2.50%	100.00%
0.3	72.10%	17.70%	7.00%	3.20%	100.00%
0.4	63.30%	21.90%	10.50%	4.30%	100.00%
0.5	54.10%	25.30%	14.90%	5.70%	100.00%
0.6	45.20%	27.50%	19.50%	7.80%	100.00%
0.7	37.20%	28.70%	23.80%	10.30%	100.00%
0.8	30.20%	28.70%	27.40%	13.70%	100.00%
0.9	24.40%	27.70%	30.20%	17.70%	100.00%
1.0	19.90%	26.00%	32.10%	22.00%	100.00%
1.1	16.40%	23.80%	33.10%	26.70%	100.00%
1.2	13.80%	21.20%	33.20%	31.80%	100.00%
1.3	12.00%	18.60%	32.60%	36.80%	100.00%
1.4	10.70%	16.10%	31.30%	41.90%	100.00%
1.5	9.80%	13.80%	29.70%	46.70%	100.00%
1.6	9.10%	11.90%	27.70%	51.30%	100.00%
1.7	8.40%	10.40%	25.60%	55.60%	100.00%
1.8	7.70%	9.40%	23.50%	59.40%	100.00%
1.9	7.00%	8.70%	21.50%	62.80%	100.00%
2.0	6.40%	8.40%	19.70%	65.50%	100.00%
2.1	5.70%	8.20%	18.20%	67.90%	100.00%
2.2	5.20%	8.10%	16.80%	69.90%	100.00%
2.3	5.00%	8.00%	15.70%	71.30%	100.00%
2.4	4.70%	7.80%	15.10%	72.40%	100.00%
2.5	4.60%	7.60%	14.50%	73.30%	100.00%
2.6	4.50%	7.00%	14.30%	74.20%	100.00%
2.7	4.30%	6.80%	14.00%	74.90%	100.00%
2.8	4.30%	6.60%	13.30%	75.80%	100.00%
2.9	4.00%	6.00%	13.30%	76.70%	100.00%
3.0	3.60%	5.40%	13.40%	77.60%	100.00%
3.1	3.10%	4.90%	13.50%	78.50%	100.00%
3.2	3.10%	4.60%	12.90%	79.40%	100.00%
3.3	2.90%	4.30%	12.50%	80.30%	100.00%
3.4	2.70%	3.90%	12.20%	81.20%	100.00%
3.5	2.50%	3.50%	11.90%	82.10%	100.00%
3.6	2.20%	3.10%	11.70%	83.00%	100.00%
3.7	2.00%	2.70%	11.40%	83.90%	100.00%

Ref: Demographic_v22.xls HHIncT

3.4 Vehicle Availability Sub-model

The vehicle availability sub-model is the last demographic sub-model. It is a disaggregate choice model that apportions households among vehicle availability levels. The variables considered are household size, household income (furnished by the previous models), the area type, and transit accessibility defined as the number of jobs accessible in 40 minutes using AM transit service. The model is shown on Table 3-4.

Table 3-4 Vehicle availability model

No. of vehicles 0	1	2	3+	Variable name	Coeff.
	x			Constant	1.0138
		x		Constant	-2.3381
			x	Constant	-5.1710
		x		HH size	0.8700
			x	HH size	1.3026
	x			Income level 2 dummy	1.2376
		x		Income level 2 dummy	1.7892
			x	Income level 2 dummy	1.8221
	x			Income level 3 dummy	1.3285
		x		Income level 3 dummy	2.4831
			x	Income level 3 dummy	2.7395
	x			Income level 4 dummy	1.9991
		x		Income level 4 dummy	3.7372
			x	Income level 4 dummy	4.1987
	x			Tot emp w/in 40 min transit (AM pk)	-1.10E-06
		x		Tot emp w/in 40 min transit (AM pk)	-1.82E-06
			x	Tot emp w/in 40 min transit (AM pk)	-2.05E-06
	x			Area type, 1994 (1 to 7)	0.0668
		x		Area type, 1994 (1 to 7)	0.2783
			x	Area type, 1994 (1 to 7)	0.4093
	x			DC dummy	-0.9246
		x		DC dummy	-1.0751
			x	DC dummy	-1.6334

Ref:Demographicu.1Tpp.xls VA

Chapter 4 Trip Generation

The Version 2.2 trip generation process computes zonal trip productions and trip attractions, for each modeled purpose. This chapter details the trip generation model pertaining to resident, commercial vehicle, and truck purposes.

4.1 *Model Structure*

The generation model is used to compute the number of daily motorized person trips and truck trips produced and attracted to each traffic analysis zone. Motorized person trips are defined as those using automobile, motorcycle, or transit modes. Resident trips consist of four purposes:

- Home-Based Work (HBW)
- Home-Based Shopping (HBS)
- Home-Based Other (HBO)
- Non-Home-Based (NHB) – excluding Commercial trips

Truck trips are developed for two vehicle types:

- Medium (single unit, two axles, 6 or more tires)
- Heavy (all combination vehicles)
- Commercial vehicles (autos and light duty trucks)

The commercial vehicle purpose was subsumed within the NHB purpose in previous TPB models. The Version 2.2 model now accounts for commercial trips as a separate and distinct trip purpose. Both the NHB and commercial trips are inclusive of light trucks. The trip generation process also estimates productions and attractions associated with HBW non-motorized (walk and bicycle) trips. The non-motorized trips are ultimately removed from the 'final' trip-ends prior to the trip distribution step. The trip generation model produces home-based productions and attractions which are stratified by the four income levels.

The resident trip generation process can be envisioned as a series of five sequential steps. These are:

1) Trip production model;
2) Internal-to-external trip extraction model;
3) Non-motorized HBW trip extraction model;
4) Trip attraction model; and
5) Home-based attraction income disaggregation model.

These five models are specified below.

4.2 *Trip Production Model*

The trip production model is a cross-classification type model involving the application of trip rates which are applied to households in specific socio-economic categories. The trip rates are specific to each purpose. The cross-classes established for the Version 2.2 model are structured by the four household income, four household size, and four vehicle availability levels developed by the demographic models. The total number of cross-classes equals 64 (i.e., 4 x 4 x 4). The trip rates are displayed, by purpose on Table 4-1, Table 4-2, Table 4-3, and Table 4-4.

Prior TPB travel models have included the application of a global trip production factor of 1.50 to the non-work (i.e., HBS, HBO, and NHB) trip productions so that the traffic assignment model will validate to counts. This underestimation of the model is believed to be due principally to the under-reporting of non-work trips and the fact that there was no explicit commercial vehicle model, so these trips were included in the NHB purpose. Without such an adjustment factor, the simulated vehicle miles of travel (VMT) assigned to the highway network would fall short of the observed VMT. This factoring of non-work trips procedure is carried forth into the Version 2.2 model, except that the global factor applied to the NHB purpose has been reduced from 1.50 to 1.168, to avoid the double-counting of commercial trips, which were subsumed in earlier models. Appendix A contains a description of all the adjustment factors using in the travel model.

4.3 *The Internal-to-External Trip Extraction Model*

External (I-X, X-I) travel is entered exogenously into the trip generation process and is passed through to the final trip-ends, unaltered. Since the trip production rates reflect both internal and internal-to-external (I-X) travel generated by households in the modeled area, it is, therefore, necessary to remove the I-X portion of total trip productions to avoid double-counting. The model used to remove I-X trips is specified as the following equation, and is shown graphically in Figure 4-1:

Equation 4-1 Percent of total trips productions that are I-X

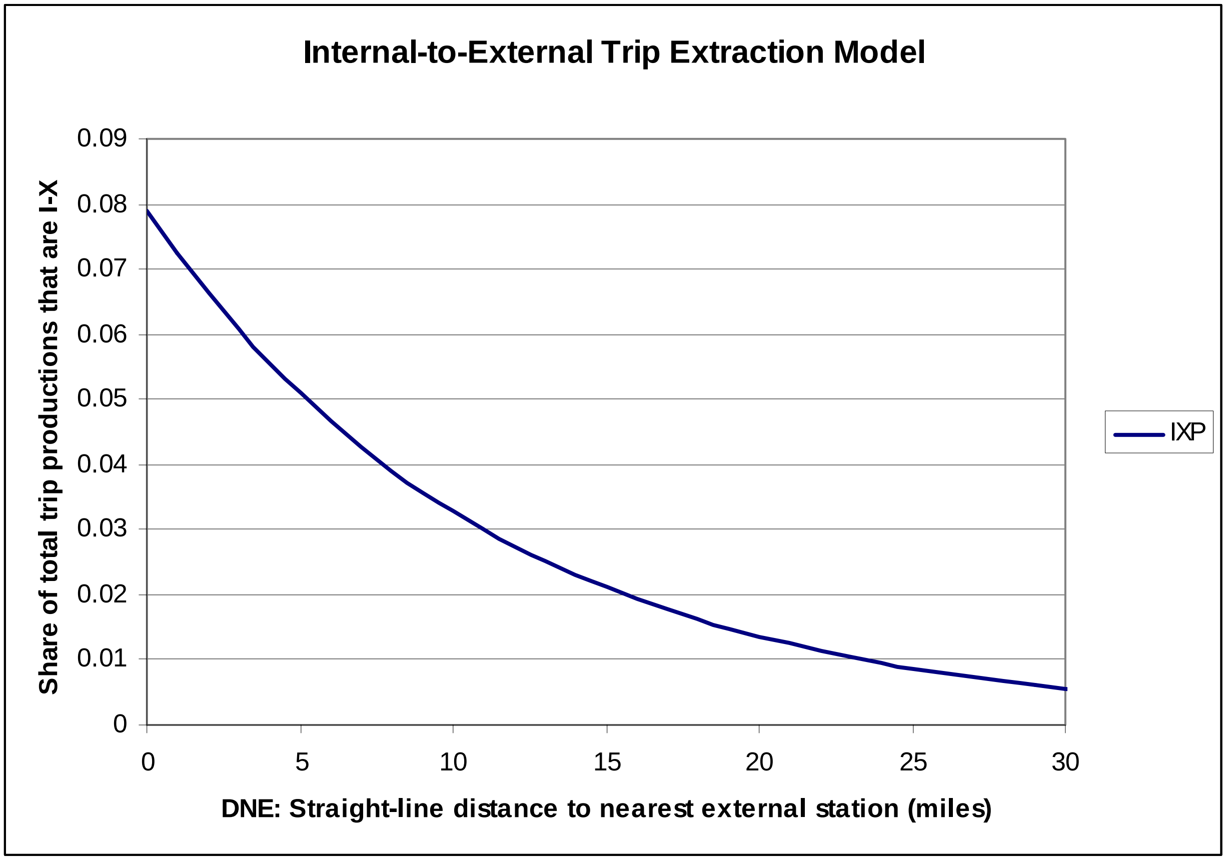
$$\mathrm{IXP} = 0.079\mathrm{Exp}(-0.088 * \mathrm{DNE})$$

where:

IXP	=	the percent of total trip productions that are I-X
DNE	=	the 'straight-line' distance to the nearest external station (in miles)
Exp	=	the exponential function

This function captures the fact that, as the distance to the nearest external station increases, the share of total trip productions that is attracted to external locations (I-X) drops.

Figure 4-1 Internal-to-External Trip Extraction Model



Ref: tripExtractionModel.xls

Table 4-1 Final HBW Trip Production Rates

Income Level	HH Size	Vehicles 0	1	2	3+	Sub-Total
1	1	0.69	0.85	0.75	0.96	**0.79**
	2	1.08	1.08	1.41	1.41	**1.22**
	3	1.10	1.52	1.94	1.94	**1.66**
	4+	1.66	1.66	1.94	1.94	**1.81**
	Subtotal	**0.91**	**1.07**	**1.58**	**1.74**	**1.20**
2	1	1.02	1.18	1.30	1.53	**1.17**
	2	1.35	1.35	1.53	2.12	**1.53**
	3	1.66	1.66	1.79	2.12	**1.85**
	4+	1.85	1.85	2.05	2.43	**2.10**
	Subtotal	**1.21**	**1.34**	**1.73**	**2.23**	**1.61**
3	1	1.02	1.22	1.22	1.22	**1.20**
	2	1.46	1.46	1.84	2.15	**1.77**
	3	1.66	1.66	2.02	3.02	**2.36**
	4+	2.30	2.30	2.30	3.08	**2.55**
	Subtotal	**1.31**	**1.46**	**2.03**	**2.87**	**2.04**
4	1	1.33	1.33	1.33	2.00	**1.34**
	2	1.45	1.45	1.84	2.15	**1.80**
	3	1.67	1.67	2.02	3.02	**2.43**
	4+	3.33	3.33	3.33	3.36	**3.35**
	Subtotal	**1.67**	**1.72**	**2.34**	**3.05**	**2.42**
	TOTAL	**1.05**	**1.33**	**2.02**	**2.72**	**1.85**

Table 4-2 Final HBS Trip Production Rates

Income Level	HH Size	Vehicles 0	Vehicles 1	Vehicles 2	Vehicles 3+	Sub-Total
1	1	0.22	0.60	0.60	0.63	**0.46**
	2	0.22	0.68	0.68	0.68	**0.60**
	3	0.22	0.68	0.84	0.84	**0.68**
	4+	0.22	0.68	0.96	1.00	**0.76**
	Subtotal	**0.22**	**0.64**	**0.77**	**0.85**	**0.58**
2	1	0.22	0.60	0.60	0.63	**0.55**
	2	0.29	0.68	0.68	0.84	**0.68**
	3	0.40	0.96	0.96	1.04	**0.96**
	4+	0.45	0.96	1.00	1.10	**1.01**
	Subtotal	**0.27**	**0.70**	**0.83**	**1.01**	**0.76**
3	1	0.29	0.67	0.67	0.67	**0.62**
	2	0.43	0.68	0.90	0.96	**0.83**
	3	0.50	0.96	1.00	1.14	**1.05**
	4+	0.60	0.96	1.14	1.40	**1.21**
	Subtotal	**0.38**	**0.73**	**1.00**	**1.22**	**0.96**
4	1	0.43	0.86	0.86	0.86	**0.81**
	2	0.89	0.89	0.96	0.98	**0.95**
	3	0.90	1.04	1.15	1.20	**1.16**
	4+	1.09	1.28	1.33	1.66	**1.46**
	Subtotal	**0.68**	**0.95**	**1.11**	**1.39**	**1.16**
	TOTAL	**0.27**	**0.72**	**0.97**	**1.22**	**0.88**

Table 4-3 Final HBO Trip Production Rates

Income Level	HH Size	Vehicles 0	1	2	3+	Sub-Total
1	1	0.42	1.12	1.44	1.44	**0.89**
	2	0.54	1.70	1.77	1.80	**1.54**
	3	1.28	2.40	2.61	2.39	**2.29**
	4+	1.36	2.90	4.27	3.82	**3.29**
	Subtotal	**0.62**	**1.61**	**2.45**	**2.74**	**1.66**
2	1	0.69	1.16	1.47	1.47	**1.12**
	2	0.89	1.89	1.97	2.04	**1.90**
	3	1.35	2.50	3.19	3.47	**3.02**
	4+	0.75	3.49	4.27	5.67	**4.40**
	Subtotal	**0.81**	**1.72**	**2.88**	**3.99**	**2.42**
3	1	0.71	1.04	1.47	1.47	**1.04**
	2	0.89	2.16	2.46	2.66	**2.34**
	3	1.55	2.84	3.19	3.56	**3.28**
	4+	3.45	4.65	5.39	6.50	**5.68**
	Subtotal	**1.00**	**1.95**	**3.68**	**4.70**	**3.37**
4	1	0.71	1.09	1.08	2.00	**1.05**
	2	1.57	1.81	2.46	2.46	**2.28**
	3	3.45	3.45	3.94	3.94	**3.89**
	4+	4.15	4.84	5.92	6.74	**6.17**
	Subtotal	**1.57**	**2.22**	**3.81**	**5.02**	**3.84**
	TOTAL	**0.75**	**1.81**	**3.40**	**4.52**	**2.88**

Table 4-4 Final NHB Trip Production Rates

Income Level	HH Size	Vehicles				Sub-Total
		0	1	2	3+	
1	1	0.20	1.26	1.26	1.26	**0.88**
	2	0.30	1.26	1.43	1.43	**1.17**
	3	0.40	1.43	1.43	1.43	**1.26**
	4+	0.50	1.50	1.60	1.70	**1.42**
	Subtotal	**0.27**	**1.30**	**1.45**	**1.52**	**1.11**
2	1	0.30	1.26	1.40	1.49	**1.14**
	2	0.40	1.26	2.20	2.20	**1.83**
	3	0.50	1.76	2.60	2.80	**2.36**
	4+	0.60	1.98	2.80	2.97	**2.64**
	Subtotal	**0.36**	**1.39**	**2.42**	**2.69**	**1.90**
3	1	0.40	1.52	1.57	1.57	**1.39**
	2	0.50	1.62	2.33	2.54	**2.10**
	3	0.60	2.48	2.89	2.89	**2.83**
	4+	0.61	2.19	2.92	4.20	**3.26**
	Subtotal	**0.46**	**1.73**	**2.64**	**3.41**	**2.50**
4	1	0.60	1.76	1.76	2.40	**1.64**
	2	0.70	1.76	2.40	2.69	**2.30**
	3	0.80	2.72	2.81	3.10	**2.92**
	4+	0.90	1.54	3.35	4.38	**3.62**
	Subtotal	**0.68**	**1.84**	**2.77**	**3.67**	**2.83**
	TOTAL	**0.33**	**1.50**	**2.48**	**3.21**	**2.13**

4.4 *Non-Motorized HBW Trip Extraction Model*

The HBW trip rates reflect both motorized and non-motorized travel. The inclusion of non-motorized trips was intended to allow the modeler the ability to relate land use policy (e.g. land use mix, density, etc.) to the level of walking and bicycling, and its explicit effect on the reduction of motorized HBW travel. However, the decision was also made early on that non-motorized trips should not be carried forth into trip distribution and mode choice steps given that the non-motorized trips are extremely dissimilar in spatial scale compared to that of motorized travel (non-motorized trips predominantly occur within zones, or between adjacent zones). The model is based on the area type variable, an index ranging from 1 to 7 that is based on both population density and employment density within 1 mile of a given zone, as shown in the table below:

Table 4-5 Area Type Definitions (1-7) as a function of population and employment density

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

The area type code, therefore, represents both the intensity of land use development as well as the mix of home and job locations. This variable is also used as a basis for highway link capacities and free-flow speeds. The model, shown on Table 4-6, expresses the share of non-motorized travel based on the area type designation of the zone

Table 4-6 Average share of HBW non-motorized productions as a function of area type

Area Type	Avg. Share of HBW Non-Motorized Productions
1	0.4033
2	0.1116
3	0.0320
4 – 7	0.0235

The extraction of non-motorized trips at the attraction end is done using the equation below.

Equation 4-2 Extraction of non-motorized trips at the attraction end of trip

NMAttrs = 0.8982 * NMProds

where:

NMAttrs = The number of non-motorized attractions
NMProds = The number of non-motorized productions

Subject to following condition:

If NMAttrs > Total Attractions, then NMAttrs = Total Attractions * 0.187%

4.5 *Trip Attraction Model*

The trip attraction models are essentially regression equations which are detailed on Table 4-7. In the case of HBS and NHB trips, the equations vary further by area type. The equations were developed using district-level data from the 1994 Household Travel Survey.

Table 4-7 Summary of the Trip Attraction Models

Trip Purpose	Area Type	No. of Observations	Independent Variable(s)	Attraction Rates
HBW	All (Area Type 1-7)	253	Total Employment	1.11
HBS	Area Type 1	8	Retail Employment	0.29
	Area Type 2	32	Retail Employment	2.44
	Area Type 3-7	180	Retail Employment	3.35
HBO	All (Area Type 1-7)	266	Retail Employment Non-Retail Employment Household Population	1.30 0.30 0.77
NHB	Area Type 1	9	Non-Retail Employment	0.42
	Area Type 2-7	257	Retail Employment Non-Retail Employment Household Population	2.77 0.49 0.28

Notes:

- HBW model reflects motorized and non-motorized person travel.
  HBS, HBO, and NHB models reflect motorized person travel only.

4.6 *HB Trip Attraction Income Disaggregation Model*

The trip attraction model provides the *total* number of trip attractions for each purpose. In order to support the income stratified trip distribution process (discussed in the next chapter), a technique for allocating total home-based attractions among four income levels is necessary. The stratification of trip productions is not problematic since income is one of the dimensions used in the cross-class structure.

A simple technique is used to apportion total HB attractions among the four income groups. Income shares, developed from the 1994 Household Travel Survey, are applied on the basis of purpose and area type, as shown on Table 4-8. The table indicates that the distributions of attractions by income group, for each purpose, generally do not vary dramatically on average.

Table 4-8 Income Distribution (Percents) of Home-Based Trip Attractions

Purpose	Area Type Code	Income 1	Income 2	Income 3	Income 4	Total
HBW	1	12.20	17.82	28.97	41.01	100.00
	2	15.59	17.14	30.06	37.21	100.00
	3	15.23	21.53	33.30	29.94	100.00
	4-7	20.62	25.01	32.36	22.01	100.00
HBS	1-2	17.65	17.90	30.66	33.78	100.00
	3	15.01	20.10	37.32	27.57	100.00
	4-7	14.46	20.55	30.51	34.48	100.00
HBO	1-2	15.88	16.65	30.39	37.08	100.00
	3	9.71	16.26	38.42	35.61	100.00
	4-7	13.09	21.19	34.56	31.16	100.00

Source: 1994 HTS

4.7 *Truck Model*

The truck trip generation process is based on the rates that have been in use for several years. The rates, shown on Table 4-9, are based on fixed locations and land activity variables. This model will be updated in upcoming work planning for the latter half of this fiscal year.

Table 4-9 Truck trip generation rates as a function of truck type, location, and land use category

Vehicle Type	Location	Land Use Category				
		Office	Retail	Industrial	Other	HH
Medium Truck (Single Unit 6+ Tires)	Regional. Core	0.01	0.17	0.09	0.04	0.04
	DC Non-Core	0.01	0.17	0.19	0.04	0.04
	VA 10-mi Sq.	0.01	0.17	0.14	0.04	0.04
	Other	0.01	0.17	0.11	0.04	0.04
Heavy Truck (All Combination Vehicles)	Regional. Core	-	0.04	0.03	0.03	-
	DC Non-Core	-	0.04	0.13	0.03	-
	VA 10-mi Sq.	-	0.04	0.04	0.03	-
	Other	-	0.04	0.11	0.03	-

Ref.: tgcheck.xls

4.8 *Commercial Vehicle Model*

The trip generation of zonal commercial vehicle trips is developed with the equation shown below (Allen, 2007):

Equation 4-3 Trip generation of commercial vehicle trips

COM productions = (0.056 * indemp + 0.168 * offemp + 0.494 * retemp + 0.082 * othemp + 0.130 * HH) * ATFAC

(attractions = productions, by zone)

where:

Indemp = industrial employment
offemp = office employment
retemp = retail employment
othemp = other employment
HH = households
ATFAC = area type adjustment factor:

Area type	Factor
1	1.05
2	0.90
6	1.20
7	1.15

Note: no factor is applied to area types 3-5.

Chapter 5 Trip Distribution

As with previous model specifications, the Version 2.2 trip distribution model involves a standard gravity model approach and the use of a composite (highway and transit) travel time impedance measure. The model also employs income stratification as well as special external auto and truck distribution models. The primary trip distribution updates to the Version 2.2 model include:

- a reduced number of K-factors used for the HBW purpose;
- The complete elimination of K-factors for HBS, HBO, and NHB;
- The removal of inter-jurisdictional time penalties, including bridge penalties;
- The additional commercial vehicle purpose has been added.

A detailed discussion of the model structure follows below.

5.1 *Model Structure*

The Version 2.2 trip distribution model is used to develop zonal trip tables corresponding to the six basic purposes established above: HBW, HBS, HBO, and NHB motorized person trips, commercial vehicle trips, and Medium and Heavy truck trips. The Version 2.2 trip distribution process consists of several different distribution models that are developed for special travel markets within the six basic purposes. Table 5-1 indicates the 27 specific trip markets that are modeled.

Table 5-1 Trip distribution markets

Purpose/Mode	Internal Person Models	External Person Models
HBW person	4 Income Strata	2 Facility Types (Interstate /Arterial)
HBS person	4 Income Strata	2 Facility Types (Interstate /Arterial)
HBO person	4 Income Strata	2 Facility Types (Interstate /Arterial)
NHB person	1 (non-stratified)	2 Facility Types (Interstate /Arterial)
Commercial Vehicles	1 (non-stratified)	1 (non-stratified)
Medium Truck	1 (non-stratified)	1 (non-stratified)
Heavy Truck	1 (non-stratified)	1 (non-stratified)
Total Intl./Extl. Markets	**16**	**11**
Total Markets Modeled	**27**	

5.2 *Internal Motorized Person Models*

The Version 2.2 trip distribution model includes income stratification for the home-based trip purposes. The model also makes use of a composite time formulation involving both highway and transit travel times. The composite time formulation is desirable since many corridors in the Washington region are well served by transit, and the consideration of highway time only (as has been used in some previous model versions) has the potential to understate accessibility. The definition of the composite impedance is:

Equation 5-1 Composite Impedance Equation

$$\mathrm{CT_i} = \frac{1.0}{1.0/HT + P_i/TT}$$

Where:

$\mathrm{CT_i}$ = composite time for income group 'i' for a given interchange.
HT = un-weighted highway time (including terminal times)
TT = un-weighted transit time (in-vehicle and out-of-vehicle time)
$\mathrm{P_i}$ = regional transit share of income group 'i' for a given purpose

The highway and transit times used in the formulation vary by purpose. AM peak highway/transit times are used for the HBW purpose and off-peak highway/transit times are used for the remaining HBS, HBO, and NHB purposes.

The regional transit shares used in the formulation vary by purpose and income group. The transit shares, shown in Table 5-2, have been taken from the HTS. The exhibit indicates the work transit shares (shown as percents) vary by income from 0.1402 to 0.2572. The transit percentages for the remaining purposes vary by income group from 0.0075 to 0.0755. Since these values are relatively small, the effect of highway times will be generally more predominant on the overall composite time function compared to the effect of transit times for most interchanges.

Some points can be made regarding the composite time function. First, for interchanges that are not served by transit, the composite time function reflects highway time. Second, the presence of transit service will generally contribute small benefit to the travel time since the regional transit shares are relatively small. Nonetheless, the composite time function will still reflect *some* travel time benefit with the presence of competitive transit service. This benefit would not be captured with an impedance measure based on highway time alone.

The highway time in the composite time function consists of both over-the-network time combined with terminal times (both production and attraction-end times). The highway time also includes toll values accumulated along the path that have been transformed into equivalent minutes. The time-cost equivalents are provided by income level and purpose, and are shown on Table 5-3. These equivalents were developed using 2000 CTPP income data and are described in greater detail in Chapter 11.

Table 5-2 Summary of Motorized Trips by Purpose, Mode, and Income Level

Source: 1994 COG/TPB Household Travel Survey
All trips geocoded within the HTS survey area

Purpose	Mode	Income Level <30k	30k - 50k	50k - 75k	>75k	Total
HBW	Auto Driver	265,104	402,570	660,332	742,078	2,070,084
	Auto Passenger	41,854	47,055	73,652	76,477	239,038
	Auto Person Subtotal:	306,958	449,625	733,984	818,555	2,309,122
	Average Auto Occupancy	*1.2*	*1.1*	*1.1*	*1.1*	*1.12*
	Transit	106,263	78,376	116,054	133,428	434,121
	Auto Person & Transit Subtotal:	413,221	528,001	850,038	951,983	2,743,243
	Transit Percentage	*25.72%*	*14.84%*	*13.65%*	*14.02%*	*15.83%*
HBS	Auto Driver	179,240	222,468	395,854	361,316	1,158,878
	Auto Passenger	42,034	51,234	85,486	90,586	269,340
	Auto Person Subtotal:	221,274	273,702	481,340	451,902	1,428,218
	Average Auto Occupancy	*1.2*	*1.2*	*1.2*	*1.3*	*1.23*
	Transit	12,092	6,601	4,521	3,435	26,649
	Auto Person & Transit Subtotal:	233,366	280,303	485,861	455,337	1,454,867
	Transit Percentage	*5.18%*	*2.35%*	*0.93%*	*0.75%*	*1.83%*
HBO	Auto Driver	378,412	541,343	1,003,575	1,044,304	2,967,634
	Auto Passenger	158,697	210,756	465,074	478,663	1,313,190
	Auto Person Subtotal:	537,109	752,099	1,468,649	1,522,967	4,280,824
	Average Auto Occupancy	*1.4*	*1.4*	*1.5*	*1.5*	*1.44*
	Transit	43,863	24,177	27,803	38,078	133,921
	Auto Person & Transit Subtotal:	580,972	776,276	1,496,452	1,561,045	4,414,745
	Transit Percentage	*7.55%*	*3.11%*	*1.86%*	*2.44%*	*3.03%*
NHB	Auto Driver	317,239	488,048	859,926	878,859	2,544,072
	Auto Passenger	74,157	108,357	215,941	239,842	638,297
	Auto Person Subtotal:	391,396	596,405	1,075,867	1,118,701	3,182,369
	Average Auto Occupancy	*1.2*	*1.2*	*1.3*	*1.3*	*1.25*
	Transit	28,671	28,320	46,358	58,052	161,401
	Auto Person & Transit Subtotal:	420,067	624,725	1,122,225	1,176,753	3,343,770
	Transit Percentage	*6.83%*	*4.53%*	*4.13%*	*4.93%*	*4.83%*
All Purposes	Auto Driver	1,139,995	1,654,429	2,919,687	3,026,557	8,740,668
	Auto Passenger	316,742	417,402	840,153	885,568	2,459,865
	Auto Person Subtotal:	1,456,737	2,071,831	3,759,840	3,912,125	11,200,533
	Average Auto Occupancy	*1.3*	*1.3*	*1.3*	*1.3*	*1.28*
	Transit	190,889	137,474	194,736	232,993	756,092
	Auto Person & Transit Subtotal:	1,647,626	2,209,305	3,954,576	4,145,118	11,956,625
	Transit Percentage	*11.59%*	*6.22%*	*4.92%*	*5.62%*	*6.32%*

Ref: 94htstrip2.1.xls

Table 5-3 Work & Non-Work Time – Toll Dollar Equivalents by Income Level

Annual Household Income Quartile	**(b) Work Equivalent** (minutes per 1994 $)	**(c) Non-Work Equivalent** (minutes per 1994 $)
1	21.1	30.2
2	7.8	11.1
3	4.6	6.6
4	2.3	3.3

5.3 *External Auto Person / Truck Models*

The external trip distribution models segment markets by purpose and facility. Facilities are distinguished as interstates (or interstate-like facilities) and arterial facilities. The rationale behind this distinction is that arterial facilities tend to serve more localized traffic associated with shorter trip lengths while interstate travel is associated with longer trip lengths. In contrast, the external truck models (medium and heavy) are not segmented by facility types.

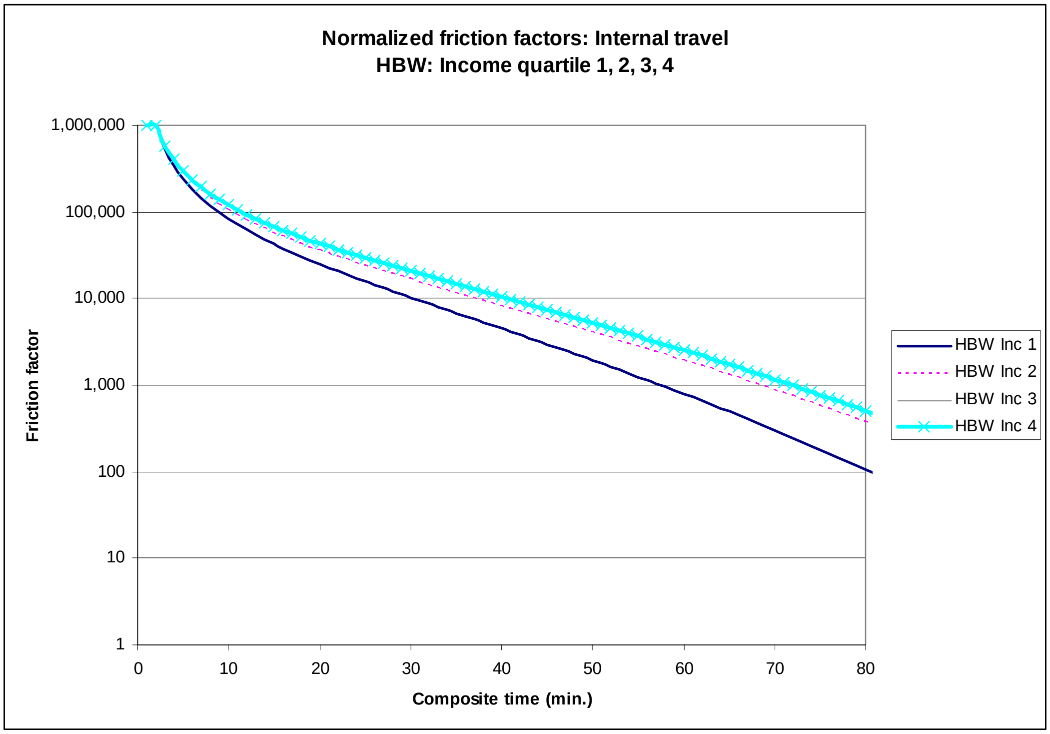
The modeled network contains 47 external stations, numbered consecutively from 2145 to 2191. Among these stations interstate-type facilities are defined as I-95 north and south (external stations 2149, 2182), US 301 (2146), US 15/29 (2154), I-66 (2156), I-70 east and west (2166, 2180), US 15 north (2179), US 1& I-195 (2183), MD 295 (2184), I-97 (2187), and US50/301, Bay Bridge (2191). All remaining stations are defined as arterial-type facilities.

The highway time is used as the impedance measure in the distribution of external trips. AM peak time is used for the HBW purpose and off-peak times are used for all remaining purposes. The external calibration does not make use of time penalties added into the impedance files. However, the impedances are altered in that extremely large time values were inserted into internal and through (I-I, X-X) interchanges to preclude those types of interchanges from occurring in the trip distribution process.

5.4 *Friction Factor Summary*

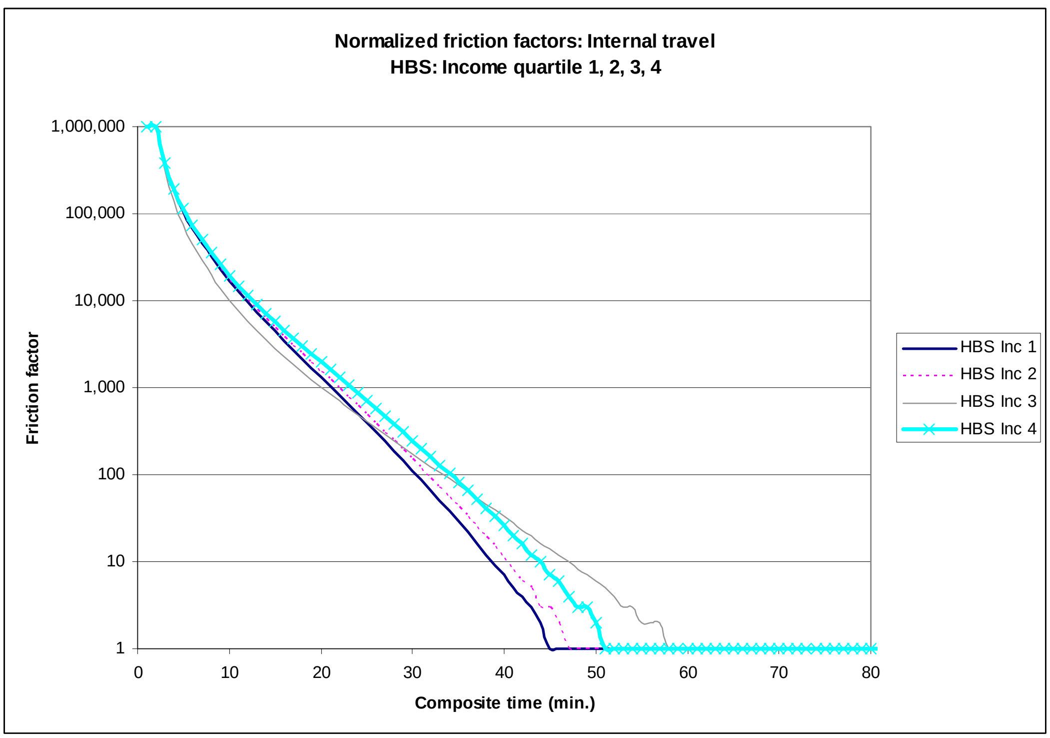
The friction factors, or F-factors, for internal travel are shown in graphical form in Figure 5-1, Figure 5-2, Figure 5-3, and Figure 5-4. The same information is shown in tabular form in Table 5-4. The friction factors for commercial vehicle travel, both internal and external, are shown in Figure 5-5. The friction factors for external travel are shown in Figure 5-6, Figure 5-7, and Figure 5-8.

Figure 5-1 Friction factors for HBW, internal travel



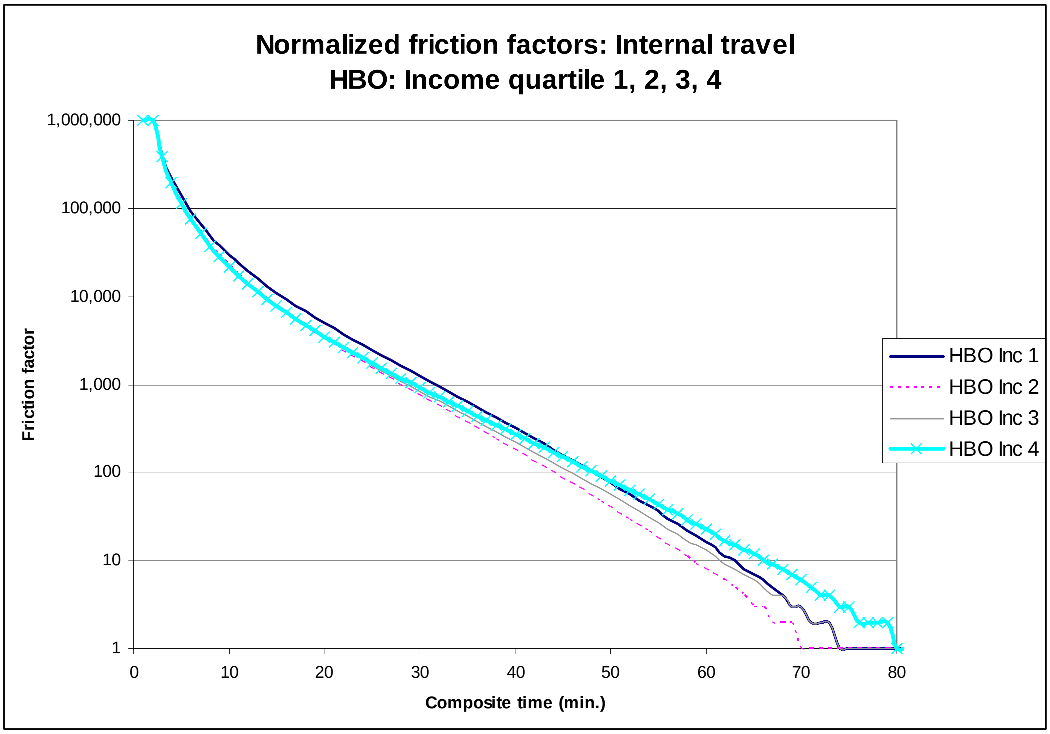
Ref: v22_f_factors.xls

Figure 5-2 Friction factors for HBS, internal travel



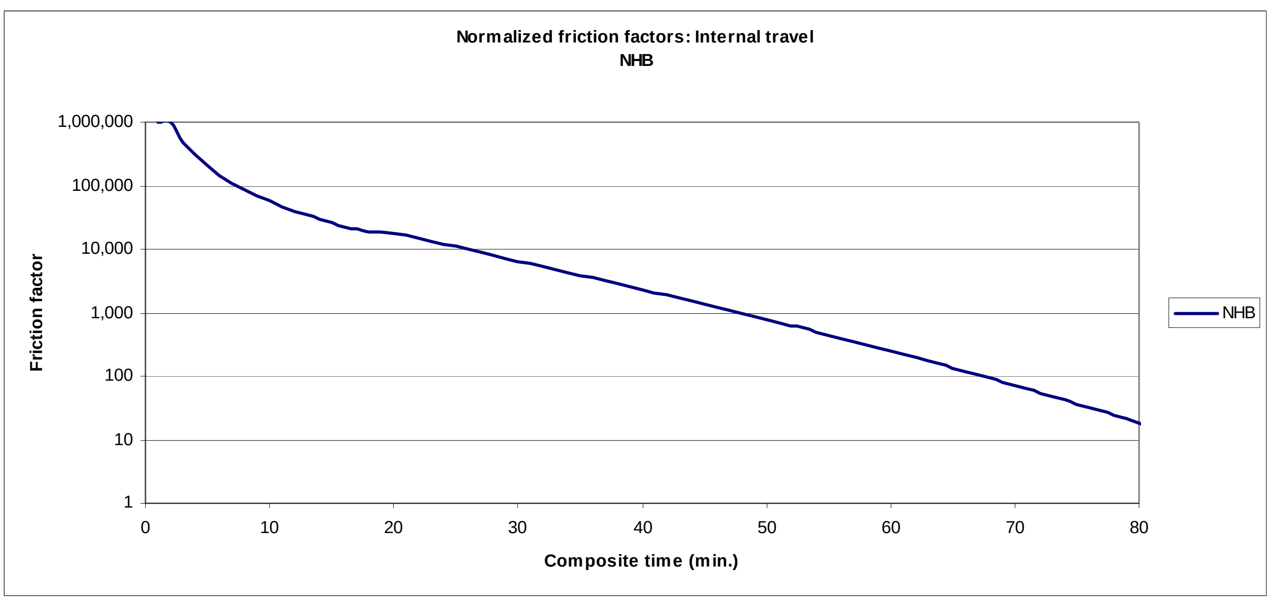
Ref: v22_f_factors.xls

Figure 5-3 Friction factors for HBO, internal travel



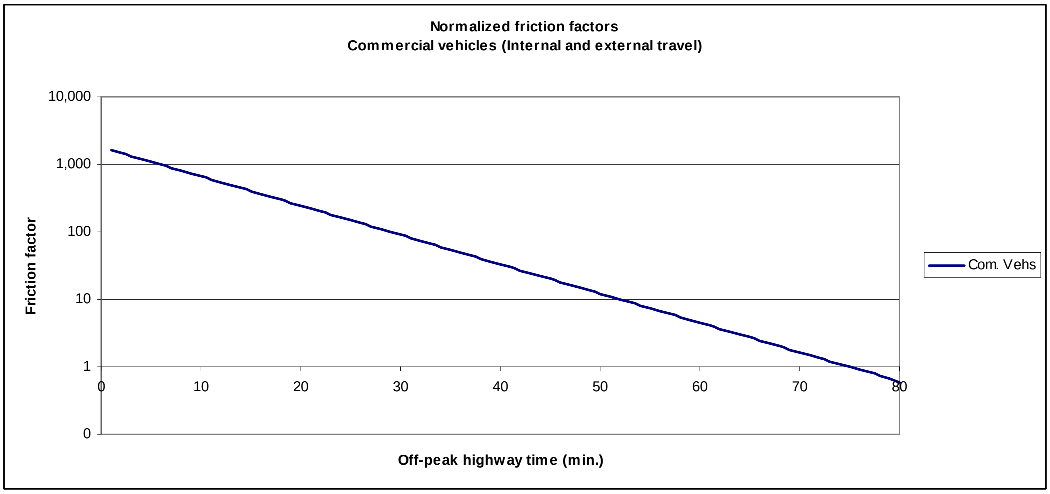
Ref: v22_f_factors.xls

Figure 5-4 Friction factors for NHB, internal travel



Ref: v22_f_factors.xls

Figure 5-5 Friction factors for commercial vehicle trips (both internal and external travel)



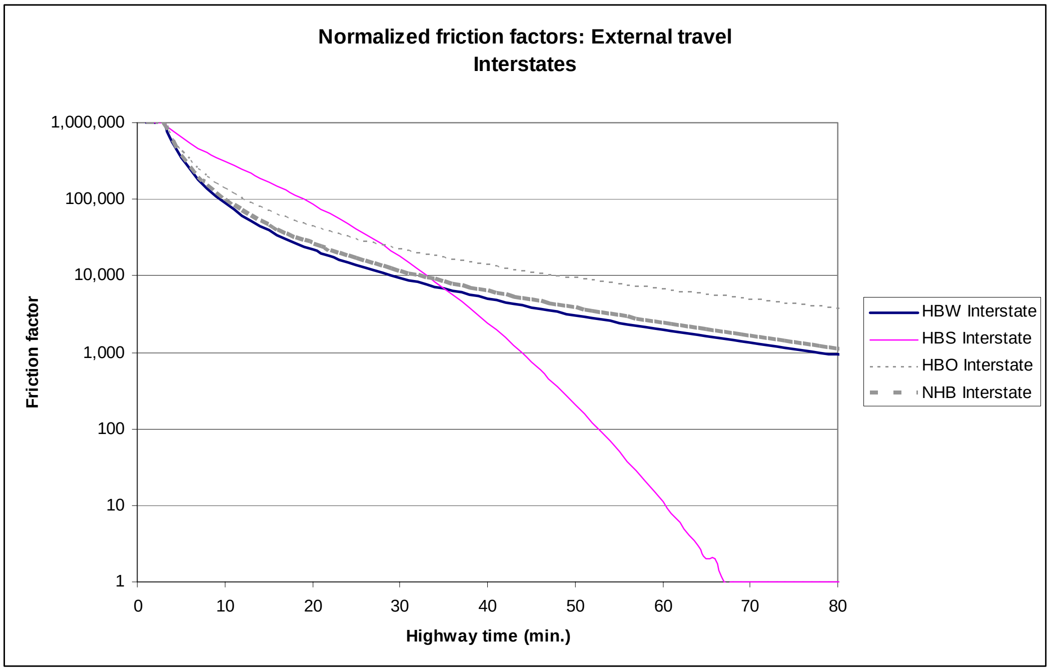
Ref: v22_f_factors.xls

Table 5-4 Friction factors for internal travel: HBW, HBS, HBO, NHB, commercial vehicles

Comp. Time	HBW				HBS				HBO				NHB	Com.
(min)	Inc 1	Inc 2	Inc 3	Inc 4	Inc 1	Inc 2	Inc 3	Inc 4	Inc 1	Inc 2	Inc 3	Inc 4		Vehs
1	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	1,629
2	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	1,474
3	534,862	566,562	586,872	584,487	375,164	376,643	318,181	382,415	416,158	387,467	387,021	382,823	486,880	1,333
4	346,225	382,193	405,901	403,096	187,206	188,666	142,136	193,948	225,057	199,164	198,868	195,320	294,634	1,207
5	246,589	281,175	304,449	301,683	107,995	109,279	75,734	113,614	139,174	118,391	118,244	115,574	199,021	1,092
6	186,490	218,449	240,292	237,689	68,132	69,246	45,071	72,786	93,608	77,092	77,050	75,064	144,039	988
7	146,952	176,174	196,388	193,977	45,635	46,606	28,927	49,529	66,675	53,422	53,452	51,966	109,278	894
8	119,294	145,983	164,616	162,394	31,883	32,735	19,608	35,182	49,498	38,721	38,800	37,680	85,782	809
9	99,042	123,469	140,645	138,600	22,971	23,723	13,848	25,796	37,907	29,031	29,143	28,294	69,089	732
10	83,678	106,108	121,966	120,081	16,935	17,600	10,098	19,374	29,737	22,343	22,479	21,834	56,765	662
11	71,688	92,358	107,029	105,291	12,704	13,295	7,552	14,824	23,778	17,557	17,708	17,220	47,384	599
12	62,115	81,228	94,831	93,226	9,658	10,183	5,764	11,509	19,307	14,030	14,190	13,823	40,064	542
13	54,323	72,054	84,694	83,208	7,418	7,884	4,475	9,038	15,875	11,366	11,532	11,260	34,232	491
14	47,879	64,375	76,143	74,767	5,741	6,155	3,522	7,163	13,190	9,314	9,482	9,284	29,506	444
15	42,476	57,863	68,839	67,564	4,470	4,836	2,805	5,718	11,054	7,705	7,873	7,735	25,619	402
16	37,892	52,279	62,533	61,349	3,495	3,819	2,256	4,590	9,331	6,424	6,591	6,501	22,381	363
17	33,964	47,443	57,035	55,935	2,742	3,026	1,829	3,701	7,926	5,393	5,557	5,506	21,000	329
18	30,566	43,219	52,203	51,181	2,155	2,404	1,494	2,995	6,767	4,554	4,714	4,693	19,073	298
19	27,605	39,500	47,925	46,974	1,695	1,913	1,227	2,429	5,802	3,864	4,019	4,022	18,426	269
20	25,006	36,206	44,112	43,228	1,334	1,524	1,014	1,974	4,994	3,292	3,442	3,465	17,350	244
21	22,711	33,269	40,696	39,873	1,050	1,215	841	1,606	4,312	2,814	2,959	2,997	17,014	220
22	20,674	30,638	37,618	36,852	826	968	700	1,308	3,733	2,413	2,552	2,602	15,196	199
23	18,857	28,269	34,833	34,120	648	771	585	1,065	3,239	2,075	2,207	2,267	13,598	180
24	17,228	26,126	32,302	31,639	508	613	490	867	2,815	1,787	1,914	1,980	12,190	163
25	15,764	24,182	29,994	29,377	398	487	411	705	2,451	1,543	1,663	1,734	10,944	148
26	14,442	22,410	27,882	27,309	310	386	346	573	2,136	1,333	1,447	1,522	9,838	134
27	13,246	20,792	25,944	25,412	242	305	291	466	1,864	1,154	1,261	1,338	8,852	121
28	12,160	19,309	24,161	23,667	187	241	246	377	1,628	999	1,101	1,179	7,972	109
29	11,171	17,947	22,517	22,058	145	190	208	306	1,422	866	961	1,039	7,185	99
30	10,270	16,693	20,997	20,572	112	149	175	247	1,243	751	841	918	6,478	90
31	9,447	15,536	19,590	19,196	86	117	148	199	1,086	652	735	811	5,844	81
32	8,693	14,467	18,284	17,919	66	91	125	160	950	565	644	718	5,272	73
33	8,002	13,477	17,072	16,734	50	71	106	129	830	491	563	635	4,759	66
34	7,368	12,560	15,943	15,632	38	55	90	103	725	426	493	563	4,294	60
35	6,785	11,708	14,892	14,605	29	42	76	82	634	369	432	499	3,875	54
36	6,249	10,916	13,913	13,648	22	33	64	66	554	320	378	442	3,497	49
37	5,755	10,179	12,998	12,754	16	25	54	52	483	277	331	392	3,156	45
38	5,300	9,493	12,144	11,920	12	19	46	41	422	240	290	348	2,846	40
39	4,881	8,854	11,346	11,140	9	15	39	33	367	208	254	309	2,566	36
40	4,494	8,258	10,599	10,411	7	11	33	26	320	180	222	274	2,313	33
41	4,137	7,701	9,901	9,729	5	8	28	20	279	156	194	243	2,083	30
42	3,808	7,181	9,247	9,090	4	6	23	16	242	134	169	215	1,876	27
43	3,504	6,696	8,635	8,491	3	5	20	12	210	116	148	191	1,688	24
44	3,223	6,242	8,061	7,931	2	3	16	10	183	100	129	169	1,519	22
45	2,963	5,818	7,524	7,406	1	3	14	7	158	86	113	150	1,365	20
46	2,724	5,422	7,020	6,913	1	2	12	6	137	74	98	133	1,226	18
47	2,502	5,051	6,548	6,452	1	1	10	4	119	64	85	117	1,100	16
48	2,298	4,704	6,106	6,019	1	1	8	3	103	55	74	104	987	15
49	2,109	4,380	5,692	5,614	1	1	7	3	88	47	65	92	885	13
50	1,935	4,077	5,303	5,234	1	1	6	2	76	40	56	81	792	12
51	1,774	3,793	4,940	4,878	1	1	5	1	66	34	49	72	710	11
52	1,626	3,528	4,599	4,544	1	1	4	1	56	29	42	63	634	10
53	1,489	3,280	4,280	4,232	1	1	3	1	48	25	36	56	567	9
54	1,363	3,049	3,981	3,939	1	1	3	1	42	21	31	49	505	8
55	1,247	2,832	3,701	3,664	1	1	2	1	36	18	27	43	451	7
56	1,140	2,630	3,440	3,408	1	1	2	1	30	15	23	38	402	7
57	1,041	2,441	3,195	3,167	1	1	2	1	26	13	20	34	357	6
58	951	2,264	2,966	2,942	1	1	1	1	22	11	17	29	318	5
59	868	2,099	2,752	2,732	1	1	1	1	19	9	15	26	283	5
60	791	1,945	2,552	2,536	1	1	1	1	16	8	13	23	251	4
61	721	1,802	2,365	2,352	1	1	1	1	14	7	11	20	221	4
62	656	1,668	2,191	2,180	1	1	1	1	11	6	9	17	196	4
63	597	1,544	2,028	2,020	1	1	1	1	10	5	8	15	174	3
64	543	1,427	1,877	1,871	1	1	1	1	8	4	7	13	154	3
65	493	1,319	1,735	1,731	1	1	1	1	7	3	6	12	136	3
66	447	1,219	1,604	1,601	1	1	1	1	6	3	5	10	119	2
67	406	1,125	1,481	1,480	1	1	1	1	5	2	4	9	105	2
68	368	1,038	1,367	1,367	1	1	1	1	4	2	4	8	92	2
69	333	957	1,261	1,262	1	1	1	1	3	2	3	7	81	2
70	301	882	1,162	1,165	1	1	1	1	3	1	3	6	71	2

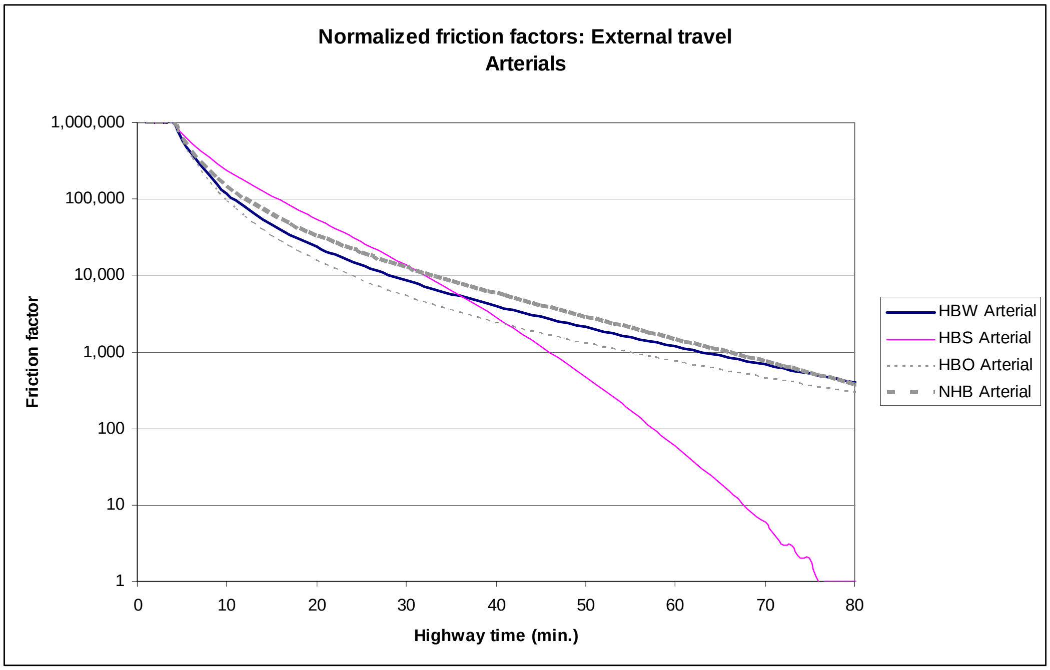
Ref: v22_f_factors.xls

Figure 5-6 Friction factors for external travel on interstates



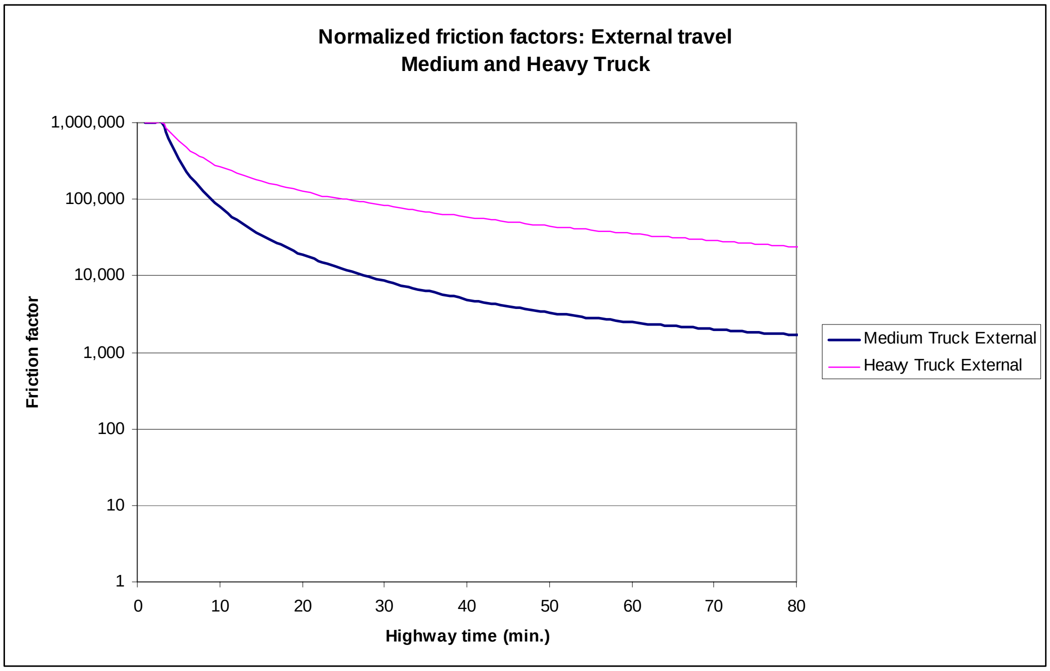
Ref: v22_f_factors.xls

Figure 5-7 Friction factors for external travel on arterials



Ref: v22_f_factors.xls

Figure 5-8 Friction factors for external travel: Heavy and medium truck



Ref: v22_f_factors.xls

Table 5-5 Friction factors for external travel: Interstate, arterial, medium & heavy truck, commercial vehicles

HighwayTime (min)	HBW Interstate	HBS Interstate	HBO Interstate	NHB Interstate	HBW Arterial	HBS Arterial	HBO Arterial	NHB Arterial	Medium Truck External	Heavy Truck External	Comm Vehs
1	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	1,629
2	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	1,474
3	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	984,609	1,333
4	554,679	777,594	615,654	570,003	984,609	984,609	984,609	984,609	539,457	723,621	1,207
5	355,325	641,659	427,667	372,910	590,136	709,738	556,119	622,434	338,371	569,788	1,092
6	246,882	543,380	317,518	263,572	388,216	539,905	348,612	427,490	231,213	468,652	988
7	181,418	467,715	246,809	196,487	272,306	425,824	234,823	310,836	167,614	397,234	894
8	138,887	406,863	198,396	152,294	200,170	344,544	166,714	235,615	126,889	344,185	809
9	109,702	356,371	163,619	121,600	152,496	284,052	123,206	184,340	99,294	303,267	732
10	88,811	313,505	137,691	99,391	119,490	237,502	93,977	147,852	79,760	270,769	662
11	73,343	276,499	117,780	82,787	95,778	200,729	73,538	120,982	65,442	244,351	599
12	61,571	244,160	102,114	70,039	78,219	171,065	58,769	100,633	54,643	222,462	542
13	52,404	215,648	89,538	60,031	64,886	146,728	47,805	84,862	46,305	204,035	491
14	45,127	190,357	79,269	52,027	54,546	126,484	39,474	72,397	39,735	188,314	444
15	39,254	167,832	70,762	45,522	46,379	109,454	33,020	62,377	34,470	174,746	402
16	34,444	147,722	63,624	40,161	39,827	94,994	27,933	54,206	30,188	162,919	363
17	30,457	129,747	57,568	35,689	34,498	82,624	23,864	47,458	26,659	152,520	329
18	27,114	113,682	52,381	31,919	30,111	71,975	20,567	41,823	23,718	143,305	298
19	24,284	99,334	47,898	28,709	26,461	62,763	17,863	37,070	21,242	135,084	269
20	21,868	86,539	43,995	25,954	23,394	54,761	15,623	33,026	19,138	127,704	244
21	19,787	75,154	40,573	23,571	20,795	47,789	13,749	29,558	17,336	121,043	220
22	17,983	65,048	37,553	21,495	18,575	41,699	12,169	26,562	15,781	115,001	199
23	16,410	56,104	34,873	19,675	16,667	36,370	10,826	23,959	14,430	109,495	180
24	15,028	48,213	32,482	18,071	15,014	31,701	9,676	21,682	13,249	104,457	163
25	13,808	41,278	30,339	16,650	13,576	27,607	8,686	19,681	12,211	99,829	148
26	12,727	35,203	28,410	15,384	12,316	24,016	7,828	17,913	11,294	95,564	134
27	11,763	29,905	26,666	14,252	11,208	20,866	7,080	16,344	10,479	91,619	121
28	10,901	25,301	25,083	13,235	10,229	18,104	6,426	14,947	9,754	87,961	109
29	10,126	21,318	23,642	12,319	9,359	15,684	5,850	13,697	9,104	84,558	99
30	9,427	17,888	22,325	11,489	8,585	13,565	5,341	12,576	8,519	81,385	90
31	8,795	14,946	21,119	10,736	7,892	11,712	4,890	11,566	7,993	78,419	81
32	8,221	12,435	20,010	10,051	7,270	10,093	4,488	10,654	7,516	75,641	73
33	7,699	10,301	18,989	9,425	6,710	8,681	4,129	9,828	7,083	73,032	66
34	7,222	8,495	18,045	8,852	6,205	7,452	3,807	9,079	6,690	70,577	60
35	6,785	6,976	17,172	8,326	5,747	6,383	3,517	8,396	6,330	68,264	54
36	6,384	5,702	16,361	7,841	5,331	5,456	3,256	7,774	6,001	66,080	49
37	6,016	4,641	15,607	7,395	4,953	4,653	3,019	7,206	5,699	64,014	45
38	5,676	3,760	14,905	6,982	4,608	3,959	2,805	6,685	5,422	62,057	40
39	5,362	3,032	14,249	6,600	4,292	3,361	2,610	6,207	5,166	60,201	36
40	5,071	2,434	13,636	6,245	4,003	2,846	2,432	5,768	4,930	58,437	33
41	4,802	1,945	13,062	5,916	3,738	2,404	2,270	5,364	4,712	56,759	30
42	4,552	1,547	12,524	5,609	3,494	2,026	2,121	4,992	4,510	55,161	27
43	4,319	1,225	12,017	5,323	3,269	1,703	1,985	4,648	4,322	53,636	24
44	4,101	965	11,541	5,055	3,061	1,428	1,860	4,330	4,147	52,181	22
45	3,899	757	11,092	4,805	2,869	1,194	1,745	4,037	3,984	50,789	20
46	3,709	591	10,669	4,571	2,692	996	1,639	3,764	3,833	49,458	18
47	3,531	459	10,269	4,351	2,527	829	1,540	3,512	3,691	48,182	16
48	3,365	355	9,890	4,145	2,374	687	1,450	3,278	3,558	46,959	15
49	3,209	273	9,532	3,951	2,232	569	1,365	3,060	3,434	45,786	13
50	3,062	209	9,192	3,768	2,100	469	1,287	2,858	3,318	44,658	12
51	2,924	160	8,869	3,596	1,977	386	1,215	2,670	3,209	43,574	11
52	2,793	121	8,563	3,434	1,862	317	1,147	2,495	3,106	42,531	10
53	2,671	91	8,271	3,280	1,755	259	1,084	2,332	3,009	41,526	9
54	2,555	69	7,994	3,135	1,655	212	1,026	2,180	2,919	40,558	8
55	2,445	51	7,730	2,998	1,561	172	971	2,038	2,833	39,625	7
56	2,342	38	7,478	2,868	1,473	140	920	1,905	2,752	38,724	7
57	2,243	28	7,237	2,745	1,391	113	872	1,782	2,676	37,854	6
58	2,150	21	7,008	2,628	1,314	91	827	1,666	2,604	37,013	5
59	2,062	15	6,788	2,518	1,242	73	785	1,558	2,535	36,199	5
60	1,979	11	6,578	2,412	1,174	59	745	1,458	2,471	35,413	4
61	1,899	8	6,377	2,312	1,110	47	708	1,363	2,410	34,651	4
62	1,824	6	6,184	2,217	1,050	38	673	1,275	2,352	33,913	4
63	1,752	4	5,999	2,127	993	30	641	1,193	2,297	33,198	3
64	1,683	3	5,822	2,040	940	24	610	1,115	2,245	32,505	3
65	1,618	2	5,652	1,958	890	19	580	1,043	2,195	31,832	3
66	1,556	2	5,489	1,880	843	15	553	976	2,148	31,179	2
67	1,497	1	5,332	1,805	798	12	527	912	2,104	30,544	2
68	1440	1	5181	1733	756	9	502	853	2061	29928	2
69	1386	1	5035	1665	717	7	479	798	2021	29329	2
70	1335	1	4895	1600	679	6	457	746	1983	28747	2

Ref: v22_f_factors.xls

Chapter 6 Mode Choice

The Version 2.2 mode choice model is identical to that used in the Version 2.1D#50 model except that many of the geographic adjustment factors used to fine-tune transit percentages and car occupancies at county-to county levels have been removed. This chapter details the specification of the model.

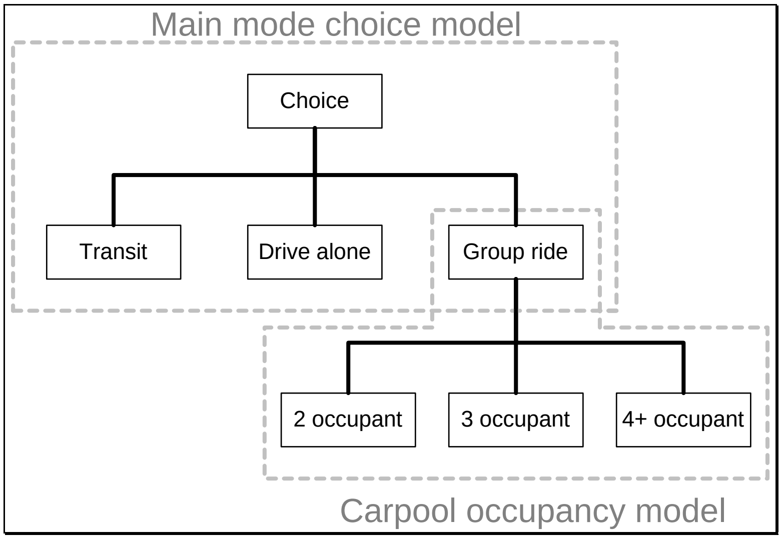
6.1 *Model Structure*

The mode choice model estimates the share of person trips made by each travel mode. Estimates are made at the zone-to-zone interchange level, but are usually presented at the jurisdiction interchange level or regional level. The following modes are represented in the Version 2.2 model:

- TR Transit
- DA Drive alone
- GR2 Group ride, two occupants
- GR3 Group ride, three occupants
- GR4 Group ride, four or more occupants

There are four separate and distinct mode choice models -- one for each trip purpose: HBW, HBS, HBO, and NHB. Each of the four models is comprised of two sub-models: a "main mode choice model" and a "carpool occupancy model." The main mode choice model allocates person trips among transit, drive alone, and group ride (carpool) modes. The carpool occupancy model allocates group-ride person trips among 2-person carpool, 3-person carpool, and 4+person carpool modes. The structure of the COG/TPB mode choice model (Versions 1, 2, 2.0, 2.1D, and 2.2) is shown in Figure 6-1. Each sub-model is a multinomial logit model. The two sub-models are applied in a sequential manner, so the model form is referred to as a "sequential multinomial logit model." The carpool occupancy model is executed first. The resulting occupancy information is then used within the main model to determine average costs associated with each person in the carpool mode.

Figure 6-1 Structure of the COG/TPB mode choice model



mcstruct.vsd

Market segmentation in the mode choice models is established on the basis of household vehicle ownership, access mode to transit, and the walking distance to/from transit service. Vehicle ownership is defined as the number of vehicles available to a household (0, 1, or 2+). There are three general access mode types:

Table 6-1 Access modes used in the mode choice model

Access mode	Description
Walk-access	Both ends of the trip are within walking distance of transit
Drive-access	The origin end of the trip is beyond walking distance to transit
No access	The destination end of the trip is beyond walking distance to transit, so transit cannot be used for the trip

Walking distance to/from transit is defined as being either "short" or "long," based on the following definitions:

Table 6-2 Definition of short and long walk to transit

Distance to a rail station	Distance to a bus stop	Walking distance to/from transit
0 - 0.33 miles	Any	Short
0.33 - 1.00 miles	Any	Long
> 1.00 mile	0 - 0.33 miles	Short
> 1.00 mile	0.33 - 1.00 miles	Long
> 1.00 mile	> 1.00 mile	Beyond walking distance to/from transit

Thus, each zone is made up of zero or more short-walk areas, zero or more long-walk areas, and zero or more beyond-walking-distance areas. This market segmentation by walking distance to/from transit is referred to as the "two-tier walk-access" segmentation, since there are two main types of walk access: short and long. Distances are straight-line distances ("as the crow flies").

6.2 *Treatment of Parking Costs and Terminal Times*

Parking costs and highway terminal time assumptions

In applying the Version 2.2 model, prior to the execution of the mode choice model programs are used to generate zonal files containing zonal parking costs and highway terminal times. The files are, in turn, read into the mode choice model upon execution. A graph of daily HBW and hourly non-HBW parking costs, as a function of zonal employment density, is shown in Figure 6-2. The non-HBW hourly parking cost is assumed to be one-third of the daily HBW rate, subject to a minimum employment density of 80,000 employees per sq. mile.

Highway terminal time is typically associated with the average time spent parking or un-parking an automobile. The current mode choice model application program considers highway terminal time only at the attraction end. Highway time is calculated as a function of employment density, as shown in the table below:

Employment density range (Emp/Sq. Mi.)	Highway terminal time (minutes)
0 - 4,617	1
4,618 - 6,631	2
6,632 - 11,562	4
11,563 - 32,985	6
32,986 +	8

Auto Operating Costs

The Auto operating cost in the mode choice model relate to expenditures directly associated with the requirements of an automobile trip including fuel, oil, maintenance, tire wear, etc. (auto ownership costs including insurance, registration fees, etc. are not included). The mode choice model expresses operating costs as a per mile rate (1994 cents per mi) that is specified as a parameter (UPARMS(12)). The parameter values currently vary by year and are shown on the table below.

year	Auto Operating Cost Rate (1994 cents/mi)
1994	9.1
2000	8.5
2005	8.3
2010	8.2
2015	8.1
2020	8.0
2025	7.9
2030	7.8

Figure 6-2 Parking cost model for the Version 2.1 D #50 model set

parkingCostModelUpdate.xls

The final set of adjusted mode choice models is shown in Table 6-3 through Table 6-10.

Table 6-3 Final adjusted HBW mode choice model (main model)

Utility TR	Utility DA	Utility GR	Variable name	Alogit coeff name	Coeff.
x	x	x	IVTT	IVTT	-0.03000
x			OVTT	OVTT	-0.07500
x	x	x	Cost	Cost	-0.00425
	x		0-veh HH dummy	ve0dumda	-4.83100
	x		1-veh HH dummy	ve1dumda	-0.85460
	x		2+veh HH dummy	ve2dumda	0.08240
		x	0-veh HH dummy	ve0dumgr	-4.61750
		x	1-veh HH dummy	ve1dumgr	-2.40710
		x	2+veh HH dummy	ve2dumgr	-1.89790
x*			0-veh HH & drv acc dummy		-2.04990
x*			1-veh HH & drv acc dummy	ve1autacc	-0.58760
x*			2+veh HH & drv acc dummy	ve2autacc	-0.35710
x			Land-use mix index, prod end	LUmixiTR	4.449E-05
	x		Land-use mix index, attr end	LUmixjDA	-2.518E-05
			Value of time**		$4.23
			OVTT / IVTT		2.50

Notes:
* This variable relates to only drive-access transit trips.
** For the work purpose, one would expect a VOT between $4.44 and $8.88 in 1994 dollars.
VOT = 0.60 * (IVTT/Cost), where 0.60 converts cents/min to dollars/hour
Ref: adj_dab_mb.xls, final

Table 6-4 Final adjusted HBW mode choice model (carpool occupancy model)

Utility 2	Utility 3	Utility 4+	Variable name	Alogit coeff name	Coeff.
x	x	x	Operating cost	opcost	-0.01124
x	x	x	Parking cost	pkcost	-0.02318
x	x	x	Toll	toll	-0.05077
	x	x	Time saved by HOV3+ relat. to HOV2	timsav	0.03611
	x		1-vehicle HH dummy	Oc31vdum	-1.47162
	x		2+vehicle HH dummy	Oc32vdum	-1.88085
		x	1-vehicle HH dummy	Oc41vdum	-3.04973
		x	2+vehicle HH dummy	Oc42vdum	-2.54494

Ref: adj_dab_mb.xls, final

Table 6-5 Final adjusted HBS mode choice model (main model)

Utility TR	DA	GR	Variable name	Alogit coeff name	Coeff.
x	x	x	IVTT	IVTT	-0.00912
x			OVTT	OVTT	-0.02432
x	x	x	Cost	Cost	-0.00416
	x		0-veh HH dummy	ve0dumda	-3.03700
	x		1-veh HH dummy	ve1dumda	2.27200
	x		2+veh HH dummy	ve2dumda	3.75100
		x	0-veh HH dummy	ve0dumgr	-0.88800
		x	1-veh HH dummy	ve1dumgr	1.92900
		x	2+veh HH dummy	ve2dumgr	3.50700
x*			0-veh HH & drv acc dummy		-2.90000
x*			1-veh HH & drv acc dummy		0.00000
x*			2+veh HH & drv acc dummy		2.00000
x			Land-use mix index, attr end	LUmixjTR	4.869E-05
	x		Land-use mix index, prod end	LUmixiDA	2.627E-05
	x		Land-use mix index, attr end	LUmixjDA	2.438E-05
x			Metrorail use dummy	metrodum	0.84404
			Value of time**		$1.31
			OVTT / IVTT		2.67

Notes:
* This variable relates to only drive-access transit trips.
** For non-work trips, one would expect a VOT between $1.11 and $4.44 in 1994 dollars.
VOT = 0.60 * (IVTT/Cost), where 0.60 converts cents/min to dollars/hour
Ref: adj_dab_mb.xls, final

Table 6-6 Final adjusted HBS mode choice model (carpool occupancy model)

Utility 2	3	4+	Variable name	Alogit coeff name	Coeff.
x	x	x	IVTT	IVTT	-0.45633
	x		1-vehicle HH dummy	Oc31vdum	-0.92201
	x		2+vehicle HH dummy	Oc32vdum	-0.48966
		x	1-vehicle HH dummy	Oc41vdum	-1.51854
		x	2+vehicle HH dummy	Oc42vdum	-0.84071

Ref: adj_dab_mb.xls, final

Table 6-7 Final adjusted HBO mode choice model (main model)

Utility TR	Utility DA	Utility GR	Variable name	Alogit coeff name	Coeff.
x	x	x	IVTT	IVTT	-0.01902
x			OVTT	OVTT	-0.04991
x	x	x	LnCost	LnCost	-0.78384
	x		0-veh HH dummy	ve0dumda	-4.35730
	x		1-veh HH dummy	ve1dumda	0.00470
	x		2+veh HH dummy	ve2dumda	0.31110
		x	0-veh HH dummy	ve0dumgr	-3.19380
		x	1-veh HH dummy	ve1dumgr	-0.50410
		x	2+veh HH dummy	ve2dumgr	0.04990
x*			0-veh HH & drv acc dummy		-2.90000
x*			1-veh HH & drv acc dummy		-1.10000
x*			2+veh HH & drv acc dummy		-0.65000
x			Land-use mix index, prod end	LUmixiTR	5.194E-05
x			Land-use mix index, attr end	LUmixjTR	2.307E-05
	x		Land-use mix index, prod end	LUmixiDA	2.585E-05
	x		Land-use mix index, attr end	LUmixjDA	2.171E-05
x			Metrorail use dummy	fmetdum	0.69708
x			Short walk to short walk dummy	SWtoSWmkt	0.41346
			Value of time**		$0.74
			OVTT / IVTT		2.62
			Average cost, cents/trip, 1994 $	51.06	

Notes:
* This variable relates to only drive-access transit trips.
** For the non-work purpose, one would expect a VOT between $1.11 and $4.44 in 1994 dollars.
VOT w/ ln(cost) = 0.60 * (ave. trip cost) * (Time/Cost).
Ref: adj_dab_mb.xls, final

Table 6-8 Final adjusted HBO mode choice model (carpool occupancy model)

Utility 2	Utility 3	Utility 4+	Variable name	Alogit coeff name	Coeff.
x	x	x	IVTT	IVTT	-0.68530
	x		1-vehicle HH dummy	Oc31vdum	-0.31756
	x		2+vehicle HH dummy	Oc32vdum	-0.15151
		x	2+vehicle HH dummy	Oc42vdum	0.21854

Ref: adj_dab_mb.xls, final

Table 6-9 Final adjusted NHB mode choice model (main model)

Utility TR	DA	GR	Variable name	Alogit coeff name	Coeff.
	x		Constant	DAconst	0.85410
		x	Constant	GRconst	-0.07600
x*			Drive-access transit dummy		-1.40000
x	x	x	IVTT	IVTT	-0.03242
x			OVTT	OVTT	-0.06695
x	x	x	LnCost	LnCost	-0.86043
x			Land-use mix index, attr end	TRLUmixj	1.659E-05
	x		Land-use mix index, prod end	DALUmixi	1.369E-05
	x		Land-use mix index, attr end	DALUmixj	1.300E-05
x			Metrorail use dummy	Metrodum	1.47447
x			Short walk to short walk dummy	SWtoSWmkt	0.76998
			Value of time**		$1.46
			OVTT / IVTT		2.07
			Average cost, cents/trip, 1994 $	64.63	

Notes:
* This variable relates to only drive-access transit trips.
** For the non-work purpose, one would expect a VOT between $1.11 and $4.44 in 1994 dollars.
VOT w/ ln(cost) = 0.60 * (ave. trip cost) * (Time/Cost).
Ref: adj_dab_mb.xls, final

Table 6-10 adjusted NHB mode choice model (carpool occupancy model)

Utility 2	3	4+	Variable name	Alogit coeff name	Coeff.
	x		Constant	Const3oc	-0.92477
		x	Constant	Const4oc	-1.41003
	x	x	IVTT	IVTT	-0.00709
x	x		Highway distance	hwydst	-0.00187

Ref: adj_dab_mb.xls, final

Chapter 7 Time-of-Day Model

The Version 2.2 time-of-day model functions to apportion daily vehicle trips among three time modeled periods, prior to the traffic assignment step. Peak-hour factors corresponding to the three time periods are also required to support the traffic assignment process. This chapter presents the details of the model and the development of the peaking factors.

7.1 Model Structure

The Time-of-Day Model addresses the temporal dimension of travel subsequent to the mode choice step. The time of day model functions to convert daily trips by purpose and mode to specific time periods, in preparation for the traffic assignment step. The modeled time periods are defined as the AM peak period (6-9AM), PM peak period (4-7PM) and the off-peak period (all remaining hours).

The conversion of daily trips for the resident trip purposes (HBW, HBS, HBO, and NHB) are made with the application of temporal factors that have been developed directly from the HTS. The factors, shown as Table 7-2, have been developed from detailed trips-in-motion summaries. The factors are applied on the basis of purpose, mode, and direction of the trip, with respect to the home-end of the trip.

The truck and various non-modeled auto driver travel markets are also converted from daily trip tables to the three time periods using a system of temporal factors. The factors are summarized in Table 7-1.

Table 7-1 Version 2.2 Temporal Factors (Percentages) For Truck and Non-Modeled Travel Markets

Time Period	Travel Market							
	X-X Truck	Medium Truck	Heavy Truck	X-X Auto Dr	Taxi Auto Dr	Tourist Auto Dr	School Auto Dr	Airport Auto Dr
AM	23.00	19.50	15.40	18.00	9.00	33.00	33.00	18.00
PM	11.00	15.20	13.00	22.00	27.00	33.00	33.00	29.00
Off-Peak	66.00	65.30	71.60	60.00	64.00	34.00	34.00	53.00

The temporal medium and heavy truck factors above were derived from the most recent Federal guidance on freight modeling[4]. The through (X-X) truck factors were developed from the 1996 COG Truck External Survey. The remaining temporal factors were based on professional judgment.

The daily commercial vehicle trips are apportioned among the AM, PM, and off-peak periods based on a 23%, 27%, and 50% split, respectively. The directional production/attraction split within the AM, PM, and off-peak periods is 70/30, 30/70, and 50/50, respectively. It should be added that the resulting trips are subject to small trip increments (or 'deltas') that are added to the modeled trips on an i/j basis in order to better match observed commercial link volumes. The delta

[4] Quick Response Freight Manual, TMIP, Sept. 1996, (pg 4-38)

trips were developed separately for internal and external trips through a rigorous calibration process called adaptable assignment (Allen, 2005B).

In application these factors are assumed to remain *constant* over time. Although it is reasonable to expect, that congestion will encourage traffic spreading from the AM and PM periods to the off-peak, the peak spreading phenomenon is complex and not well understood in the profession. Instead of addressing this issue in the regional model, TPB accounts for peak spreading issues in its travel model post-processor (a.k.a. the mobile emissions post processor), where hourly volume and speed estimates are formulated.

Another important temporal parameter in the traffic assignment process is the peaking factor, which is the proportion of traffic in a given time period which occurs in the peak hour. Link speeds are a function of the volume-to-capacity (V/C) ratio. The peaking factor is necessary for converting hourly lane capacities into 'period lane capacities', from which V/C ratios are computed. The Version 2.2 model requires peaking factors for the AM, PM, and Off-peak time periods. To arrive at regionally appropriate peaking factors, an analysis of total auto driver trips from the HTS was summarized to the modeled time periods. The maximum hourly volume occurring within each time period was then determined. The resulting peaking factors are shown below.

Peak Hour Factors (Percentages)	
AM Period (6:00-9:00AM):	40%
PM Period (4:00-7:00PM):	37%
Off-Peak (All Other Hours):	12%

Table 7-2 Observed travel distributions during peak and non-peak time periods by purpose, mode, and direction

(Source: 1994 COG/TPB Household Travel Survey)

		Home to Non-Home Direction				Non-Home to Home Direction			
Purpose	**Mode**	**AM Pk Prd. 6-9AM**	**PM Pk. Prd. 4-7PM**	**Non-Pk. Prd.**	**Total**	**AM Pk Prd. 6-9AM**	**PM Pk. Prd. 4-7PM**	**Non-Pk. Prd.**	**Total**
HBW	Transit	71%	5%	25%	100%	1%	72%	27%	100%
	Auto Driver	68%	3%	30%	100%	1%	63%	35%	100%
	Auto Passenger	74%	4%	23%	100%	1%	69%	30%	100%
	Auto Person	69%	3%	29%	100%	1%	64%	35%	100%
	Drive Alone	66%	3%	31%	100%	2%	61%	37%	100%
	Carpool Person	75%	3%	22%	100%	1%	72%	27%	100%
	Motorized Person	69%	3%	28%	100%	1%	66%	33%	100%
HBS	Transit	24%	15%	62%	100%	2%	35%	64%	100%
	Auto Driver	11%	21%	69%	100%	2%	32%	67%	100%
	Auto Passenger	5%	28%	68%	100%	0%	32%	67%	100%
	Auto Person	9%	22%	69%	100%	2%	32%	67%	100%
	Drive Alone	13%	18%	69%	100%	2%	32%	66%	100%
	Carpool Person	6%	27%	68%	100%	1%	31%	68%	100%
	Motorized Person	10%	22%	69%	100%	2%	31%	67%	100%
HBO	Transit	38%	13%	49%	100%	2%	35%	63%	100%
	Auto Driver	24%	21%	54%	100%	5%	29%	67%	100%
	Auto Passenger	31%	28%	41%	100%	1%	30%	69%	100%
	Auto Person	27%	23%	50%	100%	4%	29%	67%	100%
	Drive Alone	23%	19%	58%	100%	7%	26%	68%	100%
	Carpool Person	29%	27%	45%	100%	2%	32%	67%	100%
	Motorized Person	34%	21%	46%	100%	3%	28%	69%	100%
NHB	Transit	14%	31%	55%	100%	14%	31%	55%	100%
	Auto Driver	9%	27%	65%	100%	9%	27%	65%	100%
	Auto Passenger	8%	27%	65%	100%	8%	27%	65%	100%
	Auto Person	8%	27%	65%	100%	8%	27%	65%	100%
	Drive Alone	9%	26%	65%	100%	9%	26%	65%	100%
	Carpool Person	7%	28%	65%	100%	7%	28%	65%	100%
	Motorized Person	9%	25%	66%	100%	9%	25%	66%	100%

Note: The distributions shown are based on time-in-motion summaries.

Ref: todpkftr.xls

Chapter 8 Traffic Assignment / Feedback

The traffic assignment step is used to load a trip table onto the highway network in order to producing network link flows and speeds. The process culminates in the estimation of network link volumes, which, in turn, enable the estimation of highway link speeds. The traffic assignment process of the Version 2.2 model is detailed in this chapter.

8.1 *Model Application and Structure*

The traffic assignment step is executed seven times during a given model run. The first assignment is called the "pump prime" traffic assignment. The last six traffic assignments are called iteration 1, 2, 3, 4, 5, and 6. For each of the seven traffic assignments, there are actually three individual assignments, one for each of the three time-of-day periods: AM (6:00 to 9:00), PM (4:00 to 7:00), and off-peak (the remaining 18 hours of the day). The trips loaded in each time period are comprised of *all* purposes, as allocated by the time-of-day model. Each of the three assignments utilize a user equilibrium algorithm that is applied using 60 fixed iterations. The algorithm used in the equilibrium approach attempts to increasingly minimize the delay of all trips in the system with each iteration pass. An important component of the equilibrium assignment process is the volume-delay function (VDF). VDFs are used to develop link speeds at the end of each loading pass. It represents the ratio of congested travel time to the free-flow time as a function of the volume-to-capacity (V/C) ratio. The function typically varies by facility type. Another important property of the function is the capacity definition: in this case, volume reaches capacity at a V/C ratio of 1.0, where the capacity is the level-of-service (LOS) 'E' capacity. The restrained speed calculation is also subject to the assumed free flow speeds and capacity assumptions, which vary by facility type and area type. The Version 2.2 capacities and free flow speeds are defined in Table 8-1 and Table 8-2.

Conical volume delay functions are a class of "well behaved" volume delay functions. Spiess (1989) lists a number of characteristics that define a set of "well behaved" functions, including:

1. Function is strictly increasing. This is a necessary condition for the assignment to converge to a unique solution.
2. Capacity is defined as the volume at which the congested speed is half the free-flow speed.
3. The derivative of the function exists and is strictly increasing.
4. The slope of the function at a V/C ratio of 1 is equal to α

In equation form, the conical VDF is:

Equation 8-1 Conical volume delay function (VDF)

$$t/t_0 = f^C(x) = 2 + \sqrt{\alpha^2(1-x)^2 + \beta^2} - \alpha(1-x) - \beta$$

where

$$\alpha = \text{Slope of the function at V/C} = 1 \text{ (slope must be} > 1.0)$$

$$\beta = \frac{2\alpha - 1}{2\alpha - 2}$$

$$t/t_0 = \text{Ratio of congested travel time to free-flow travel time}$$

Table 8-3 shows, in tabular form, the conical VDFs used in the Version 2.2 travel model. There is a separate curve for each facility type, although ramps and freeways are assumed to have the same VDF. The conical VDFs are shown in graphical form in Figure 8-1 (for V/C >1) and Figure 8-2 (for V/C ≤ 1). In reality, no link would ever have a V/C ratio above one. However, in a typical regional travel model, V/C ratios above 1 do occur, so the VDF needs to account for this domain. Figure 8-1 shows the behavior of the Version 2.2 conical VDFs for large V/C ratios (V/C >1). The curve for freeways is the steepest, followed by expressways, then major arterials, minor arterials, and collectors. A steeper cure means more sensitivity to high V/C ratios, forcing excess traffic off of these facilities. Figure 8-2 shows the behavior of the Version 2.2 conical VDFs for V/Cs less than or equal to one. In this area of V/C ratio, the freeways show the least sensitivity to V/C ratio, but, as the V/C ratio approaches 1, the freeway VDFs have the steepest slope (a slope of 15).

In Figure 8-3, Figure 8-4, Figure 8-5, Figure 8-6, and Figure 8-7, the vertical axis now shows congested speed (not ratio of congested to free-flow travel time). Table 8-4 show the same information as the aforementioned five figures, but in tabular form. One can see that, for freeways, the congested speed drops to about 2 mph at a V/C ratio of 2.00. For arterials, the congested speeds drops to about 2 or 3 mph at a V/C = 2.0. For collectors, speeds drop to about 2 to 4 mph when the V/C ratio hits 2.0. By contrast, in the Version 2.1D #50 travel model, there was a speed "floor" for freeways, such that the minimum speed at for high V/C ratios (V/C > 1.75) was 11 to 13 mph.

In addition to the aforementioned change in VDFs, the Version 2.2 model includes one other major change with respect to the Version 2.1D #50 model: the inclusion of a queuing function, for ramps and freeways only, which was added to mimic the queuing that occurs in congested networks, but is difficult to represent in traditional, link-based static user equilibrium traffic models. One of the motivations behind including this queuing function was to reduce the number of hyper-congested links that occurred in the modeled network. According to this function, which is based on a sigmoid function, a queuing time is added to excessively congested freeway and ramp links. As shown in Figure 8-8, the queuing time ranges from 0 minutes, at low V/Cs (V/C ≤ 0.80) to a maximum of 14 minutes at high V/Cs (above V/C = 1.5).

Thus, previously, congested time was:

Equation 8-2 Congested time without queuing function

$T_C = T_0 * \text{VDF } f(V/C)$

Now, in the Version 2.2 travel model, for ramps and freeway links:

Equation 8-3 Congested time with queuing function (freeways and ramps only)

$T_C = [\, T_0 * \text{VDF } f(V/C) \,] + \text{Queuing Time } f(V/C)$

The main benefit of the new queuing function is that is prevents hyper-loading of links (i.e., cases where the estimated daily volume exceeds the daily capacity of the link). However, there are is a caveat to keep in mind: The link time is independent of link distance, which means the link speed can drop to extremely low levels. For example, a 14-minute delay is a much larger delay on a one-tenth-mile link than on a one-mile link.

The time on the link with a large queuing time, realistically reflects queuing delay that occurs on 'upstream links'. Static assignments are limited in their ability to represent the operational details of traffic. One typically needs to move to dynamic assignments to accurately simulate freeway operations.

Table 8-1 LOS E Capacities

		Area Type						
Facility Type		**1**	**2**	**3**	**4**	**5**	**6**	**7**
Centroids	FT = 0	3,150	3,150	3,150	3,150	3,150	3,150	3,150
Freeways	FT = 1	1,500	1,600	1,800	1,800	2,000	2,000	2,100
Major Arterials	FT = 2	800	800	960	960	1,260	1,260	1,260
Minor Arterials	FT = 3	500	600	700	840	1,000	1,000	1,000
Collectors	FT = 4	300	400	500	700	700	700	800
Expressways	FT = 5	900	1,000	1,000	1,200	1,500	1,500	1,500
Ramps	FT = 6	1,500	1,600	1,800	1,800	2,000	2,000	2,100

Ref: vdf_v21d.xls

Table 8-2 Free-Flow Speeds

		Area Type						
Facility Type		**1**	**2**	**3**	**4**	**5**	**6**	**7**
Centroids	FT = 0	15	15	20	25	30	30	35
Freeways	FT = 1	55	55	60	60	67	67	67
Major Arterials	FT = 2	25	25	35	35	40	45	45
Minor Arterials	FT = 3	20	20	30	30	35	40	40
Collectors	FT = 4	15	15	20	20	25	30	30
Expressways	FT = 5	45	45	50	50	50	55	55
Ramps	FT = 6	55	55	60	60	67	67	67

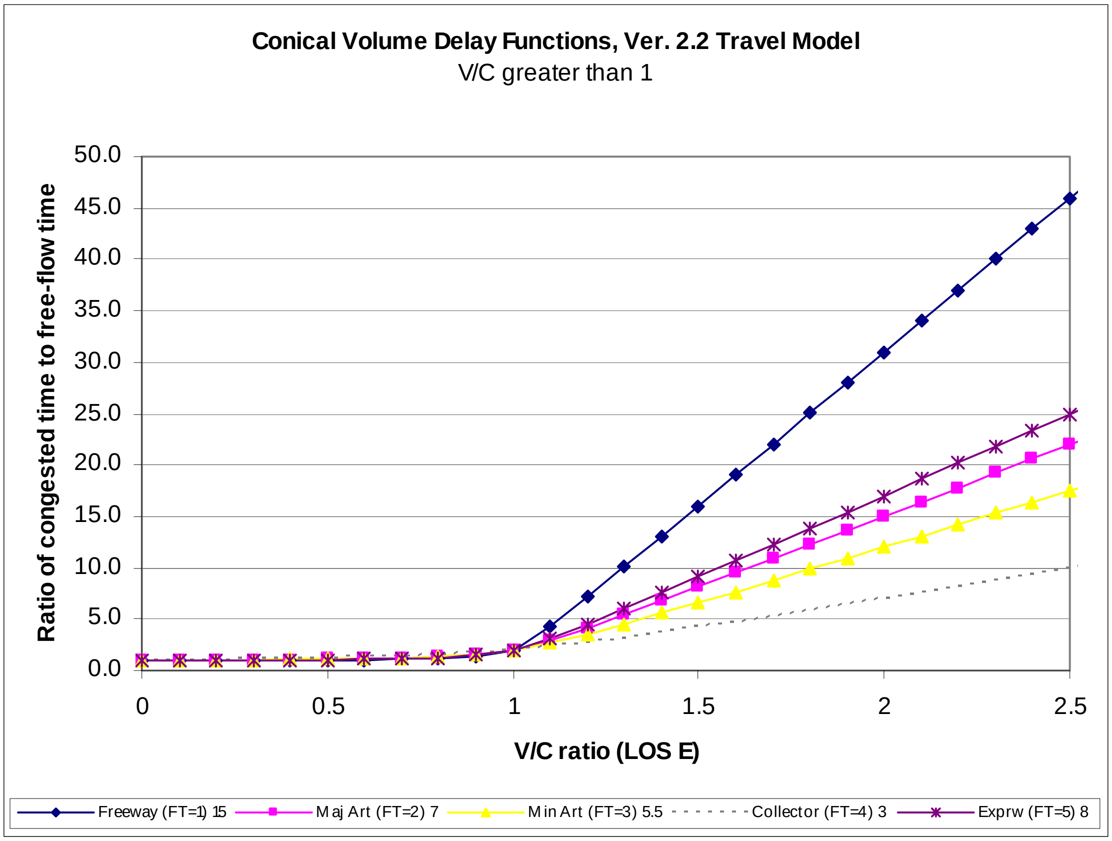
Ref: vdf_v21d.xls

Table 8-3 Conical volume-delay functions used in the Version 2.2 travel model: Tabular format

	Centroid (FT=0)	Freeway (FT=1)	Maj Art (FT=2)	Min Art (FT=3)	Collector (FT=4)	Exprw (FT=5)	Ramps (FT=6)
a		15	7	5.5	3	8	15
b		1.035714	1.083333	1.111111	1.25	1.071429	1.035714
v/c	**t/t0**	**t/t0**	**t/t0**	**t/t0**	**t/t0**	**t/t0**	**t/t0**
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.1	1.000	1.004	1.009	1.012	1.025	1.008	1.004
0.2	1.000	1.009	1.020	1.027	1.056	1.018	1.009
0.3	1.000	1.015	1.035	1.046	1.094	1.030	1.015
0.4	1.000	1.024	1.054	1.071	1.141	1.047	1.024
0.5	1.000	1.035	1.080	1.105	1.203	1.070	1.035
0.6	1.000	1.053	1.119	1.154	1.283	1.103	1.053
0.7	1.000	1.082	1.180	1.228	1.390	1.157	1.082
0.8	1.000	1.138	1.287	1.352	1.537	1.254	1.138
0.9	1.000	1.287	1.506	1.579	1.735	1.466	1.287
1	1.000	2.000	2.000	2.000	2.000	2.000	2.000
1.1	1.000	4.287	2.906	2.679	2.335	3.066	4.287
1.2	1.000	7.138	4.087	3.552	2.737	4.454	7.138
1.3	1.000	10.082	5.380	4.528	3.190	5.957	10.082
1.4	1.000	13.053	6.719	5.554	3.683	7.503	13.053
1.5	1.000	16.035	8.080	6.605	4.203	9.070	16.035
1.6	1.000	19.024	9.454	7.671	4.741	10.647	19.024
1.7	1.000	22.015	10.835	8.746	5.294	12.230	22.015
1.8	1.000	25.009	12.220	9.827	5.856	13.818	25.009
1.9	1.000	28.004	13.609	10.912	6.425	15.408	28.004
2	1.000	31.000	15.000	12.000	7.000	17.000	31.000
2.1	1.000	33.997	16.393	13.090	7.579	18.594	33.997
2.2	1.000	36.994	17.786	14.182	8.161	20.188	36.994
2.3	1.000	39.992	19.181	15.275	8.745	21.784	39.992
2.4	1.000	42.990	20.576	16.369	9.332	23.380	42.990
2.5	1.000	45.988	21.972	17.463	9.920	24.976	45.988
2.6	1.000	48.987	23.369	18.559	10.510	26.573	48.987
2.7	1.000	51.985	24.766	19.655	11.101	28.171	51.985
2.8	1.000	54.984	26.163	20.751	11.693	29.768	54.984
2.9	1.000	57.983	27.561	21.848	12.285	31.366	57.983
3	1.000	60.982	28.959	22.945	12.879	32.964	60.982
999.9	1.000	60.982	28.959	22.945	12.879	32.964	60.982

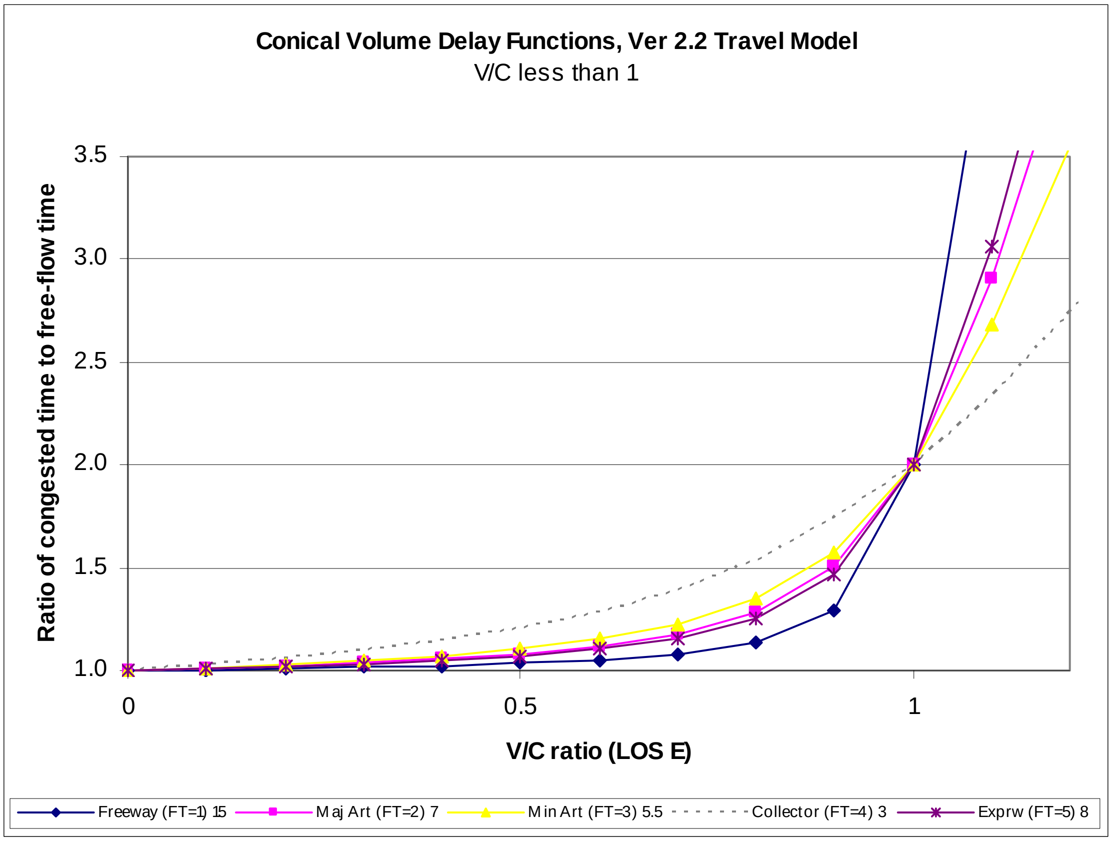
Ref: conical_vdf_v22.xls

Figure 8-1 Conical volume-delay functions used in the Version 2.2 travel model: V/C > 1



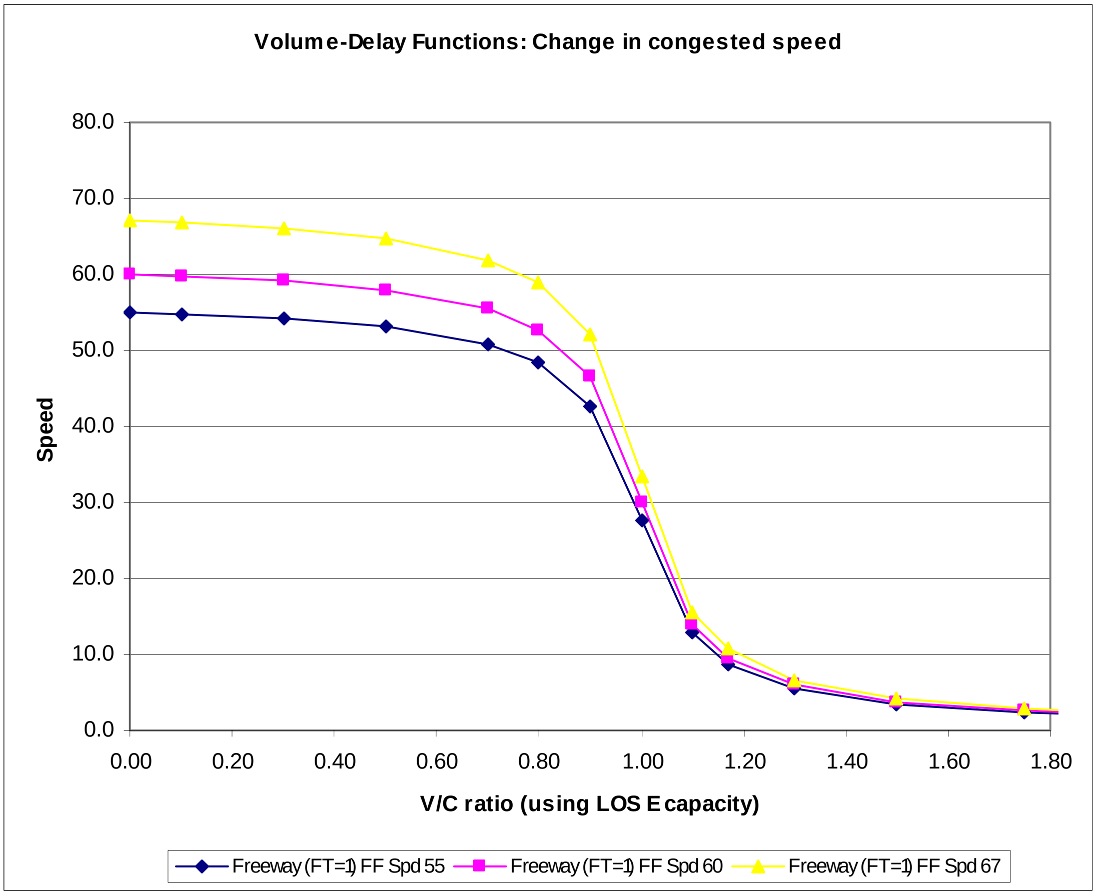
Ref: conical_vdf_v22.xls

Figure 8-2 Conical volume-delay functions used in the Version 2.2 travel model: V/C < 1



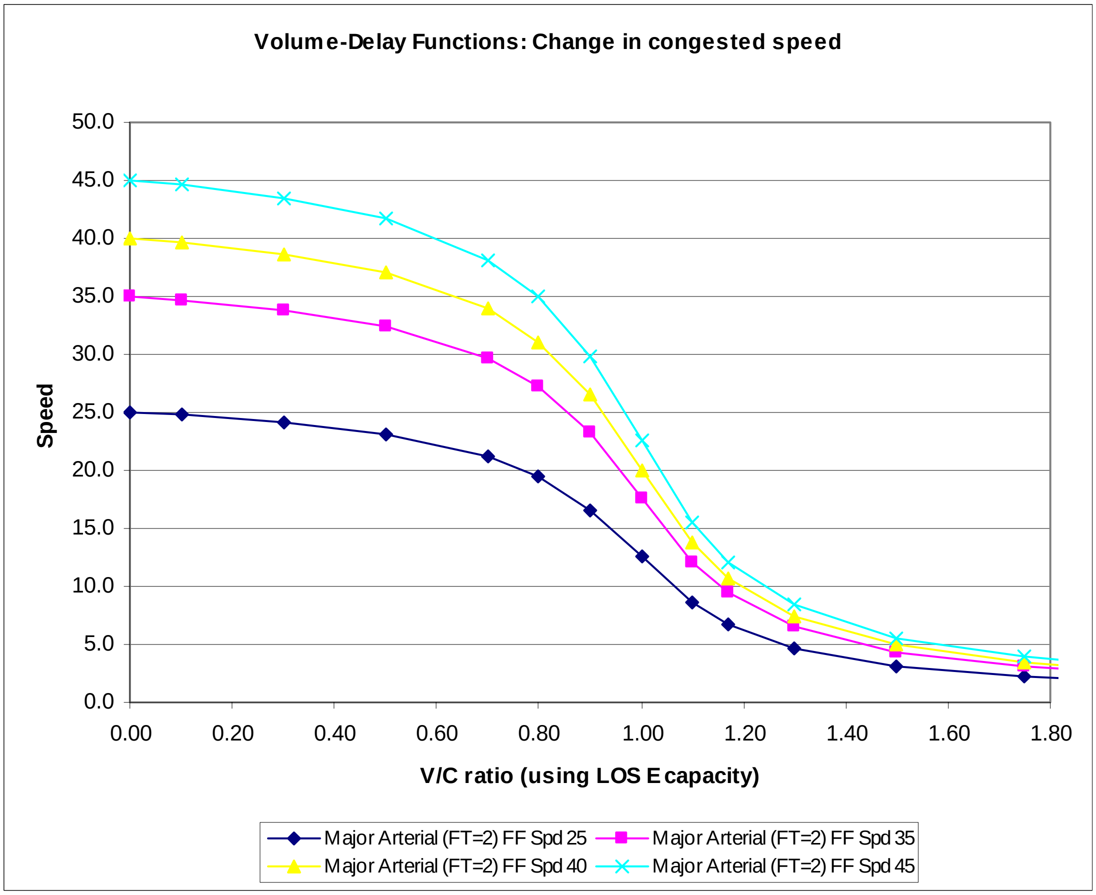
Ref: conical_vdf_v22.xls

Figure 8-3 Volume-delay functions used in the Version 2.2 travel model: Freeways



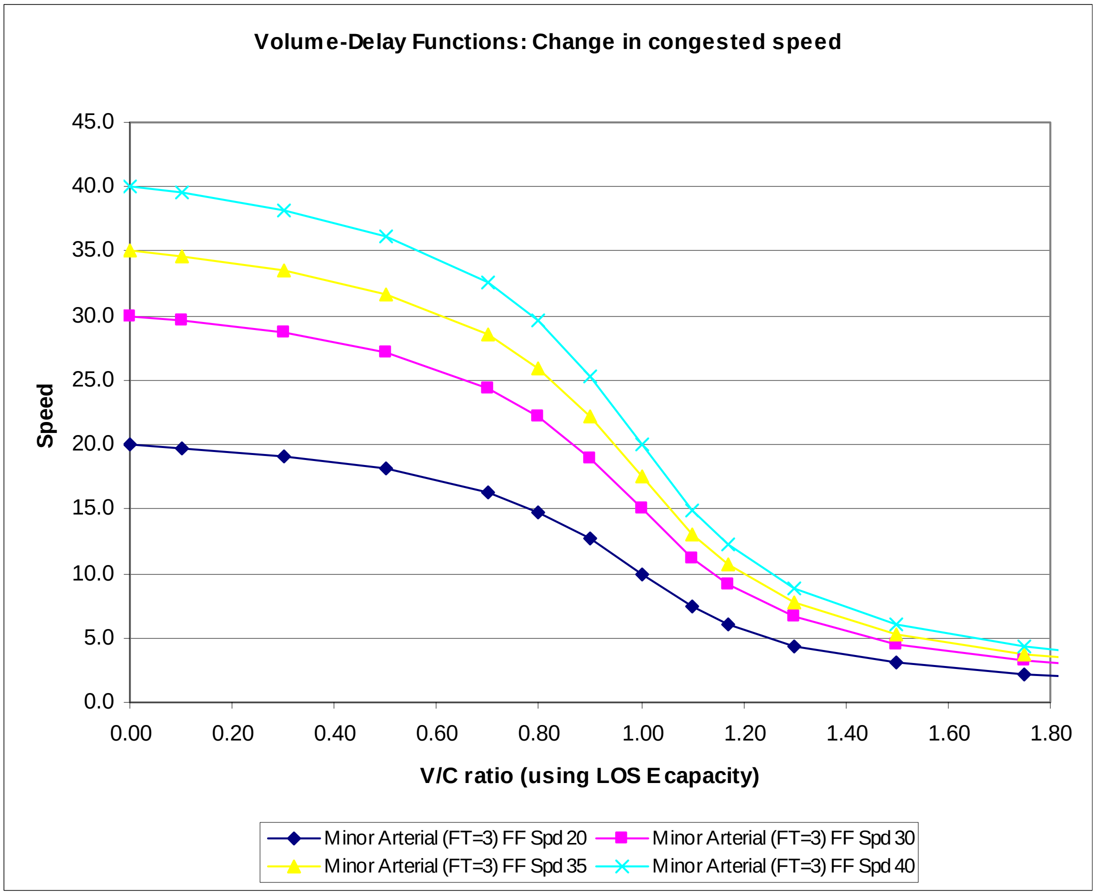
Ref: conical_vdf_v22.xls

Figure 8-4 Volume-delay functions used in the Version 2.2 travel model: Major Arterials



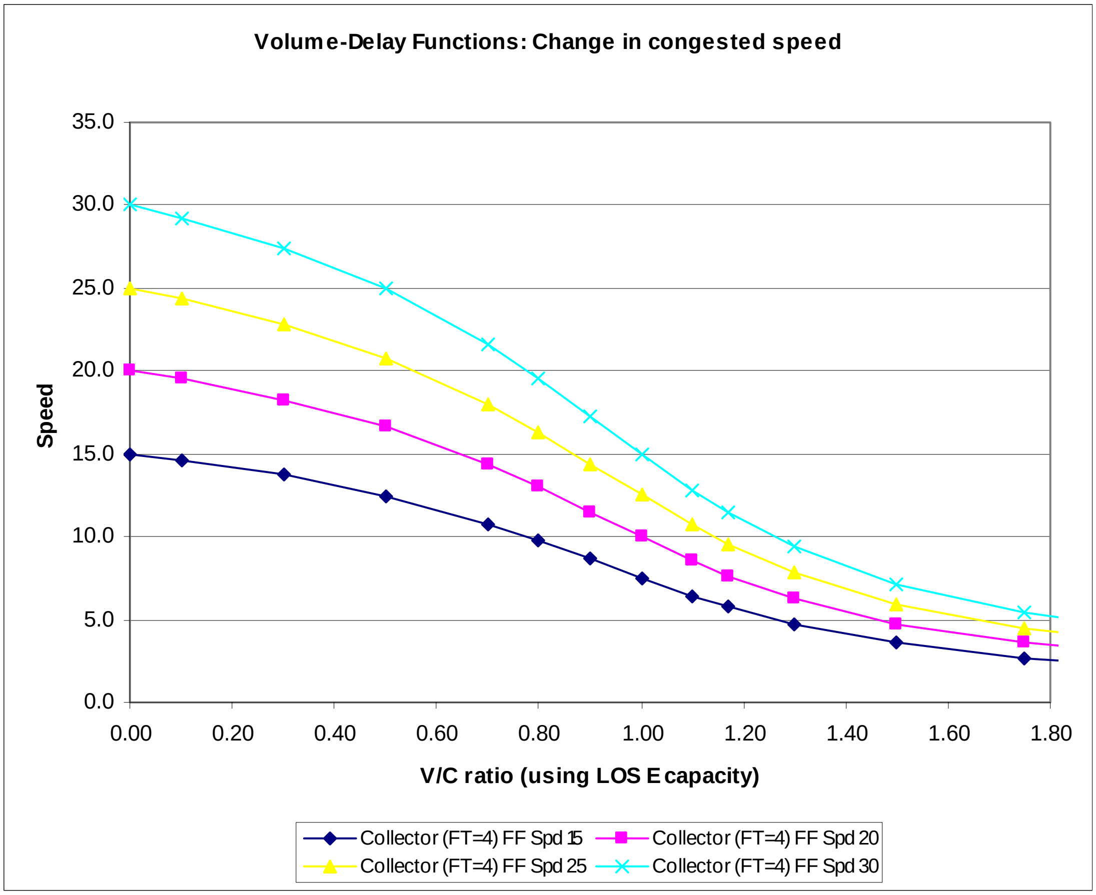
Ref: conical_vdf_v22.xls

Figure 8-5 Volume-delay functions used in the Version 2.2 travel model: Minor Arterials



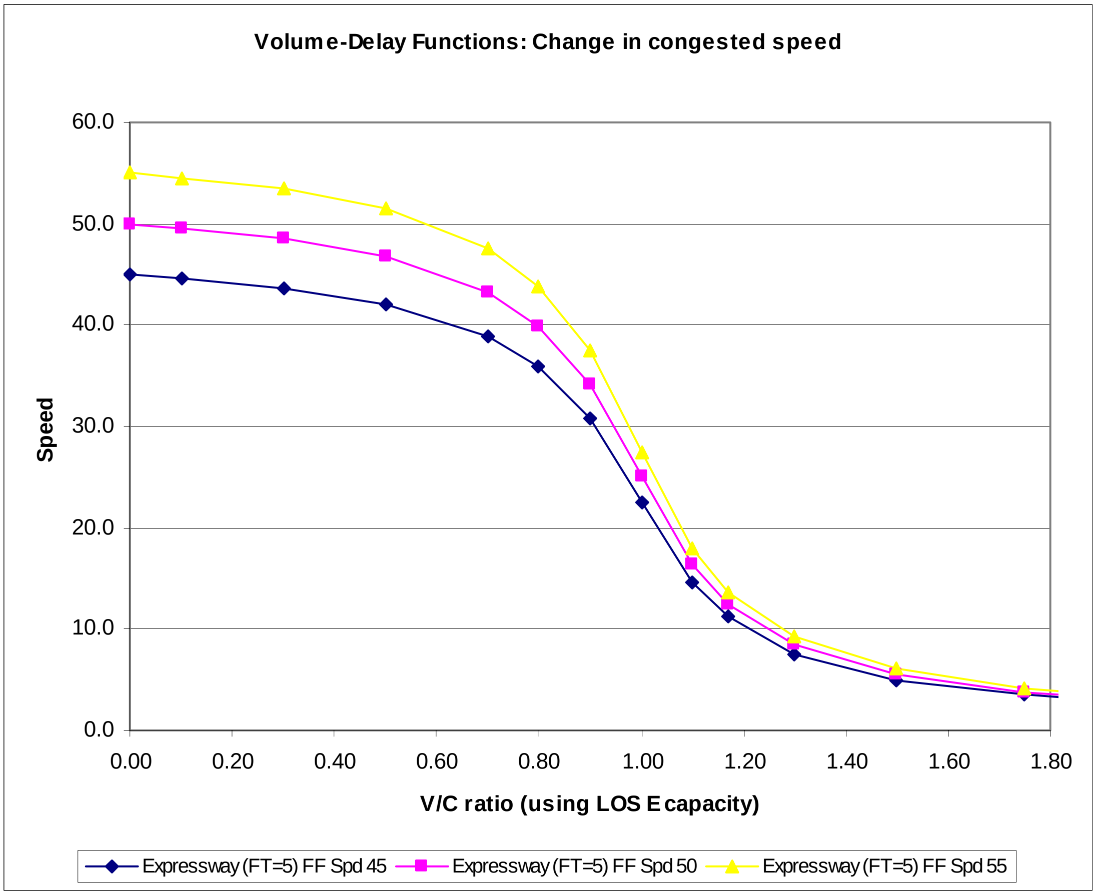
Ref: conical_vdf_v22.xls

Figure 8-6 Volume-delay functions used in the Version 2.2 travel model: Collectors



Ref: conical_vdf_v22.xls

Figure 8-7 Volume-delay functions used in the Version 2.2 travel model: Expressways



Ref: conical_vdf_v22.xls

Table 8-4 Volume-delay functions used in the Version 2.2, travel model: Speeds, Part 1 of 2

	Freeway (FT=1)			Major Arterial (FT=2)				Minor Arterial (FT=3)			
V/C	FF Spd 55 ConSpd	FF Spd 60 ConSpd	FF Spd 67 ConSpd	FF Spd 25 ConSpd	FF Spd 35 ConSpd	FF Spd 40 ConSpd	FF Spd 45 ConSpd	FF Spd 20 ConSpd	FF Spd 30 ConSpd	FF Spd 35 ConSpd	FF Spd 40 ConSpd
0.00	55.00	60.00	67.00	25.00	35.00	40.00	45.00	20.00	30.00	35.00	40.00
0.10	54.78	59.76	66.74	24.77	34.68	39.64	44.59	19.76	29.64	34.58	39.52
0.30	54.17	59.10	65.99	24.15	33.82	38.65	43.48	19.12	28.68	33.46	38.24
0.50	53.12	57.95	64.71	23.14	32.39	37.02	41.65	18.10	27.15	31.68	36.20
0.70	50.83	55.46	61.93	21.19	29.67	33.91	38.15	16.28	24.43	28.50	32.57
0.80	48.33	52.72	58.87	19.43	27.20	31.08	34.97	14.79	22.18	25.88	29.58
0.90	42.73	46.62	52.05	16.60	23.23	26.55	29.87	12.67	19.00	22.17	25.34
1.00	27.50	30.00	33.50	12.50	17.50	20.00	22.50	10.00	15.00	17.50	20.00
1.10	12.83	14.00	15.63	8.60	12.04	13.76	15.48	7.47	11.20	13.07	14.93
1.17	8.78	9.57	10.69	6.73	9.42	10.76	12.11	6.10	9.16	10.68	12.21
1.30	5.46	5.95	6.65	4.65	6.51	7.44	8.36	4.42	6.63	7.73	8.83
1.50	3.43	3.74	4.18	3.09	4.33	4.95	5.57	3.03	4.54	5.30	6.06
1.75	2.34	2.55	2.85	2.17	3.04	3.47	3.90	2.15	3.23	3.77	4.31
2.00	1.77	1.94	2.16	1.67	2.33	2.67	3.00	1.67	2.50	2.92	3.33

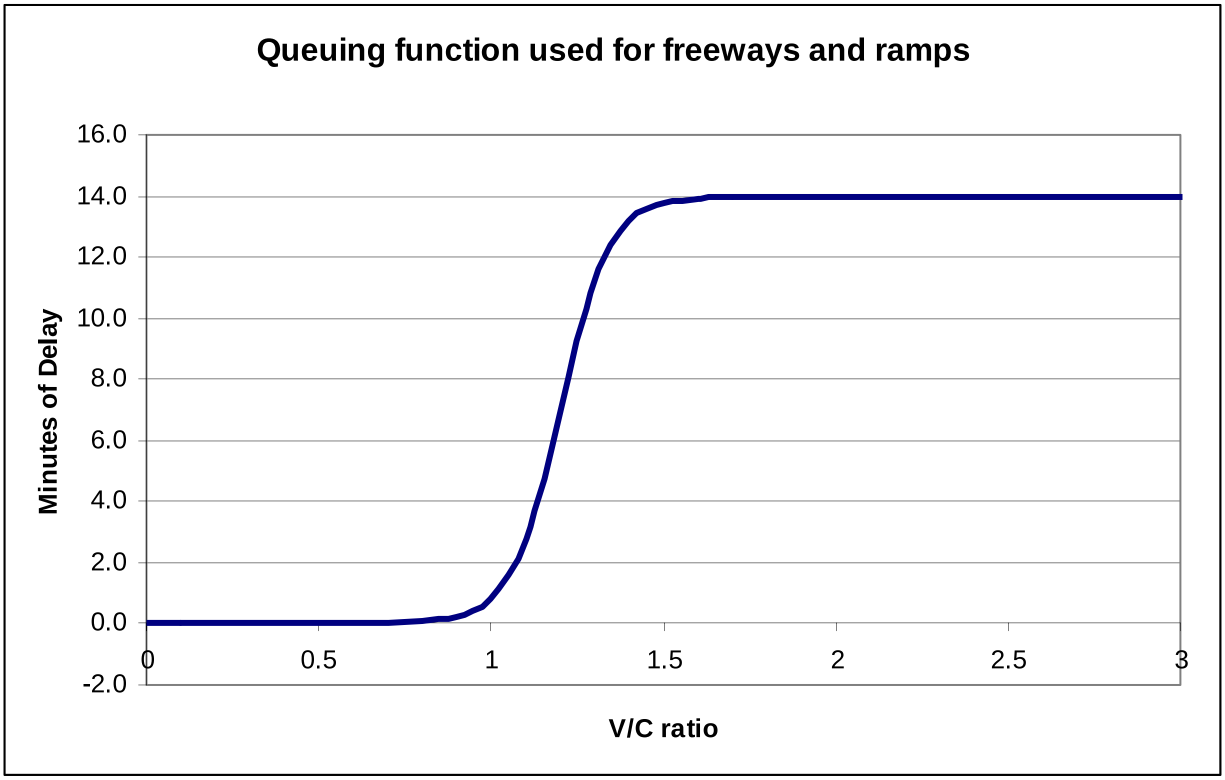
Ref: vdf_v21d.xls

Table 8-5 Volume-delay functions used in the Version 2.2, travel model: Speeds, Part 1 of 2

Collector (FT=4)				Expressway (FT=5)		
FF Spd 15 ConSpd	FF Spd 20 ConSpd	FF Spd 25 ConSpd	FF Spd 30 ConSpd	FF Spd 45 ConSpd	FF Spd 50 ConSpd	FF Spd 55 ConSpd
15.00	20.00	25.00	30.00	45.00	50.00	55.00
14.63	19.51	24.38	29.26	44.65	49.61	54.57
13.71	18.28	22.85	27.43	43.68	48.54	53.39
12.47	16.63	20.79	24.95	42.07	46.75	51.42
10.79	14.39	17.98	21.58	38.90	43.22	47.54
9.76	13.02	16.27	19.52	35.88	39.87	43.85
8.64	11.52	14.41	17.29	30.70	34.11	37.52
7.50	10.00	12.50	15.00	22.50	25.00	27.50
6.42	8.56	10.70	12.85	14.68	16.31	17.94
5.75	7.66	9.58	11.49	11.19	12.44	13.68
4.70	6.27	7.84	9.40	7.55	8.39	9.23
3.57	4.76	5.95	7.14	4.96	5.51	6.06
2.69	3.59	4.49	5.38	3.46	3.84	4.22
2.14	2.86	3.57	4.29	2.65	2.94	3.24

Ref: vdf_v21d.xls

Figure 8-8 Queuing function used for freeways and ramps



Ref: conical_vdf_v22.xls

Chapter 9 Validation

This chapter briefly describes some performance results of the Version 2.2 model and also provides travel statistics from the most recent TPB forecasts. This chapter also contains a section describing sensitivity testing that was undertaken during FY-2007.

9.1 *Validation Summaries*

A summary of state level estimated and observed vehicle-miles-of-travel (VMT) is shown in Table 9-2. The table reflects the 12-county MSA area which is a subset of the modeled study area. The table indicates that the model over-estimates VMT slightly in the District of Columbia and Virgina (by 4% and 1%, respectively) and slightly under-estimates VMT in Maryland by 2%. VMT for the entire MSA agrees well. Jurisdiction-level VMT performance based on a *sample* of 5,400 daily counts is shown in Table 9-2. The performance on Table 9-2 is shown to be more volatile as would be expected with a sample of counts at the jurisdiction level. The overall link RMSE is 41%.

Screenline locations currently analyzed by TPB staff are provided on Figure 9-1 and Figure 9-2. 2005 Screenline level performance is shown on Table 9-3. The table also indicates the percentage of screenline links with observed counts is about 37%. Overall, estimated screenline counts are 2% higher than the observed counts.

Transit performance is shown on Table 9-4. The table shows estimated and observed transit trips and percentages for both the 2.2 and 2.1D models. Version 2.2 now over estimates total transit about 7% in contrast to the underestimation of 4% shown for the Version 2.1D model. This reduced performance is attributed largely to a reduction in the use of K-factors and transit adjustments that were previously implemented in the Version 2.1D model. Interestingly, the Version 2.2 model matches observed HBW transit trips well (it underestimates work transit trips by 1%) in comparison with Version 2.1D (it underestimates work transit trips by 7%).

A summary of global statistics over time (from 2000 to 2030) is shown on Table 9-5. The table displays available forecasts using the Version 2.2 from 2000 through and 2030. It should be noted that the Version 2.2 2030 forecast produces about 8% less VMT that that produced by the previous 2.1D model.

Table 9-1 2005 Estimated/Observed (HPMS)VMT for the Washington, DC MSA (VMT in thousands)

VMT - V2.2 Iterations			
MSA	**Est(000s)**	**Obs(000s)**	**E-O Ratio**
DC	8,987	8,619	1.04
MD	55,935	56,806	0.98
VA	50,998	50,733	1.01
MSA Total	**115,920**	**116,158**	**1.00**

Note: VMT shown excludes local traffic

Jurisdictions in the MSA are:
District of Columbia, Montgomery County, Prince George's County, Arlington County, City of Alexandria, Fairfax County, Loudoun County, Prince William County, Frederick County, Charles County, Calvert County, Stafford County.

Table 9-2 Year 2005 Estimated and Observed VMT Summary by Jurisdiction (VMT in thousands)

	Version 2.2			
Jurisdiction	**Est**	**Obs**	**Ratio Est / Obs**	**Number of Counts**
District of Columbia	3,169	2,670	1.19	578
Montgomery	9,010	8,437	1.07	594
Prince George's	9,168	10,162	0.90	520
Arlington	1,675	1,727	0.97	268
Alexandria	820	788	1.04	124
Fairfax	12,938	12,895	1.00	1,191
Loudoun	2,077	2,304	0.90	226
Prince William	4,033	4,469	0.90	358
Frederick	6,429	5,111	1.26	248
Howard	6,484	6,463	1.00	180
Anne Arundel	9,301	9,089	1.02	324
Charles	1,435	1,660	0.86	94
Carroll	2,025	2,000	1.01	130
Calvert	734	983	0.75	64
St. Mary's	950	1,005	0.95	86
King George	729	615	1.19	32
Fredericksburg	276	415	0.67	24
Stafford	2,337	2,184	1.07	112
Spotsylvania	1,303	1,712	0.76	82
Fauquier	2,352	2,244	1.05	89
Clarke	700	582	1.20	36
Jefferson	68	30	2.27	2
Total	**78,013**	**77,545**	**1.01**	**5,362**

Ref: Sum_vmt_2005_V22.xls

Figure 9-1 Highway Network Screen lines Map 1 of 2

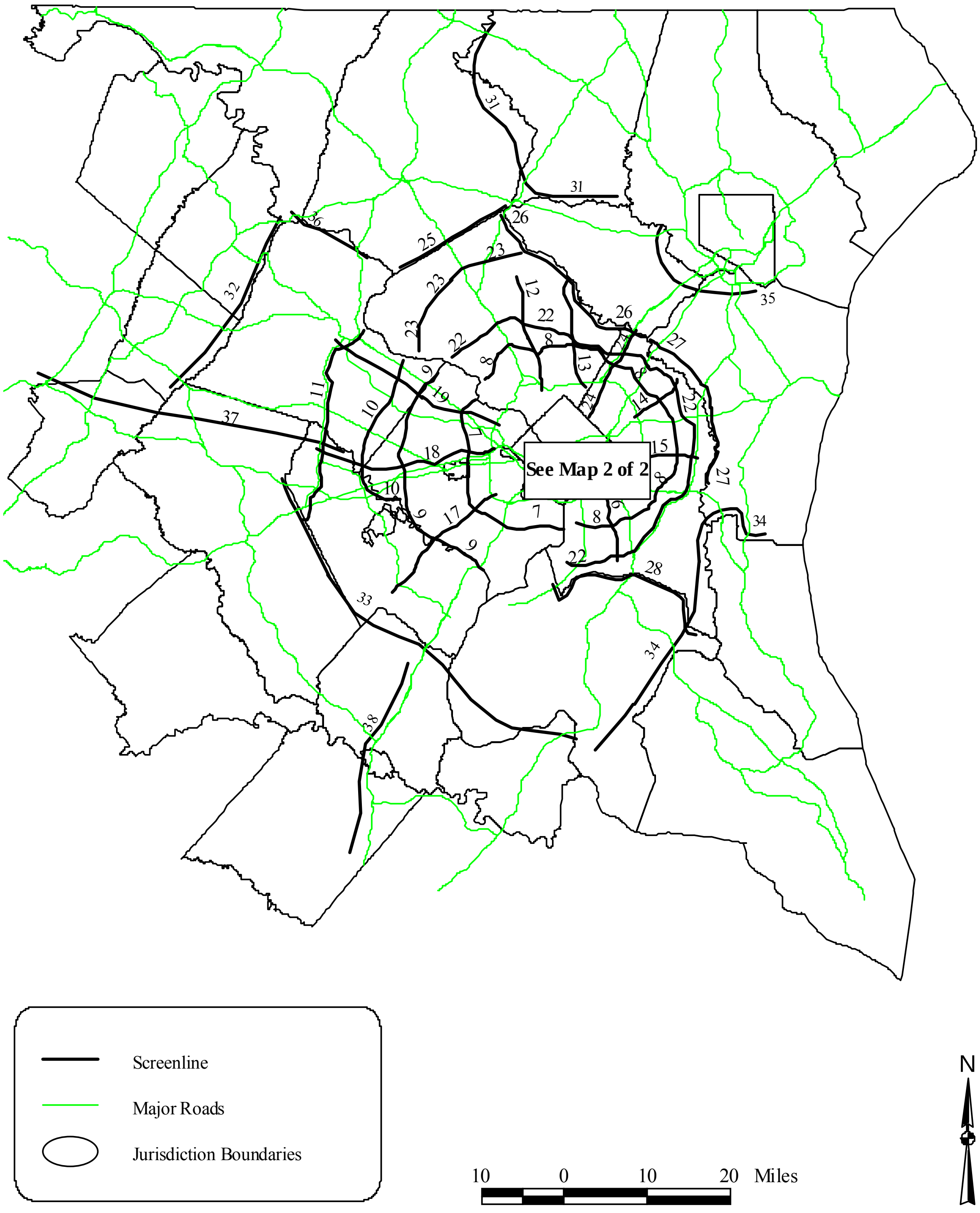


Figure 9-2 Highway Network Screen lines (Inside the Capital Beltway) Map 2 of 2

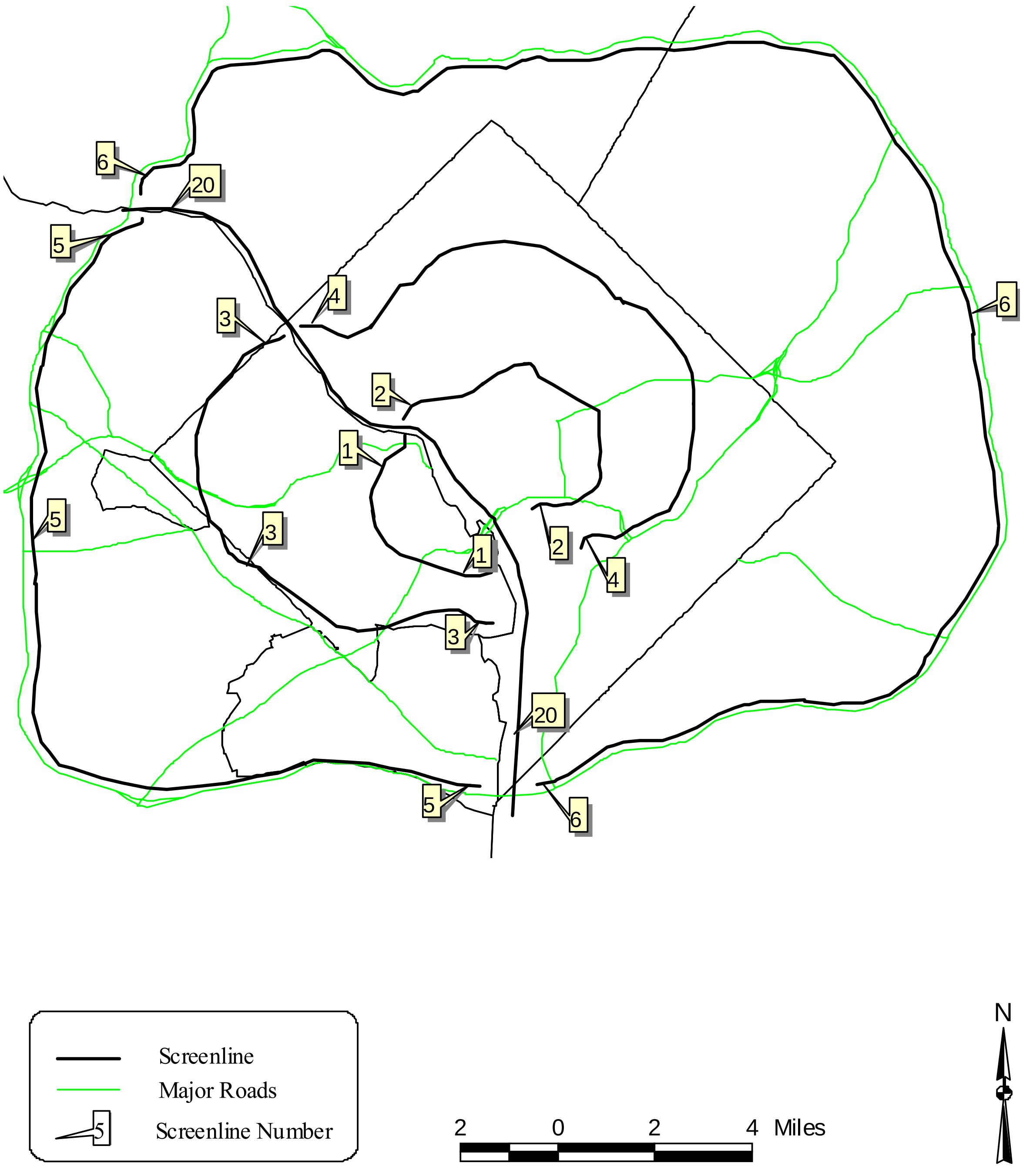


Table 9-3 Year 2005 Estimated and Observed Daily Screenline Crossings (in thousands)

	Version 2.2					
Screenline No.	Est	Obs	Ratio Est / Obs	No. of links w/ Screenline Code	No. of links w/ Counts	% of links w/ Counts
1	325	304	1.07	40	18	45.0%
2	396	294	1.35	74	14	18.9%
3	381	356	1.07	56	22	39.3%
4	484	366	1.32	66	22	33.3%
5	394	378	1.04	52	14	26.9%
6	1,047	992	1.06	100	40	40.0%
7	666	720	0.93	66	30	45.5%
8	522	494	1.06	102	22	21.6%
9	684	664	1.03	46	26	56.5%
10	77	122	0.63	20	8	40.0%
11	6	12	0.50	18	4	22.2%
12	234	272	0.86	32	6	18.8%
13	234	240	0.98	18	4	22.2%
14	187	244	0.77	16	2	12.5%
15	172	216	0.80	12	2	16.7%
16	133	162	0.82	16	2	12.5%
17	84	92	0.91	30	10	33.3%
18	247	306	0.81	35	18	51.4%
19	395	442	0.89	42	20	47.6%
20	1,037	958	1.08	14	14	100.0%
22	557	558	1.00	118	26	22.0%
23	157	140	1.12	24	8	33.3%
24	253	296	0.85	28	4	14.3%
25	14	10	1.40	8	2	25.0%
26	372	318	1.17	20	12	60.0%
27	176	154	1.14	16	8	50.0%
28	31	28	1.11	10	2	20.0%
31	111	72	1.54	20	12	60.0%
32	76	40	1.90	8	4	50.0%
33	104	80	1.30	14	6	42.9%
34	74	84	0.88	14	10	71.4%
35	792	854	0.93	42	30	71.4%
36	48	24	2.00	6	4	66.7%
37	49	38	1.29	10	8	80.0%
38	152	168	0.90	18	14	77.8%
Total	**10,671**	**10,498**	**1.02**	**1,211**	**448**	**37.0%**

Ref: Sum_links_2005_V22.xls

Table 9-4 Year 2000 Estimated Vs. Observed Transit Trips and Percentages by Purpose

				V21D#50		V22	
Purpose	**Est V2.1D50**	**Est V22**	**Obs**	**Diff. (Est-Obs)**	**Ratio (Est/Obs)**	**Diff. (Est-Obs)**	**Ratio (Est/Obs)**
HBW	502,001	532,668	538,582	-36,581	0.93	-5,914	0.99
Pct. Transit	*16.78%*	*18.27%*	*17.80%*	*-1.02%*	*0.94*	*0.47%*	*1.03*
HBS	34,079	46,657	33,262	817	1.02	13,395	1.4
Pct. Transit	*1.39%*	*1.89%*	*1.36%*	*0.03%*	*1.02*	*0.53%*	*1.39*
HBO	163,864	226,259	151,645	12,219	1.08	74,614	1.49
Pct. Transit	*2.24%*	*3.04%*	*2.07%*	*0.16%*	*1.08*	*0.97%*	*1.47*
NHB	156,238	144,549	166,461	-10,223	0.94	-21,912	0.87
Pct. Transit	*2.90%*	*3.54%*	*3.09%*	*-0.18%*	*0.94*	*0.45%*	*1.15*
Total	856,182	950,133	889,950	-33,768	0.96	60,183	1.07
Pct. Transit	*4.72%*	*5.62%*	*4.89%*	*-0.18%*	*0.96*	*0.73%*	*1.15*

Ref: compare_mceo_00_uns_scr.xls

Note: This summary excludes some portions of the modeled study where complete modal data was unavailable.

1. For home-based travel, the excluded area is:
   a) external trips, both IX and XI;
   b) trips FROM the following jurisdictions: St. Mary's, Clarke, Jefferson, Spotsylvania, Fredericksburg, or King George.
2. For non-home-based travel, the excluded area is:
   a) external trips, both IX and XI;
   b) trips FROM the following jurisdictions: Carroll, Howard, Anne Arundel, St. Mary's, Clarke, Jefferson, Spotsylvania, Fredericksburg, or King George;
   c) trips TO the following jurisdictions: Carroll, Howard, and Anne Arundel.

Ref: compare_mceo_00_uns_scr.xls

Table 9-5 Summary of Version 2.2 travel model output: Years 2000, 2005, 2008, 2009, 2010, 2020, and 2030

	2000	2002	2005	2008	2009	2010	2020	2030
Households	2,143,451	2,228,949	2,357,238	2,482,578	2,524,355	2,566,132	2,935,713	3,199,982
Employment	3,441,381	3,548,630	3,709,533	3,927,538	4,000,202	4,072,854	4,667,974	5,156,567
HH Population	5,632,014	5,843,440	6,160,526	6,467,172	6,569,380	6,671,579	7,527,123	8,133,627
HH & GQ Population	5,748,119	5,966,696	6,294,528	6,603,136	6,705,983	6,808,844	7,668,922	8,282,368
Extl. Productions/ HBW Auto Person	272,044	284,407	303,657	328,884	337,611	346,502	416,669	474,282
Extl. Productions/ HBS Auto Person	69,459	72,207	76,475	82,082	84,016	85,990	101,577	114,371
Extl. Productions/ HBO Auto Person	189,625	198,445	212,187	230,204	236,430	242,779	292,873	333,994
Extl. Productions/ NHB Auto Person	72,207	75,156	79,751	85,774	87,860	89,984	106,738	120,497
Extl. Productions/ Auto Person Subtotal	603,335	630,215	672,070	726,944	745,917	765,255	917,857	1,043,144
Extl. Productions/ Medium Truck	3,637	3,803	4,066	4,407	4,529	4,650	5,608	6,386
Extl. Productions/ Heavy Truck	23,517	24,605	26,292	28,504	29,266	30,046	36,194	41,246
Extl. Productions/ Truck Subtotal	27,154	28,408	30,358	32,911	33,795	34,696	41,802	47,632
Extl. Attractions/ HBW Auto Person	168,565	175,558	186,443	200,708	205,639	210,670	250,348	282,929
Extl. Attractions/ HBS Auto Person	68,295	71,141	75,566	81,367	83,373	85,421	101,552	114,800
Extl. Attractions/ HBO Auto Person	265,224	277,245	295,960	320,489	328,974	337,618	405,837	461,850
Extl. Attractions/ NHB Auto Person	72,193	75,146	79,741	85,765	87,852	89,975	106,726	120,480
Extl. Attractions/ Auto Person Subtotal	574,277	599,090	637,710	688,329	705,838	723,684	864,463	980,059
Extl. Attractions/ Medium Truck	3,637	3,803	4,066	4,407	4,529	4,650	5,608	6,386
Extl. Attractions/ Heavy Truck	23,517	24,605	26,292	28,504	29,266	30,046	36,194	41,246
Extl. Attractions/ Truck Subtotal	27,154	28,408	30,358	32,911	33,795	34,696	41,802	47,632
Inc. Grp 1 HHs	511,231	527,594	552,147	581,074	590,716	600,353	688,764	756,667
Inc. Grp 2 HHs	491,350	510,062	538,139	566,138	575,471	584,796	668,956	732,621
Inc. Grp 3 HHs	590,697	615,948	653,833	688,972	700,681	712,383	814,744	888,293
Inc. Grp 4 HHs	550,170	575,311	613,033	646,393	657,487	668,578	762,166	821,137
HHs Subtotal	2,143,448	2,228,915	2,357,151	2,482,577	2,524,354	2,566,110	2,934,630	3,198,718
1- person HHs	538,031	561,187	599,096	633,362	645,711	659,316	781,733	872,859
2- person HHs	658,171	685,312	723,030	763,473	776,402	789,537	903,985	985,693
3- person HHs	378,225	393,187	413,897	435,741	442,627	449,194	506,373	546,520
4+ person HHs	569,021	589,229	621,128	650,000	659,615	668,063	742,540	793,646
HHs Subtotal	2,143,448	2,228,915	2,357,151	2,482,577	2,524,354	2,566,110	2,934,630	3,198,718
0 Vehicle HHs	204,016	214,265	223,970	238,223	242,952	248,266	305,977	348,478
1 Vehicle HHs	707,242	736,334	780,123	825,247	840,150	856,069	997,895	1,100,248
2 Vehicle HHs	832,251	863,349	914,085	960,701	975,956	990,746	1,110,879	1,195,409
3+ Vehicle HHs	399,940	414,966	438,973	458,406	465,295	471,029	519,879	554,583
HHs Subtotal	2,143,448	2,228,915	2,357,151	2,482,577	2,524,354	2,566,110	2,934,630	3,198,718

Table 9-5 Continued

	2000	2002	2005	2008	2009	2010	2020	2030
HBW Motorized Person Trips	4,042,330	4,206,415	4,452,829	4,692,090	4,772,858	4,851,013	5,520,205	5,996,319
HBS Motorized Person Trips	3,115,082	3,237,127	3,424,359	3,604,849	3,665,228	3,723,890	4,221,172	4,569,541
HBO Motorized Person Trips	9,617,312	9,979,233	10,538,298	11,068,582	11,247,009	11,415,266	12,861,069	13,875,760
NHB Motorized Person Trips	5,288,394	5,497,525	5,821,022	6,121,597	6,222,072	6,318,215	7,143,369	7,723,519
Total Motorized Person Trips	22,063,118	22,920,300	24,236,508	25,487,118	25,907,167	26,308,384	29,745,815	32,165,139
Motorized Person Trips per HH	10.29	10.28	10.28	10.27	10.26	10.25	10.13	10.05
Motorized Person Trips per capita	3.84	3.84	3.85	3.86	3.86	3.86	3.88	3.88
Non-Motorized HBW Trips	171,191	176,558	187,602	202,787	207,087	212,133	255,781	292,158
HBW Auto Driver Trips	3,104,194	3,216,654	3,433,590	3,609,056	3,670,545	3,709,888	4,158,222	4,508,419
HBS Auto Driver Trips	2,463,254	2,557,004	2,706,749	2,856,557	2,905,427	2,952,551	3,360,190	3,650,906
HBO Auto Driver Trips	7,023,515	7,275,299	7,728,748	8,123,350	8,255,244	8,368,094	9,420,064	10,183,148
NHB Auto Driver Trips	4,008,715	4,164,592	4,430,517	4,667,499	4,745,857	4,819,538	5,454,338	5,931,222
Total Auto Driver Trips	16,599,678	17,213,549	18,299,604	19,256,462	19,577,073	19,850,071	22,392,813	24,273,695
HBW Auto Passenger Trips	388,900	398,772	423,589	443,796	453,975	493,503	594,895	647,367
HBS Auto Passenger Trips	603,645	623,958	661,718	686,918	697,190	707,404	779,531	829,349
HBO Auto Passenger Trips	2,362,597	2,453,201	2,569,061	2,682,994	2,722,841	2,771,623	3,093,649	3,311,387
NHB Auto Passenger Trips	1,133,623	1,171,899	1,231,466	1,282,072	1,301,007	1,320,473	1,466,911	1,556,516
Total Auto Passenger Trips	4,488,765	4,647,830	4,885,834	5,095,780	5,175,013	5,293,003	5,934,987	6,344,620
HBW Auto Occupancies	1.13	1.12	1.12	1.12	1.12	1.13	1.14	1.14
HBS Auto Occupancies	1.25	1.24	1.24	1.24	1.24	1.24	1.23	1.23
HBO Auto Occupancies	1.34	1.34	1.33	1.33	1.33	1.33	1.33	1.33
NHB Auto Occupancies	1.28	1.28	1.28	1.27	1.27	1.27	1.27	1.26
Total Auto Occupancies	1.27	1.27	1.27	1.26	1.26	1.27	1.27	1.26
HBW Transit Trips	549,236	590,989	595,650	639,238	648,338	647,622	767,088	840,533
HBS Transit Trips	48,183	56,165	55,892	61,374	62,611	63,935	81,451	89,285
HBO Transit Trips	231,200	250,733	240,489	262,238	268,924	275,549	347,356	381,224
NHB Transit Trips	146,056	161,034	159,039	172,026	175,208	178,204	222,120	235,781
Total Transit Trips	974,675	1,058,921	1,051,070	1,134,876	1,155,081	1,165,310	1,418,015	1,546,824
HBW Transit Percentage	13.59	14.05	13.38	13.62	13.58	13.35	13.9	14.02
HBS Transit Percentage	1.55	1.74	1.63	1.7	1.71	1.72	1.93	1.95
HBO Transit Percentage	2.4	2.51	2.28	2.37	2.39	2.41	2.7	2.75
NHB Transit Percentage	2.76	2.93	2.73	2.81	2.82	2.82	3.11	3.05
Total Transit Percentage	4.42	4.62	4.34	4.45	4.46	4.43	4.77	4.81

Table 9-5 Continued

	2000	2002	2005	2008	2009	2010	2020	2030
Medium Truck	300,967	311,641	327,730	345,086	350,911	356,751	406,270	445,544
Heavy Truck	155,519	161,405	169,770	179,976	182,805	186,390	215,618	240,939
Misc. Auto Driver	583,921	605,990	639,093	670,762	681,319	691,875	774,772	847,389
Through (X-X) Auto&Comm.Veh	37,330	39,077	41,818	45,414	46,663	47,931	57,941	66,161
Through (X-X) Trucks	29,852	31,278	33,503	36,416	37,419	38,451	46,553	53,208
Airport Passenger Auto Drivers	49,723	49,587	49,386	59,843	63,329	66,814	93,695	109,850
Commercial Vehicles (Int/&Extl)	1,106,894	1,138,689	1,192,629	1,253,674	1,273,063	1,291,828	1,459,392	1,588,607
Total Vehicle Trips	18,863,884	19,551,217	20,753,533	21,847,634	22,212,582	22,530,111	25,447,054	27,625,394
Freeway VMT	55,777,819	56,711,720	58,251,419	61,024,893	61,983,648	64,912,902	76,228,862	79,181,522
Major Art VMT	54,378,611	55,189,303	57,845,670	59,665,111	60,573,922	60,787,623	65,475,364	68,497,061
Minor Art VMT	17,588,653	18,300,023	19,420,629	21,493,837	21,786,637	22,264,400	26,171,351	28,655,538
Collector VMT	7,765,771	8,086,163	8,990,156	9,260,393	9,520,371	9,371,840	10,523,839	11,888,756
Express. VMT	7,259,335	6,993,936	7,199,168	6,690,930	6,690,138	6,738,361	7,593,303	9,412,480
Ramp VMT	1,197,081	1,207,265	1,261,239	1,271,906	1,284,303	1,345,388	1,491,599	1,565,948
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Total VMT	143,967,270.91	146,488,409.69	152,968,279.68	159,407,070.80	161,839,017.71	165,420,513.24	187,484,317.72	199,201,305.44
VMT per Capita	25.05	24.55	24.3	24.14	24.13	24.29	24.45	24.05
VMT per HH	67.17	65.72	64.89	64.21	64.11	64.46	63.86	62.25
VMT per Vehicle Trip	7.63	7.49	7.37	7.3	7.29	7.34	7.37	7.21

Ref: View_From_Space_V22.xls

9.2 *Sensitivity Testing*

TPB staff worked with the TFS in formulating a series of sensitivity tests during the spring and summer of 2007. The sensitivity tests were not undertaken with the 'final' Version 2.2 model that is specified in this report, but rather, were undertaken with the draft form of the model that was available in the spring of 2007. The sensitivity work focused on two 'dynamic validation' tests and a single future transit fare test. Dynamic validation refers to an assessment of travel pattern changes when a critical highway link is either modified or removed, for a base year condition. Two such tests where studied:

1) the removal of the John Phillip Sousa Bridge and;
2) a reduction in the directional lanes, from 4 to 3, on the American Legion (Capital Beltway) Bridge.

A transit fare sensitivity test was also undertaken for the year 2030. The standard escalation assumption that transit fares will rise directly with the historical inflation rate was modified to reflect a rise of *one-half* of the inflation rate.

The results of the dynamic validation tests were generally found to be reasonable. The Sousa bridge closure resulted in a VMT decrease of 50,000 (from a base of 143 million vehicle miles) and an increase of 7,100 transit trips (from a base of 981,000 total transit trips). The general decrease in VMT was attributed to what one would expect with a loss of bridge capacity: increased congestion and a reduction in mobility. Some TFS members commented that a bridge closure might result in an increase in VMT due to traffic re-routing. Ultimately it was agreed that increased VMT due to re-routing would be likely be a short-term effect that a long range forecasting model would not capture. The most significant trip distribution change at the jurisdiction level was a decrease in 5,100 auto driver trips between Prince George's County and the District, as one would expect. Accordingly, transit trips for the same interchange increased by 5,600 trips. The American Legion Bridge lane reduction resulted in a decrease of 211,000 vehicle miles, with no significant difference in transit trips at the jurisdiction level. The differences in auto driver trip patterns reflected diminished interaction between Montgomery County and Fairfax County (-12,400) as well as in the reverse direction (-10,600). Accordingly, auto driver trips within Montgomery County increased by 16,000. These are results that one would expect. Bandwidth volume-difference plots indicated that shifts in travel patterns were reasonable.

When assuming that 2030 transit fares will grow at one-half the rate of inflation, as opposed to the standard assumption that fares will escalate directly with the rate of inflation, regional transit trips increased by 284 thousand, from 1.535 million to 1.819 million trips. This result reasonably matched expectations. The increase in transit ridership, in turn, caused a reduction in the regional VMT by about 300 thousand, from 199.9 million to 199.6 million. The calculated HBW fare elasticity implied by this test was -0.29, which is in line with the commonly cited elasticity value of -0.30.

TPB staff also summarized estimated and observed vehicular crossings of the Metro Core and the Capital Beltway, as a way of checking on how well the model was matching directional counts by time of day. Observed cordon counts are normally collected in the inbound direction during the AM-peak period, and in the outbound direction during the PM peak period. These data are one-day counts that are periodically surveyed (typically, every 3 to 6 years). Observed Metro Core counts were assembled from the years 1996, 2002, and 2006. Beltway counts were assembled for the years 1995, 1998, and 2001. These observed count sets were compared against comparable simulated crossings for the years 2000 and 2005. Generally the 2000 and 2005 model results trended reasonably the observed data in all cases, except for the Metro Core Cordon in the PM/outbound direction where the model appeared to over-estimate traffic crossings by over 30%. The over-estimation of PM outbound traffic perhaps indicates where the regional time-of-day model (which essentially involves global factors that are applied by purpose and direction) falls short in capturing 'real world' policies affecting traveling schedules. Such policies might include, for example, the staggered work scheduling that is offered to the federal employees (which happen to be concentrated in the regional core). This type of policy would, of course, tend to spread the peak travel pattern. The time-of-day model could potentially be adjusted to account for this type of policy, but at the same time, the TPB should be wary about adding adjustments when staff has recently been working to remove external factors from the model. Furthermore, the use of such adjustments may reflect a policy that may not continue over time.

The sensitivity testing described above was considered useful for assessing the Version 2.2 model's response to various test conditions. This type of analysis will continue to be undertaken as a validation step as part of model development future work.

Chapter 10 Model Application Overview

The Version 2.2 travel model is executed on microcomputer running Windows XP Professional (32-bit version), Windows XP Home (32-bit version), or Windows Server 2003 (32-bit version). Other later Windows operating systems, such as Windows Vista, may work, but they have not been tested by COG/TPB staff. The 64-bit version of Windows should not be used for executing the Version 2.2 model because several of the Fortran programs used in the Version 2.2 model are not compatible with that type of operating system. COG/TPB staff has executed Version 2.2 using Intel-based computers, but alternative “clones” (e.g., AMD) should suffice as well.

The Version 2.2 travel model is executed with Cube Base and TP+ application software (version 4.1.1). This commercial software package is available from Citilabs (www.citilabs.com) and must be installed on the microcomputer before the Version 2.2 model is applied. The use of earlier TP+ versions will likely preclude the ability to replicate model results presented in this report. To determine which version of TP+ is installed in Windows, select Start => All Programs => Citilabs Licensed Software => TP+ Models and Utilities => TP+. Click the button “About TPPLUS”. All of the modules listed (e.g., TPMAIN, HWYLOAD, HWYNET, MATRIX, TRNBUILD, LIBRARY) should explicitly indicate Version 4.1.1. COG/TPB staff currently uses Cube Base Version 4.1.1

Computers running the Version 2.2 model should be equipped with at least 3 GB RAM of memory and a minimum hard drive size of 100 GB. The microcomputer marketplace now offers machines with multiple central processing units (CPUs). A “Quad Core” CPU is currently recommended for minimizing model running times, as opposed to the Dual Core CPU or single-core CPU which are generally lower in price. Multiple CPU machines are preferred over single core computers because they enable one to more easily multitask as model is in execution. TPB’s fastest computer is currently a single processor Quad Core Intel Xeon X5365, with a clock speed of 3.00 GHz, and bus speed of 1,333 MHz. This computer can complete a model run in half the time needed by a similar computer using two Dual Core CPUs. Although we have a modeling server that is running Windows Server 2003, our fastest computer (mentioned above) is running Windows XP Professional and has not yet been tested with Windows Server 2003.

Model run times are approximately 20-30 hours in duration, depending on hardware and modeled scenarios (“out” year model executions generally require longer running times than do “base” year executions). These run times do not reflect the incorporation of distributed processing (DP) which increases processing speed by enabling the use of multiple CPUs for a single modeling process. The DP capability has recently been made available, but has not yet been fully incorporated into the TPB travel model. Each scenario (e.g., 2002, 2020, etc.) results in approximately 1,000 output files, requiring 3.5 GB of hard disk space.

A powerful text editor is also strongly recommended to support modeling work. TPB staff uses both KEDIT, a commercial package (http://www.kedit.com/), and PSPad, a freeware text editor (http://www.pspad.com/). PSPad can be configured to highlight (color code) syntax for various languages (e.g., SAS, Fortran, even TP+). Color coding of syntax can help eliminate syntax errors. TPB also recommends using the following utility software:

- Windows “Open Command Window Here” PowerToy (CmdHere.exe), which allows one to right-click a folder in Windows Explorer and open a command window at that folder/subdirectory location.
- TimeThis.exe: Allows one to time a command. This is a tool found in the “Windows 2000 Resource Kit.” This utility is called from runall????.bat (and is included is with TPB transmittals) .
- Tee.exe: Splits standard output (normally sent to either the screen or a file) to both the screen and a file at the same time. This is part of the Windows 2000 Resource Kit. This is also called from runall????.bat (and is included with TPB transmittals).

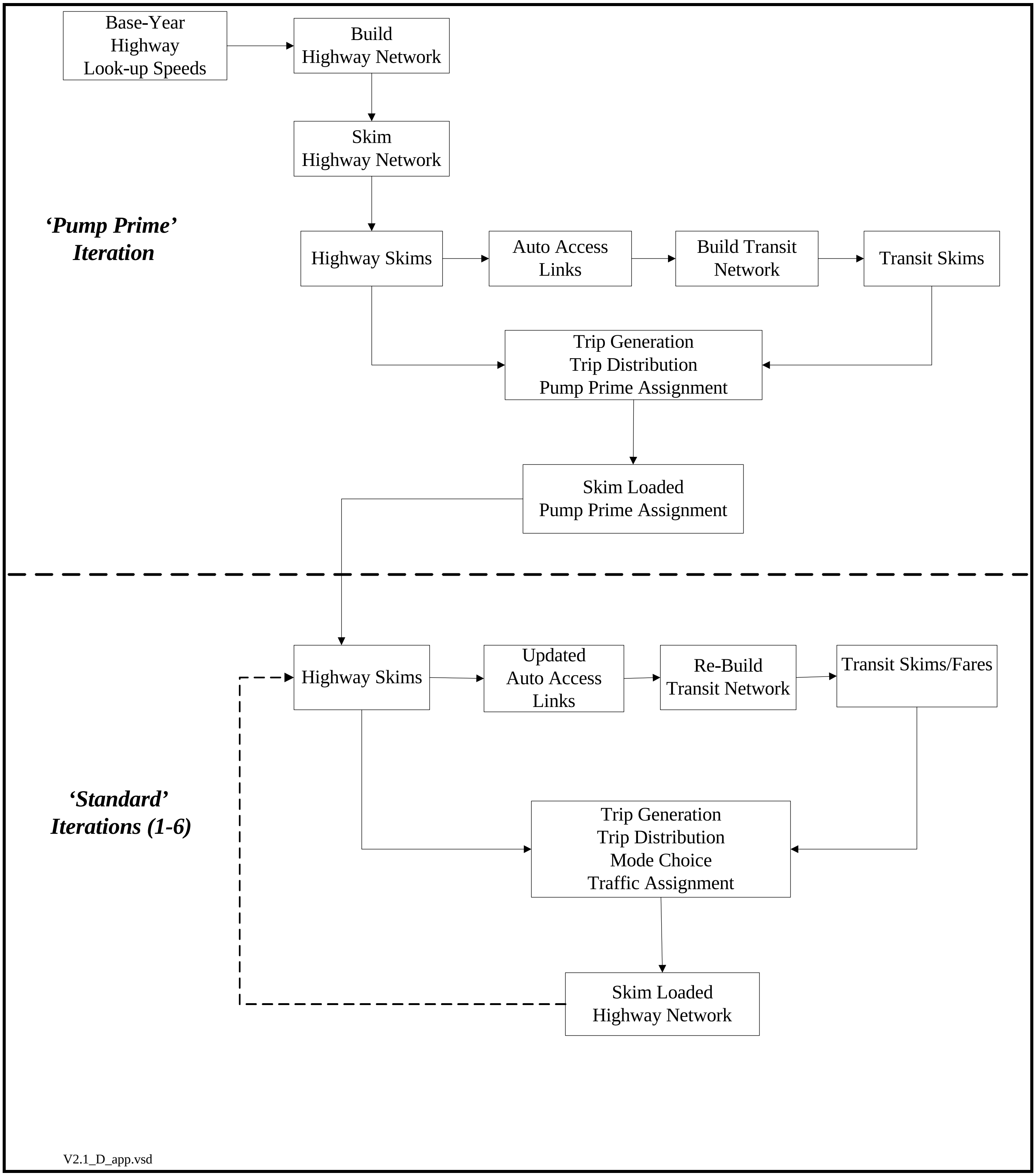
The application steps of the model are graphically outlined on Figure 10-1. The figure indicates that an initial (or pump-prime) iteration occurs where a first pass of the four-step process occurs using *initial* AM and off-peak highway speeds, and *initial* mode choice percentages (the mode choice model is not executed in the initial iteration). The ‘skimmed’ highway times are used to develop zone–to-PNR lot links as part of the transit network. After the transit network is built and skimmed, trip generation and trip distribution are next executed. The resulting person trips are converted to vehicle trips on the basis of default mode choice and car occupancy percentages, which are then assigned to the highway network.

The next series of ‘standard’ iterations (1 through 6) involve the execution of the complete four step model which now includes: 1) a mode choice model execution and 2) the use of recycled traffic assignment based speeds as input. The AM and off-peak restrained highway times are used to update the zone-to-PNR link speeds, and the transit network is again built and skimmed. The highway and transit time skims are used as inputs to the mode choice model. The auto driver trips produced from the mode choice model are processed through the time-of-day model, and then the next highway assignment step is executed. The assignment consists of three separate assignments, pertaining to the AM period (6-9 AM), PM period (4-7 PM), and off-peak period (all other hours of the day). The standard four-step loop iterates six times.

The Version 2.2 model uses a successive volume averaging for each of the three time-of-day periods to force convergence of link volumes, and hence, link highway speeds. The averaging occurs 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 from the pump-prime iteration.
- The ‘final’ second iteration link volume equals one half of the first iteration link volume plus one half 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.

Figure 10-1 Application process of the Version 2.2 travel model



Typically, by the 6th iteration, over 99% of the highway links yield restrained speeds that are within +/-2 mph of the previous (fifth) iteration speed. Although a fixed number of speed feedback iterations (i.e., 6) are used, the modeler should check the highway assignment report file (i6_Highway_Assignment.rpt) to make sure that key convergence metrics (e.g., relative gap or RELGAP) are within desired tolerances.

10.1 *Executing the Model*

A structured application procedure has been established for applying the Version 2.2 model from a command-prompt window. The procedure involves:

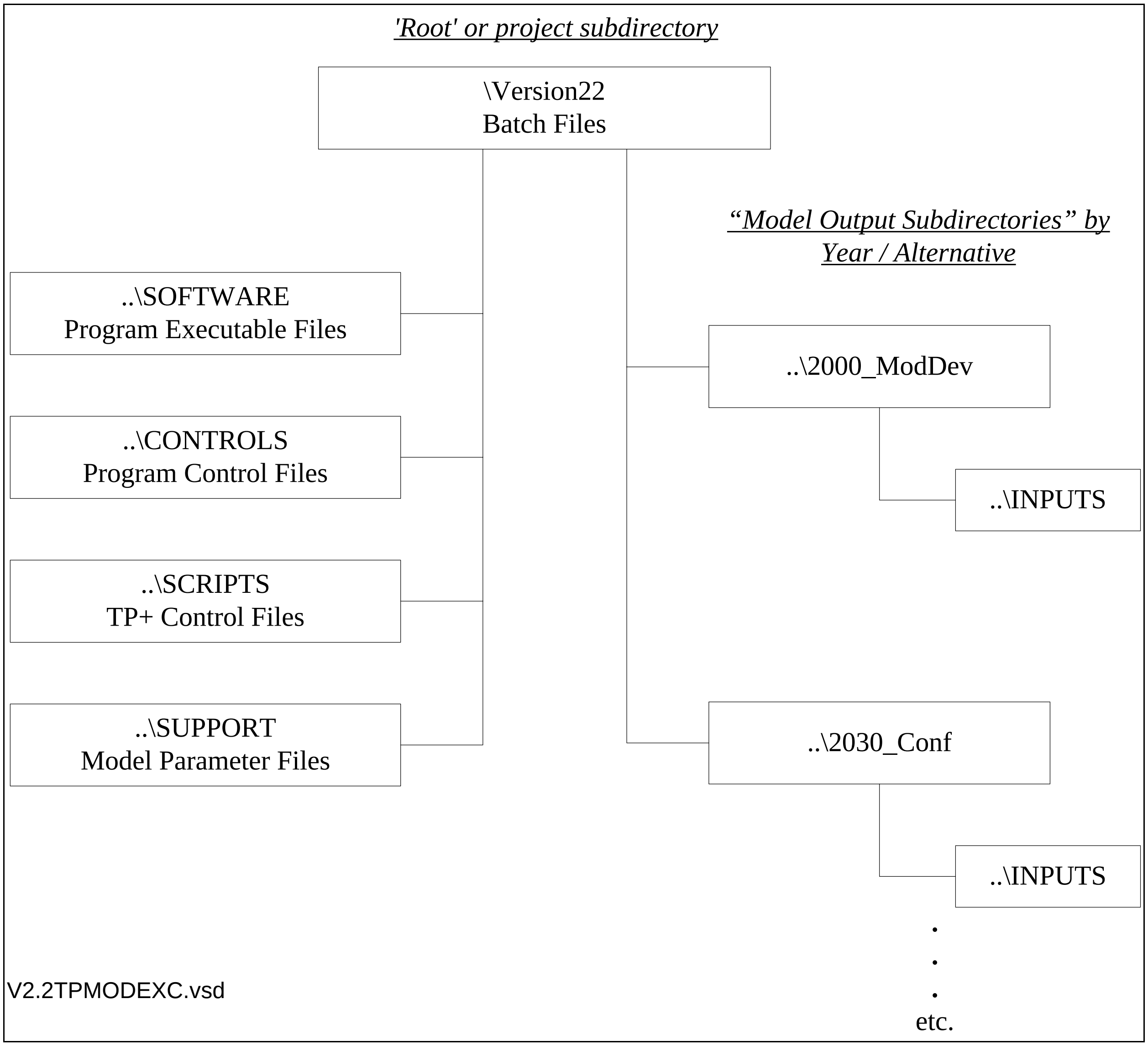
1. A series of pre-established batch files;
2. A standardized subdirectory system, in which input files, output files, TP+ scripts, etc. are rigidly organized; and
3. The use of generically named input and output files, which are stored in designated locations in the subdirectory system.

An example subdirectory structure for applying the Version 2.2 model is shown graphically on Figure 10-2. A ‘root’ subdirectory appears at the top of the structure. The root subdirectory may exist anywhere on the computer hard drive and may be arbitrarily named by the analyst (the name typically is related to a project). On the left side of the figure, there are four specially designated subdirectories under the root which are established specifically for non-TP+ software executables (*SOFTWARE*), control files that are required by some of the executables (*CONTROLS*), TP+ scripts (*SCRIPTS*), and general parameter files used by the scripts or executables (*SUPPORT*). The SUPPORT subdirectory is reserved for parameter files that generally do not change by year or alternative such as K-factors, F-factors, and the like. These four subdirectories must exist under the root, and must be named as shown. Furthermore, the files residing in these four subdirectories must not be altered or renamed.

The right side of Figure 10-2 shows subdirectories that are established for model inputs and outputs of one or more alternatives or scenarios. The figure indicates that each alternative subdirectory has its own *INPUTS* subdirectory where all necessary model inputs are stored and generically named (e.g., land use file, network files, etc.). The scenario-specific subdirectory (e.g., ..\2000 on Figure 10-2) is arbitrarily named and typically has some relation to a year and/or an alternative being modeled. The user may establish one or many such alternative subdirectories as long as a unique \INPUTS subdirectory exists under it. \INPUTS subdirectories can not be shared among more than one alternative.

Standardized ‘parent’ and ‘child’ batch files reside in the root subdirectory. The ‘child’ batch files function to execute individual modeling steps, such as the trip generation step or the traffic assignment step. ‘Child’ batch files generally call TP+ scripts and/or program executables. There are also named listings that result from each model step. Listing files are assigned *.RPT or *.TAB naming extensions. The former refers to TP+ listings while the latter refers to a subset of the report file containing only trip table totals or jurisdictional summaries. ‘Parent’ batch files are used to string ‘child’ batch files together so that the entire model execution can be initiated with a single line command (see report section 10.2). The ‘parent’ batch file also establishes environment variables that are used in the child batch files, such as the iteration number, the model year, and the model description.

Figure 10-2 Subdirectory Structure for executing the Version 2.2 Model



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 list of the software executables is shown on Table 10-1. There are fewer non-TP+ executables used by the Versions 2.2 model than in previous TPB models, since several Fortran programs have been converted to TP+ scripts. A list of the generically named input files is shown in Table 10-2. The files shown in this list must exist, as named, in the \INPUTS subdirectory. Each file must be provided in the prescribed file format (described later).

A listing of ‘child’ batch files is provided on Table 10-3. The table also indicates the programs and/or TP+ scripts that are invoked and the purpose of each batch file. Given the iterative application process of the model, most of the batch files are called multiple times during an execution. The sequence of batch file applications, by iteration, is shown on Table 10-4. The table indicates that there are 72 batch files steps called during a standard application of the model. Some of the batch files are called once, while others (e.g., trip_generation.bat) are called during the pump-prime and all 6 standard iterations. A ‘parent’ batch file is used to string each of the 72 ‘child’ batch files together during a typical model execution. The ‘parent’ batch files, like ‘child’ batch files, reside in the root subdirectory. A ‘parent’ batch file is typically prepared for each individual model run. The process for executing a model is addressed in the next section. The remaining chapters address the specific details of each modeling step.

Table 10-1 Non-TP+ Software Required for Version 2.2 Model Execution

Executable Name	Size (bytes)	Date	Program Function	Comments	Requires a Control File?
STAPROTP.EXE	141,568	2/25/2005	Creates support files for transit network building from station file		Yes
NODESTB.EXE	421,396	6/27/2007	Reads TRNBUILD route/line files; Creates formated stop node file	Executed 2X to process AM/Off-Pk transit lines	Yes
SORTLINE.EXE	45,056	12/3/2007	Sorts the stop nodes file	Executed 2X to process AM/Off-Pk transit lines	No
CNTCONN2.EXE	488,668	6/26/2007	Creates walk access links (TAZs to transit stops)	Executed 2X to process AM/Off-Pk transit lines	Yes
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	Yes
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	Yes
COGMCA1.EXE	232,468	6/2/2004	Creates the zonal data file ("A1-deck") for the mode choice model	Executed 4 times (once for each purpose)	Yes
COGMC.EXE	561,486	4/6/2001	Applies COG's mode choice model	Executed 4 times (once for each purpose)	Yes
EXTRTAB.EXE	24,663	7/26/2001	Extracts sections from TP+ report files.	Program is 'called' by many TP+ Scripts	No

Ref: v22_software.xls

Table 10-2 Input Files Required for the Version 2.2 Model Execution

	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.TB,… MODE9AM.TB	AM Transit Line Files, Mode 1 to 9	Text
13	Network, transit	MODE1OP.TB,… MODE9OP.TB	Off-peak Transit Line Files, Mode 1 to 9	Text
14	Network, transit	STA_TPP.BSE	Rail Station/PNR File	Text
15	Network, transit	RAIL_LNK.BSE	Rail Links	Text
16	Network, transit	TRNPEN.DAT	Metrorail Station Network Turn Penalty File	Text
17	Network, transit	GISWKAAM.ASC	GIS AM Zonal Walk Area File	Text
18	Network, transit	GISWKAOP.ASC	GIS Off-Peak Zonal Walk Area File	Text
19	Network, transit	GISWKLAM.ASC	GIS AM Walk Link File	Text
20	Network, transit	GISWKLOP.ASC	GIS Off-Peak Walk Link File	Text
21	Network, transit	LBUS_TIMFTRS.ASC	Local Bus Time Degradation Factors	Text
22	Network, transit	RIVERSTP.BNA	River Coordinate File	Text
23	Network, transit	TAZFRZN.ASC	TAZ/Bus Fare Zone Equivalency	Text
24	Network, transit	BUSFARAM.ASC	MFARE2 AM Bus Fare Zone Matrix	Text
25	Network, transit	BUSFAROP.ASC	MFARE2 Off-Peak Fare Zone Matrix	Text
26	Network, transit	HBOMC.OLD	Initial HBO Mode Choice Trips	Binary
27	Network, transit	HBSMC.OLD	Initial HBS Mode Choice Trips	Binary
28	Network, transit	HBWMC.OLD	Initial HBW Mode Choice Trips	Binary
29	Network, transit	NHBMC.OLD	Initial NHB Mode Choice Trips	Binary
30	Network, transit	mfare1_Sta_Disc.ASC	Metrorail Station Discount File	Text
31	Network, transit	Tariff.txt	WMATA Tariff policy control file	Text
32	Network, transit	CPI_FILE.txt	Historical CPI file	Text
33	Network, transit	walk_am.old	Extra AM transit access links (optional input file)	Text
34	Network, transit	walk_op.old	Extra Off-Peak transit access links (optional input file)	Text
35	Trip	AEXT.ASC	Zonal External Attractions	Text
36	Trip	PEXT.ASC	Zonal External Productions	Text
37	Trip	CV_ExtThru_Ends.ASC	Zonal Commercial Vehicles External and Through trip ends	Text
38	Trip	AIRPAX.ADR	Air Passenger Auto Dr. Trips	Binary
39	Trip	SCHL.ADR	School Auto Dr. Trips	Binary
40	Trip	TAXI.ADR	Taxi Auto Dr. Trips	Binary
41	Trip	VISI.ADR	Visitor/Tourist Auto Dr. Trips	Binary
42	Trip	XXAUT.VTT	Through Auto Drivers	Binary
43	Trip	XXTRK.VTT	Through Trucks	Binary
44	Trip	XXCV.VTT	Through Commercial Vehicles trips	Binary

Ref: v22_inputs.xls

Table 10-3 Batch Files Used in the Version 2.2 Model Execution

Batch File	Scripts / Programs	Purpose
Set_Factors.bat	Set_Factors.s	Create K-factors and time penalties
Set_CPI.bat	Set_CPI.s	Create highway and transit cost deflators
PP_Highway_Build.bat	Staprotp.exe Highway_Build_Toll.s	Extract transit network elements from station file. Build highway network
PP_Highway_PNR.bat	Pump_Prime_Skims.s	Create initial AM/ off-peak hwy. skims & auto access links
Highway_PNR.bat	Auto_Access.s	Create current iteration auto access links
PP_Transit_Prep.bat	NodesTB.exe Cntconn2.exe Gis_proc.exe Wlklnktp.exe Update_Wklinks.s Prefartp.s	Create base transit network, walk links, and transit fare file
Transit_Skim.bat	Transit_Skims.s	Create transit skims of initial or current iteration
Transit_Fare.bat	Metrorail_Skims.s Mfare1.s Mfare2.s	Create current iteration transit fares
Trip_Generation.bat	Demo_models.s Trip_Generation.s CV_Trip_Generation.s COGMCA1.exe	Execute daily trip generation
Trip_Distribution.bat	Trip_Distribution.s CV_Trip_Distribution.s	Execute daily trip distribution
Mode_Choice.bat or Mode_Choice_TC.bat or HSR10_Mode_Choice.bat or HSR20_Mode_Choice_TC10.bat or HSR30_Mode_Choice_TC10.bat	COGMC.exe MC_Summary.s MC_Constraint.s MC_ConSummary.s	Execute daily mode choice model (optionally execute mode choice model with the Transit Constraint (TC) and/or with HOV Skim Replacement (HSR))
PP_Auto_Drivers.bat	PP_Auto_Drivers.s	Generate initial auto drivers (without mode choice model)
Auto_Driver.bat	MC_Auto_Drivers.s	Generate initial auto drivers after mode choice model
Time-of-Day.bat	Time-of-Day.s CV_Time-of-Day.s Misc_Time-of-Day.s	Convert daily modeled trips to AM, PM, and Off-peak
Highway_Assignment.bat	Highway_Assignment.s	Execute user equilibrium hwy. assignment using Frank-Wolfe algorithm
Highway_Skims.bat	Highway_Skims.s	Create highway skims from assignment

Ref: Flowchart_Table.xls

Table 10-4 Sequence of Batch Files Executed by Iteration

		Initial (Pump Prime) Iteration	Standard Iterations					
Batch File	**Scripts / Programs**	PP	1	2	3	4	5	6
Set_Factors.bat	Set_Factors.s	1						
Set_CPI.bat	Set_CPI.s	2						
PP_Highway_Build.bat	Staprotp.exe Highway_Build_Toll.s	3						
PP_Highway_PNR.bat	Pump_Prime_Skims.s	4						
Highway_PNR.bat	Auto_Access.s		13	23	33	43	53	63
PP_Transit_Prep.bat	NodesTB.exe Cntconn2.exe Gis_proc.exe Wlklnktp.exe Update_Wklinks.s Prefartp.s	5						
Transit_Skim.bat	Transit_Skims.s	6	14	24	34	44	54	64
Transit_Fare.bat	Metrorail_Skims.s Mfare1.S Mfare2.s		15	25	35	45	55	65
Trip_Generation.bat	Trip_Generation.s CV_Trip_Generation.s	7	16	26	36	46	56	66
Trip_Distribution.bat	Trip_Distribution.s CV_Trip_Distribution.s	8	17	27	37	47	57	67
Mode_Choice.bat or Mode_Choice_TC.bat or HSR10_Mode_Choice.bat or HSR20_Mode_Choice_TC10.bat or HSR30_Mode_Choice_TC10.bat	COGMC.exe MC_Summary.s MC_Constraint.s MC_ConSummary.s		18	28	38	48	58	68
PP_Auto_Drivers.bat	PP_Auto_Drivers.s	9						
Auto_Driver.bat	MC_Auto_Drivers.s		19	29	39	49	59	69
Time-of-Day.bat	Time-of-Day.s CV_Time-of-Day.s Misc_Time-of-Day.s	10	20	30	40	50	60	70
Highway_Assignment.bat	Highway_Assignment.s	11	21	31	41	51	61	71
Highway_Skims.bat	Highway_Skims.s	12	22	32	42	52	62	72

Ref: Flowchart_Table.xls

10.2 *Launching a Model Run*

The model is normally launched with a very small ‘wrapper’ batch file that executes the ‘parent’ batch file described above. The ‘wrapper’ batch file name is a pre-existing batch file that is typed from a command window that is opened to the root subdirectory. This may be done expeditiously by opening Windows Explorer, navigating to the root directory, selecting the root subdirectory, and right-clicking the mouse, choosing “Open Command Window Here” in Windows XP.[1] The command prompt should show something like this:

```
C:\user\cgv22>
```

A number of pre-existing batch (*.bat) files will normally exist in the root directory. One of these batch files is designated for initiating a model run. For example, RUNALL2000.bat is used to initiate a model run for the year 2000 (see below).

```
:: runall2000.bat, 2008-01-04
:: Source:  M:\model_dev\Version2.2


set root=F:\model_dev\Version2.2
set scenar=2000_ModDev
set runbat=runall_2000.bat
set fullpth=%root%\%scenar%
:: Std error redirected to a file; Std output split between file and screen
timethis "cmd /c %runbat%  %scenar%  2> %fullpth%\%scenar%_errs.txt" | tee
%fullpth%\%scenar%_output.txt
start %fullpth%\%scenar%_errs.txt
start %fullpth%\%scenar%_output.txt

:: Cleanup
set root=
set scenar=
set fullpth=
set runbat=
```

The above batch file is used to specify the root and model output subdirectories and initiates the model run by calling another batch file. The basic syntax of the execution command is:

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

For example:

```
runall_2000.bat 2000
```

[1] In Windows XP, the “Open Command Windows 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).

will run the "runall_2000.bat" batch file using the "2000" 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\cgv22>set _year_=2000

C:\user\cgv22>set _alt_=Base

C:\user\cgv22>rem ====== Pump Prime Iteration ==========================================

C:\user\cgv22>set _iter_=pp

C:\user\cgv22>set _prev_=pp

C:\user\cgv22>call Set_Factors.bat 2000

C:\user\cgv22>cd support

C:\user\cgv22\support>del tppl*.*

C:\user\cgv22\support>del set_factors.rpt

C:\user\cgv22\support>start /w TPPLUS.EXE ..\scripts\Set_Factors.s /start -Ptppl -S..\support

C:\user\cgv22\support>if errorlevel 1 goto error

C:\user\cgv22\support>copy tppl*.prn set_factors.rpt
tppl0001.PRN
        1 file(s) copied.
```

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 (or later). When launching 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:

```
cmd /c runall_2000.bat 2000 2> errs2000.txt
```

The "cmd /c" starts a new instance of the Windows XP 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\cgv22> timethis “cmd /c runall_2000.bat 2000 2> errs2000.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  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 until 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.[2] Thus, the final command is:

```
timethis "cmd /c runall_2000.bat    2000  2> errs2000.txt" | tee scr_outp2000.txt
```

Table 10-5 contains a listing of the key files resulting from the final iteration.

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

Table 10-5 Listing of Final Iteration (I6) Files Produced by the Version 2.2 Model

File Name	Model Step File Created	File Contents	File Type	File Format
i6_AM_WK.STA	Transit Network Building	Metrorail station-to-station file (t1-2: boarding, alighting station)	Zonal Skim Matrix	TP+ binary
i6_AM_DR.STA	Transit Network Building	Metrorail station-to-station file (t1-2: boarding, alighting station)	Zonal Skim Matrix	TP+ binary
i6_OP_WK.STA	Transit Network Building	Metrorail station-to-station file (t1-2: boarding, alighting station)	Zonal Skim Matrix	TP+ binary
i6_OP_DR.STA	Transit Network Building	Metrorail station-to-station file (t1-2: boarding, alighting station)	Zonal Skim Matrix	TP+ binary
i6_AM_WK.SKM	Transit Network Building	Transit component skims file t1-6: xfr wlk, dr acc.,ini.wait, xfr wait,bus ivt., metrorail ivt	Zonal Skim Matrix	MINUTP binary
i6_AM_DR.SKM	Transit Network Building	Transit component skims file t1-6: xfr wlk, dr acc.,ini.wait, xfr wait,bus ivt., metrorail ivt	Zonal Skim Matrix	MINUTP binary
i6_OP_WK.SKM	Transit Network Building	Transit component skims file t1-6: xfr wlk, dr acc.,ini.wait, xfr wait,bus ivt., metrorail ivt	Zonal Skim Matrix	MINUTP binary
i6_OP_DR.SKM	Transit Network Building	Transit component skims file t1-6: xfr wlk, dr acc.,ini.wait, xfr wait,bus ivt., metrorail ivt	Zonal Skim Matrix	MINUTP binary
i6_AM_WK.TTT	Transit Network Building	Total AM walk acc. transit time skims (t1/ total transit time (min))	Zonal Skim Matrix	TP+ binary
i6_AM_DR.TTT	Transit Network Building	Total AM drive acc. transit time skims (t1/ total transit time (min))	Zonal Skim Matrix	TP+ binary
i6_OP_WK.TTT	Transit Network Building	Total OP walk acc. transit time skims (t1/ total transit time (min))	Zonal Skim Matrix	TP+ binary
i6_OP_DR.TTT	Transit Network Building	Total OP drive acc. transit time skims (t1/ total transit time (min))	Zonal Skim Matrix	TP+ binary
i6_AM_WK.FAR	Transit Fare Building	Total AM walk acc. transit fare skim (t1/ total transit fare ('94 cents)	Zonal Skim Matrix	MINUTP binary
i6_AM_DR.FAR	Transit Fare Building	Total AM drive acc. transit fare skim (t1/ total transit fare ('94 cents)	Zonal Skim Matrix	MINUTP binary
i6_OP_WK.FAR	Transit Fare Building	Total OP walk acc. transit fare skim (t1/ total transit fare ('94 cents)	Zonal Skim Matrix	MINUTP binary
i6_OP_DR.FAR	Transit Fare Building	Total OP drive acc. transit fare skim (t1/ total transit fare ('94 cents)	Zonal Skim Matrix	MINUTP binary
i6HH_Veh.dat	Demographic Model	Zonal HHs by Vehs. Avail (0, 1, 2+)	Zonal Attribute File	Text
i6HHI1_SV.ASC	Demographic Model	Zonal Income level 1 HHs by size (1, 2, 3, 4) and vehs. Avail (0, 1, 2, 3+)	Zonal Attribute File	Text
i6HHI2_SV.ASC	Demographic Model	Zonal Income level 2 HHs by size (1, 2, 3, 4) and vehs. Avail (0, 1, 2, 3+)	Zonal Attribute File	Text
i6HHI3_SV.ASC	Demographic Model	Zonal Income level 3 HHs by size (1, 2, 3, 4) and vehs. Avail (0, 1, 2, 3+)	Zonal Attribute File	Text
i6HHI4_SV.ASC	Demographic Model	Zonal Income level 4 HHs by size (1, 2, 3, 4) and vehs. Avail (0, 1, 2, 3+)	Zonal Attribute File	Text
i6_Demo_Models.txt	Demographic Model	Regional Summary Report		Text
i6_Trip_Generation.txt	Trip Generation	Jurisdictional Summary Report		Text
hbwesti6.ptt	Trip Distribution	Daily HBW Person trips (t1-7: Income 1,.., Income 4, Extl_ Interstate, Extl_ Arterial, Total)	Zonal Trip Matrix	TP+ binary
hbsesti6.ptt	Trip Distribution	Daily HBS Person trips (t1-7: Income 1,.., Income 4, Extl_ Interstate, Extl_ Arterial, Total)	Zonal Trip Matrix	TP+ binary
hboesti6.ptt	Trip Distribution	Daily HBO Person trips (t1-7: Income 1,.., Income 4, Extl_ Interstate, Extl_ Arterial, Total)	Zonal Trip Matrix	TP+ binary
nhbesti6.ptt	Trip Distribution	Daily NHB Person trips (t1-4: Internal, Extl_ Interstate, Extl_ Arterial, Total)	Zonal Trip Matrix	TP+ binary
mtkesti6.vtt	Trip Distribution	Daily Medium truck trips (t1-3: Internal, External, Total)	Zonal Trip Matrix	TP+ binary
htkesti6.vtt	Trip Distribution	Daily Heavy truck trips (t1-3: Internal, External, Total)	Zonal Trip Matrix	TP+ binary
com.trp	Trip Distribution	Daily Commercial trips (t1)	Zonal Trip Matrix	TP+ binary

Table 10-5 Continued

File Name	Model Step File Created	File Contents	File Type	File Format
i6_hbwmu.ptt	Trip Distribution	Daily HBW Total Internal and External Person trips (t1)	Zonal Trip Matrix	MINUTP binary
i6_hbsmu.ptt	Trip Distribution	Daily HBS Total Internal and External Person trips (t1)	Zonal Trip Matrix	MINUTP binary
i6_hbomu.ptt	Trip Distribution	Daily HBO Total Internal and External Person trips (t1)	Zonal Trip Matrix	MINUTP binary
i6_nhbmu.ptt	Trip Distribution	Daily NHB Total Internal and External Person trips (t1)	Zonal Trip Matrix	MINUTP binary
i6_TrpDst.tab	Trip Distribution	Juris. I/J Summary Report		Text
mc_hbwi6.fin	Mode Choice	Daily Modal HBW trips, t1-7: sv_Adr, sv_Apns,wk_Trn,dr_Trn, hv2_Adrs,hv_Psns,hv3_adrs	Zonal Trip Matrix	MINUTP binary
mc_hbsi6.fin	Mode Choice	Daily Modal HBS trips, t1-7: sv_Adr, sv_Apns,wk_Trn,dr_Trn, hv2_Adrs,hv_Psns,hv3_adrs	Zonal Trip Matrix	MINUTP binary
mc_hboi6.fin	Mode Choice	Daily Modal HBO trips, t1-7: sv_Adr, sv_Apns,wk_Trn,dr_Trn, hv2_Adrs,hv_Psns,hv3_adrs	Zonal Trip Matrix	MINUTP binary
mc_nhbi6.fin	Mode Choice	Daily Modal NHB trips, t1-7: sv_Adr, sv_Apns,wk_Trn,dr_Trn, hv2_Adrs,hv_Psns,hv3_adrs	Zonal Trip Matrix	MINUTP binary
MC_ALLi6.FIN	Mode Choice	Daily Modal ALL trips, t1-7: sv_Adr, sv_Apns,wk_Trn,dr_Trn, hv2_Adrs,hv_Psns,hv3_adrs	Zonal Trip Matrix	TP+ binary
i6_mc_summary.tab	Mode Choice	Juris. I/J Summary Report		Text
HBWi6.ADR	(Post-) Mode Choice	Daily HBW Auto Dr. trips by Occupancy t1-3: i-occ, 2-occ, 3+occ	Zonal Trip Matrix	TP+ binary
HBSi6.ADR	(Post-) Mode Choice	Daily HBS Auto Dr. trips by Occupancy t1-3: i-occ, 2-occ, 3+occ	Zonal Trip Matrix	TP+ binary
HBOi6.ADR	(Post-) Mode Choice	Daily HBO Auto Dr. trips by Occupancy t1-3: i-occ, 2-occ, 3+occ	Zonal Trip Matrix	TP+ binary
NHBi6.ADR	(Post-) Mode Choice	Daily NHB Auto Dr. trips by Occupancy t1-3: i-occ, 2-occ, 3+occ	Zonal Trip Matrix	TP+ binary
i6_mc_Auto_Drivers.tab	(Post-) Mode Choice	Regional Summary Report		Text
AMi6.ADR	Time-of-Day	AM Period Auto Dr. trips by Occupancy t1-3: i-occ, 2-occ, 3+occ	Zonal Trip Matrix	TP+ binary
PMi6.ADR	Time-of-Day	PM Period Auto Dr. trips by Occupancy t1-3: i-occ, 2-occ, 3+occ	Zonal Trip Matrix	TP+ binary
OPi6.ADR	Time-of-Day	Off-pk. Period Auto Dr. trips by Occupancy t1-3: i-occ, 2-occ, 3+occ	Zonal Trip Matrix	TP+ binary
i6tmcom.trp	Time-of-Day	Commercial Veh. Trips by Period t1-3: AM, PM, Off-Pk.	Zonal Trip Matrix	TP+ binary
i6_Time-of-Day.tab	Time-of-Day	Regional Summary Report		Text
MISCAMi6.TT	Time-of-Day	AM truck/misc.auto dr trips t1-8: xx_trk, xx_auto, taxi, tourist,school, med_trk, hvy_trk, air_pax	Zonal Trip Matrix	TP+ binary
MISCPMi6.TT	Time-of-Day	PM truck/misc.auto dr trips t1-8: xx_trk, xx_auto, taxi, tourist,school, med_trk, hvy_trk, air_pax	Zonal Trip Matrix	TP+ binary
MISCOPi6.TT	Time-of-Day	Off-Pk truck/misc.auto dr trips t1-8: xx_trk, xx_auto, taxi, tourist,school, med_trk, hvy_trk, air_pax	Zonal Trip Matrix	TP+ binary
i6_Misc_Time-of-Day.tab	Time-of-Day	Regional Summary Report		Text
i6AM.VTT	Traffic Assignment	AM Vehicle Trips by market t1-5: SOV/Com_Veh., HOV2, HOV3+, Med/Hvy Truck, Airport_Pax	Zonal Trip Matrix	TP+ binary
i6PM.VTT	Traffic Assignment	PM Vehicle Trips by market t1-5: SOV/Com_Veh., HOV2, HOV3+, Med/Hvy Truck, Airport_Pax	Zonal Trip Matrix	TP+ binary
i6OP.VTT	Traffic Assignment	Off-Pk Vehicle Trips by market t1-5: SOV/Com_Veh., HOV2, HOV3+, Med/Hvy Truck, Airport_Pax	Zonal Trip Matrix	TP+ binary
I6HWY.NET	Traffic Assignment	Loaded Highway Network I6 Volume, Speed, VC by time period		TP+ binary
i6_Highway_Assignment.tab	Traffic Assignment	Regional Summary Report		Text
sovi6am.skm	Highway Skimming	AM SOV Restrained Highway skims t1-3: time(min), Distance (1/10s mi), Toll ('94 cents)	Zonal Skim Matrix	MINUTP binary
hov2i6am.skm	Highway Skimming	AM HOV 2-occ Restrained Highway skims t1-3: time(min), Distance (1/10s mi), Toll ('94 cents)	Zonal Skim Matrix	MINUTP binary
hov3i6am.skm	Highway Skimming	AM HOV 3+Occ Restrained Highway skims t1-3: time(min), Distance (1/10s mi), Toll ('94 cents)	Zonal Skim Matrix	MINUTP binary
sovi6op.skm	Highway Skimming	Off-Pk. SOV Restrained Highway skims t1-3: time(min), Distance (1/10s mi), Toll ('94 cents)	Zonal Skim Matrix	MINUTP binary
hov2i6op.skm	Highway Skimming	Off-Pk. HOV 2-occ Restrained Highway skims t1-3: time(min), Distance (1/10s mi), Toll ('94 cents)	Zonal Skim Matrix	MINUTP binary
hov3i6op.skm	Highway Skimming	Off-Pk. HOV 3+Occ Restrained Highway skims t1-3: time(min), Distance (1/10s mi), Toll ('94 cents)	Zonal Skim Matrix	MINUTP binary

Ref: ver2 2model_outputs_i6b.xls

Chapter 11 Set-Up Programs and Highway Network Building

User Provided Input(s):

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

Key Output(s):

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

Program File(s):

STAPROTP.EXE, TP+

Control/Support File(s):

SET_FACTORS.S, SET_CPI.S, STAPROTP.CTL (Control files for the STAPROTP Program)
HIGHWAY_BUILD_TOLL.S (TP+ script file for network building)

Application Details:

The Set_Factors.S script is used to establish K-factors and time penalty files (which are null for the Version 2.2 model) The Set_CPI.S script is used to create highway and transit deflation factors in small text files that are used in subsequent modeling steps. Set_CPI.S reads a small file (CPI_File.txt) which contains a CPI schedule for Washington, D.C. The CPI schedule and also uses the environment variable _year_ from the RUNALL_????.bat file to calculate the deflation factors automatically. It is important to note that CPI_File.txt includes a parameter named INFLATIONFTR that may be used to alter the CPI growth rate assumption in developing future deflation factors. The default value for this parameter is 1.0, which indicates that the historical inflation rate is used. This value may be altered to reflect alternate growth assumptions if desired.

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, in Maryland State Plane coordinates, NAD83, 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.[3] 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 11-1. Note that zonal area type override values may be specified in the AREAOVR.ASC file.

Exhibit 11-1 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 convert text 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.

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

Finally, procedures have been placed in the script to identify freeway links to be excused from queuing delay procedures (as described in Chapter 1). A variable named AllowQue variable is established for this purpose.

The STAPROTP program is used to create transit link and node files in TRNBUILD format, on the basis of two user-prepared files. Exhibit 11-2 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 METRORAIL_SKIMS.S and MFARE1.S programs.

The input file format descriptions for the HIGHWAY_BUILD_TOLL.S and STAPROTP programs are shown at the end of this chapter.

Exhibit 11-2 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 2.2 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 <u>per-mile</u> *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 2.2/TP+ Toll Escaltion - by toll group |
;|//////////////////////////////////////////////////////////////////////|
;|\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
;
;
;    ============================================
;    = TOLL ESCALATION OVERRIDE FACTORS         =
;    = by TOLL GROUP                            =
;    = TABLE LOOKUP                             =
;    = For converting current year cents to     =
;    = 1994 cents                               =
;    = Note these are used to override the      =
;    = default deflation factor set in the file =
;    = named HWY_Deflator.txt                   =
;    ============================================
;
; If the value is 0 below, default value will be taken
; from HWY_Deflator.txt
 LOOKUP NAME= ESCFAC,
        LOOKUP[1] = 1, RESULT=2,
        FAIL= 0,0,0,INTERPOLATE=F,
;   Toll  Escalation Toll Rate
;   Grp   Factor
;   ---   ------
 R=" 1    0.00000     ",  ;
   " 2    0.00000     ",  ;
   " 3    0.00000     ",  ;
   " 4    0.00000     ",  ;
   " 5    0.00000     ",  ;
   " 6    0.00000     ",  ;
   " 7    0.00000     ",  ;
   " 8    0.00000     ",  ;
   " 9    0.00000     "   ;
; 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
;
;    ============================================
;    = Min. & Max                               =
;    = Area Type overide       by TOLL GROUP    =
;    =                                          =
;    =                                          =
;    ============================================
;
; If the value is 0 below, default value will be
; based on the standard zonal density
; the override must be >= 1 and <=7
 LOOKUP NAME= TG_ATOVR,
        LOOKUP[1] = 1, RESULT=2,
        FAIL= 0,0,0,INTERPOLATE=F,
;   Toll  Area Type Override
;   Grp   Min  Max
;   ---   ---- ---
 R=" 1    0     0   ",  ;
   " 2    0     0   ",  ;
   " 3    0     0   ",  ;
   " 4    0     0   ",  ;
   " 5    0     0   ",  ;
   " 6    0     0   ",  ;
   " 7    0     0   ",  ;
   " 8    0     0   ",  ;
   " 9    0     0   ",  ;
   "10    0     0   "   ;
; end of Area type override
```

```
;|//////////////////////////////////////////////////////////////////////|
;|// TOLL.INC  - Version 2.2     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 2.2     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 11-3 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.

Exhibit 11-4 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 11-5 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
35-36	I2	Daily Ground Count Quality Code
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
66-69	I4	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 11-6 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, L=Light rail, N= BRT/street car)
15	A1	Parking Available? (Y/N)
18	A1	Station Active? (Y/N)
21-45	A25	Station Name/PNR lot name
46-50	I5	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 11-7 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 12 Auto Access Link Development

Input(s):

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

Output(s):

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

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 13 Pre-Transit Network Processing

Input(s):

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

Output(s):

Off-Peak Walk Link File, TRNBUILD Format	WALK_AM.TB, WALK_OP.TB	Text
Peak and Off-Peak Transit line files, TRNBUILD Format	MODE???.TB	Text
A2 Deck for MFARE Process	FARE_A2.ASC	Text

Program File(s):

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

Control/Support File(s):

CNTCONN2 Control (CTL) files, NODESTB Control Files, WLKLNKTP Control (CTL) files,
UPDATE_WKLINKS.S (TP+ script)
PREFARTP.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 TRNBUILD 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 node 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' text 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.

An TP+ scripts is called into the batch process. PREFARTP.S reads 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.

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.

The control file descriptions used with the pre-transit network programs and file format descriptions of the input files used are provided at the end of this chapter.

Exhibit 13-1 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 13-2 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 13-3 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 13-4 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 13-5 '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 13-6 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 13-7 TAZ / Bus Fare Zone Equivalency File Format Description (TAZFRZN.ASC)

Columns	***Format***	***Field Description***
Zonal data		
1-4	I4	TAZ Number (1-2141) (or Station No. 1-150)
9-16	I4	Bus fare zone 1
17-24	I4	Bus fare zone 2
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		
41-48	I4	Bus Fare Zone for a given station
49-56	I4	Station Bus Fare Code 2
57-64	I8	Jurisdiction code
65-72	I8	P discount
73-80	I8	A discount

Chapter 14 Transit Skim File Development

Input(s):

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

Output(s):

Peak/Off-Pk Walk Access Total Trn time skims	??_AM_WK.ttt, ??_OP_WK.ttt	Binary
Peak/Off-Pk Drive Access Total Trn time skims	??_AM_DR.ttt, ??_OP_DR.ttt	Binary
Peak/Off-Pk Walk Access Skims	??_AM_WK.SKM, ??_OP_WK.SKM	Binary
Peak/Off-Pk Drive Access Skims	??_AM_DR.SKM, ??_OP_DR.SKM	Binary
Peak/Off-Pk Walk Access Station-to-Station Tables	??_AM_WK.STA, ??_OP_WK.STA	Binary
Peak/Off-Pk Drive Access Station-to-Station Tables	??_AM_DR.STA, ??_OP_DR.STA	Binary
Transit Accessibility File	JOBACC.ASC	Text

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. TRNBUILD is executed in four ‘loops’ corresponding to two access types (walk and drive) and two time periods (AM-peak and off-peak). 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,[4] 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

[4] 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 script also adjusts the non-Metrorail in-vehicle time from adjustment factors in the file named `LBUS_TIMFTRS.ASC` to account for bus speed degradation over time. 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 15 Transit Fare Development

Input(s):

Metro Station Link File	METLNKM1.TB	Text
Metro Station XY File	METNODM1.TB	Text
Metrorail turn penalty file	INPUTS\TRNPEN.DAT	Text
MFARE1 A1 (Coordinate) File	MFARE1.A1	Text
Deflation factor file	Trn_deflator.txt	Text
WMATA tariff parameters	Inputs\tarrif.txt	Text
Metrorail station discount file	Inputs\mfare1_sta_disc.asc	Text
Peak/Off-Peak Station-to-Station Tables	??_AM_WK.STA, ??_OP_WK.STA	Binary
Peak / Off-Peak MFARE2 Bus Fare Matrix	Inputs\busfaram.asc Inputs\busfarop.asc	Text
Peak /Off-Peak MFARE2 A2 File	FARE_A2.ASC	Text

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

Control/Support File(s):

METRORAIL_SKIMS.S, MFARE1.S, MFARE2.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.S program, which calculates peak and off-peak Metrorail fares between station pairs. The peak and off-peak Metrorail fares are next entered to the MFARE2.S program which is used to calculate zone-to-zone transit fares.

Input File Descriptions and Formats

Exhibit 15-1 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 15-2 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 15-3 Bus Fare Matrix File Format Description (BUSFAR??.ASC)

Columns are Space-delimited	*Field Description*
	Origin Bus Zone No. (1-21)
	Bus Fare value From Origin Zone to Destination zone 1
	Bus Fare value From Origin Zone to Destination zone 2
	Bus Fare value From Origin Zone to Destination zone 3
	…
	Bus Fare value From Origin Zone to Destination zone 21

Exhibit 15-4 TAZ / Bus Fare Zone Equivalency File Format Description (FARE_A2.ASC)

Columns are Space-delimited	*Field Description*
	TAZ (1-2191)
	Bus Fare Zone 1 associated with TAZ
	Bus Fare Zone 2 associated with TAZ
	TAZ Origin Walk Pct to Metrorail in 10ths of pcts
	TAZ Destination Walk Pct to Metrorail in 10ths of pcts
	Bus Fare Zone 1 associated with Metrorail station (TAZ 1-150)
	Bus Fare Zone 2 associated with Metrorail station (TAZ 1-150)
	Jur. Code (0/DC, 1/MD, 2/VA-Area1, 3/VA-Area2)
	Origin-end Bus fare override value (default=0)
	Destination-end Bus fare override value (default=0)

Chapter 16 Demographic Submodels

Input(s):

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

Output(s):

Zonal HHs of Income Level 1, Stratified by Size and Vehicle Avail.	HHI1_SV.DAT	Text
Zonal HHs of Income Level 2, Stratified by Size and Vehicle Avail.	HHI2_SV.DAT	Text
Zonal HHs of Income Level 3, Stratified by Size and Vehicle Avail.	HHI3_SV.DAT	Text
Zonal HHs of Income Level 4, Stratified by Size and Vehicle Avail.	HHI4_SV.DAT	Text
Interim Output: Zonal Household Size, Income Level File	HHSIZINC.DAT	Text
Interim Output: Households by Number of Vehicles (0, 1, 2+)	HH_VEH.DAT	Text
HBW Zonal A1 Deck (for the Mode Choice Model)	HBWV2.A1F	Text
HBS Zonal A1 Deck (for the Mode Choice Model)	HBSV2.A1F	Text
HBO Zonal A1 Deck (for the Mode Choice Model)	HBOV2.A1F	Text
NHB Zonal A1 Deck (for the Mode Choice Model)	NHBV2.A1F	Text

Program File(s):

COGMCA1.EXE

Control/Support File(s):

COGMCA1.CTL (Control file for COGMCA1 Program)
DEMO_MODELS.S

Application Details:

The Demographic models are applied using the TP+ script named Demo_Models.S. The COGMCA1 program is used to establish the zonal (A1-deck) file inputs to the COGMC mode choice program. The control file of the COGMCA1 program and file formats of the input and output files are provided below.

Exhibit 16-1 COGMCA1 Control Parameters

Type	Name	Description
&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

2. Zonal Area Type File

Exhibit 16-2 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 16-3 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 16-4 Zonal Household Income File (Est_Zonal_HH_Inc.txt)

Columns	*Format*	*Field Description*
1-4	I4	TAZ
5 -16	F12.2	Zonal HHs of Income level 1
17 -28	F12.2	Zonal HHs of Income level 2
29 -40	F12.2	Zonal HHs of Income level 3
41 -52	F12.2	Zonal HHs of Income level 4

Exhibit 16-5 Zonal Household Size File (Est_Zonal_HH_Size.txt)

Columns	*Format*	*Field Description*
1-4	I4	TAZ
5 -16	F12.2	Zonal HHs in Size group 1
17 -28	F12.2	Zonal HHs in Size group 2
29 -40	F12.2	Zonal HHs in Size group 3
41 -52	F12.2	Zonal HHs in Size group 4+

Exhibit 16-6 Zonal Household Vehicle Ownership File (Est_Zonal_HH_VehAv.txt)

Columns	*Format*	*Field Description*
1-4	I4	TAZ
5 -16	F12.2	Households with 0 vehicles available
17 -28	F12.2	Households with 1 vehicles available
29 -40	F12.2	Households with 2 vehicles available
41 -52	F12.2	Households with 3+ vehicles available

Exhibit 16-7 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 16-8 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 17 Trip Generation

Input(s):

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

Output(s):

Trip End, Production-Attraction Files	HBWpros_ALL.TXT,HBWpros_INC.TXT, HBWattrs_ALL.TXT,HBWattrs_INC.TXT, HBSpros_ALL.TXT,HBSpros_INC.TXT, HBSattrs_ALL.TXT,HBSattrs_INC.TXT, HBOpros_ALL.TXT,HBOpros_INC.TXT, HBOattrs_ALL.TXT,HBOattrs_INC.TXT, NHBpros_ALL.TXT,NHBpros_INT.TXT, NHBattrs_ALL.TXT,NHBattrs_INT.TXT, MTKpros_ALL.TXT,MTKpros_INT.TXT, MTKattrs_ALL.TXT,MTKattrs_INT.TXT, HTKpros_ALL.TXT,HTKpros_INT.TXT, HTKattrs_ALL.TXT,HTKattrs_INT.TXT	Text
HBW Non-Motorized Trip Ends	HBW_NM_PsAs.ASC	Text

Control/Support File(s):

TRIP_GENERATION.S
CV_TRIP_GENERATION.S

Application Details:

The trip generation process consists of two TP+ scripts functions to generate trip-end (production and attraction) files corresponding to seven 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 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.

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.

File format descriptions are provided below.

Input File Descriptions and Formats

1. Land Use File

2. Zonal HH File, Income Stratified

Exhibit 17-1 Zonal HH File Format Description (HHI?_SV.DAT)

Columns	***Format***	***Field Description***
1-4	I4	TAZ
5 -16	F12.2	HH in Size group 1, Veh. Availability. Group 1
17 -28	F12.2	HH in Size group 1, Veh. Availability. Group 2
29 -40	F12.2	HH in Size group 1, Veh. Availability. Group 3
41 -52	F12.2	HH in Size group 1, Veh. Availability. Group 4
53 -64	F12.2	HH in Size group 2, Veh. Availability. Group 1
65 -76	F12.2	HH in Size group 2, Veh. Availability. Group 2
77 -88	F12.2	HH in Size group 2, Veh. Availability. Group 3
89 -100	F12.2	HH in Size group 2, Veh. Availability. Group 4
101 -112	F12.2	HH in Size group 3, Veh. Availability. Group 1
113 -124	F12.2	HH in Size group 3, Veh. Availability. Group 2
125 -136	F12.2	HH in Size group 3, Veh. Availability. Group 3
137 -148	F12.2	HH in Size group 3, Veh. Availability. Group 4
149 -160	F12.2	HH in Size group 4, Veh. Availability. Group 1
161 -172	F12.2	HH in Size group 4, Veh. Availability. Group 2
173 -184	F12.2	HH in Size group 4, Veh. Availability. Group 3
185 -196	F12.2	HH in Size group 4, Veh. Availability. Group 4

3. Zonal Adjustment File (Purpose-Specific)

Exhibit 17-2 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 17-3 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

Chapter 18 Trip Distribution

input(s):

Trip End, Production-Attraction Files	HBWpros_ALL.TXT,HBWpros_INC.TXT, HBWattrs_ALL.TXT,HBWattrs_INC.TXT, HBSpros_ALL.TXT,HBSpros_INC.TXT, HBSattrs_ALL.TXT,HBSattrs_INC.TXT, HBOpros_ALL.TXT,HBOpros_INC.TXT, HBOattrs_ALL.TXT,HBOattrs_INC.TXT, NHBpros_ALL.TXT,NHBpros_INT.TXT, NHBattrs_ALL.TXT,NHBattrs_INT.TXT, MTKpros_ALL.TXT,MTKpros_INT.TXT, MTKattrs_ALL.TXT,MTKattrs_INT.TXT, HTKpros_ALL.TXT,HTKpros_INT.TXT, HTKattrs_ALL.TXT,HTKattrs_INT.TXT,	Text
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	Text
Highway Terminal Time File	ZTERMTM.ASC	Text
F-Factor Files	HBWV2.FFS, HBSV2.FFS, HBOV2.FFS, N_TV2.FFS	Text
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	Text

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
CV_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 27 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

2. Highway Terminal Time File

Exhibit 18-1 Highway Terminal Time File (ZTERMTM.ASC)

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

Chapter 19 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	Text
Transit Percentage Adjustment File	MCTF_HBW.ASC, MCTF_HBS.ASC, MCTF_HBO.ASC, MCTF_NHB.ASC	Text
Car Occupancy Adjustment Files	MCCF_HBW.ASC, MCCF_HBS.ASC, MCCF_HBO.ASC, MCCF_NHB.ASC	Text
Non-work Transit Factors File (unused)	MC_FAC.ASC	Text

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,

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 2010).

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 2010 levels. The transit constraint was therefore applied to impose a transit trip maximum on forecasted transit trips, as established by 2010 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 2.2 transit constraint process, specifically:

1) The program reads the constrained (2010) 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 2010 *daily* totals. Given that the travel model 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 19-1 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 19-1 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 2010 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).

2010 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[5]. 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) $DConFTrn_{ij} = DUncFTrn_{ij} - PUncFTrn_{ij} + P10Trn_{ij}$

[5] 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
$P10Trn_{ij}$ = Peak period 2010 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 2010 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 (2010) peak transit trips
- Constrained (2010) 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, 2010 transit trip tables *must* exist on the machine of execution. The user also *must* specify the path of the pre-existing 2010 transit trip tables produced by the mode choice model. The path of the 2010 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 _path10_=...

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 _path10_ 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 19-2 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 19-3 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 19-4 Mode Choice Parameter Listing, Values which may be changed by user

COG/TPB Model, Version 2.2

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 19-5 Mode Choice Parameter Listing, Values which should not be changed by user

COG/TPB Model, Version 2.2

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 20 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	text / 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, CV_TIME-OF-DAY.S

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 = 65.30    ; 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 = 18.00    ; AM  Pk Prd            Air Pax, Auto Dr.
PMAIRPXP = 29.00    ; PM  Pk Prd            Air Pax, Auto Dr.
OPAIRPXP = 53.00    ; NON Pk Prd            Air Pax, Auto Dr.
; End of Misc. Auto Driver Trips (Taxi, Visitor, School)
```

Chapter 21 Traffic Assignment

Input(s):

Volume delay and queuing parameters	..\support\Conical_VDF_22.txt ..\support\Queuing_time.txt	Text
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, HIGHWAY_SKIMS.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 60 fixed iterations.

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

1. AM SOV, HOV-2 occupant, and HOV 3+ occupant auto driver trips
2. PM SOV, HOV-2 occupant, and HOV 3+ occupant auto driver trips
3. Off-peak SOV, HOV-2 occupant, and HOV 3+ occupant auto driver trips
4. Commercial vehicle trips by time period
5. AM truck and non-modeled trips
6. PM truck and non-modeled trips
7. Off-peak truck and non-modeled trips

The program first collapses the seven files into three files (AM,PM and Off-peak) containing five tables: 1) 1-occupant auto drivers (including commercial vehicle trips), 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 21-1.

Exhibit 21-1 Link variables on the final loaded-link highway network (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	A/N	Project ID
TAZ	4	Transportation Analysis Zone associated with the link
AREATP	1	Area type (1-7)
DEFLATIONFTR	6.3	Factor for deflating current year tolls to 1994 values
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 (mph)
PPOPSPD	2	Pump prime iteration, off-peak speed (mph)
PPPMSPD	2	Pump prime iteration, PM speed (mph)
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
ALLOWQUE	1	0 or 1 (0/ disallow queuing delay / 1 /allow queuing delay)
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 VDF value for the corresponding VC ratio
PPAMQTIMEPEN	7.5	Pump prime Iteration AM Queuing Delay time (min)
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 VDF value for the corresponding VC ratio
PPPMQTIMEPEN	7.5	Pump prime Iteration PM Queuing Delay time (min)
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 VDF value for the corresponding VC ratio
PPOPQTIMEPEN	7.5	Pump prime Iteration OP Queuing Delay time (min)
PP24VOL	12.5	Pump prime iteration, daily (24-hour) estimated volume (AAWDT)

Variable	Format	Description
PP24VMT	12.5	Pump prime iteration, daily (24-hour) estimated vehicle miles of travel
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 VDF value for the corresponding VC ratio
I1AMSPD	8.5	First iteration, AM speed (mph)
I1AMQTIMEPEN	7.5	First Iteration AM Queuing Delay time (min)
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 VDF value for the corresponding VC ratio
I1PMSPD	8.5	First iteration, PM speed (mph)
I1PMQTIMEPEN	7.5	First Iteration PM Queuing Delay time (min)
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 VDF value for the corresponding VC ratio
I1OPSPD	8.5	First iteration, OP speed (mph)
I1OPQTIMEPEN	7.5	First Iteration OP Queuing Delay time (min)
I124VOL	12.5	First iteration, daily (24-hour) estimated volume (AAWDT)
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 VDF value for the corresponding VC ratio
I6AMSPD	8.5	Sixth iteration, AM speed (mph)
I6AMQTIMEPEN	7.5	Sixth Iteration AM Queuing Delay time (min)
I6PMVOL	5	Sixth iteration, PM estimated volume
I6PMVC	7.5	Sixth iteration, PM estimated volume-to-capacity ratio
I6PMVDF	7.5	Sixth iteration, PM VDF value for the corresponding VC ratio
I6PMSPD	8.5	Sixth iteration, PM speed (mph)
I6PMQTIMEPEN	7.5	Sixth Iteration PM Queuing Delay time (min)
I6OPVOL	5	Sixth iteration, OP estimated volume
I6OPVC	7.5	Sixth iteration, OP estimated volume-to-capacity ratio
I6OPVDF	7.5	Sixth iteration, OP VDF value for the corresponding VC ratio
I6OPSPD	8.5	Sixth iteration, OP speed (mph)
I6OPQTIMEPEN	7.5	Sixth Iteration OP Queuing Delay time (min)
I624VOL	6	Sixth iteration, daily (24-hour) estimated volume (AAWDT)
I624VMT	12.5	Sixth iteration, daily (24-hour) estimated vehicle miles of travel

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).

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Appendix A. Model adjustment factors

Ref:

1 Trip Distribution Adjustments

1.1 Background

Historically, two sets of adjustment factors have been applied to the trip distribution model. The first set has been a series of time penalties applied sparingly to a matrix of twelve superdistricts to address physical barrier effects on trip patterns and to address jurisdictional effects (e.g., school trips and shopping trips tend to remain in a given traveler's residence jurisdiction). The time penalties were not developed in a mechanical process, but were developed after running and rerunning the calibration process with different time penalty sets. An analysis of the results was conducted between iterations.

A second set of adjustment factors was introduced during model application. Commonly referenced as K-factors, 52 individual values were applied in the Version 2.1 D #50 model. This is a reduction from the 68 K-factors that were employed in the Version 2.1C model, and reflects the improvements obtained with the introduction of other model and data input enhancements in the Version 2.1 D #50 model. Furthermore, of the remaining 52 K-factors in the Version 2.1 D #50 model, 32 were dampened (i.e., their values were made closer to 1.0). The breakdown, by trip purpose, of these factors were as follows:

HBW - 29 factors
HBS - 8 factors
HBO - 10 factors
NHB - 5 factors

K-factors were developed in the application of the model for the entire modeled area, after the F-factor calibration was completed. The K-factors were developed separately for each purpose, after several application iterations.

1.2 Version 2.2 Travel Model

The Version 2.2 model has a greatly reduced set of adjustment factors compared with the Version 2.1D #50 model. All time penalties have been removed, as have all non-work K-factors. HBW purpose K-factors have been further reduced to eleven, eight of which involve travel into or within the District of Columbia. The remaining three involve intra-jurisdiction movements within Montgomery County, Frederick County, and Fairfax County. These eleven K-factors are presented in Table 1-1, illustrating a substantial reduction in the number of such factors when compared with the Version 2.1D #50 model.

The eight remaining K-factors, involving the District of Columbia, reflect a continuing federal government presence, a larger "downtown" than one finds in many other cities of similar size, and the influence of a major heavy rail transit system in attracting trips to the central city. Simple time and cost variables in the impedance function of the travel demand model presently cannot explain these effects adequately.

Table 1-1 Trip distribution K-factors in the Version 2.1D #50 and Version 2.2 travel models

Interchange	V2.1 D#50 HBW	V2.2 HBW	Change from 2.1D to V2.2
dc cr - dc cr	2.0		removed
dc cr - dc ncr	2.2		removed
dc ncr - dc cr	1.8	1.7	reduced magnitude
dc ncr - dc ncr			
dc ncr - mtg			
dc ncr - ffx			
dc ncr - extls			
mtg - dc cr	2.0	2.0	maintained
mtg - dc ncr	1.7		removed
mtg - mtg	2.0	1.6	reduced magnitude
mtg - how	0.5		removed
mtg - aa	0.2		removed
pg - dc cr	1.4		removed
pg - dc ncr	1.4		removed
pg - pg	1.5		removed
pg - how	0.5		removed
pg - aa	0.5		removed
pg - mtg			
pg - extls			
pw - dc cr	2.8	3.2	increased magnitude
arl cr - dc cr	2.5	2.5	maintained
arl cr - dc ncr	1.8		removed
arl ncr - arl ncr			
arl ncr - dc cr	2.4	1.7	reduced magnitude
alx - alx			
alx - dc cr	1.9	1.6	reduced magnitude
how - mtg			
how - pg	2.2		removed
how - extls/balt	2.5		removed
aa - aa	0.5		removed
aa - pg			
ffx - dc cr	2.2	2.0	reduced magnitude
ffx - dc ncr	1.3	1.4	increased magnitude
ffx - ffx	0.9	0.8	reduced magnitude
ffx - arl ncr	1.3		removed
frd - frd		0.9	added
frd - aa	0.2		removed
frd - how	0.2		removed
chs - chs			
chs - dc cr	2.2		removed
chs - pg	2.0		removed
car - car			

Ref: k_facs_v22_summary.xls

Fairfax County illustrates an additional behavioral pattern which simple time and cost variables in modeling cannot explain. The county has experienced substantial growth in employment during the past two decades, and is projected to continue this trend. However, there remains a significant amount of interaction with the District of Columbia, largely in terms of commutation to government employment and to other jobs related to government employment. Given the large growth in employment projected within Fairfax County in the future, a gravity model will likely understate this commutation into the central jurisdictions unless K-factors are applied. A K-factor less than 1.0 was therefore applied to intra-Fairfax County estimated trip patterns.

Montgomery County also is a major generator of employment. However, a K-factor greater than 1.0 for intra-county travel was retained, albeit reduced in magnitude from that employed in the Version 2.1D #50 model, to reflect the tendency of the model to otherwise send trips northward into Howard and Anne Arundel Counties with their growing concentrations of employment. Previous K-factors less than 1.0 for trips destined to these counties from TPB member jurisdictions have been removed in the Version 2.2 model.

Finally, a K-factor less than 1.0 was added in the Version 2.2 model for intra-Frederick County travel (including City of Frederick). The size of TPB zones in that jurisdiction, coupled with the projected employment growth, tends to result in overestimation of intra-county travel unless a K-factor is applied. It is hoped that future zone refinement may reduce the need for this adjustment.

In conclusion, many of the K-factors employed in the Version 2.1D #50 model have been removed with the Version 2.2 model, and the few that remain have largely been dampened as well. The result is a model which substantially moves toward the goal of eliminating adjustment factors. As noted earlier, the effect of this is to produce a model which will likely have a looser fit in the year 2000 validation year at finer levels of geography than previous COG/TPB travel demand models. As the region continues to grow, some of the time-honored adjustments may no longer apply as they have in the past.

2 Mode Choice Adjustments

2.1 Background

As part of the Version 2.2 travel model, the existing multinomial logit (MNL) mode choice model was recalibrated. In the past, this calibration/validation was done for a 1994 base year, using observed trips from the 1994 Household Travel Survey. This time, however, the base year was 2000, using Census Transportation Planning Package (CTPP) trips. Since we are using Census data, which records only information about work trips, only home-based work (HBW) was adjusted. Non-work (HBS, HBO, NHB) mode choice models were not adjusted.

A full-scale mode choice calibration would typically consist of three steps:

1. Statistical estimation of utility equation coefficients and constants;
2. A system-wide adjustment of the model, where constants are adjusted until certain control totals match;

3. A jurisdiction-level or superdistrict-level adjustment.

In this case, due to time limitations, we conducted only the third step – superdistrict-level adjustments. For the first two calibration steps, we used what was developed in the last calibration exercise, done in 2002 and 2004 (See COG/TPB 2002.12).

The Version 2 mode choice model consists of four models, one per trip purpose. Each model consists of two sub-models: a main model and a carpool occupancy model. The main model apportions motorized person trips across three modes: drive alone (DA), transit (TR), and carpool (also referred to as group ride, or GR). Within the group ride mode, the carpool occupancy model apportions carpool person trips across three modes: 2-person carpool, 3-person carpool, and 4+person carpool. After model estimation, the system-wide aggregate adjustments are made. These adjusted models are shown in the main body of this report and are the input to the jurisdiction-level aggregate adjustment process described in this appendix.

The COG mode choice model is applied using a Fortran program named COGMC.EXE. This program was written in the mid 1980s, and has been revised numerous times, most recently in January 1999 and April 2001 (Allen 1999). This program allows one to apply two sets of jurisdiction-level or superdistrict-level factors to each of the four mode choice models:

- Transit percent adjustment factors (TPAFs) and
- Car occupancy adjustment factors (COAFs)

The current implementation of COGMC.EXE allows for up to 20 user-defined superdistricts. The superdistrict area system that is currently used is shown in Figure 2-1 and Table 2-1. Note that two transportation analysis zones (648 and 650) that used to be in Prince George's County are now in Montgomery County. This change affects the superdistrict definitions compared to what was used in 2002 and 2004.

The TPAFs can be used to help ensure that the estimated percent transit matches the observed percent transit at the jurisdiction-interchange level. Raising the TPAF value for a cell (jurisdiction-to-jurisdiction interchange) has the effect of raising the estimated percent transit for that cell. Although TPAFs act on the *percent* transit, they also help ensure that the estimated transit person *trips* match the observed transit person *trips*. The COAFs can be used to ensure that the estimated average vehicle occupancies (AVOs) match the observed AVOs at the jurisdiction-interchange level. They affect the split of auto person trips into auto driver and auto passenger. Raising the COAF value for a cell has the effect of raising the share of auto person trips that are auto passenger trips.

Thus, each of the four mode choice models has two factor files, and each factor file (TPAF or COAF) is a 20x20 matrix of factors. The output of the jurisdiction-level adjustment process is usually eight factor files (four TPAFs and four COAFs). However, this time, we generated only one file: the HBW TPAF file. The other seven files were turned off (i.e., they were filled with values of 1.000).

Figure 2-1Superdistrict system used for transit percent adjustment factors (TPAFs) and car occupancy adjustment factors (COAFs)

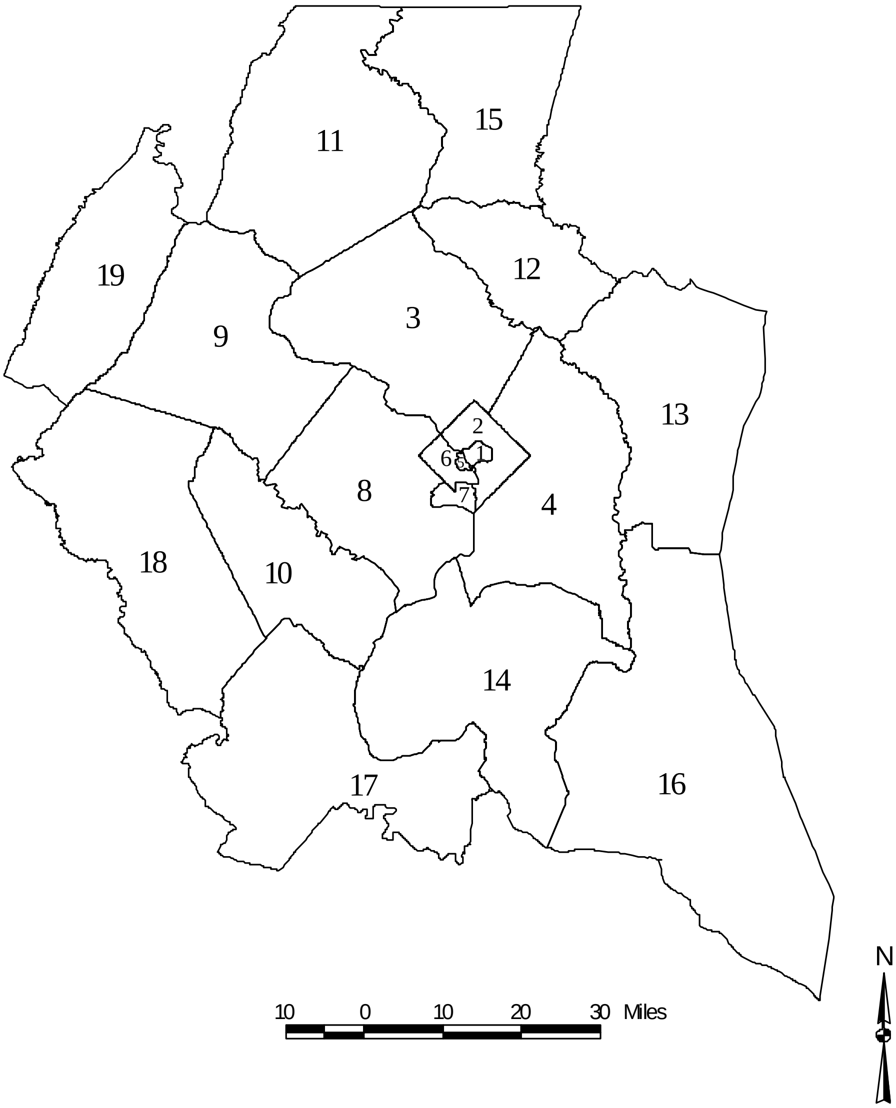

Table 2-1 Superdistricts defined in terms of TAZ

Super-district No.	Jurisdiction	TAZ Range
1	District of Columbia, core	1-88
2	District of Columbia, non-core	89-319
3	Montgomery Co.	320-639,648,650
4	Prince George’s Co.	640-647,649,651-1029
5	Arlington Co., core	1230-1238

6	Arlington Co., non-core	1239-1329
7	Alexandria	1330-1399
8	Fairfax Co.	1400-1779
9	Loudoun Co.	1780-1919
10	Prince William Co.	1920-2069
11	Frederick Co.	1030-1059
12	Howard Co.	1080-1109
13	Anne Arundel Co.	1110-1149
14	Charles Co.	1200-1229
15	Carroll Co.	1060-1079
16	Calvert Co. & Saint Mary's Co.	1150-1169,1170-1199
17	King George Co.; Fredericksburg; Stafford Co.; Spotsylvania Co.	2070-2079,2100-2104,2080-2099,2105-2141
18	Fauquier Co., VA	2115-2129
19	Clarke Co., Va. and Jefferson Co., WVa.	2130-2134,2135-2144
20	Externals	2145-2191

Year-2000 TPAFs were calculated for HBW only, and then, only a subset of the year-2000 HBW TPAFs were retained for the final file – primarily those on the diagonal, with others being re-set to a value of 1.000 – (See Table 2-2). TPAFs for the non-work purposes were left turned off (i.e., with values of 1.000). Year-2000 COAFs were calculated for all four purposes (HBW, HBS, HBO, and NHB), then it was decided not to use these, since it was felt that, although the 2000 Census data is robust for jurisdiction-to-jurisdiction person trip patterns, it may not be accurate enough for auto-driver trip patterns. Consequently, no COAFs are used (i.e., they all have a value of one).

Table 2-2 Final HBW TPAF file

1	1.2076	.9693	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	1.0976	1.3469	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	1.0000	1.0000	.5864	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	1.0000	1.0000	1.0000	1.1166	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000	.5807	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.8858	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
8	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.5000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
17	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
18	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
19	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Ref: I:\ateam\model_dev\Version_2.2P_CV\Support \mctf_hbw.asc

Appendix B. Year 2000 mode choice summary (final, i6, iteration)

Ref: i6_mc_summary2000.tab

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2   Iteration: i6
Purpose: HBW   MODE: LOV Auto Driver

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	4298	3007	768	688	496	800	349	1377	38	24	1	0	39	65	1	0	2	0	3	0	0	0	933	12889
2 DC NC	45312	32214	14382	13014	3971	5921	2293	8413	160	67	32	0	625	986	14	2	65	3	0	0	0	1	7851	135326
3 MTG	47865	26985	270744	24862	3849	6193	1557	20118	643	83	5320	328	7118	2721	9	1	21	4	2	162	1	0	18924	437510
4 PG	57595	64785	32714	157060	5792	10039	5348	11972	105	58	51	20	9322	21008	742	300	3972	0	3	1	1	93	17999	398980
5 ARLCR	1000	266	140	51	579	416	136	564	20	5	0	0	1	5	0	0	0	1	0	0	0	0	105	3289
6 ARNCR	16543	5391	3115	918	5297	18668	5040	23768	616	188	9	1	32	45	0	0	5	18	7	0	7	0	1977	81645
7 ALX	9577	3225	1175	1035	2861	8133	12894	20154	207	262	1	0	8	32	2	1	18	6	19	0	13	1	1047	60671
8 FFX	39708	16931	12968	4572	10390	26697	28319	320189	23747	11172	111	1	86	121	7	1	60	879	286	58	298	8	7721	504330
9 LDN	664	495	2048	77	360	799	344	46294	42764	1157	2157	21	63	4	0	0	1	425	5	1452	2	0	2522	101654
10 PW	2064	476	423	277	609	1929	4408	61573	3896	78060	20	0	0	4	0	0	0	2961	3215	37	2973	75	2020	165020
11 FRD	246	467	20524	491	62	77	14	830	2906	18	75010	3233	4522	684	0	0	0	7	0	2067	0	0	9306	120464
12 CAR	20	68	4543	627	3	2	0	37	156	2	10655	49540	7394	1196	0	0	2	0	0	183	0	0	13783	88211
13 HOW	2355	3690	15146	14728	179	259	68	549	72	1	3039	775	50041	16695	3	0	6	1	0	96	0	0	21350	129053
14 AAR	6328	7773	5517	30723	475	735	287	481	3	0	106	47	18006	160603	829	48	241	0	0	1	0	2	27380	259585
15 CAL	1070	1800	272	6832	110	177	116	163	0	1	0	0	76	3261	17824	8620	1468	0	2	0	1	96	312	42201
16 STM	151	314	20	2041	12	26	23	31	0	1	0	0	3	104	2394	39699	3844	1	10	0	34	1018	161	49887
17 CHS	3470	4842	398	16210	364	618	526	713	1	4	0	0	30	739	1270	2243	30682	1	20	0	69	1636	519	64355
18 FAU	5	3	20	0	5	18	23	5723	1703	6291	13	0	0	0	0	0	0	13638	1071	132	979	25	1002	30651
19 STA	46	31	11	20	52	175	514	5072	38	9113	0	0	0	0	1	4	27	1401	19551	2	13569	736	1655	52018
20 CL/JF	6	18	1354	5	1	3	1	1261	5395	227	3825	49	129	9	0	0	0	288	2	17915	0	0	4793	35281
21 SP/FB	8	5	3	6	7	28	109	1296	10	3076	0	0	0	0	0	4	14	495	6532	0	37903	646	5163	55305
22 KGEO	1	5	0	80	0	0	0	13	1	117	0	0	0	4	20	122	481	18	426	0	961	7424	187	9860
23 EXTL	4539	5023	18374	18459	664	1449	911	13425	5003	7137	20992	18819	28267	62797	575	387	1038	5233	2681	9761	10317	808	0	236659
TOTAL	242871	177814	404659	292776	36138	83162	63280	544016	87484	117064	121342	72834	125762	271083	23691	51432	41947	25380	33835	31867	67128	12569	146710	3074844

Simulation - Year: 2000 Alternative: Version2.2   Iteration: i6
Purpose: HBW   MODE: LOV Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	4956	3438	882	817	570	934	405	1616	57	29	1	0	53	86	1	0	3	1	3	0	0	0	1072	14924
2 DC NC	52588	35461	16363	14972	4535	6886	2621	9778	210	76	38	1	776	1244	22	3	81	4	1	0	0	1	9024	154685
3 MTG	56328	30216	298726	27703	4465	7176	1794	22832	761	100	6024	374	7977	3117	11	1	27	5	3	195	2	0	21753	489590
4 PG	67394	72251	37161	171481	6644	11737	6045	13716	132	69	68	23	10417	23627	829	353	4420	0	3	3	2	118	20688	447181
5 ARLCR	1158	298	162	60	606	475	157	639	23	7	0	0	1	6	0	0	0	1	0	0	0	0	121	3714
6 ARNCR	18512	5926	3543	1019	5887	20879	5597	26583	730	233	9	1	35	53	1	0	4	18	8	0	8	0	2270	91316
7 ALX	10486	3498	1297	1148	3117	9083	14062	22547	254	304	2	0	11	39	2	1	21	7	23	0	14	1	1201	67118
8 FFX	41324	17841	14418	5039	10833	28371	31022	349333	26301	12403	139	1	91	130	11	1	72	1007	328	77	361	8	8857	547968
9 LDN	664	502	2221	82	366	801	353	51763	46398	1326	2424	25	78	4	0	0	1	474	8	1630	3	0	2896	112019
10 PW	2149	504	440	304	641	2066	4807	66957	4384	84236	22	0	0	3	0	0	0	3330	3619	48	3429	92	2327	179358
11 FRD	320	573	23608	593	81	94	14	1086	3385	23	79715	3641	5296	828	0	0	0	10	0	2375	0	0	10692	132334
12 CAR	27	81	5292	739	3	2	0	59	200	2	12154	51755	8394	1390	0	0	2	0	0	229	0	0	15845	96174
13 HOW	2885	4261	17185	16465	216	315	81	659	93	1	3496	864	53186	18456	3	0	8	1	0	121	0	0	24539	142835
14 AAR	7839	9017	6498	34648	579	909	338	580	5	0	131	55	20109	172532	928	59	279	0	0	3	0	2	31474	285985
15 CAL	1348	2104	336	7788	134	222	137	197	0	1	1	0	95	3737	18892	9620	1691	0	2	0	1	125	360	46791
16 STM	200	381	29	2372	18	30	28	40	0	1	0	0	4	133	2700	42698	4338	1	14	0	45	1216	187	54435
17 CHS	4292	5569	488	18252	435	757	607	834	2	5	0	0	33	873	1436	2549	32556	1	26	0	94	1926	596	71331
18 FAU	5	3	20	0	4	17	25	6486	1951	7049	16	0	0	0	0	0	1	14406	1200	151	1113	32	1153	33632
19 STA	48	35	13	24	53	199	579	5566	50	10154	0	0	0	0	1	7	35	1593	20577	2	14898	837	1904	56575
20 CL/JF	6	22	1684	10	2	2	2	1691	6242	273	4378	59	170	10	0	0	0	336	2	18813	0	0	5510	39212
21 SP/FB	8	6	4	5	7	32	124	1454	10	3571	0	0	0	0	1	4	23	585	7237	0	39778	742	5935	59526
22 KGEO	1	7	1	104	0	0	0	14	2	144	0	0	0	5	23	153	576	22	484	0	1088	7761	215	10600
23 EXTL	5215	5772	21124	21216	762	1668	1050	15432	5751	8200	24129	21629	32497	72173	664	444	1192	6016	3081	11218	11857	930	0	272020
TOTAL	277753	197766	451495	324841	39958	92655	69848	599862	96941	128207	132747	78428	139223	298446	25525	55893	45330	27818	36619	34865	72693	13791	168619	3409323

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBW MODE: Transit

DESTINATION

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
1 DC CR	13713	3790	1260	465	1042	1527	399	1222	0	2	0	0	6	4	0	0	0	0	0	0	0	0	0	23430
2 DC NC	83136	24602	9549	4053	3606	5146	1165	3169	0	6	0	0	21	25	0	0	0	0	0	0	0	0	0	134478
3 MTG	45592	7769	29825	2040	1790	2502	336	2124	0	1	0	0	7	3	0	0	0	0	0	0	0	0	0	91989
4 PG	51828	15854	6675	13171	3152	4787	960	1531	0	0	0	0	121	65	0	0	0	0	0	0	0	0	0	98144
5 ARLCR	2228	187	95	16	203	418	70	285	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3503
6 ARNCR	21435	2145	1017	168	3570	4254	1506	5701	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39798
7 ALX	11345	1276	455	102	1877	4589	3259	3475	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	26382
8 FFX	41127	4287	2111	260	5406	11295	4941	14300	25	82	0	0	0	0	0	0	0	0	0	0	0	0	0	83834
9 LDN	404	55	139	2	115	197	13	2219	324	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3468
10 PW	5716	254	118	11	636	1185	1352	4065	0	2683	0	0	0	0	0	0	0	0	0	0	0	0	0	16020
11 FRD	160	73	1292	6	19	14	0	3	0	0	234	0	0	0	0	0	0	0	0	0	0	0	0	1801
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	2046	650	1446	428	96	116	15	47	0	0	0	0	842	69	0	0	0	0	0	0	0	0	0	5755
14 AAR	5626	1321	749	735	254	335	58	45	0	0	0	0	205	337	4	0	0	0	0	0	0	0	0	9669
15 CAL	1539	478	58	106	81	108	26	23	0	0	0	0	0	0	43	0	0	0	0	0	0	0	0	2462
16 STM	239	83	7	31	10	20	4	5	0	0	0	0	0	0	0	0	41	0	0	0	0	0	0	440
17 CHS	4493	1234	144	330	246	382	75	70	0	0	0	0	0	0	0	0	63	0	0	0	0	0	0	7037
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	119	16	5	1	47	98	110	222	0	8	0	0	0	0	0	0	0	0	10	0	3	0	0	639
20 CL/JF	9	5	136	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	151
21 SP/FB	33	3	3	0	6	19	30	96	0	4	0	0	0	0	0	0	0	0	18	0	24	0	0	236
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	290788	64082	55084	21926	22156	36992	14319	38602	352	2789	234	0	1203	503	47	0	104	0	28	0	27	0	0	549236

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBW MODE: HOV Auto Person

DESTINATION

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
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	315	78	67	0	33	215	24	261	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	999
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	1515	238	36	43	199	375	11	6	0	0	0	0	0	6	0	0	1	0	0	0	0	0	0	2430
7 ALX	1551	267	154	48	262	309	0	74	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2667
8 FFX	20804	4290	1242	447	3795	7442	1323	6420	4	0	2	0	1	20	0	0	1	0	0	0	0	0	0	45791
9 LDN	958	334	522	48	416	861	259	3951	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	7351
10 PW	6146	632	360	155	1091	2376	1503	7670	26	2	1	0	0	5	0	0	1	0	0	0	0	0	0	19968
11 FRD	44	13	11	0	13	28	4	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	176
12 CAR	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
13 HOW	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
18 FAU	12	3	11	3	8	29	18	464	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	548
19 STA	250	71	27	22	162	378	322	1452	6	15	0	0	0	0	0	0	1	0	0	0	0	0	0	2706
20 CL/JF	29	6	3	0	6	11	4	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	198
21 SP/FB	69	23	12	6	30	87	107	566	3	12	0	0	0	0	0	0	0	0	0	0	0	0	0	915
22 KGEO	2	3	0	0	0	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	31695	5958	2446	772	6015	12112	3576	21080	45	29	3	0	4	31	0	0	5	0	0	0	0	0	0	83771

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBW MODE: HOV AUTO Driver

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
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	120	33	29	0	15	78	17	105	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	400
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	563	89	11	20	80	140	4	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	911
7 ALX	444	80	46	14	76	91	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	775
8 FFX	7356	1658	457	167	1454	2856	508	2668	0	0	0	0	2	8	0	0	0	0	0	0	0	0	0	17134
9 LDN	284	108	174	17	144	284	88	1338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2437
10 PW	1804	207	128	43	340	749	461	2592	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6331
11 FRD	12	6	4	0	4	11	2	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	3	0	4	1	4	12	8	191	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	223
19 STA	69	21	7	6	48	106	94	414	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	770
20 CL/JF	6	2	1	0	0	2	1	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
21 SP/FB	18	6	4	1	7	27	30	160	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	255
22 KGEO	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	10680	2210	865	269	2172	4356	1213	7556	9	8	0	0	2	10	0	0	0	0	0	0	0	0	0	29350

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBW MODE: Auto Driver

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
1 DC CR	4298	3007	768	688	496	800	349	1377	38	24	1	0	39	65	1	0	2	0	3	0	0	0	933	12889
2 DC NC	45312	32214	14382	13014	3971	5921	2293	8413	160	67	32	0	625	986	14	2	65	3	0	0	0	1	7851	135326
3 MTG	47985	27018	270773	24862	3864	6271	1574	20223	645	84	5320	328	7118	2721	9	1	21	4	2	162	1	0	18924	437910
4 PG	57595	64785	32714	157060	5792	10039	5348	11972	105	58	51	20	9322	21008	742	300	3972	0	3	1	1	93	17999	398980
5 ARLCR	1000	266	140	51	579	416	136	564	20	5	0	0	1	5	0	0	0	1	0	0	0	0	105	3289
6 ARNCR	17106	5480	3126	938	5377	18808	5044	23770	616	188	9	1	32	47	0	0	5	18	7	0	7	0	1977	82556
7 ALX	10021	3305	1221	1049	2937	8224	12894	20178	207	262	1	0	8	32	2	1	18	6	19	0	13	1	1047	61446
8 FFX	47064	18589	13425	4739	11844	29553	28827	322857	23747	11172	111	1	88	129	7	1	60	879	286	58	298	8	7721	521464
9 LDN	948	603	2222	94	504	1083	432	47632	42764	1157	2157	21	63	4	0	0	1	425	5	1452	2	0	2522	104091
10 PW	3868	683	551	320	949	2678	4869	64165	3902	78061	20	0	0	4	0	0	0	2961	3215	37	2973	75	2020	171351
11 FRD	258	473	20528	491	66	88	16	848	2906	18	75010	3233	4522	684	0	0	0	7	0	2067	0	0	9306	120521
12 CAR	20	68	4543	627	3	2	0	37	156	2	10655	49540	7394	1196	0	0	2	0	0	183	0	0	13783	88211
13 HOW	2355	3690	15146	14728	179	259	68	549	72	1	3039	775	50041	16695	3	0	6	1	0	96	0	0	21350	129053
14 AAR	6328	7773	5517	30723	475	735	287	481	3	0	106	47	18006	160603	829	48	241	0	0	1	0	2	27380	259585
15 CAL	1070	1800	272	6832	110	177	116	163	0	1	0	0	76	3261	17824	8620	1468	0	2	0	1	96	312	42201
16 STM	151	314	20	2041	12	26	23	31	0	1	0	0	3	104	2394	39699	3844	1	10	0	34	1018	161	49887
17 CHS	3470	4842	398	16210	364	618	526	713	1	4	0	0	30	739	1270	2243	30682	1	20	0	69	1636	519	64355
18 FAU	8	3	24	1	9	30	31	5914	1703	6291	13	0	0	0	0	0	0	13638	1071	132	979	25	1002	30874
19 STA	115	52	18	26	100	281	608	5486	39	9117	0	0	0	0	1	4	27	1401	19551	2	13569	736	1655	52788
20 CL/JF	12	20	1355	5	1	5	2	1301	5395	227	3825	49	129	9	0	0	0	288	2	17915	0	0	4793	35333
21 SP/FB	26	11	7	7	14	55	139	1456	10	3078	0	0	0	0	0	4	14	495	6532	0	37903	646	5163	55560
22 KGEO	2	5	0	80	0	0	0	17	1	117	0	0	0	4	20	122	481	18	426	0	961	7424	187	9865
23 EXTL	4539	5023	18374	18459	664	1449	911	13425	5003	7137	20992	18819	28267	62797	575	387	1038	5233	2681	9761	10317	808	0	236659
TOTAL	253551	180024	405524	293045	38310	87518	64493	551572	87493	117072	121342	72834	125764	271093	23691	51432	41947	25380	33835	31867	67128	12569	146710	3104194

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBW MODE: Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	4956	3438	882	817	570	934	405	1616	57	29	1	0	53	86	1	0	3	1	3	0	0	0	1072	14924
2 DC NC	52588	35461	16363	14972	4535	6886	2621	9778	210	76	38	1	776	1244	22	3	81	4	1	0	0	1	9024	154685
3 MTG	56643	30294	298793	27703	4498	7391	1818	23093	767	100	6024	374	7977	3117	11	1	27	5	3	195	2	0	21753	490589
4 PG	67394	72251	37161	171481	6644	11737	6045	13716	132	69	68	23	10417	23627	829	353	4420	0	3	3	2	118	20688	447181
5 ARLCR	1158	298	162	60	606	475	157	639	23	7	0	0	1	6	0	0	0	1	0	0	0	0	121	3714
6 ARNCR	20027	6164	3579	1062	6086	21254	5608	26589	730	233	9	1	35	59	1	0	5	18	8	0	8	0	2270	93746
7 ALX	12037	3765	1451	1196	3379	9392	14062	22621	254	304	2	0	13	39	2	1	21	7	23	0	14	1	1201	69785
8 FFX	62128	22131	15660	5486	14628	35813	32345	355753	26305	12403	141	1	92	150	11	1	73	1007	328	77	361	8	8857	593759
9 LDN	1622	836	2743	130	782	1662	612	55714	46398	1326	2424	25	79	4	0	0	2	474	8	1630	3	0	2896	119370
10 PW	8295	1136	800	459	1732	4442	6310	74627	4410	84238	23	0	0	8	0	0	1	3330	3619	48	3429	92	2327	199326
11 FRD	364	586	23619	593	94	122	18	1149	3385	23	79715	3641	5296	828	0	0	0	10	0	2375	0	0	10692	132510
12 CAR	27	81	5293	739	3	2	0	62	200	2	12154	51755	8394	1390	0	0	2	0	0	229	0	0	15845	96178
13 HOW	2885	4261	17185	16465	216	316	81	661	93	1	3496	864	53186	18456	3	0	8	1	0	121	0	0	24539	142838
14 AAR	7839	9017	6498	34648	579	909	338	580	5	0	131	55	20109	172532	928	59	279	0	0	3	0	2	31474	285985
15 CAL	1348	2104	336	7788	134	222	137	197	0	1	1	0	95	3737	18892	9620	1691	0	2	0	1	125	360	46791
16 STM	200	381	29	2372	18	30	28	40	0	1	0	0	4	133	2700	42698	4338	1	14	0	45	1216	187	54435
17 CHS	4292	5569	488	18252	435	757	607	835	2	5	0	0	33	873	1436	2549	32556	1	26	0	94	1926	596	71332
18 FAU	17	6	31	3	12	46	43	6950	1951	7049	16	0	0	0	0	0	1	14406	1200	151	1113	32	1153	34180
19 STA	298	106	40	46	215	577	901	7018	56	10169	0	0	0	0	1	7	36	1593	20577	2	14898	837	1904	59281
20 CL/JF	35	28	1687	10	8	13	6	1830	6242	273	4378	59	170	10	0	0	0	336	2	18813	0	0	5510	39410
21 SP/FB	77	29	16	11	37	119	231	2020	13	3583	0	0	0	0	1	4	23	585	7237	0	39778	742	5935	60441
22 KGEO	3	10	1	104	0	0	1	22	2	144	0	0	0	5	23	153	576	22	484	0	1088	7761	215	10614
23 EXTL	5215	5772	21124	21216	762	1668	1050	15432	5751	8200	24129	21629	32497	72173	664	444	1192	6016	3081	11218	11857	930	0	272020
TOTAL	309448	203724	453941	325613	45973	104767	73424	620942	96986	128236	132750	78428	139227	298477	25525	55893	45335	27818	36619	34865	72693	13791	168619	3493094

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBW MODE: Total Motorized Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	18669	7228	2142	1282	1612	2461	804	2838	57	31	1	0	59	90	1	0	3	1	3	0	0	0	1072	38354
2 DC NC	135724	60063	25912	19025	8141	12032	3786	12947	210	82	38	1	797	1269	22	3	81	4	1	0	0	1	9024	289163
3 MTG	102235	38063	328618	29743	6288	9893	2154	25217	767	101	6024	374	7984	3120	11	1	27	5	3	195	2	0	21753	582578
4 PG	119222	88105	43836	184652	9796	16524	7005	15247	132	69	68	23	10538	23692	829	353	4420	0	3	3	2	118	20688	545325
5 ARLCR	3386	485	257	76	809	893	227	924	24	7	0	0	1	6	0	0	0	1	0	0	0	0	121	7217
6 ARNCR	41462	8309	4596	1230	9656	25508	7114	32290	732	233	9	1	35	59	1	0	5	18	8	0	8	0	2270	133544
7 ALX	23382	5041	1906	1298	5256	13981	17321	26096	254	307	2	0	14	39	2	1	21	7	23	0	14	1	1201	96167
8 FFX	103255	26418	17771	5746	20034	47108	37286	370053	26330	12485	141	1	92	150	11	1	73	1007	328	77	361	8	8857	677593
9 LDN	2026	891	2882	132	897	1859	625	57933	46722	1326	2424	25	79	4	0	0	2	474	8	1630	3	0	2896	122838
10 PW	14011	1390	918	470	2368	5627	7662	78692	4410	86921	23	0	0	8	0	0	1	3330	3619	48	3429	92	2327	215346
11 FRD	524	659	24911	599	113	136	18	1152	3385	23	79949	3641	5296	828	0	0	0	10	0	2375	0	0	10692	134311
12 CAR	27	81	5293	739	3	2	0	62	200	2	12154	51755	8394	1390	0	0	2	0	0	229	0	0	15845	96178
13 HOW	4931	4911	18631	16893	312	432	96	708	93	1	3496	864	54028	18525	3	0	8	1	0	121	0	0	24539	148593
14 AAR	13465	10338	7247	35383	833	1244	396	625	5	0	131	55	20314	172869	932	59	279	0	0	3	0	2	31474	295654
15 CAL	2887	2582	394	7894	215	330	163	220	0	1	1	0	95	3737	18935	9620	1691	0	2	0	1	125	360	49253
16 STM	439	464	36	2403	28	50	32	45	0	1	0	0	4	133	2700	42698	4379	1	14	0	45	1216	187	54875
17 CHS	8785	6803	632	18582	681	1139	682	905	2	5	0	0	33	873	1436	2549	32619	1	26	0	94	1926	596	78369
18 FAU	17	6	31	3	12	46	43	6950	1951	7049	16	0	0	0	0	0	1	14406	1200	151	1113	32	1153	34180
19 STA	417	122	45	47	262	675	1011	7240	56	10177	0	0	0	0	1	7	36	1593	20587	2	14901	837	1904	59920
20 CL/JF	44	33	1823	11	8	13	6	1830	6242	273	4378	59	170	10	0	0	0	336	2	18813	0	0	5510	39561
21 SP/FB	110	32	19	11	43	138	261	2116	13	3587	0	0	0	0	1	4	23	585	7255	0	39802	742	5935	60677
22 KGEO	3	10	1	104	0	0	1	22	2	144	0	0	0	5	23	153	576	22	484	0	1088	7761	215	10614
23 EXTL	5215	5772	21124	21216	762	1668	1050	15432	5751	8200	24129	21629	32497	72173	664	444	1192	6016	3081	11218	11857	930	0	272020
TOTAL	600236	267806	509025	347539	68129	141759	87743	659544	97338	131025	132984	78428	140430	298980	25572	55893	45439	27818	36647	34865	72720	13791	168619	4042330

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBW MODE: Transit Percentage

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	73.5	52.4	58.8	36.3	64.6	62.0	49.6	43.1	0	6.5	0	0	10.2	4.4	0	0	0	0	0	0	0	0	0	61.1
2 DC NC	61.3	41.0	36.9	21.3	44.3	42.8	30.8	24.5	0	7.3	0	0	2.6	2.0	0	0	0	0	0	0	0	0	0	46.5
3 MTG	44.6	20.4	9.1	6.9	28.5	25.3	15.6	8.4	0	1.0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	15.8
4 PG	43.5	18.0	15.2	7.1	32.2	29.0	13.7	10.0	0	0	0	0	1.1	0.3	0	0	0	0	0	0	0	0	0	18.0
5 ARLCR	65.8	38.6	37.0	21.1	25.1	46.8	30.8	30.8	4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.5
6 ARNCR	51.7	25.8	22.1	13.7	37.0	16.7	21.2	17.7	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.8
7 ALX	48.5	25.3	23.9	7.9	35.7	32.8	18.8	13.3	0	1.0	0	0	7.1	0	0	0	0	0	0	0	0	0	0	27.4
8 FFX	39.8	16.2	11.9	4.5	27.0	24.0	13.3	3.9	0.1	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	12.4
9 LDN	19.9	6.2	4.8	1.5	12.8	10.6	2.1	3.8	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.8
10 PW	40.8	18.3	12.9	2.3	26.9	21.1	17.6	5.2	0	3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	7.4
11 FRD	30.5	11.1	5.2	1.0	16.8	10.3	0	0.3	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	1.3
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	41.5	13.2	7.8	2.5	30.8	26.9	15.6	6.6	0	0	0	0	1.6	0.4	0	0	0	0	0	0	0	0	0	3.9
14 AAR	41.8	12.8	10.3	2.1	30.5	26.9	14.6	7.2	0	0	0	0	1.0	0.2	0.4	0	0	0	0	0	0	0	0	3.3
15 CAL	53.3	18.5	14.7	1.3	37.7	32.7	16.0	10.5	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	5.0
16 STM	54.4	17.9	19.4	1.3	35.7	40.0	12.5	11.1	0	0	0	0	0	0	0	0	0.9	0	0	0	0	0	0	0.8
17 CHS	51.1	18.1	22.8	1.8	36.1	33.5	11.0	7.7	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	9.0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	28.5	13.1	11.1	2.1	17.9	14.5	10.9	3.1	0	0.1	0	0	0	0	0	0	0	0	0.0	0	0.0	0	0	1.1
20 CL/JF	20.5	15.2	7.5	9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4
21 SP/FB	30.0	9.4	15.8	0	14.0	13.8	11.5	4.5	0	0.1	0	0	0	0	0	0	0	0	0.2	0	0.1	0	0	0.4
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	48.4	23.9	10.8	6.3	32.5	26.1	16.3	5.9	0.4	2.1	0.2	0	0.9	0.2	0.2	0	0.2	0	0.1	0	0.0	0	0	13.6

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBW MODE: Avg. Auto Occupancy

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	1.15	1.14	1.15	1.19	1.15	1.17	1.16	1.17	1.50	1.21	1.00	0	1.36	1.32	1.00	0	1.50	1.00	1.00	0	0	0	1.15	1.16
2 DC NC	1.16	1.10	1.14	1.15	1.14	1.16	1.14	1.16	1.31	1.13	1.19	1.00	1.24	1.26	1.57	1.50	1.25	1.33	1.00	0	0	1.00	1.15	1.14
3 MTG	1.18	1.12	1.10	1.11	1.16	1.18	1.16	1.14	1.19	1.19	1.13	1.14	1.12	1.15	1.22	1.00	1.29	1.25	1.50	1.20	2.00	0	1.15	1.12
4 PG	1.17	1.12	1.14	1.09	1.15	1.17	1.13	1.15	1.26	1.19	1.33	1.15	1.12	1.12	1.12	1.18	1.11	0	1.00	3.00	2.00	1.27	1.15	1.12
5 ARLCR	1.16	1.12	1.16	1.18	1.05	1.14	1.15	1.13	1.15	1.40	0	0	1.00	1.20	0	0	0	1.00	0	0	0	0	1.15	1.13
6 ARNCR	1.17	1.12	1.14	1.13	1.13	1.13	1.11	1.12	1.19	1.24	1.00	1.00	1.09	1.26	1.00	0	1.00	1.00	1.14	0	1.14	0	1.15	1.14
7 ALX	1.20	1.14	1.19	1.14	1.15	1.14	1.09	1.12	1.23	1.16	2.00	0	1.63	1.22	1.00	1.00	1.17	1.17	1.21	0	1.08	1.00	1.15	1.14
8 FFX	1.32	1.19	1.17	1.16	1.24	1.21	1.12	1.10	1.11	1.11	1.27	1.00	1.05	1.16	1.57	1.00	1.22	1.15	1.15	1.33	1.21	1.00	1.15	1.14
9 LDN	1.71	1.39	1.23	1.38	1.55	1.53	1.42	1.17	1.08	1.15	1.12	1.19	1.25	1.00	0	0	2.00	1.12	1.60	1.12	1.50	0	1.15	1.15
10 PW	2.14	1.66	1.45	1.43	1.83	1.66	1.30	1.16	1.13	1.08	1.15	0	0	2.00	0	0	1.00	1.12	1.13	1.30	1.15	1.23	1.15	1.16
11 FRD	1.41	1.24	1.15	1.21	1.42	1.39	1.13	1.35	1.16	1.28	1.06	1.13	1.17	1.21	0	0	0	1.43	0	1.15	0	0	1.15	1.10
12 CAR	1.35	1.19	1.17	1.18	1.00	1.00	0	1.68	1.28	1.00	1.14	1.04	1.14	1.16	0	0	1.00	0	0	1.25	0	0	1.15	1.09
13 HOW	1.23	1.15	1.13	1.12	1.21	1.22	1.19	1.20	1.29	1.00	1.15	1.11	1.06	1.11	1.00	0	1.33	1.00	0	1.26	0	0	1.15	1.11
14 AAR	1.24	1.16	1.18	1.13	1.22	1.24	1.18	1.21	1.67	0	1.24	1.17	1.12	1.07	1.12	1.23	1.16	0	0	3.00	0	1.00	1.15	1.10
15 CAL	1.26	1.17	1.24	1.14	1.22	1.25	1.18	1.21	0	1.00	1.00	0	1.25	1.15	1.06	1.12	1.15	0	1.00	0	1.00	1.30	1.15	1.11
16 STM	1.32	1.21	1.45	1.16	1.50	1.15	1.22	1.29	0	1.00	0	0	1.33	1.28	1.13	1.08	1.13	1.00	1.40	0	1.32	1.19	1.16	1.09
17 CHS	1.24	1.15	1.23	1.13	1.20	1.22	1.15	1.17	2.00	1.25	0	0	1.10	1.18	1.13	1.14	1.06	1.00	1.30	0	1.36	1.18	1.15	1.11
18 FAU	2.13	2.00	1.29	3.00	1.33	1.53	1.39	1.18	1.15	1.12	1.23	0	0	0	0	0	1.00	1.06	1.12	1.14	1.14	1.28	1.15	1.11
19 STA	2.59	2.04	2.22	1.77	2.15	2.05	1.48	1.28	1.44	1.12	0	0	0	0	1.00	1.75	1.33	1.14	1.05	1.00	1.10	1.14	1.15	1.12
20 CL/JF	2.92	1.40	1.25	2.00	8.00	2.60	3.00	1.41	1.16	1.20	1.14	1.20	1.32	1.11	0	0	0	1.17	1.00	1.05	0	0	1.15	1.12
21 SP/FB	2.96	2.64	2.29	1.57	2.64	2.16	1.66	1.39	1.30	1.16	0	0	0	0	1.00	1.00	1.64	1.18	1.11	0	1.05	1.15	1.15	1.09
22 KGEO	1.50	2.00	1.00	1.30	0	0	1.00	1.29	2.00	1.23	0	0	0	1.25	1.15	1.25	1.20	1.22	1.14	0	1.13	1.05	1.15	1.08
23 EXTL	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	0	1.15
TOTAL	1.22	1.13	1.12	1.11	1.20	1.20	1.14	1.13	1.11	1.10	1.09	1.08	1.11	1.10	1.08	1.09	1.08	1.10	1.08	1.09	1.08	1.10	1.15	1.13

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: LOV Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	3814	2882	547	646	231	3327	651	554	11	30	17	3	13	25	2	21	21	2	71	9	160	0	2	13039
2 DC NC	7913	70767	20366	22435	748	11953	2678	2165	84	74	78	12	150	221	10	61	124	20	387	42	668	2	31	140989
3 MTG	471	9168	381322	22530	107	1410	215	2501	120	111	1016	41	3314	493	17	108	100	23	547	82	1017	7	810	425530
4 PG	776	6888	12355	258769	49	1162	2254	1851	143	210	200	19	3144	10219	230	236	9573	35	863	100	1642	7	874	311599
5 ARLCR	142	109	37	12	1796	2094	266	329	3	3	0	0	1	3	0	0	11	0	8	0	11	0	0	4825
6 ARNCR	531	524	352	89	805	58825	5065	10695	38	49	15	2	9	14	1	11	12	5	60	6	98	0	9	77215
7 ALX	184	184	52	163	139	14472	38814	11707	13	142	14	0	3	10	1	9	7	2	43	4	85	1	2	66051
8 FFX	262	473	2710	713	383	24177	18276	414097	24454	11591	330	22	112	323	46	366	326	338	1793	274	3292	22	89	504469
9 LDN	11	20	254	98	5	124	39	4514	58470	135	701	9	36	95	12	17	34	70	484	1623	902	5	523	68181
10 PW	14	15	275	133	0	181	233	6919	713	116610	123	16	44	122	20	72	102	2264	5448	94	3521	10	87	137016
11 FRD	21	39	3091	217	4	148	77	509	379	95	67310	528	263	117	5	0	27	31	391	289	352	0	3695	77588
12 CAR	35	60	850	385	7	186	123	744	395	95	898	35690	1248	190	13	0	43	34	91	37	65	0	14326	55515
13 HOW	3	7	1895	4817	0	24	16	60	17	26	706	187	66707	3465	5	26	22	5	150	25	281	1	6637	85082
14 AAR	37	86	734	6970	9	179	113	643	284	162	163	10	6592	179335	566	93	164	29	785	48	1013	4	6607	204626
15 CAL	16	28	241	676	6	76	48	266	89	73	45	5	42	301	24796	2200	80	7	317	7	481	1	5	29806
16 STM	36	55	372	381	3	147	94	572	149	86	9	0	76	110	206	29291	566	8	675	0	662	2	4	33504
17 CHS	25	36	253	1682	3	86	59	347	163	73	43	3	45	70	566	583	44429	13	384	0	453	17	10	49343
18 FAU	9	11	141	70	1	42	29	240	399	553	42	4	29	36	4	0	19	17145	2554	28	844	2	481	22683
19 STA	1	1	8	2	0	3	1	13	3	828	4	0	2	1	0	2	2	9	29822	0	10111	0	116	40929
20 CL/JF	15	24	291	125	3	85	50	370	807	54	204	1	63	66	0	0	11	25	445	19334	304	0	6549	28826
21 SP/FB	0	1	3	2	0	0	0	3	0	3	0	0	1	0	0	0	1	0	1848	0	35184	0	623	37669
22 KGEO	13	17	111	94	3	56	39	227	117	40	0	0	14	41	6	11	42	10	570	0	1093	3676	230	6410
23 EXTL	0	11	524	1458	0	3	3	52	62	192	2422	6311	6042	16592	1	4	8	1323	967	1295	4880	209	0	42359
TOTAL	14329	91406	426784	322467	4302	118760	69143	459378	86913	131235	74340	42863	87950	211849	26507	33111	55724	21398	48703	23297	67119	3966	41710	2463254

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: LOV Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	4477	3626	690	864	275	4160	837	722	22	36	28	3	22	36	5	29	30	3	113	15	251	0	4	16248
2 DC NC	10317	84806	26487	30736	930	15521	3603	2935	138	112	128	18	215	319	21	118	185	28	650	80	1119	5	54	178525
3 MTG	617	11871	470153	30284	139	1914	298	3405	193	188	1448	61	4609	703	33	187	161	38	917	132	1754	11	1332	530448
4 PG	1043	9181	16571	321154	68	1547	3050	2581	247	321	336	33	4310	14230	335	364	13298	63	1445	181	2820	22	1427	394627
5 ARLCR	177	133	48	17	1820	2583	337	419	3	5	0	0	1	4	0	0	17	0	12	1	15	0	1	5593
6 ARNCR	688	668	476	112	972	68106	6537	13909	60	74	24	2	14	20	2	18	18	7	84	10	155	1	12	91969
7 ALX	248	243	70	221	175	18533	45067	15284	21	191	19	0	7	13	1	13	13	2	72	11	128	1	6	80339
8 FFX	356	665	3779	1040	490	31989	24213	510636	33117	15895	524	43	169	511	86	647	560	505	2840	453	5342	34	141	634035
9 LDN	14	22	403	163	6	183	61	6161	70304	215	1011	15	64	161	19	38	63	97	822	2292	1588	9	859	84570
10 PW	15	22	438	213	1	256	332	9551	1001	142466	214	22	75	210	31	135	180	3167	7896	170	5317	18	142	171872
11 FRD	35	63	4402	367	6	234	133	842	586	175	78733	735	395	207	10	1	49	52	731	413	675	0	6061	94905
12 CAR	56	97	1305	631	13	307	205	1265	667	173	1311	38861	1777	314	25	0	74	62	170	62	122	0	23486	70983
13 HOW	3	13	2635	6505	0	38	24	92	31	44	1025	263	75861	4773	10	45	38	10	271	41	521	3	10882	103128
14 AAR	53	132	1128	9659	12	271	170	1053	507	280	278	17	9078	204353	792	155	266	54	1441	90	1872	6	10831	242498
15 CAL	25	41	402	987	7	119	75	448	162	125	81	8	74	437	28377	3063	126	15	578	13	877	3	5	36048
16 STM	58	92	649	633	8	234	148	986	276	152	16	0	134	188	298	33652	808	18	1192	0	1152	4	6	40704
17 CHS	34	57	417	2364	4	126	84	557	282	121	79	5	82	111	789	814	50106	24	663	0	777	27	16	57539
18 FAU	14	17	235	124	1	68	43	368	563	788	71	6	47	73	7	2	30	19502	3666	44	1282	3	786	27740
19 STA	1	1	12	4	0	4	2	19	5	1144	6	0	4	2	0	5	3	11	34102	0	13843	0	192	49360
20 CL/JF	28	39	480	225	8	144	88	622	1172	91	296	2	109	122	0	0	21	42	817	20696	560	0	10739	36301
21 SP/FB	0	1	4	6	0	0	0	5	1	5	0	0	1	0	0	0	1	0	2536	0	38337	0	1020	41917
22 KGEO	20	30	199	168	5	94	63	396	214	66	0	0	25	73	10	17	66	17	835	1	1585	3850	374	8108
23 EXTL	0	15	858	2393	0	3	3	86	103	321	3973	10345	9907	27201	1	5	12	2168	1582	2122	8001	343	0	69442
TOTAL	18279	111835	531841	408870	4940	146434	85373	572342	109675	162988	89601	50439	106980	254061	30852	39308	66125	25885	63435	26827	88093	4340	68376	3066899

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: Transit

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	574	642	147	124	91	925	148	110	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2763
2 DC NC	1759	6397	3520	2714	213	2359	401	244	0	0	0	0	3	0	0	0	0	0	0	0	4	0	0	17614
3 MTG	33	718	9506	333	19	91	19	33	0	0	0	0	9	0	0	0	0	0	0	0	1	0	0	10762
4 PG	54	423	548	2950	7	88	46	34	0	0	0	0	9	7	0	0	0	0	0	0	0	0	0	4166
5 ARLCR	21	10	3	1	23	216	22	22	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	319
6 ARNCR	53	45	16	1	117	1813	208	452	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2706
7 ALX	5	5	6	1	14	620	848	369	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1869
8 FFX	7	18	82	11	58	1496	926	4061	2	63	0	0	0	0	0	0	0	0	0	0	0	0	0	6724
9 LDN	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
10 PW	0	0	0	1	0	5	3	34	0	1124	0	0	0	0	0	0	0	0	0	0	0	0	0	1167
11 FRD	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	1	8	0	0	0	0	0	0	0	0	16	2	0	0	0	0	0	0	0	0	0	27
14 AAR	0	1	7	6	0	4	3	1	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0	29
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	2506	8259	13836	6150	542	7617	2624	5360	30	1190	8	0	41	14	0	0	0	0	0	0	6	0	0	48183

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: HOV Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: HOV AUTO Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	3814	2882	547	646	231	3327	651	554	11	30	17	3	13	25	2	21	21	2	71	9	160	0	2	13039
2 DC NC	7913	70767	20366	22435	748	11953	2678	2165	84	74	78	12	150	221	10	61	124	20	387	42	668	2	31	140989
3 MTG	471	9168	381322	22530	107	1410	215	2501	120	111	1016	41	3314	493	17	108	100	23	547	82	1017	7	810	425530
4 PG	776	6888	12355	258769	49	1162	2254	1851	143	210	200	19	3144	10219	230	236	9573	35	863	100	1642	7	874	311599
5 ARLCR	142	109	37	12	1796	2094	266	329	3	3	0	0	1	3	0	0	11	0	8	0	11	0	0	4825
6 ARNCR	531	524	352	89	805	58825	5065	10695	38	49	15	2	9	14	1	11	12	5	60	6	98	0	9	77215
7 ALX	184	184	52	163	139	14472	38814	11707	13	142	14	0	3	10	1	9	7	2	43	4	85	1	2	66051
8 FFX	262	473	2710	713	383	24177	18276	414097	24454	11591	330	22	112	323	46	366	326	338	1793	274	3292	22	89	504469
9 LDN	11	20	254	98	5	124	39	4514	58470	135	701	9	36	95	12	17	34	70	484	1623	902	5	523	68181
10 PW	14	15	275	133	0	181	233	6919	713	116610	123	16	44	122	20	72	102	2264	5448	94	3521	10	87	137016
11 FRD	21	39	3091	217	4	148	77	509	379	95	67310	528	263	117	5	0	27	31	391	289	352	0	3695	77588
12 CAR	35	60	850	385	7	186	123	744	395	95	898	35690	1248	190	13	0	43	34	91	37	65	0	14326	55515
13 HOW	3	7	1895	4817	0	24	16	60	17	26	706	187	66707	3465	5	26	22	5	150	25	281	1	6637	85082
14 AAR	37	86	734	6970	9	179	113	643	284	162	163	10	6592	179335	566	93	164	29	785	48	1013	4	6607	204626
15 CAL	16	28	241	676	6	76	48	266	89	73	45	5	42	301	24796	2200	80	7	317	7	481	1	5	29806
16 STM	36	55	372	381	3	147	94	572	149	86	9	0	76	110	206	29291	566	8	675	0	662	2	4	33504
17 CHS	25	36	253	1682	3	86	59	347	163	73	43	3	45	70	566	583	44429	13	384	0	453	17	10	49343
18 FAU	9	11	141	70	1	42	29	240	399	553	42	4	29	36	4	0	19	17145	2554	28	844	2	481	22683
19 STA	1	1	8	2	0	3	1	13	3	828	4	0	2	1	0	2	2	9	29822	0	10111	0	116	40929
20 CL/JF	15	24	291	125	3	85	50	370	807	54	204	1	63	66	0	0	11	25	445	19334	304	0	6549	28826
21 SP/FB	0	1	3	2	0	0	0	3	0	3	0	0	1	0	0	0	1	0	1848	0	35184	0	623	37669
22 KGEO	13	17	111	94	3	56	39	227	117	40	0	0	14	41	6	11	42	10	570	0	1093	3676	230	6410
23 EXTL	0	11	524	1458	0	3	3	52	62	192	2422	6311	6042	16592	1	4	8	1323	967	1295	4880	209	0	42359
TOTAL	14329	91406	426784	322467	4302	118760	69143	459378	86913	131235	74340	42863	87950	211849	26507	33111	55724	21398	48703	23297	67119	3966	41710	2463254

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	4477	3626	690	864	275	4160	837	722	22	36	28	3	22	36	5	29	30	3	113	15	251	0	4	16248
2 DC NC	10317	84806	26487	30736	930	15521	3603	2935	138	112	128	18	215	319	21	118	185	28	650	80	1119	5	54	178525
3 MTG	617	11871	470153	30284	139	1914	298	3405	193	188	1448	61	4609	703	33	187	161	38	917	132	1754	11	1332	530448
4 PG	1043	9181	16571	321154	68	1547	3050	2581	247	321	336	33	4310	14230	335	364	13298	63	1445	181	2820	22	1427	394627
5 ARLCR	177	133	48	17	1820	2583	337	419	3	5	0	0	1	4	0	0	17	0	12	1	15	0	1	5593
6 ARNCR	688	668	476	112	972	68106	6537	13909	60	74	24	2	14	20	2	18	18	7	84	10	155	1	12	91969
7 ALX	248	243	70	221	175	18533	45067	15284	21	191	19	0	7	13	1	13	13	2	72	11	128	1	6	80339
8 FFX	356	665	3779	1040	490	31989	24213	510636	33117	15895	524	43	169	511	86	647	560	505	2840	453	5342	34	141	634035
9 LDN	14	22	403	163	6	183	61	6161	70304	215	1011	15	64	161	19	38	63	97	822	2292	1588	9	859	84570
10 PW	15	22	438	213	1	256	332	9551	1001	142466	214	22	75	210	31	135	180	3167	7896	170	5317	18	142	171872
11 FRD	35	63	4402	367	6	234	133	842	586	175	78733	735	395	207	10	1	49	52	731	413	675	0	6061	94905
12 CAR	56	97	1305	631	13	307	205	1265	667	173	1311	38861	1777	314	25	0	74	62	170	62	122	0	23486	70983
13 HOW	3	13	2635	6505	0	38	24	92	31	44	1025	263	75861	4773	10	45	38	10	271	41	521	3	10882	103128
14 AAR	53	132	1128	9659	12	271	170	1053	507	280	278	17	9078	204353	792	155	266	54	1441	90	1872	6	10831	242498
15 CAL	25	41	402	987	7	119	75	448	162	125	81	8	74	437	28377	3063	126	15	578	13	877	3	5	36048
16 STM	58	92	649	633	8	234	148	986	276	152	16	0	134	188	298	33652	808	18	1192	0	1152	4	6	40704
17 CHS	34	57	417	2364	4	126	84	557	282	121	79	5	82	111	789	814	50106	24	663	0	777	27	16	57539
18 FAU	14	17	235	124	1	68	43	368	563	788	71	6	47	73	7	2	30	19502	3666	44	1282	3	786	27740
19 STA	1	1	12	4	0	4	2	19	5	1144	6	0	4	2	0	5	3	11	34102	0	13843	0	192	49360
20 CL/JF	28	39	480	225	8	144	88	622	1172	91	296	2	109	122	0	0	21	42	817	20696	560	0	10739	36301
21 SP/FB	0	1	4	6	0	0	0	5	1	5	0	0	1	0	0	0	1	0	2536	0	38337	0	1020	41917
22 KGEO	20	30	199	168	5	94	63	396	214	66	0	0	25	73	10	17	66	17	835	1	1585	3850	374	8108
23 EXTL	0	15	858	2393	0	3	3	86	103	321	3973	10345	9907	27201	1	5	12	2168	1582	2122	8001	343	0	69442
TOTAL	18279	111835	531841	408870	4940	146434	85373	572342	109675	162988	89601	50439	106980	254061	30852	39308	66125	25885	63435	26827	88093	4340	68376	3066899

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: Total Motorized Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	5051	4268	837	988	366	5085	985	832	22	36	28	3	24	36	5	29	30	3	113	15	251	0	4	19011
2 DC NC	12076	91203	30007	33450	1143	17880	4004	3179	138	112	128	18	218	319	21	118	185	28	650	80	1123	5	54	196139
3 MTG	650	12589	479659	30617	158	2005	317	3438	193	188	1448	61	4618	703	33	187	161	38	917	132	1755	11	1332	541210
4 PG	1097	9604	17119	324104	75	1635	3096	2615	247	321	336	33	4319	14237	335	364	13298	63	1445	181	2820	22	1427	398793
5 ARLCR	198	143	51	18	1843	2799	359	441	3	6	0	0	1	4	0	0	17	0	12	1	15	0	1	5912
6 ARNCR	741	713	492	113	1089	69919	6745	14361	60	75	24	2	14	20	2	18	18	7	84	10	155	1	12	94675
7 ALX	253	248	76	222	189	19153	45915	15653	21	192	19	0	7	13	1	13	13	2	72	11	128	1	6	82208
8 FFX	363	683	3861	1051	548	33485	25139	514697	33119	15958	524	43	169	511	86	647	560	505	2840	453	5342	34	141	640759
9 LDN	14	22	403	163	6	183	61	6161	70332	215	1011	15	64	161	19	38	63	97	822	2292	1588	9	859	84598
10 PW	15	22	438	214	1	261	335	9585	1001	143590	214	22	75	210	31	135	180	3167	7896	170	5317	18	142	173039
11 FRD	35	63	4402	367	6	234	133	842	586	175	78741	735	395	207	10	1	49	52	731	413	675	0	6061	94913
12 CAR	56	97	1305	631	13	307	205	1265	667	173	1311	38861	1777	314	25	0	74	62	170	62	122	0	23486	70983
13 HOW	3	13	2636	6513	0	38	24	92	31	44	1025	263	75877	4775	10	45	38	10	271	41	521	3	10882	103155
14 AAR	53	133	1135	9665	12	275	173	1054	507	280	278	17	9080	204358	792	155	266	54	1441	90	1872	6	10831	242527
15 CAL	25	41	402	987	7	119	75	448	162	125	81	8	74	437	28377	3063	126	15	578	13	877	3	5	36048
16 STM	58	92	649	633	8	234	148	986	276	152	16	0	134	188	298	33652	808	18	1192	0	1152	4	6	40704
17 CHS	34	57	417	2364	4	126	84	557	282	121	79	5	82	111	789	814	50106	24	663	0	777	27	16	57539
18 FAU	14	17	235	124	1	68	43	368	563	788	71	6	47	73	7	2	30	19502	3666	44	1282	3	786	27740
19 STA	1	1	12	4	0	4	2	19	5	1144	6	0	4	2	0	5	3	11	34102	0	13844	0	192	49361
20 CL/JF	28	39	480	225	8	144	88	622	1172	91	296	2	109	122	0	0	21	42	817	20696	560	0	10739	36301
21 SP/FB	0	1	4	6	0	0	0	5	1	5	0	0	1	0	0	0	1	0	2536	0	38337	0	1020	41917
22 KGEO	20	30	199	168	5	94	63	396	214	66	0	0	25	73	10	17	66	17	835	1	1585	3850	374	8108
23 EXTL	0	15	858	2393	0	3	3	86	103	321	3973	10345	9907	27201	1	5	12	2168	1582	2122	8001	343	0	69442
TOTAL	20785	120094	545677	415020	5482	154051	87997	577702	109705	164178	89609	50439	107021	254075	30852	39308	66125	25885	63435	26827	88099	4340	68376	3115082

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: Transit Percentage

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	11.4	15.0	17.6	12.6	24.9	18.2	15.0	13.2	0	0	0	0	8.3	0	0	0	0	0	0	0	0	0	0	14.5
2 DC NC	14.6	7.0	11.7	8.1	18.6	13.2	10.0	7.7	0	0	0	0	1.4	0	0	0	0	0	0	0	0.4	0	0	9.0
3 MTG	5.1	5.7	2.0	1.1	12.0	4.5	6.0	1.0	0	0	0	0	0.2	0	0	0	0	0	0	0	0.1	0	0	2.0
4 PG	4.9	4.4	3.2	0.9	9.3	5.4	1.5	1.3	0	0	0	0	0.2	0.0	0	0	0	0	0	0	0	0	0	1.0
5 ARLCR	10.6	7.0	5.9	5.6	1.2	7.7	6.1	5.0	0	16.7	0	0	0	0	0	0	0	0	0	0	0	0	0	5.4
6 ARNCR	7.2	6.3	3.3	0.9	10.7	2.6	3.1	3.1	0	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9
7 ALX	2.0	2.0	7.9	0.5	7.4	3.2	1.8	2.4	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	2.3
8 FFX	1.9	2.6	2.1	1.0	10.6	4.5	3.7	0.8	0.0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0
9 LDN	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
10 PW	0	0	0	0.5	0	1.9	0.9	0.4	0	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7
11 FRD	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0.0	0.1	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0.0
14 AAR	0	0.8	0.6	0.1	0	1.5	1.7	0.1	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0.0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0.0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	12.1	6.9	2.5	1.5	9.9	4.9	3.0	0.9	0.0	0.7	0.0	0	0.0	0.0	0	0	0	0	0	0	0.0	0	0	1.5

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBS MODE: Avg. Auto Occupancy

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	1.17	1.26	1.26	1.34	1.19	1.25	1.29	1.30	2.00	1.20	1.65	1.00	1.69	1.44	2.50	1.38	1.43	1.50	1.59	1.67	1.57	0	2.00	1.25
2 DC NC	1.30	1.20	1.30	1.37	1.24	1.30	1.35	1.36	1.64	1.51	1.64	1.50	1.43	1.44	2.10	1.93	1.49	1.40	1.68	1.90	1.68	2.50	1.74	1.27
3 MTG	1.31	1.29	1.23	1.34	1.30	1.36	1.39	1.36	1.61	1.69	1.43	1.49	1.39	1.43	1.94	1.73	1.61	1.65	1.68	1.61	1.72	1.57	1.64	1.25
4 PG	1.34	1.33	1.34	1.24	1.39	1.33	1.35	1.39	1.73	1.53	1.68	1.74	1.37	1.39	1.46	1.54	1.39	1.80	1.67	1.81	1.72	3.14	1.63	1.27
5 ARLCR	1.25	1.22	1.30	1.42	1.01	1.23	1.27	1.27	1.00	1.67	0	0	1.00	1.33	0	0	1.55	0	1.50	1.00	1.36	0	1.00	1.16
6 ARNCR	1.30	1.27	1.35	1.26	1.21	1.16	1.29	1.30	1.58	1.51	1.60	1.00	1.56	1.43	2.00	1.64	1.50	1.40	1.40	1.67	1.58	1.00	1.33	1.19
7 ALX	1.35	1.32	1.35	1.36	1.26	1.28	1.16	1.31	1.62	1.35	1.36	0	2.33	1.30	1.00	1.44	1.86	1.00	1.67	2.75	1.51	1.00	3.00	1.22
8 FFX	1.36	1.41	1.39	1.46	1.28	1.32	1.32	1.23	1.35	1.37	1.59	1.95	1.51	1.58	1.87	1.77	1.72	1.49	1.58	1.65	1.62	1.55	1.58	1.26
9 LDN	1.27	1.10	1.59	1.66	1.20	1.48	1.56	1.36	1.20	1.59	1.44	1.67	1.78	1.69	1.58	2.24	1.85	1.39	1.70	1.41	1.76	1.80	1.64	1.24
10 PW	1.07	1.47	1.59	1.60	1.00	1.41	1.42	1.38	1.40	1.22	1.74	1.38	1.70	1.72	1.55	1.88	1.76	1.40	1.45	1.81	1.51	1.80	1.63	1.25
11 FRD	1.67	1.62	1.42	1.69	1.50	1.58	1.73	1.65	1.55	1.84	1.17	1.39	1.50	1.77	2.00	1.00	1.81	1.68	1.87	1.43	1.92	0	1.64	1.22
12 CAR	1.60	1.62	1.54	1.64	1.86	1.65	1.67	1.70	1.69	1.82	1.46	1.09	1.42	1.65	1.92	0	1.72	1.82	1.87	1.68	1.88	0	1.64	1.28
13 HOW	1.00	1.86	1.39	1.35	0	1.58	1.50	1.53	1.82	1.69	1.45	1.41	1.14	1.38	2.00	1.73	1.73	2.00	1.81	1.64	1.85	3.00	1.64	1.21
14 AAR	1.43	1.53	1.54	1.39	1.33	1.51	1.50	1.64	1.79	1.73	1.71	1.70	1.38	1.14	1.40	1.67	1.62	1.86	1.84	1.88	1.85	1.50	1.64	1.19
15 CAL	1.56	1.46	1.67	1.46	1.17	1.57	1.56	1.68	1.82	1.71	1.80	1.60	1.76	1.45	1.14	1.39	1.58	2.14	1.82	1.86	1.82	3.00	1.00	1.21
16 STM	1.61	1.67	1.74	1.66	2.67	1.59	1.57	1.72	1.85	1.77	1.78	0	1.76	1.71	1.45	1.15	1.43	2.25	1.77	0	1.74	2.00	1.50	1.21
17 CHS	1.36	1.58	1.65	1.41	1.33	1.47	1.42	1.61	1.73	1.66	1.84	1.67	1.82	1.59	1.39	1.40	1.13	1.85	1.73	0	1.72	1.59	1.60	1.17
18 FAU	1.56	1.55	1.67	1.77	1.00	1.62	1.48	1.53	1.41	1.42	1.69	1.50	1.62	2.03	1.75	2.00	1.58	1.14	1.44	1.57	1.52	1.50	1.63	1.22
19 STA	1.00	1.00	1.50	2.00	0	1.33	2.00	1.46	1.67	1.38	1.50	0	2.00	2.00	0	2.50	1.50	1.22	1.14	0	1.37	0	1.66	1.21
20 CL/JF	1.87	1.63	1.65	1.80	2.67	1.69	1.76	1.68	1.45	1.69	1.45	2.00	1.73	1.85	0	0	1.91	1.68	1.84	1.07	1.84	0	1.64	1.26
21 SP/FB	0	1.00	1.33	3.00	0	0	0	1.67	1.00	1.67	0	0	1.00	0	0	0	1.00	0	1.37	0	1.09	0	1.64	1.11
22 KGEO	1.54	1.76	1.79	1.79	1.67	1.68	1.62	1.74	1.83	1.65	0	0	1.79	1.78	1.67	1.55	1.57	1.70	1.46	1.00	1.45	1.05	1.63	1.26
23 EXTL	0	1.36	1.64	1.64	0	1.00	1.00	1.65	1.66	1.67	1.64	1.64	1.64	1.64	1.00	1.25	1.50	1.64	1.64	1.64	1.64	1.64	0	1.64
TOTAL	1.28	1.22	1.25	1.27	1.15	1.23	1.23	1.25	1.26	1.24	1.21	1.18	1.22	1.20	1.16	1.19	1.19	1.21	1.30	1.15	1.31	1.09	1.64	1.25

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBO MODE: LOV Auto Driver

DESTINATION

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
1 DC CR	13005	8288	1144	1258	345	1604	397	958	12	13	2	1	11	38	0	0	4	0	0	2	0	0	445	27527
2 DC NC	54352	270538	54098	43128	2788	13437	4326	11265	249	87	20	11	705	1168	39	8	156	10	9	11	14	4	7658	464081
3 MTG	12207	47379	1020536	44955	1272	7910	1834	27378	1263	136	6421	626	14528	3225	21	18	45	23	44	222	52	20	22816	1212931
4 PG	25141	78306	47543	635108	1328	5711	7074	10034	93	194	36	26	9839	26181	826	227	9277	30	46	27	44	19	16046	873156
5 ARLCR	1068	1017	324	137	3184	2548	489	1083	11	11	0	0	1	2	0	0	0	0	2	0	0	0	124	10001
6 ARNCR	13967	11071	4946	2049	5560	140586	17186	50490	571	339	11	6	22	60	1	7	12	11	15	15	9	3	3182	250119
7 ALX	5882	4710	1198	1790	1668	17055	63798	28634	82	500	4	1	9	35	1	5	26	4	35	6	11	0	1506	126960
8 FFX	14413	11318	14560	5483	3755	48922	42778	1065120	38322	19017	44	28	89	201	19	25	86	927	661	106	364	32	15999	1282269
9 LDN	171	149	707	64	34	496	107	21817	182744	690	1413	17	42	49	1	0	11	446	18	3765	18	4	2979	215742
10 PW	1243	860	536	470	290	2901	3778	59576	3419	302666	26	10	46	119	9	16	25	1876	5137	97	2894	19	5639	391652
11 FRD	115	193	18090	216	23	106	55	472	2459	64	219035	4507	4293	340	6	1	21	23	36	3659	32	0	9975	263721
12 CAR	123	167	2193	235	23	114	71	336	82	65	5173	143548	5284	325	5	2	31	27	5	43	1	0	14221	172074
13 HOW	232	1035	13127	9802	7	48	17	159	32	19	1444	1381	188420	15911	5	8	14	7	9	59	9	3	13916	245664
14 AAR	1483	4262	4168	35481	59	292	269	667	88	105	84	54	22104	514700	1562	53	293	30	47	32	34	18	30909	616794
15 CAL	235	577	264	4331	17	91	102	290	42	48	20	10	45	3423	86747	6059	1164	7	23	2	26	10	587	104120
16 STM	116	150	240	683	16	84	31	236	22	46	2	2	55	119	1999	100408	3584	12	20	0	24	287	435	108571
17 CHS	629	1164	231	11807	29	162	318	575	34	41	20	5	42	287	862	2536	137600	27	26	6	32	1113	1111	158657
18 FAU	96	102	221	108	21	169	68	5565	1346	5124	29	10	36	85	3	6	28	42923	2423	288	1024	19	1688	61382
19 STA	34	32	53	30	6	72	126	1093	16	4006	6	0	10	23	1	7	8	541	73677	7	14120	141	2447	96456
20 CL/JF	122	172	563	161	25	112	62	385	4853	149	4425	29	94	62	2	0	10	429	24	58832	10	0	4710	75231
21 SP/FB	37	45	85	46	5	34	26	191	20	908	7	0	7	16	4	7	16	312	10871	1	105703	46	7704	126091
22 KGEO	98	132	177	132	16	86	47	245	51	76	0	0	11	44	9	79	535	90	874	2	597	19110	350	22761
23 EXTL	1594	4789	15217	10176	182	2010	1119	10629	2475	3146	6965	7851	11388	25342	314	273	696	949	1784	4381	6053	222	0	117555
TOTAL	146363	446456	1200221	807650	20653	244550	144078	1297198	238286	337450	245187	158123	257081	591755	92436	109745	153642	48704	95786	71563	131071	21070	164447	7023515

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBO MODE: LOV Auto Person

DESTINATION

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
1 DC CR	16112	11632	1597	1811	469	2206	553	1360	19	14	3	1	20	56	0	2	7	1	0	2	1	0	722	36588
2 DC NC	78881	356527	80387	65838	4007	19529	6396	16947	365	130	29	15	1093	1817	64	10	247	14	14	15	23	9	12359	644716
3 MTG	18050	70914	1351185	68566	1871	11753	2787	41927	1942	200	9955	970	22413	4963	30	33	68	37	65	363	85	32	36804	1645013
4 PG	37525	118620	72142	829418	1958	8439	10710	15388	145	293	72	41	15066	40435	1276	349	14427	45	71	40	72	35	25892	1192459
5 ARLCR	1482	1416	458	193	3366	3524	689	1529	17	15	0	0	2	4	0	0	0	0	2	0	0	0	200	12897
6 ARNCR	20217	16130	7329	3045	7934	176537	25305	75432	868	510	11	6	32	97	1	8	20	20	24	17	12	3	5139	338697
7 ALX	8563	6918	1767	2677	2414	24860	79747	42550	125	757	8	3	11	52	3	6	46	8	49	7	16	0	2428	173015
8 FFX	21506	17008	22140	8414	5513	72933	64432	1420141	59135	29314	68	47	138	310	27	38	130	1435	1023	154	561	45	25823	1750335
9 LDN	248	223	1096	96	49	743	164	33675	224574	1065	2207	26	66	75	3	0	17	702	27	5867	32	5	4815	275775
10 PW	1874	1296	826	723	436	4337	5726	91783	5308	386145	40	27	64	186	15	27	36	2900	7969	146	4495	35	9102	523496
11 FRD	173	298	28027	334	31	160	84	728	3818	97	273084	7024	6667	529	10	2	35	37	58	5691	54	0	16086	343027
12 CAR	186	249	3404	369	35	166	110	517	129	105	8045	157846	8212	506	6	4	55	45	7	67	3	0	22936	203002
13 HOW	346	1576	20257	15086	11	73	28	242	53	27	2250	2152	221987	24584	9	17	19	10	14	92	17	6	22443	311299
14 AAR	2236	6505	6391	54805	92	435	403	1032	138	164	127	83	34088	663418	2430	83	453	53	76	43	59	21	49851	822986
15 CAL	357	886	405	6739	25	130	159	450	65	75	31	18	69	5332	98799	9415	1812	14	36	4	42	16	943	125822
16 STM	173	229	386	1061	25	124	49	368	36	78	5	3	92	185	3110	119157	5586	19	27	0	43	447	702	131905
17 CHS	951	1788	354	18322	41	242	481	889	56	63	28	13	68	443	1344	3959	159366	42	40	11	49	1738	1794	192082
18 FAU	145	154	339	169	30	254	104	8616	2094	7970	44	19	58	134	9	8	43	47745	3775	446	1588	27	2723	76494
19 STA	52	50	79	47	9	108	196	1692	23	6227	10	0	14	35	4	7	15	844	94699	13	21907	216	3947	130194
20 CL/JF	184	262	866	253	34	167	95	593	7539	234	6870	43	148	95	3	0	19	665	37	65324	18	1	7597	91047
21 SP/FB	55	69	131	69	6	50	41	294	32	1402	14	0	14	27	5	10	25	482	16808	2	117033	69	12424	149062
22 KGEO	148	200	278	205	26	128	71	378	85	120	0	0	21	66	13	122	832	139	1362	2	927	20907	566	26596
23 EXTL	2573	7725	24541	16409	296	3240	1803	17143	3992	5077	11237	12656	18375	40873	504	442	1125	1536	2882	7066	9758	352	0	189605
TOTAL	212037	620675	1624385	1094649	28678	330138	200133	1773674	310558	440082	314138	180993	328718	784222	107665	133699	184383	56793	129065	85372	156795	23964	265296	9386112

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBO MODE: Transit

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	7110	3937	934	639	346	1339	244	471	0	2	0	0	0	1	0	0	0	0	0	0	1	0	0	15024
2 DC NC	34155	27416	12017	7293	1289	4748	1070	1804	0	4	0	0	20	8	0	0	0	0	0	0	0	0	0	89824
3 MTG	5370	6267	22402	2020	300	968	169	473	0	3	0	0	28	1	0	0	0	0	0	0	0	0	0	38001
4 PG	7341	6200	2919	6617	247	737	251	280	0	0	0	0	22	13	0	0	0	0	0	0	0	0	0	24627
5 ARLCR	1057	335	109	34	115	598	121	237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2606
6 ARNCR	9005	2334	852	279	1326	7786	1768	4467	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	27824
7 ALX	2390	628	166	93	348	2119	1750	1597	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	9099
8 FFX	4007	1072	632	142	648	4709	1934	8720	0	58	0	0	0	0	0	0	0	0	0	0	0	0	0	21922
9 LDN	0	0	0	0	0	0	0	0	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87
10 PW	94	5	4	0	17	51	48	161	0	1414	0	0	0	0	0	0	0	0	0	0	0	0	0	1794
11 FRD	0	0	0	0	0	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	34
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	19	9	19	12	0	0	0	0	0	0	0	0	36	5	0	0	0	0	0	0	0	0	0	100
14 AAR	67	61	46	45	3	6	4	0	0	0	0	0	6	17	0	0	0	0	0	0	0	0	0	255
15 CAL	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	70616	48264	40100	17176	4639	23061	7359	18210	87	1496	34	0	112	45	0	0	0	0	0	0	1	0	0	231200

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBO MODE: HOV Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBO MODE: HOV AUTO Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBO MODE: Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	13005	8288	1144	1258	345	1604	397	958	12	13	2	1	11	38	0	0	4	0	0	2	0	0	445	27527
2 DC NC	54352	270538	54098	43128	2788	13437	4326	11265	249	87	20	11	705	1168	39	8	156	10	9	11	14	4	7658	464081
3 MTG	12207	47379	1020536	44955	1272	7910	1834	27378	1263	136	6421	626	14528	3225	21	18	45	23	44	222	52	20	22816	1212931
4 PG	25141	78306	47543	635108	1328	5711	7074	10034	93	194	36	26	9839	26181	826	227	9277	30	46	27	44	19	16046	873156
5 ARLCR	1068	1017	324	137	3184	2548	489	1083	11	11	0	0	1	2	0	0	0	0	2	0	0	0	124	10001
6 ARNCR	13967	11071	4946	2049	5560	140586	17186	50490	571	339	11	6	22	60	1	7	12	11	15	15	9	3	3182	250119
7 ALX	5882	4710	1198	1790	1668	17055	63798	28634	82	500	4	1	9	35	1	5	26	4	35	6	11	0	1506	126960
8 FFX	14413	11318	14560	5483	3755	48922	42778	1065120	38322	19017	44	28	89	201	19	25	86	927	661	106	364	32	15999	1282269
9 LDN	171	149	707	64	34	496	107	21817	182744	690	1413	17	42	49	1	0	11	446	18	3765	18	4	2979	215742
10 PW	1243	860	536	470	290	2901	3778	59576	3419	302666	26	10	46	119	9	16	25	1876	5137	97	2894	19	5639	391652
11 FRD	115	193	18090	216	23	106	55	472	2459	64	219035	4507	4293	340	6	1	21	23	36	3659	32	0	9975	263721
12 CAR	123	167	2193	235	23	114	71	336	82	65	5173	143548	5284	325	5	2	31	27	5	43	1	0	14221	172074
13 HOW	232	1035	13127	9802	7	48	17	159	32	19	1444	1381	188420	15911	5	8	14	7	9	59	9	3	13916	245664
14 AAR	1483	4262	4168	35481	59	292	269	667	88	105	84	54	22104	514700	1562	53	293	30	47	32	34	18	30909	616794
15 CAL	235	577	264	4331	17	91	102	290	42	48	20	10	45	3423	86747	6059	1164	7	23	2	26	10	587	104120
16 STM	116	150	240	683	16	84	31	236	22	46	2	2	55	119	1999	100408	3584	12	20	0	24	287	435	108571
17 CHS	629	1164	231	11807	29	162	318	575	34	41	20	5	42	287	862	2536	137600	27	26	6	32	1113	1111	158657
18 FAU	96	102	221	108	21	169	68	5565	1346	5124	29	10	36	85	3	6	28	42923	2423	288	1024	19	1688	61382
19 STA	34	32	53	30	6	72	126	1093	16	4006	6	0	10	23	1	7	8	541	73677	7	14120	141	2447	96456
20 CL/JF	122	172	563	161	25	112	62	385	4853	149	4425	29	94	62	2	0	10	429	24	58832	10	0	4710	75231
21 SP/FB	37	45	85	46	5	34	26	191	20	908	7	0	7	16	4	7	16	312	10871	1	105703	46	7704	126091
22 KGEO	98	132	177	132	16	86	47	245	51	76	0	0	11	44	9	79	535	90	874	2	597	19110	350	22761
23 EXTL	1594	4789	15217	10176	182	2010	1119	10629	2475	3146	6965	7851	11388	25342	314	273	696	949	1784	4381	6053	222	0	117555
TOTAL	146363	446456	1200221	807650	20653	244550	144078	1297198	238286	337450	245187	158123	257081	591755	92436	109745	153642	48704	95786	71563	131071	21070	164447	7023515

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2   Iteration: i6
Purpose: HBO   MODE: Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	16112	11632	1597	1811	469	2206	553	1360	19	14	3	1	20	56	0	2	7	1	0	2	1	0	722	36588
2 DC NC	78881	356527	80387	65838	4007	19529	6396	16947	365	130	29	15	1093	1817	64	10	247	14	14	15	23	9	12359	644716
3 MTG	18050	70914	1351185	68566	1871	11753	2787	41927	1942	200	9955	970	22413	4963	30	33	68	37	65	363	85	32	36804	1645013
4 PG	37525	118620	72142	829418	1958	8439	10710	15388	145	293	72	41	15066	40435	1276	349	14427	45	71	40	72	35	25892	1192459
5 ARLCR	1482	1416	458	193	3366	3524	689	1529	17	15	0	0	2	4	0	0	0	0	2	0	0	0	200	12897
6 ARNCR	20217	16130	7329	3045	7934	176537	25305	75432	868	510	11	6	32	97	1	8	20	20	24	17	12	3	5139	338697
7 ALX	8563	6918	1767	2677	2414	24860	79747	42550	125	757	8	3	11	52	3	6	46	8	49	7	16	0	2428	173015
8 FFX	21506	17008	22140	8414	5513	72933	64432	1420141	59135	29314	68	47	138	310	27	38	130	1435	1023	154	561	45	25823	1750335
9 LDN	248	223	1096	96	49	743	164	33675	224574	1065	2207	26	66	75	3	0	17	702	27	5867	32	5	4815	275775
10 PW	1874	1296	826	723	436	4337	5726	91783	5308	386145	40	27	64	186	15	27	36	2900	7969	146	4495	35	9102	523496
11 FRD	173	298	28027	334	31	160	84	728	3818	97	273084	7024	6667	529	10	2	35	37	58	5691	54	0	16086	343027
12 CAR	186	249	3404	369	35	166	110	517	129	105	8045	157846	8212	506	6	4	55	45	7	67	3	0	22936	203002
13 HOW	346	1576	20257	15086	11	73	28	242	53	27	2250	2152	221987	24584	9	17	19	10	14	92	17	6	22443	311299
14 AAR	2236	6505	6391	54805	92	435	403	1032	138	164	127	83	34088	663418	2430	83	453	53	76	43	59	21	49851	822986
15 CAL	357	886	405	6739	25	130	159	450	65	75	31	18	69	5332	98799	9415	1812	14	36	4	42	16	943	125822
16 STM	173	229	386	1061	25	124	49	368	36	78	5	3	92	185	3110	119157	5586	19	27	0	43	447	702	131905
17 CHS	951	1788	354	18322	41	242	481	889	56	63	28	13	68	443	1344	3959	159366	42	40	11	49	1738	1794	192082
18 FAU	145	154	339	169	30	254	104	8616	2094	7970	44	19	58	134	9	8	43	47745	3775	446	1588	27	2723	76494
19 STA	52	50	79	47	9	108	196	1692	23	6227	10	0	14	35	4	7	15	844	94699	13	21907	216	3947	130194
20 CL/JF	184	262	866	253	34	167	95	593	7539	234	6870	43	148	95	3	0	19	665	37	65324	18	1	7597	91047
21 SP/FB	55	69	131	69	6	50	41	294	32	1402	14	0	14	27	5	10	25	482	16808	2	117033	69	12424	149062
22 KGEO	148	200	278	205	26	128	71	378	85	120	0	0	21	66	13	122	832	139	1362	2	927	20907	566	26596
23 EXTL	2573	7725	24541	16409	296	3240	1803	17143	3992	5077	11237	12656	18375	40873	504	442	1125	1536	2882	7066	9758	352	0	189605
TOTAL	212037	620675	1624385	1094649	28678	330138	200133	1773674	310558	440082	314138	180993	328718	784222	107665	133699	184383	56793	129065	85372	156795	23964	265296	9386112

Simulation - Year: 2000 Alternative: Version2.2   Iteration: i6
Purpose: HBO   MODE: Total Motorized Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	23222	15569	2531	2450	815	3545	797	1831	19	16	3	1	20	57	0	2	7	1	0	2	2	0	722	51612
2 DC NC	113036	383943	92404	73131	5296	24277	7466	18751	365	134	29	15	1113	1825	64	10	247	14	14	15	23	9	12359	734540
3 MTG	23420	77181	1373587	70586	2171	12721	2956	42400	1942	203	9955	970	22441	4964	30	33	68	37	65	363	85	32	36804	1683014
4 PG	44866	124820	75061	836035	2205	9176	10961	15668	145	293	72	41	15088	40448	1276	349	14427	45	71	40	72	35	25892	1217086
5 ARLCR	2539	1751	567	227	3481	4122	810	1766	17	15	0	0	2	4	0	0	0	0	2	0	0	0	200	15503
6 ARNCR	29222	18464	8181	3324	9260	184323	27073	79899	868	517	11	6	32	97	1	8	20	20	24	17	12	3	5139	366521
7 ALX	10953	7546	1933	2770	2762	26979	81497	44147	125	765	8	3	11	52	3	6	46	8	49	7	16	0	2428	182114
8 FFX	25513	18080	22772	8556	6161	77642	66366	1428861	59135	29372	68	47	138	310	27	38	130	1435	1023	154	561	45	25823	1772257
9 LDN	248	223	1096	96	49	743	164	33675	224661	1065	2207	26	66	75	3	0	17	702	27	5867	32	5	4815	275862
10 PW	1968	1301	830	723	453	4388	5774	91944	5308	387559	40	27	64	186	15	27	36	2900	7969	146	4495	35	9102	525290
11 FRD	173	298	28027	334	31	160	84	728	3818	97	273118	7024	6667	529	10	2	35	37	58	5691	54	0	16086	343061
12 CAR	186	249	3404	369	35	166	110	517	129	105	8045	157846	8212	506	6	4	55	45	7	67	3	0	22936	203002
13 HOW	365	1585	20276	15098	11	73	28	242	53	27	2250	2152	222023	24589	9	17	19	10	14	92	17	6	22443	311399
14 AAR	2303	6566	6437	54850	95	441	407	1032	138	164	127	83	34094	663435	2430	83	453	53	76	43	59	21	49851	823241
15 CAL	358	886	405	6741	25	130	159	450	65	75	31	18	69	5332	98799	9415	1812	14	36	4	42	16	943	125825
16 STM	173	229	386	1061	25	124	49	368	36	78	5	3	92	185	3110	119157	5586	19	27	0	43	447	702	131905
17 CHS	951	1788	354	18322	41	242	481	889	56	63	28	13	68	443	1344	3959	159366	42	40	11	49	1738	1794	192082
18 FAU	145	154	339	169	30	254	104	8616	2094	7970	44	19	58	134	9	8	43	47745	3775	446	1588	27	2723	76494
19 STA	52	50	79	47	9	108	196	1692	23	6227	10	0	14	35	4	7	15	844	94699	13	21907	216	3947	130194
20 CL/JF	184	262	866	253	34	167	95	593	7539	234	6870	43	148	95	3	0	19	665	37	65324	18	1	7597	91047
21 SP/FB	55	69	131	69	6	50	41	294	32	1402	14	0	14	27	5	10	25	482	16808	2	117033	69	12424	149062
22 KGEO	148	200	278	205	26	128	71	378	85	120	0	0	21	66	13	122	832	139	1362	2	927	20907	566	26596
23 EXTL	2573	7725	24541	16409	296	3240	1803	17143	3992	5077	11237	12656	18375	40873	504	442	1125	1536	2882	7066	9758	352	0	189605
TOTAL	282653	668939	1664485	1111825	33317	353199	207492	1791884	310645	441578	314172	180993	328830	784267	107665	133699	184383	56793	129065	85372	156796	23964	265296	9617312

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBO MODE: Transit Percentage

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	30.6	25.3	36.9	26.1	42.5	37.8	30.6	25.7	0	12.5	0	0	0	1.8	0	0	0	0	0	0	50.0	0	0	29.1
2 DC NC	30.2	7.1	13.0	10.0	24.3	19.6	14.3	9.6	0	3.0	0	0	1.8	0.4	0	0	0	0	0	0	0	0	0	12.2
3 MTG	22.9	8.1	1.6	2.9	13.8	7.6	5.7	1.1	0	1.5	0	0	0.1	0.0	0	0	0	0	0	0	0	0	0	2.3
4 PG	16.4	5.0	3.9	0.8	11.2	8.0	2.3	1.8	0	0	0	0	0.1	0.0	0	0	0	0	0	0	0	0	0	2.0
5 ARLCR	41.6	19.1	19.2	15.0	3.3	14.5	14.9	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.8
6 ARNCR	30.8	12.6	10.4	8.4	14.3	4.2	6.5	5.6	0	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	7.6
7 ALX	21.8	8.3	8.6	3.4	12.6	7.9	2.1	3.6	0	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.0
8 FFX	15.7	5.9	2.8	1.7	10.5	6.1	2.9	0.6	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2
9 LDN	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
10 PW	4.8	0.4	0.5	0	3.8	1.2	0.8	0.2	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3
11 FRD	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	5.2	0.6	0.1	0.1	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0.0
14 AAR	2.9	0.9	0.7	0.1	3.2	1.4	1.0	0	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0.0
15 CAL	0.3	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	25.0	7.2	2.4	1.5	13.9	6.5	3.5	1.0	0.0	0.3	0.0	0	0.0	0.0	0	0	0	0	0	0	0.0	0	0	2.4

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: HBO MODE: Avg. Auto Occupancy

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	1.24	1.40	1.40	1.44	1.36	1.38	1.39	1.42	1.58	1.08	1.50	1.00	1.82	1.47	0	2.00	1.75	1.00	0	1.00	1.00	0	1.62	1.33
2 DC NC	1.45	1.32	1.49	1.53	1.44	1.45	1.48	1.50	1.47	1.49	1.45	1.36	1.55	1.56	1.64	1.25	1.58	1.40	1.56	1.36	1.64	2.25	1.61	1.39
3 MTG	1.48	1.50	1.32	1.53	1.47	1.49	1.52	1.53	1.54	1.47	1.55	1.55	1.54	1.54	1.43	1.83	1.51	1.61	1.48	1.64	1.63	1.60	1.61	1.36
4 PG	1.49	1.51	1.52	1.31	1.47	1.48	1.51	1.53	1.56	1.51	2.00	1.58	1.53	1.54	1.54	1.54	1.56	1.50	1.54	1.48	1.64	1.84	1.61	1.37
5 ARLCR	1.39	1.39	1.41	1.41	1.06	1.38	1.41	1.41	1.55	1.36	0	0	2.00	2.00	0	0	0	0	1.00	0	0	0	1.61	1.29
6 ARNCR	1.45	1.46	1.48	1.49	1.43	1.26	1.47	1.49	1.52	1.50	1.00	1.00	1.45	1.62	1.00	1.14	1.67	1.82	1.60	1.13	1.33	1.00	1.62	1.35
7 ALX	1.46	1.47	1.47	1.50	1.45	1.46	1.25	1.49	1.52	1.51	2.00	3.00	1.22	1.49	3.00	1.20	1.77	2.00	1.40	1.17	1.45	0	1.61	1.36
8 FFX	1.49	1.50	1.52	1.53	1.47	1.49	1.51	1.33	1.54	1.54	1.55	1.68	1.55	1.54	1.42	1.52	1.51	1.55	1.55	1.45	1.54	1.41	1.61	1.37
9 LDN	1.45	1.50	1.55	1.50	1.44	1.50	1.53	1.54	1.23	1.54	1.56	1.53	1.57	1.53	3.00	0	1.55	1.57	1.50	1.56	1.78	1.25	1.62	1.28
10 PW	1.51	1.51	1.54	1.54	1.50	1.50	1.52	1.54	1.55	1.28	1.54	2.70	1.39	1.56	1.67	1.69	1.44	1.55	1.55	1.51	1.55	1.84	1.61	1.34
11 FRD	1.50	1.54	1.55	1.55	1.35	1.51	1.53	1.54	1.55	1.52	1.25	1.56	1.55	1.56	1.67	2.00	1.67	1.61	1.61	1.56	1.69	0	1.61	1.30
12 CAR	1.51	1.49	1.55	1.57	1.52	1.46	1.55	1.54	1.57	1.62	1.56	1.10	1.55	1.56	1.20	2.00	1.77	1.67	1.40	1.56	3.00	0	1.61	1.18
13 HOW	1.49	1.52	1.54	1.54	1.57	1.52	1.65	1.52	1.66	1.42	1.56	1.56	1.18	1.55	1.80	2.13	1.36	1.43	1.56	1.56	1.89	2.00	1.61	1.27
14 AAR	1.51	1.53	1.53	1.54	1.56	1.49	1.50	1.55	1.57	1.56	1.51	1.54	1.54	1.29	1.56	1.57	1.55	1.77	1.62	1.34	1.74	1.17	1.61	1.33
15 CAL	1.52	1.54	1.53	1.56	1.47	1.43	1.56	1.55	1.55	1.56	1.55	1.80	1.53	1.56	1.14	1.55	1.56	2.00	1.57	2.00	1.62	1.60	1.61	1.21
16 STM	1.49	1.53	1.61	1.55	1.56	1.48	1.58	1.56	1.64	1.70	2.50	1.50	1.67	1.55	1.56	1.19	1.56	1.58	1.35	0	1.79	1.56	1.61	1.21
17 CHS	1.51	1.54	1.53	1.55	1.41	1.49	1.51	1.55	1.65	1.54	1.40	2.60	1.62	1.54	1.56	1.56	1.16	1.56	1.54	1.83	1.53	1.56	1.61	1.21
18 FAU	1.51	1.51	1.53	1.56	1.43	1.50	1.53	1.55	1.56	1.56	1.52	1.90	1.61	1.58	3.00	1.33	1.54	1.11	1.56	1.55	1.55	1.42	1.61	1.25
19 STA	1.53	1.56	1.49	1.57	1.50	1.50	1.56	1.55	1.44	1.55	1.67	0	1.40	1.52	4.00	1.00	1.88	1.56	1.29	1.86	1.55	1.53	1.61	1.35
20 CL/JF	1.51	1.52	1.54	1.57	1.36	1.49	1.53	1.54	1.55	1.57	1.55	1.48	1.57	1.53	1.50	0	1.90	1.55	1.54	1.11	1.80	1.00	1.61	1.21
21 SP/FB	1.49	1.53	1.54	1.50	1.20	1.47	1.58	1.54	1.60	1.54	2.00	0	2.00	1.69	1.25	1.43	1.56	1.54	1.55	2.00	1.11	1.50	1.61	1.18
22 KGEO	1.51	1.52	1.57	1.55	1.63	1.49	1.51	1.54	1.67	1.58	0	0	1.91	1.50	1.44	1.54	1.56	1.54	1.56	1.00	1.55	1.09	1.62	1.17
23 EXTL	1.61	1.61	1.61	1.61	1.63	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.62	1.62	1.62	1.62	1.61	1.61	1.59	0	1.61
TOTAL	1.45	1.39	1.35	1.36	1.39	1.35	1.39	1.37	1.30	1.30	1.28	1.14	1.28	1.33	1.16	1.22	1.20	1.17	1.35	1.19	1.20	1.14	1.61	1.34

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: LOV Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	42633	34170	11014	19815	2407	14092	7378	15770	227	676	19	6	383	1098	61	3	327	8	20	1	1	0	851	150960
2 DC NC	26172	68433	32798	40797	1896	10650	5800	13554	242	503	78	16	1461	2714	141	10	570	1	15	0	3	1	1622	207477
3 MTG	8963	33279	482292	45046	1158	7380	2803	28067	1256	585	10486	1350	15493	4991	56	1	102	22	10	138	7	0	6099	649584
4 PG	16995	40339	46194	283914	965	5558	7135	12810	93	622	116	111	14369	30875	2050	287	8515	7	17	0	7	6	5873	476858
5 ARLCR	1923	2113	1140	1065	1901	3581	1685	3770	56	169	5	0	15	45	4	0	18	0	4	1	4	0	75	17574
6 ARNCR	11293	11379	6999	5954	3376	46125	14288	38961	705	1591	33	1	86	243	20	1	110	27	46	0	25	0	601	141864
7 ALX	7028	6312	2680	6318	1586	14182	34560	35195	212	2420	10	0	43	208	33	2	242	16	103	1	40	0	420	111611
8 FFX	14594	13803	24880	12570	3647	39038	36181	516366	30686	36886	165	8	268	363	58	6	422	1700	939	67	361	1	2902	735911
9 LDN	286	247	1111	78	61	716	230	32637	79129	2514	1666	25	44	6	2	1	2	495	4	1605	0	0	666	121525
10 PW	869	625	595	681	207	1876	2790	38554	2382	136664	9	2	8	13	3	2	17	2967	3338	28	1374	11	791	193806
11 FRD	41	133	14575	154	7	55	15	302	1953	12	116950	3742	2992	207	3	0	3	4	1	1588	2	0	2284	145023
12 CAR	4	14	2032	164	0	4	1	18	34	5	4580	78740	3535	340	0	0	2	2	0	33	0	0	2135	91643
13 HOW	441	1554	16523	15427	15	90	45	270	37	6	2480	2625	106956	23139	9	0	18	0	1	30	1	0	10241	179908
14 AAR	1250	2849	5682	31113	51	243	239	401	5	15	175	258	23717	254550	1407	8	309	2	2	3	4	1	18019	340303
15 CAL	94	215	76	3006	5	24	52	78	2	4	0	2	17	2024	32393	3059	1263	0	3	1	0	2	92	42412
16 STM	13	22	12	652	0	4	8	18	2	6	1	0	3	35	3875	52980	2982	0	2	0	3	83	59	60760
17 CHS	458	828	129	11019	24	138	353	503	2	23	2	2	23	430	956	1780	61441	0	2	0	6	227	206	78552
18 FAU	11	5	17	2	1	39	19	1822	476	3392	3	1	3	3	0	0	0	15203	534	69	268	1	189	22058
19 STA	36	25	10	29	11	84	174	1387	2	4571	1	1	4	2	0	0	2	641	27836	0	9367	158	325	44666
20 CL/JF	2	3	281	6	0	1	1	115	2397	53	2307	38	48	7	0	0	1	115	1	29880	0	0	1290	36546
21 SP/FB	16	9	8	12	5	33	86	613	6	2331	2	1	3	4	2	1	2	340	10287	0	75891	284	1488	91424
22 KGEO	1	2	6	23	0	1	1	9	1	29	0	0	2	4	4	102	428	3	353	0	594	10302	93	11958
23 EXTL	885	1631	6261	5923	75	592	407	2963	661	810	2269	2156	10803	17206	95	54	205	181	320	1253	1450	92	0	56292
TOTAL	134008	217990	655315	483768	17398	144506	114251	744183	120566	193887	141357	89085	180276	338507	41172	58297	76981	21734	43838	34698	89408	11169	56321	4008715

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: LOV Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	53793	45999	14830	26982	3203	18852	9940	21376	319	915	25	7	517	1509	80	5	446	10	24	2	3	0	1092	199929
2 DC NC	35209	87968	44325	55621	2527	14226	7839	18411	319	694	104	20	2002	3704	202	12	796	2	22	1	4	1	2073	276082
3 MTG	12084	44937	620107	61539	1564	9921	3774	38337	1722	809	14429	1876	21260	6859	67	2	137	29	14	191	8	0	7810	847476
4 PG	23136	55061	63141	364858	1295	7497	9737	17572	127	849	161	154	19757	42481	2819	395	11740	7	24	1	9	9	7531	628361
5 ARLCR	2550	2815	1519	1429	2048	4719	2244	5041	74	228	7	0	21	61	5	0	25	1	6	1	4	0	99	22897
6 ARNCR	15042	15174	9380	8019	4460	56187	19061	52375	945	2155	43	1	118	328	29	3	143	39	64	0	30	0	771	184367
7 ALX	9474	8514	3615	8611	2122	18950	42794	47736	292	3299	10	0	60	285	44	3	323	18	141	2	53	0	544	146890
8 FFX	19802	18731	33994	17231	4886	52593	49092	668677	42189	50656	238	11	353	508	84	9	571	2342	1298	92	498	2	3707	967564
9 LDN	387	335	1530	107	83	966	314	44871	97150	3459	2304	36	56	9	3	1	2	685	6	2214	0	0	858	155376
10 PW	1183	862	815	938	271	2539	3809	52964	3280	169570	18	2	8	18	4	2	28	4101	4612	39	1888	14	1016	247981
11 FRD	53	186	20067	221	9	75	19	415	2694	17	142900	5170	4130	285	3	0	7	5	2	2194	2	0	2927	181381
12 CAR	4	20	2806	225	0	6	3	23	49	6	6323	87274	4883	463	0	0	4	3	0	46	0	0	2739	104877
13 HOW	599	2125	22685	21201	23	115	64	370	48	11	3422	3622	125542	31841	12	2	23	1	1	38	1	1	13132	224879
14 AAR	1706	3904	7789	42835	67	333	323	553	11	18	240	359	32638	303077	1943	11	426	2	2	7	7	1	23101	419353
15 CAL	127	300	100	4151	6	33	73	104	4	8	3	2	24	2790	37452	4227	1745	0	3	1	0	2	119	51274
16 STM	15	31	20	898	0	6	9	30	2	8	1	0	5	51	5351	63223	4121	0	2	0	3	112	76	73964
17 CHS	625	1135	180	15194	31	191	481	695	3	30	4	2	31	593	1323	2457	71464	0	3	0	7	312	265	95026
18 FAU	12	8	26	3	2	53	23	2511	660	4676	4	1	4	3	1	0	1	16788	741	94	370	2	245	26228
19 STA	48	34	16	41	12	111	243	1910	6	6306	2	1	4	4	0	0	3	887	31301	0	12915	218	419	54481
20 CL/JF	2	3	392	8	0	1	1	159	3312	73	3183	53	69	9	0	0	1	158	2	33610	0	0	1654	42690
21 SP/FB	22	11	13	17	6	46	114	848	6	3216	3	1	3	6	4	1	2	468	14184	0	84176	391	1908	105446
22 KGEO	1	3	8	33	0	2	2	11	2	40	0	0	2	5	7	141	590	6	486	1	821	11366	117	13644
23 EXTL	1132	2087	8030	7601	99	760	524	3795	850	1034	2902	2766	13849	22059	117	71	264	230	415	1609	1858	120	0	72172
TOTAL	177006	290243	855388	637763	22714	188182	150483	978784	154064	248077	176326	101358	225336	416948	49550	70565	92862	25782	53353	40143	102657	12551	72203	5142338

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: Transit

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	23057	4505	3881	1969	1395	4981	1286	2102	0	15	0	0	2	1	0	0	1	0	0	0	0	0	0	43195
2 DC NC	14310	2597	4510	1256	578	1904	460	657	0	1	0	0	3	3	0	0	0	0	0	0	0	0	0	26279
3 MTG	6753	3932	12265	968	371	1117	259	531	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	26201
4 PG	5788	1623	1490	817	191	560	173	190	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	10834
5 ARLCR	2040	330	240	82	111	501	194	264	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3763
6 ARNCR	8890	1274	908	274	715	2103	606	1515	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	16288
7 ALX	3139	402	254	100	318	1004	512	491	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	6224
8 FFX	4841	715	676	142	524	2487	794	2696	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	12882
9 LDN	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
10 PW	68	9	4	1	9	31	32	35	0	115	0	0	0	0	0	0	0	0	0	0	0	0	0	304
11 FRD	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	17	1	3	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	24
14 AAR	12	8	29	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	68915	15396	24260	5612	4212	14692	4316	8481	2	149	6	0	8	6	0	0	1	0	0	0	0	0	0	146056

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: HOV Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: HOV AUTO Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	42633	34170	11014	19815	2407	14092	7378	15770	227	676	19	6	383	1098	61	3	327	8	20	1	1	0	851	150960
2 DC NC	26172	68433	32798	40797	1896	10650	5800	13554	242	503	78	16	1461	2714	141	10	570	1	15	0	3	1	1622	207477
3 MTG	8963	33279	482292	45046	1158	7380	2803	28067	1256	585	10486	1350	15493	4991	56	1	102	22	10	138	7	0	6099	649584
4 PG	16995	40339	46194	283914	965	5558	7135	12810	93	622	116	111	14369	30875	2050	287	8515	7	17	0	7	6	5873	476858
5 ARLCR	1923	2113	1140	1065	1901	3581	1685	3770	56	169	5	0	15	45	4	0	18	0	4	1	4	0	75	17574
6 ARNCR	11293	11379	6999	5954	3376	46125	14288	38961	705	1591	33	1	86	243	20	1	110	27	46	0	25	0	601	141864
7 ALX	7028	6312	2680	6318	1586	14182	34560	35195	212	2420	10	0	43	208	33	2	242	16	103	1	40	0	420	111611
8 FFX	14594	13803	24880	12570	3647	39038	36181	516366	30686	36886	165	8	268	363	58	6	422	1700	939	67	361	1	2902	735911
9 LDN	286	247	1111	78	61	716	230	32637	79129	2514	1666	25	44	6	2	1	2	495	4	1605	0	0	666	121525
10 PW	869	625	595	681	207	1876	2790	38554	2382	136664	9	2	8	13	3	2	17	2967	3338	28	1374	11	791	193806
11 FRD	41	133	14575	154	7	55	15	302	1953	12	116950	3742	2992	207	3	0	3	4	1	1588	2	0	2284	145023
12 CAR	4	14	2032	164	0	4	1	18	34	5	4580	78740	3535	340	0	0	2	2	0	33	0	0	2135	91643
13 HOW	441	1554	16523	15427	15	90	45	270	37	6	2480	2625	106956	23139	9	0	18	0	1	30	1	0	10241	179908
14 AAR	1250	2849	5682	31113	51	243	239	401	5	15	175	258	23717	254550	1407	8	309	2	2	3	4	1	18019	340303
15 CAL	94	215	76	3006	5	24	52	78	2	4	0	2	17	2024	32393	3059	1263	0	3	1	0	2	92	42412
16 STM	13	22	12	652	0	4	8	18	2	6	1	0	3	35	3875	52980	2982	0	2	0	3	83	59	60760
17 CHS	458	828	129	11019	24	138	353	503	2	23	2	2	23	430	956	1780	61441	0	2	0	6	227	206	78552
18 FAU	11	5	17	2	1	39	19	1822	476	3392	3	1	3	3	0	0	0	15203	534	69	268	1	189	22058
19 STA	36	25	10	29	11	84	174	1387	2	4571	1	1	4	2	0	0	2	641	27836	0	9367	158	325	44666
20 CL/JF	2	3	281	6	0	1	1	115	2397	53	2307	38	48	7	0	0	1	115	1	29880	0	0	1290	36546
21 SP/FB	16	9	8	12	5	33	86	613	6	2331	2	1	3	4	2	1	2	340	10287	0	75891	284	1488	91424
22 KGEO	1	2	6	23	0	1	1	9	1	29	0	0	2	4	4	102	428	3	353	0	594	10302	93	11958
23 EXTL	885	1631	6261	5923	75	592	407	2963	661	810	2269	2156	10803	17206	95	54	205	181	320	1253	1450	92	0	56292
TOTAL	134008	217990	655315	483768	17398	144506	114251	744183	120566	193887	141357	89085	180276	338507	41172	58297	76981	21734	43838	34698	89408	11169	56321	4008715

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: Auto Person

ORIGIN	DESTINATION 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	53793	45999	14830	26982	3203	18852	9940	21376	319	915	25	7	517	1509	80	5	446	10	24	2	3	0	1092	199929
2 DC NC	35209	87968	44325	55621	2527	14226	7839	18411	319	694	104	20	2002	3704	202	12	796	2	22	1	4	1	2073	276082
3 MTG	12084	44937	620107	61539	1564	9921	3774	38337	1722	809	14429	1876	21260	6859	67	2	137	29	14	191	8	0	7810	847476
4 PG	23136	55061	63141	364858	1295	7497	9737	17572	127	849	161	154	19757	42481	2819	395	11740	7	24	1	9	9	7531	628361
5 ARLCR	2550	2815	1519	1429	2048	4719	2244	5041	74	228	7	0	21	61	5	0	25	1	6	1	4	0	99	22897
6 ARNCR	15042	15174	9380	8019	4460	56187	19061	52375	945	2155	43	1	118	328	29	3	143	39	64	0	30	0	771	184367
7 ALX	9474	8514	3615	8611	2122	18950	42794	47736	292	3299	10	0	60	285	44	3	323	18	141	2	53	0	544	146890
8 FFX	19802	18731	33994	17231	4886	52593	49092	668677	42189	50656	238	11	353	508	84	9	571	2342	1298	92	498	2	3707	967564
9 LDN	387	335	1530	107	83	966	314	44871	97150	3459	2304	36	56	9	3	1	2	685	6	2214	0	0	858	155376
10 PW	1183	862	815	938	271	2539	3809	52964	3280	169570	18	2	8	18	4	2	28	4101	4612	39	1888	14	1016	247981
11 FRD	53	186	20067	221	9	75	19	415	2694	17	142900	5170	4130	285	3	0	7	5	2	2194	2	0	2927	181381
12 CAR	4	20	2806	225	0	6	3	23	49	6	6323	87274	4883	463	0	0	4	3	0	46	0	0	2739	104877
13 HOW	599	2125	22685	21201	23	115	64	370	48	11	3422	3622	125542	31841	12	2	23	1	1	38	1	1	13132	224879
14 AAR	1706	3904	7789	42835	67	333	323	553	11	18	240	359	32638	303077	1943	11	426	2	2	7	7	1	23101	419353
15 CAL	127	300	100	4151	6	33	73	104	4	8	3	2	24	2790	37452	4227	1745	0	3	1	0	2	119	51274
16 STM	15	31	20	898	0	6	9	30	2	8	1	0	5	51	5351	63223	4121	0	2	0	3	112	76	73964
17 CHS	625	1135	180	15194	31	191	481	695	3	30	4	2	31	593	1323	2457	71464	0	3	0	7	312	265	95026
18 FAU	12	8	26	3	2	53	23	2511	660	4676	4	1	4	3	1	0	1	16788	741	94	370	2	245	26228
19 STA	48	34	16	41	12	111	243	1910	6	6306	2	1	4	4	0	0	3	887	31301	0	12915	218	419	54481
20 CL/JF	2	3	392	8	0	1	1	159	3312	73	3183	53	69	9	0	0	1	158	2	33610	0	0	1654	42690
21 SP/FB	22	11	13	17	6	46	114	848	6	3216	3	1	3	6	4	1	2	468	14184	0	84176	391	1908	105446
22 KGEO	1	3	8	33	0	2	2	11	2	40	0	0	2	5	7	141	590	6	486	1	821	11366	117	13644
23 EXTL	1132	2087	8030	7601	99	760	524	3795	850	1034	2902	2766	13849	22059	117	71	264	230	415	1609	1858	120	0	72172
TOTAL	177006	290243	855388	637763	22714	188182	150483	978784	154064	248077	176326	101358	225336	416948	49550	70565	92862	25782	53353	40143	102657	12551	72203	5142338

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: Total Motorized Person

ORIGIN	DESTINATION 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	76850	50504	18711	28951	4598	23833	11226	23478	319	930	25	7	519	1510	80	5	447	10	24	2	3	0	1092	243124
2 DC NC	49519	90565	48835	56877	3105	16130	8299	19068	319	695	104	20	2005	3707	202	12	796	2	22	1	4	1	2073	302361
3 MTG	18837	48869	632372	62507	1935	11038	4033	38868	1722	812	14429	1876	21262	6859	67	2	137	29	14	191	8	0	7810	873677
4 PG	28924	56684	64631	365675	1486	8057	9910	17762	127	849	161	154	19757	42483	2819	395	11740	7	24	1	9	9	7531	639195
5 ARLCR	4590	3145	1759	1511	2159	5220	2438	5305	74	229	7	0	21	61	5	0	25	1	6	1	4	0	99	26660
6 ARNCR	23932	16448	10288	8293	5175	58290	19667	53890	945	2158	43	1	118	328	29	3	143	39	64	0	30	0	771	200655
7 ALX	12613	8916	3869	8711	2440	19954	43306	48227	292	3303	10	0	60	285	44	3	323	18	141	2	53	0	544	153114
8 FFX	24643	19446	34670	17373	5410	55080	49886	671373	42189	50663	238	11	353	508	84	9	571	2342	1298	92	498	2	3707	980446
9 LDN	387	335	1530	107	83	966	314	44871	97152	3459	2304	36	56	9	3	1	2	685	6	2214	0	0	858	155378
10 PW	1251	871	819	939	280	2570	3841	52999	3280	169685	18	2	8	18	4	2	28	4101	4612	39	1888	14	1016	248285
11 FRD	53	186	20067	221	9	75	19	415	2694	17	142906	5170	4130	285	3	0	7	5	2	2194	2	0	2927	181387
12 CAR	4	20	2806	225	0	6	3	23	49	6	6323	87274	4883	463	0	0	4	3	0	46	0	0	2739	104877
13 HOW	616	2126	22688	21201	23	117	64	370	48	11	3422	3622	125543	31841	12	2	23	1	1	38	1	1	13132	224903
14 AAR	1718	3912	7818	42838	67	335	323	553	11	18	240	359	32638	303077	1943	11	426	2	2	7	7	1	23101	419407
15 CAL	127	300	100	4151	6	33	73	104	4	8	3	2	24	2790	37452	4227	1745	0	3	1	0	2	119	51274
16 STM	15	31	20	898	0	6	9	30	2	8	1	0	5	51	5351	63223	4121	0	2	0	3	112	76	73964
17 CHS	625	1135	180	15194	31	191	481	695	3	30	4	2	31	593	1323	2457	71464	0	3	0	7	312	265	95026
18 FAU	12	8	26	3	2	53	23	2511	660	4676	4	1	4	3	1	0	1	16788	741	94	370	2	245	26228
19 STA	48	34	16	41	12	111	243	1910	6	6306	2	1	4	4	0	0	3	887	31301	0	12915	218	419	54481
20 CL/JF	2	3	392	8	0	1	1	159	3312	73	3183	53	69	9	0	0	1	158	2	33610	0	0	1654	42690
21 SP/FB	22	11	13	17	6	46	114	848	6	3216	3	1	3	6	4	1	2	468	14184	0	84176	391	1908	105446
22 KGEO	1	3	8	33	0	2	2	11	2	40	0	0	2	5	7	141	590	6	486	1	821	11366	117	13644
23 EXTL	1132	2087	8030	7601	99	760	524	3795	850	1034	2902	2766	13849	22059	117	71	264	230	415	1609	1858	120	0	72172
TOTAL	245921	305639	879648	643375	26926	202874	154799	987265	154066	248226	176332	101358	225344	416954	49550	70565	92863	25782	53353	40143	102657	12551	72203	5288394

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: Transit Percentage

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	30.0	8.9	20.7	6.8	30.3	20.9	11.5	9.0	0	1.6	0	0	0.4	0.1	0	0	0.2	0	0	0	0	0	0	17.8
2 DC NC	28.9	2.9	9.2	2.2	18.6	11.8	5.5	3.4	0	0.1	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	8.7
3 MTG	35.8	8.0	1.9	1.5	19.2	10.1	6.4	1.4	0	0.4	0	0	0.0	0	0	0	0	0	0	0	0	0	0	3.0
4 PG	20.0	2.9	2.3	0.2	12.9	7.0	1.7	1.1	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	1.7
5 ARLCR	44.4	10.5	13.6	5.4	5.1	9.6	8.0	5.0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	14.1
6 ARNCR	37.1	7.7	8.8	3.3	13.8	3.6	3.1	2.8	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	8.1
7 ALX	24.9	4.5	6.6	1.1	13.0	5.0	1.2	1.0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	4.1
8 FFX	19.6	3.7	1.9	0.8	9.7	4.5	1.6	0.4	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3
9 LDN	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
10 PW	5.4	1.0	0.5	0.1	3.2	1.2	0.8	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
11 FRD	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	2.8	0.0	0.0	0	0	1.7	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0.0
14 AAR	0.7	0.2	0.4	0.0	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	28.0	5.0	2.8	0.9	15.6	7.2	2.8	0.9	0.0	0.1	0.0	0	0.0	0.0	0	0	0.0	0	0	0	0	0	0	2.8

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: NHB MODE: Avg. Auto Occupancy

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	1.26	1.35	1.35	1.36	1.33	1.34	1.35	1.36	1.41	1.35	1.32	1.17	1.35	1.37	1.31	1.67	1.36	1.25	1.20	2.00	3.00	0	1.28	1.32
2 DC NC	1.35	1.29	1.35	1.36	1.33	1.34	1.35	1.36	1.32	1.38	1.33	1.25	1.37	1.36	1.43	1.20	1.40	2.00	1.47	1.00	1.33	1.00	1.28	1.33
3 MTG	1.35	1.35	1.29	1.37	1.35	1.34	1.35	1.37	1.37	1.38	1.38	1.39	1.37	1.37	1.20	2.00	1.34	1.32	1.40	1.38	1.14	0	1.28	1.30
4 PG	1.36	1.36	1.37	1.29	1.34	1.35	1.36	1.37	1.37	1.36	1.39	1.39	1.37	1.38	1.38	1.38	1.38	1.00	1.41	1.00	1.29	1.50	1.28	1.32
5 ARLCR	1.33	1.33	1.33	1.34	1.08	1.32	1.33	1.34	1.32	1.35	1.40	0	1.40	1.36	1.25	0	1.39	1.00	1.50	1.00	1.00	0	1.32	1.30
6 ARNCR	1.33	1.33	1.34	1.35	1.32	1.22	1.33	1.34	1.34	1.35	1.30	1.00	1.37	1.35	1.45	3.00	1.30	1.44	1.39	0	1.20	0	1.28	1.30
7 ALX	1.35	1.35	1.35	1.36	1.34	1.34	1.24	1.36	1.38	1.36	1.00	0	1.40	1.37	1.33	1.50	1.33	1.13	1.37	2.00	1.33	0	1.30	1.32
8 FFX	1.36	1.36	1.37	1.37	1.34	1.35	1.36	1.29	1.37	1.37	1.44	1.38	1.32	1.40	1.45	1.50	1.35	1.38	1.38	1.37	1.38	2.00	1.28	1.31
9 LDN	1.35	1.36	1.38	1.37	1.36	1.35	1.37	1.37	1.23	1.38	1.38	1.44	1.27	1.50	1.50	1.00	1.00	1.38	1.50	1.38	0	0	1.29	1.28
10 PW	1.36	1.38	1.37	1.38	1.31	1.35	1.37	1.37	1.38	1.24	2.00	1.00	1.00	1.38	1.33	1.00	1.65	1.38	1.38	1.39	1.37	1.27	1.28	1.28
11 FRD	1.29	1.40	1.38	1.44	1.29	1.36	1.27	1.37	1.38	1.42	1.22	1.38	1.38	1.38	1.00	0	2.33	1.25	2.00	1.38	1.00	0	1.28	1.25
12 CAR	1.00	1.43	1.38	1.37	0	1.50	3.00	1.28	1.44	1.20	1.38	1.11	1.38	1.36	0	0	2.00	1.50	0	1.39	0	0	1.28	1.14
13 HOW	1.36	1.37	1.37	1.37	1.53	1.28	1.42	1.37	1.30	1.83	1.38	1.38	1.17	1.38	1.33	2.00	1.28	1.00	1.00	1.27	1.00	1.00	1.28	1.25
14 AAR	1.36	1.37	1.37	1.38	1.31	1.37	1.35	1.38	2.20	1.20	1.37	1.39	1.38	1.19	1.38	1.38	1.38	1.00	1.00	2.33	1.75	1.00	1.28	1.23
15 CAL	1.35	1.40	1.32	1.38	1.20	1.38	1.40	1.33	2.00	2.00	3.00	1.00	1.41	1.38	1.16	1.38	1.38	0	1.00	1.00	0	1.00	1.29	1.21
16 STM	1.15	1.41	1.67	1.38	0	1.50	1.13	1.67	1.00	1.33	1.00	0	1.67	1.46	1.38	1.19	1.38	0	1.00	0	1.00	1.35	1.29	1.22
17 CHS	1.36	1.37	1.40	1.38	1.29	1.38	1.36	1.38	1.50	1.30	2.00	1.00	1.35	1.38	1.38	1.38	1.16	0	1.50	0	1.17	1.37	1.29	1.21
18 FAU	1.09	1.60	1.53	1.50	2.00	1.36	1.21	1.38	1.39	1.38	1.33	1.00	1.33	1.00	1.00	0	1.00	1.10	1.39	1.36	1.38	2.00	1.30	1.19
19 STA	1.33	1.36	1.60	1.41	1.09	1.32	1.40	1.38	3.00	1.38	2.00	1.00	1.00	2.00	0	0	1.50	1.38	1.12	0	1.38	1.38	1.29	1.22
20 CL/JF	1.00	1.00	1.40	1.33	0	1.00	1.00	1.38	1.38	1.38	1.38	1.39	1.44	1.29	0	0	1.00	1.37	2.00	1.12	0	0	1.28	1.17
21 SP/FB	1.38	1.22	1.63	1.42	1.20	1.39	1.33	1.38	1.00	1.38	1.50	1.00	1.00	1.50	2.00	1.00	1.00	1.38	1.38	0	1.11	1.38	1.28	1.15
22 KGEO	1.00	1.50	1.33	1.43	0	2.00	2.00	1.22	2.00	1.38	0	0	1.00	1.25	1.75	1.38	1.38	2.00	1.38	1.00	1.38	1.10	1.26	1.14
23 EXTL	1.28	1.28	1.28	1.28	1.32	1.28	1.29	1.28	1.29	1.28	1.28	1.28	1.28	1.28	1.23	1.31	1.29	1.27	1.30	1.28	1.28	1.30	0	1.28
TOTAL	1.32	1.33	1.31	1.32	1.31	1.30	1.32	1.32	1.28	1.28	1.25	1.14	1.25	1.23	1.20	1.21	1.21	1.19	1.22	1.16	1.15	1.12	1.28	1.28

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: LOV Auto Driver

DESTINATION

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
1 DC CR	63750	48347	13473	22407	3479	19823	8775	18659	288	743	39	10	446	1226	64	24	354	10	94	12	161	0	2231	204415
2 DC NC	133749	441952	121644	119374	9403	41961	15097	35397	735	731	208	39	2941	5089	204	81	915	34	411	53	685	8	17162	947873
3 MTG	69506	116811	2154894	137393	6386	22893	6409	78064	3282	915	23243	2345	40453	11430	103	128	268	72	603	604	1077	27	48649	2725555
4 PG	100507	190318	138806	1334851	8134	22470	21811	36667	434	1084	403	176	36674	88283	3848	1050	31337	72	929	128	1694	125	40792	2060593
5 ARLCR	4133	3505	1641	1265	7460	8639	2576	5746	90	188	5	0	18	55	4	0	29	1	14	1	15	0	304	35689
6 ARNCR	42334	28365	15412	9010	15038	264204	41579	123914	1930	2167	68	10	149	362	22	19	139	61	128	21	139	3	5769	550843
7 ALX	22671	14431	5105	9306	6254	53842	150066	95690	514	3324	29	1	63	285	37	17	293	28	200	11	149	2	2975	365293
8 FFX	68977	42525	55118	23338	18175	138834	125554	2315772	117209	78666	650	59	555	1008	130	398	894	3844	3679	505	4315	63	26711	3026979
9 LDN	1132	911	4120	317	460	2135	720	105262	363107	4496	5937	72	185	154	15	18	48	1436	511	8445	922	9	6690	507102
10 PW	4190	1976	1829	1561	1106	6887	11209	166622	10410	634000	178	28	98	258	32	90	144	10068	17138	256	10762	115	8537	887494
11 FRD	423	832	56280	1078	96	386	161	2113	7697	189	478305	12010	12070	1348	14	1	51	65	428	7603	386	0	25260	606796
12 CAR	182	309	9618	1411	33	306	195	1135	667	167	21306	307518	17461	2051	18	2	78	63	96	296	66	0	44465	407443
13 HOW	3031	6286	46691	44774	201	421	146	1038	158	52	7669	4968	412124	59210	22	34	60	13	160	210	291	4	52144	639707
14 AAR	9098	14970	16101	104287	594	1449	908	2192	380	282	528	369	70419	1109188	4364	202	1007	61	834	84	1051	25	82915	1421308
15 CAL	1415	2620	853	14845	138	368	318	797	133	126	65	17	180	9009	161760	19938	3975	14	345	10	508	109	996	218539
16 STM	316	541	644	3757	31	261	156	857	173	139	12	2	137	368	8474	222378	10976	21	707	0	723	1390	659	252722
17 CHS	4582	6870	1011	40718	420	1004	1256	2138	200	141	65	10	140	1526	3654	7142	274152	41	432	6	560	2993	1846	350907
18 FAU	121	121	399	180	28	268	139	13350	3924	15360	87	15	68	124	7	6	47	88909	6582	517	3115	47	3360	136774
19 STA	117	89	82	81	69	334	815	7565	59	18518	11	1	16	26	2	13	39	2592	150886	9	47167	1035	4543	234069
20 CL/JF	145	217	2489	297	29	201	114	2131	13452	483	10761	117	334	144	2	0	22	857	472	125961	314	0	17342	175884
21 SP/FB	61	60	99	66	17	95	221	2103	36	6318	9	1	11	20	6	12	33	1147	29538	1	254681	976	14978	310489
22 KGEO	113	156	294	329	19	143	87	494	170	262	0	0	27	93	39	314	1486	121	2223	2	3245	40512	860	50989
23 EXTL	7018	11454	40376	36016	921	4054	2440	27069	8201	11285	32648	35137	56500	121937	985	718	1947	7686	5752	16690	22700	1331	0	452865
TOTAL	537571	933666	2686979	1906661	78491	590978	390752	3044775	533249	779636	582226	362905	651069	1413194	183806	252585	328294	117216	222162	161425	354726	48774	409188	16570328

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: LOV Auto Person

DESTINATION

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
1 DC CR	79338	64695	17999	30474	4517	26152	11735	25074	417	994	57	11	612	1687	86	36	486	15	140	19	255	0	2890	267689
2 DC NC	176995	564762	167562	167167	11999	56162	20459	48071	1032	1012	299	54	4086	7084	309	143	1309	48	687	96	1146	16	23510	1254008
3 MTG	87079	157938	2740171	188092	8039	30764	8653	106501	4618	1297	31856	3281	56259	15642	141	223	393	109	999	881	1849	43	67699	3512527
4 PG	129098	255113	189015	1686911	9965	29220	29542	49257	651	1532	637	251	49550	120773	5259	1461	43885	115	1543	225	2903	184	55538	2662628
5 ARLCR	5367	4662	2187	1699	7840	11301	3427	7628	117	255	7	0	25	75	5	0	42	2	20	2	19	0	421	45101
6 ARNCR	54459	37898	20728	12195	19253	321709	56500	168299	2603	2972	87	10	199	498	33	29	185	84	180	27	205	4	8192	706349
7 ALX	28771	19173	6749	12657	7828	71426	181670	128117	692	4551	39	3	89	389	50	23	403	35	285	20	211	2	4179	467362
8 FFX	82988	54245	74331	31724	21722	185886	168759	2948787	160742	108268	969	102	751	1459	208	695	1333	5289	5489	776	6762	89	38528	3899902
9 LDN	1313	1082	5250	448	504	2693	892	136470	438426	6065	7946	102	264	249	25	39	83	1958	863	12003	1623	14	9428	627740
10 PW	5221	2684	2519	2178	1349	9198	14674	221255	13973	782417	294	51	147	417	50	164	244	13498	24096	403	15129	159	12587	1122707
11 FRD	581	1120	76104	1515	127	563	250	3071	10483	312	574432	16570	16488	1849	23	3	91	104	791	10673	731	0	35766	751647
12 CAR	273	447	12807	1964	51	481	318	1864	1045	286	27833	335736	23266	2673	31	4	135	110	177	404	125	0	65006	475036
13 HOW	3833	7975	62762	59257	250	541	197	1363	225	83	10193	6901	476576	79654	34	64	88	22	286	292	539	10	70996	782141
14 AAR	11834	19558	21806	141947	750	1948	1234	3218	661	462	776	514	95913	1343380	6093	308	1424	109	1519	143	1938	30	115257	1770822
15 CAL	1857	3331	1243	19665	172	504	444	1199	231	209	116	28	262	12296	183520	26325	5374	29	619	18	920	146	1427	259935
16 STM	446	733	1084	4964	51	394	234	1424	314	239	22	3	235	557	11459	258730	14853	38	1235	0	1243	1779	971	301008
17 CHS	5902	8549	1439	54132	511	1316	1653	2975	343	219	111	20	214	2020	4892	9779	313492	67	732	11	927	4003	2671	415978
18 FAU	176	182	620	296	37	392	195	17981	5268	20483	135	26	109	210	17	10	75	98441	9382	735	4353	64	4907	164094
19 STA	149	120	120	116	74	422	1020	9187	84	23831	18	1	22	41	5	19	56	3335	180679	15	63563	1271	6462	290610
20 CL/JF	220	326	3422	496	44	314	186	3065	18265	671	14727	157	496	236	3	0	41	1201	858	138443	578	1	25500	209250
21 SP/FB	85	87	152	97	19	128	279	2601	49	8194	17	1	18	33	10	15	51	1535	40765	2	279324	1202	21287	355951
22 KGEO	170	240	486	510	31	224	136	799	303	370	0	0	48	149	53	433	2064	184	3167	4	4421	43884	1272	58948
23 EXTL	8920	15599	54553	47619	1157	5671	3380	36456	10696	14632	42241	47396	74628	162306	1286	962	2593	9950	7960	22015	31474	1745	0	603239
TOTAL	685075	1220519	3463109	2466123	96290	757409	505837	3924662	671238	979354	712812	411218	800257	1753677	213592	299465	388700	136278	282472	187207	420238	54646	574494	21004672

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: Transit

DESTINATION

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
1 DC CR	44454	12874	6222	3197	2874	8772	2077	3905	0	19	0	0	10	6	0	0	1	0	0	0	1	0	0	84412
2 DC NC	133360	61012	29596	15316	5686	14157	3096	5874	0	11	0	0	47	36	0	0	0	0	0	0	4	0	0	268195
3 MTG	57748	18686	73998	5361	2480	4678	783	3161	0	7	0	0	46	4	0	0	0	0	0	0	1	0	0	166953
4 PG	65011	24100	11632	23555	3597	6172	1430	2035	0	0	0	0	152	87	0	0	0	0	0	0	0	0	0	137771
5 ARLCR	5346	862	447	133	452	1733	407	808	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	10191
6 ARNCR	39383	5798	2793	722	5728	15956	4088	12135	2	11	0	0	0	0	0	0	0	0	0	0	0	0	0	86616
7 ALX	16879	2311	881	296	2557	8332	6369	5932	0	16	0	0	1	0	0	0	0	0	0	0	0	0	0	43574
8 FFX	49982	6092	3501	555	6636	19987	8595	29777	27	210	0	0	0	0	0	0	0	0	0	0	0	0	0	125362
9 LDN	404	55	139	2	115	197	13	2219	441	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3585
10 PW	5878	268	126	13	662	1272	1435	4295	0	5336	0	0	0	0	0	0	0	0	0	0	0	0	0	19285
11 FRD	160	73	1292	6	19	14	0	3	0	0	282	0	0	0	0	0	0	0	0	0	0	0	0	1849
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	2082	660	1469	448	96	118	15	47	0	0	0	0	895	76	0	0	0	0	0	0	0	0	0	5906
14 AAR	5705	1391	831	789	257	347	65	46	0	0	0	0	213	359	4	0	0	0	0	0	0	0	0	10007
15 CAL	1540	478	58	108	81	108	26	23	0	0	0	0	0	0	43	0	0	0	0	0	0	0	0	2465
16 STM	239	83	7	31	10	20	4	5	0	0	0	0	0	0	0	0	41	0	0	0	0	0	0	440
17 CHS	4493	1234	144	330	246	382	75	70	0	0	0	0	0	0	0	0	63	0	0	0	0	0	0	7037
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	119	16	5	1	47	98	110	222	0	8	0	0	0	0	0	0	0	0	10	0	4	0	0	640
20 CL/JF	9	5	136	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	151
21 SP/FB	33	3	3	0	6	19	30	96	0	4	0	0	0	0	0	0	0	0	18	0	24	0	0	236
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	432825	136001	133280	50864	31549	82362	28618	70653	471	5624	282	0	1364	568	47	0	105	0	28	0	34	0	0	974675

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: HOV Auto Person

DESTINATION

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
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	315	78	67	0	33	215	24	261	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	999
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	1515	238	36	43	199	375	11	6	0	0	0	0	0	6	0	0	1	0	0	0	0	0	0	2430
7 ALX	1551	267	154	48	262	309	0	74	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2667
8 FFX	20804	4290	1242	447	3795	7442	1323	6420	4	0	2	0	1	20	0	0	1	0	0	0	0	0	0	45791
9 LDN	958	334	522	48	416	861	259	3951	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	7351
10 PW	6146	632	360	155	1091	2376	1503	7670	26	2	1	0	0	5	0	0	1	0	0	0	0	0	0	19968
11 FRD	44	13	11	0	13	28	4	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	176
12 CAR	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
13 HOW	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
18 FAU	12	3	11	3	8	29	18	464	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	548
19 STA	250	71	27	22	162	378	322	1452	6	15	0	0	0	0	0	0	1	0	0	0	0	0	0	2706
20 CL/JF	29	6	3	0	6	11	4	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	198
21 SP/FB	69	23	12	6	30	87	107	566	3	12	0	0	0	0	0	0	0	0	0	0	0	0	0	915
22 KGEO	2	3	0	0	0	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	31695	5958	2446	772	6015	12112	3576	21080	45	29	3	0	4	31	0	0	5	0	0	0	0	0	0	83771

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: HOV AUTO Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	120	33	29	0	15	78	17	105	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	400
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	563	89	11	20	80	140	4	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	911
7 ALX	444	80	46	14	76	91	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	775
8 FFX	7356	1658	457	167	1454	2856	508	2668	0	0	0	0	2	8	0	0	0	0	0	0	0	0	0	17134
9 LDN	284	108	174	17	144	284	88	1338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2437
10 PW	1804	207	128	43	340	749	461	2592	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6331
11 FRD	12	6	4	0	4	11	2	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	3	0	4	1	4	12	8	191	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	223
19 STA	69	21	7	6	48	106	94	414	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	770
20 CL/JF	6	2	1	0	0	2	1	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
21 SP/FB	18	6	4	1	7	27	30	160	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	255
22 KGEO	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	10680	2210	865	269	2172	4356	1213	7556	9	8	0	0	2	10	0	0	0	0	0	0	0	0	0	29350

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	63750	48347	13473	22407	3479	19823	8775	18659	288	743	39	10	446	1226	64	24	354	10	94	12	161	0	2231	204415
2 DC NC	133749	441952	121644	119374	9403	41961	15097	35397	735	731	208	39	2941	5089	204	81	915	34	411	53	685	8	17162	947873
3 MTG	69626	1168442	154923	137393	6401	22971	6426	78169	3284	916	23243	2345	40453	11430	103	128	268	72	603	604	1077	27	48649	2725955
4 PG	100507	190318	1388061	334851	8134	22470	21811	36667	434	1084	403	176	36674	88283	3848	1050	31337	72	929	128	1694	125	40792	2060593
5 ARLCR	4133	3505	1641	1265	7460	8639	2576	5746	90	188	5	0	18	55	4	0	29	1	14	1	15	0	304	35689
6 ARNCR	42897	28454	15423	9030	15118	264344	41583	123916	1930	2167	68	10	149	364	22	19	139	61	128	21	139	3	5769	551754
7 ALX	23115	14511	5151	9320	6330	53933	150066	95714	514	3324	29	1	63	285	37	17	293	28	200	11	149	2	2975	366068
8 FFX	76333	44183	55575	23505	19629	141690	1260622	318440	117209	78666	650	59	557	1016	130	398	894	3844	3679	505	4315	63	26711	3044113
9 LDN	1416	1019	4294	334	604	2419	808	106600	363107	4496	5937	72	185	154	15	18	48	1436	511	8445	922	9	6690	509539
10 PW	5994	2183	1957	1604	1446	7636	11670	169214	10416	634001	178	28	98	258	32	90	144	10068	17138	256	10762	115	8537	893825
11 FRD	435	838	56284	1078	100	397	163	2131	7697	189	478305	12010	12070	1348	14	1	51	65	428	7603	386	0	25260	606853
12 CAR	182	309	9618	1411	33	306	195	1135	667	167	21306	307518	17461	2051	18	2	78	63	96	296	66	0	44465	407443
13 HOW	3031	6286	46691	44774	201	421	146	1038	158	52	7669	4968	412124	59210	22	34	60	13	160	210	291	4	52144	639707
14 AAR	9098	14970	16101	104287	594	1449	908	2192	380	282	528	369	704191	109188	4364	202	1007	61	834	84	1051	25	82915	1421308
15 CAL	1415	2620	853	14845	138	368	318	797	133	126	65	17	180	9009	161760	19938	3975	14	345	10	508	109	996	218539
16 STM	316	541	644	3757	31	261	156	857	173	139	12	2	137	368	8474	222378	10976	21	707	0	723	1390	659	252722
17 CHS	4582	6870	1011	40718	420	1004	1256	2138	200	141	65	10	140	1526	3654	7142	274152	41	432	6	560	2993	1846	350907
18 FAU	124	121	403	181	32	280	147	13541	3924	15360	87	15	68	124	7	6	47	88909	6582	517	3115	47	3360	136997
19 STA	186	110	89	87	117	440	909	7979	60	18522	11	1	16	26	2	13	39	2592	150886	9	47167	1035	4543	234839
20 CL/JF	151	219	2490	297	29	203	115	2171	13452	483	10761	117	334	144	2	0	22	857	472	125961	314	0	17342	175936
21 SP/FB	79	66	103	67	24	122	251	2263	36	6320	9	1	11	20	6	12	33	1147	29538	1	254681	976	14978	310744
22 KGEO	114	156	294	329	19	143	87	498	170	262	0	0	27	93	39	314	1486	121	2223	2	3245	40512	860	50994
23 EXTL	7018	11454	40376	36016	921	4054	2440	27069	8201	11285	32648	35137	56500	121937	985	718	1947	7686	5752	16690	22700	1331	0	452865
TOTAL	548251	935876	2687844	1906930	80663	595334	391965	3052331	533258	779644	582226	362905	651071	1413204	183806	252585	328294	117216	222162	161425	354726	48774	409188	16599678

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: Auto Person

DESTINATION

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
1 DC CR	79338	64695	17999	30474	4517	26152	11735	25074	417	994	57	11	612	1687	86	36	486	15	140	19	255	0	2890	267689
2 DC NC	176995	564762	167562	167167	11999	56162	20459	48071	1032	1012	299	54	4086	7084	309	143	1309	48	687	96	1146	16	23510	1254008
3 MTG	87394	158016	2740238	188092	8072	30979	8677	106762	4624	1297	31856	3281	56259	15642	141	223	393	109	999	881	1849	43	67699	3513526
4 PG	129098	255113	189015	1686911	9965	29220	29542	49257	651	1532	637	251	49550	120773	5259	1461	43885	115	1543	225	2903	184	55538	2662628
5 ARLCR	5367	4662	2187	1699	7840	11301	3427	7628	117	255	7	0	25	75	5	0	42	2	20	2	19	0	421	45101
6 ARNCR	55974	38136	20764	12238	19452	322084	56511	168305	2603	2972	87	10	199	504	33	29	186	84	180	27	205	4	8192	708779
7 ALX	30322	19440	6903	12705	8090	71735	181670	128191	692	4551	39	3	91	389	50	23	403	35	285	20	211	2	4179	470029
8 FFX	103792	58535	75573	32171	25517	193328	170082	2955207	160746	108268	971	102	752	1479	208	695	1334	5289	5489	776	6762	89	38528	3945693
9 LDN	2271	1416	5772	496	920	3554	1151	140421	438426	6065	7946	102	265	249	25	39	84	1958	863	12003	1623	14	9428	635091
10 PW	11367	3316	2879	2333	2440	11574	16177	228925	13999	782419	295	51	147	422	50	164	245	13498	24096	403	15129	159	12587	1142675
11 FRD	625	1133	76115	1515	140	591	254	3134	10483	312	574432	16570	16488	1849	23	3	91	104	791	10673	731	0	35766	751823
12 CAR	273	447	12808	1964	51	481	318	1867	1045	286	27833	335736	23266	2673	31	4	135	110	177	404	125	0	65006	475040
13 HOW	3833	7975	62762	59257	250	542	197	1365	225	83	10193	6901	476576	79654	34	64	88	22	286	292	539	10	70996	782144
14 AAR	11834	19558	21806	141947	750	1948	1234	3218	661	462	776	514	95913	1343380	6093	308	1424	109	1519	143	1938	30	115257	1770822
15 CAL	1857	3331	1243	19665	172	504	444	1199	231	209	116	28	262	12296	183520	26325	5374	29	619	18	920	146	1427	259935
16 STM	446	733	1084	4964	51	394	234	1424	314	239	22	3	235	557	11459	258730	14853	38	1235	0	1243	1779	971	301008
17 CHS	5902	8549	1439	54132	511	1316	1653	2976	343	219	111	20	214	2020	4892	9779	313492	67	732	11	927	4003	2671	415979
18 FAU	188	185	631	299	45	421	213	18445	5268	20483	135	26	109	210	17	10	75	98441	9382	735	4353	64	4907	164642
19 STA	399	191	147	138	236	800	1342	10639	90	23846	18	1	22	41	5	19	57	3335	180679	15	63563	1271	6462	293316
20 CL/JF	249	332	3425	496	50	325	190	3204	18265	671	14727	157	496	236	3	0	41	1201	858	138443	578	1	25500	209448
21 SP/FB	154	110	164	103	49	215	386	3167	52	8206	17	1	18	33	10	15	51	1535	40765	2	279324	1202	21287	356866
22 KGEO	172	243	486	510	31	224	137	807	303	370	0	0	48	149	53	433	2064	184	3167	4	4421	43884	1272	58962
23 EXTL	8920	15599	54553	47619	1157	5671	3380	36456	10696	14632	42241	47396	74628	162306	1286	962	2593	9950	7960	22015	31474	1745	0	603239
TOTAL	716770	1226477	3465555	2466895	102305	769521	509413	3945742	671283	979383	712815	411218	800261	1753708	213592	299465	388705	136278	282472	187207	420238	54646	574494	21088443

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: Total Motorized Person

DESTINATION

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
1 DC CR	123792	77569	24221	33671	7391	34924	13812	28979	417	1013	57	11	622	1693	86	36	487	15	140	19	256	0	2890	352101
2 DC NC	310355	625774	197158	182483	17685	70319	23555	53945	1032	1023	299	54	4133	7120	309	143	1309	48	687	96	1150	16	23510	1522203
3 MTG	145142	176702	2814236	193453	10552	35657	9460	109923	4624	1304	31856	3281	56305	15646	141	223	393	109	999	881	1850	43	67699	3680479
4 PG	194109	279213	200647	1710466	13562	35392	30972	51292	651	1532	637	251	49702	120860	5259	1461	43885	115	1543	225	2903	184	55538	2800399
5 ARLCR	10713	5524	2634	1832	8292	13034	3834	8436	118	257	7	0	25	75	5	0	42	2	20	2	19	0	421	55292
6 ARNCR	95357	43934	23557	12960	25180	338040	60599	180440	2605	2983	87	10	199	504	33	29	186	84	180	27	205	4	8192	795395
7 ALX	47201	21751	7784	13001	10647	80067	188039	134123	692	4567	39	3	92	389	50	23	403	35	285	20	211	2	4179	513603
8 FFX	153774	64627	79074	32726	32153	213315	178677	2984984	160773	108478	971	102	752	1479	208	695	1334	5289	5489	776	6762	89	38528	4071055
9 LDN	2675	1471	5911	498	1035	3751	1164	142640	438867	6065	7946	102	265	249	25	39	84	1958	863	12003	1623	14	9428	638676
10 PW	17245	3584	3005	2346	3102	12846	17612	233220	13999	787755	295	51	147	422	50	164	245	13498	24096	403	15129	159	12587	1161960
11 FRD	785	1206	77407	1521	159	605	254	3137	10483	312	574714	16570	16488	1849	23	3	91	104	791	10673	731	0	35766	753672
12 CAR	273	447	12808	1964	51	481	318	1867	1045	286	27833	335736	23266	2673	31	4	135	110	177	404	125	0	65006	475040
13 HOW	5915	8635	64231	59705	346	660	212	1412	225	83	10193	6901	477471	79730	34	64	88	22	286	292	539	10	70996	788050
14 AAR	17539	20949	22637	142736	1007	2295	1299	3264	661	462	776	514	96126	1343739	6097	308	1424	109	1519	143	1938	30	115257	1780829
15 CAL	3397	3809	1301	19773	253	612	470	1222	231	209	116	28	262	12296	183563	26325	5374	29	619	18	920	146	1427	262400
16 STM	685	816	1091	4995	61	414	238	1429	314	239	22	3	235	557	11459	258730	14894	38	1235	0	1243	1779	971	301448
17 CHS	10395	9783	1583	54462	757	1698	1728	3046	343	219	111	20	214	2020	4892	9779	313555	67	732	11	927	4003	2671	423016
18 FAU	188	185	631	299	45	421	213	18445	5268	20483	135	26	109	210	17	10	75	98441	9382	735	4353	64	4907	164642
19 STA	518	207	152	139	283	898	1452	10861	90	23854	18	1	22	41	5	19	57	3335	180689	15	63567	1271	6462	293956
20 CL/JF	258	337	3561	497	50	325	190	3204	18265	671	14727	157	496	236	3	0	41	1201	858	138443	578	1	25500	209599
21 SP/FB	187	113	167	103	55	234	416	3263	52	8210	17	1	18	33	10	15	51	1535	40783	2	279348	1202	21287	357102
22 KGEO	172	243	486	510	31	224	137	807	303	370	0	0	48	149	53	433	2064	184	3167	4	4421	43884	1272	58962
23 EXTL	8920	15599	54553	47619	1157	5671	3380	36456	10696	14632	42241	47396	74628	162306	1286	962	2593	9950	7960	22015	31474	1745	0	603239
TOTAL	1149595	1362478	3598835	2517759	133854	851883	538031	4016395	671754	985007	713097	411218	801625	1754276	213639	299465	388810	136278	282500	187207	420272	54646	574494	22063118

Appendix B Year 2000 mode choice summary (final, i6, iteration)

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: Transit Percentage

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	35.9	16.6	25.7	9.5	38.9	25.1	15.0	13.5	0	1.9	0	0	1.6	0.4	0	0	0.2	0	0	0	0.4	0	0	24.0
2 DC NC	43.0	9.7	15.0	8.4	32.2	20.1	13.1	10.9	0	1.1	0	0	1.1	0.5	0	0	0	0	0	0	0.3	0	0	17.6
3 MTG	39.8	10.6	2.6	2.8	23.5	13.1	8.3	2.9	0	0.5	0	0	0.1	0.0	0	0	0	0	0	0	0.1	0	0	4.5
4 PG	33.5	8.6	5.8	1.4	26.5	17.4	4.6	4.0	0	0	0	0	0.3	0.1	0	0	0	0	0	0	0	0	0	4.9
5 ARLCR	49.9	15.6	17.0	7.3	5.5	13.3	10.6	9.6	0.8	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	18.4
6 ARNCR	41.3	13.2	11.9	5.6	22.7	4.7	6.7	6.7	0.1	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	10.9
7 ALX	35.8	10.6	11.3	2.3	24.0	10.4	3.4	4.4	0	0.4	0	0	1.1	0	0	0	0	0	0	0	0	0	0	8.5
8 FFX	32.5	9.4	4.4	1.7	20.6	9.4	4.8	1.0	0.0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	3.1
9 LDN	15.1	3.7	2.4	0.4	11.1	5.3	1.1	1.6	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6
10 PW	34.1	7.5	4.2	0.6	21.3	9.9	8.1	1.8	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	1.7
11 FRD	20.4	6.1	1.7	0.4	11.9	2.3	0	0.1	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0.2
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	35.2	7.6	2.3	0.8	27.7	17.9	7.1	3.3	0	0	0	0	0.2	0.1	0	0	0	0	0	0	0	0	0	0.7
14 AAR	32.5	6.6	3.7	0.6	25.5	15.1	5.0	1.4	0	0	0	0	0.2	0.0	0.1	0	0	0	0	0	0	0	0	0.6
15 CAL	45.3	12.5	4.5	0.5	32.0	17.6	5.5	1.9	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0.9
16 STM	34.9	10.2	0.6	0.6	16.4	4.8	1.7	0.3	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0.1
17 CHS	43.2	12.6	9.1	0.6	32.5	22.5	4.3	2.3	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	1.7
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	23.0	7.7	3.3	0.7	16.6	10.9	7.6	2.0	0	0.0	0	0	0	0	0	0	0	0	0.0	0	0.0	0	0	0.2
20 CL/JF	3.5	1.5	3.8	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
21 SP/FB	17.6	2.7	1.8	0	10.9	8.1	7.2	2.9	0	0.0	0	0	0	0	0	0	0	0	0.0	0	0.0	0	0	0.1
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	37.7	10.0	3.7	2.0	23.6	9.7	5.3	1.8	0.1	0.6	0.0	0	0.2	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0	4.4

Simulation - Year: 2000 Alternative: Version2.2 Iteration: i6
Purpose: ALL MODE: Avg. Auto Occupancy

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	1.24	1.34	1.34	1.36	1.30	1.32	1.34	1.34	1.45	1.34	1.46	1.10	1.37	1.38	1.34	1.50	1.37	1.50	1.49	1.58	1.58	0	1.30	1.31
2 DC NC	1.32	1.28	1.38	1.40	1.28	1.34	1.36	1.36	1.40	1.38	1.44	1.38	1.39	1.39	1.51	1.77	1.43	1.41	1.67	1.81	1.67	2.00	1.37	1.32
3 MTG	1.26	1.35	1.27	1.37	1.26	1.35	1.35	1.37	1.41	1.42	1.37	1.40	1.39	1.37	1.37	1.74	1.47	1.51	1.66	1.46	1.72	1.59	1.39	1.29
4 PG	1.28	1.34	1.36	1.26	1.23	1.30	1.35	1.34	1.50	1.41	1.58	1.43	1.35	1.37	1.37	1.39	1.40	1.60	1.66	1.76	1.71	1.47	1.36	1.29
5 ARLCR	1.30	1.33	1.33	1.34	1.05	1.31	1.33	1.33	1.30	1.36	1.40	0	1.39	1.36	1.25	0	1.45	2.00	1.43	2.00	1.27	0	1.38	1.26
6 ARNCR	1.30	1.34	1.35	1.36	1.29	1.22	1.36	1.36	1.35	1.37	1.28	1.00	1.34	1.38	1.50	1.53	1.34	1.38	1.41	1.29	1.47	1.33	1.42	1.28
7 ALX	1.31	1.34	1.34	1.36	1.28	1.33	1.21	1.34	1.35	1.37	1.34	3.00	1.44	1.36	1.35	1.35	1.38	1.25	1.43	1.82	1.42	1.00	1.40	1.28
8 FFX	1.36	1.32	1.36	1.37	1.30	1.36	1.35	1.27	1.37	1.38	1.49	1.73	1.35	1.46	1.60	1.75	1.49	1.38	1.49	1.54	1.57	1.41	1.44	1.30
9 LDN	1.60	1.39	1.34	1.49	1.52	1.47	1.42	1.32	1.21	1.35	1.34	1.42	1.43	1.62	1.67	2.17	1.75	1.36	1.69	1.42	1.76	1.56	1.41	1.25
10 PW	1.90	1.52	1.47	1.45	1.69	1.52	1.39	1.35	1.34	1.23	1.66	1.82	1.50	1.64	1.56	1.82	1.70	1.34	1.41	1.57	1.41	1.38	1.47	1.28
11 FRD	1.44	1.35	1.35	1.41	1.40	1.49	1.56	1.47	1.36	1.65	1.20	1.38	1.37	1.37	1.64	3.00	1.78	1.60	1.85	1.40	1.89	0	1.42	1.24
12 CAR	1.50	1.45	1.33	1.39	1.55	1.57	1.63	1.64	1.57	1.71	1.31	1.09	1.33	1.30	1.72	2.00	1.73	1.75	1.84	1.36	1.89	0	1.46	1.17
13 HOW	1.26	1.27	1.34	1.32	1.24	1.29	1.35	1.32	1.42	1.60	1.33	1.39	1.16	1.35	1.55	1.88	1.47	1.69	1.79	1.39	1.85	2.50	1.36	1.22
14 AAR	1.30	1.31	1.35	1.36	1.26	1.34	1.36	1.47	1.74	1.64	1.47	1.39	1.36	1.21	1.40	1.52	1.41	1.79	1.82	1.70	1.84	1.20	1.39	1.25
15 CAL	1.31	1.27	1.46	1.32	1.25	1.37	1.40	1.50	1.74	1.66	1.78	1.65	1.46	1.36	1.13	1.32	1.35	2.07	1.79	1.80	1.81	1.34	1.43	1.19
16 STM	1.41	1.35	1.68	1.32	1.65	1.51	1.50	1.66	1.82	1.72	1.83	1.50	1.72	1.51	1.35	1.16	1.35	1.81	1.75	0	1.72	1.28	1.47	1.19
17 CHS	1.29	1.24	1.42	1.33	1.22	1.31	1.32	1.39	1.72	1.55	1.71	2.00	1.53	1.32	1.34	1.37	1.14	1.63	1.69	1.83	1.66	1.34	1.45	1.19
18 FAU	1.52	1.53	1.57	1.65	1.41	1.50	1.45	1.36	1.34	1.33	1.55	1.73	1.60	1.69	2.43	1.67	1.60	1.11	1.43	1.42	1.40	1.36	1.46	1.20
19 STA	2.15	1.74	1.65	1.59	2.02	1.82	1.48	1.33	1.50	1.29	1.64	1.00	1.38	1.58	2.50	1.46	1.46	1.29	1.20	1.67	1.35	1.23	1.42	1.25
20 CL/JF	1.65	1.52	1.38	1.67	1.72	1.60	1.65	1.48	1.36	1.39	1.37	1.34	1.49	1.64	1.50	0	1.86	1.40	1.82	1.10	1.84	1.00	1.47	1.19
21 SP/FB	1.95	1.67	1.59	1.54	2.04	1.76	1.54	1.40	1.44	1.30	1.89	1.00	1.64	1.65	1.67	1.25	1.55	1.34	1.38	2.00	1.10	1.23	1.42	1.15
22 KGEO	1.51	1.56	1.65	1.55	1.63	1.57	1.57	1.62	1.78	1.41	0	0	1.78	1.60	1.36	1.38	1.39	1.52	1.42	2.00	1.36	1.08	1.48	1.16
23 EXTL	1.27	1.36	1.35	1.32	1.26	1.40	1.39	1.35	1.30	1.30	1.29	1.35	1.32	1.33	1.31	1.34	1.33	1.29	1.38	1.32	1.39	1.31	0	1.33
TOTAL	1.31	1.31	1.29	1.29	1.27	1.29	1.30	1.29	1.26	1.26	1.22	1.13	1.23	1.24	1.16	1.19	1.18	1.16	1.27	1.16	1.18	1.12	1.40	1.27

Appendix C. Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Ref: compare_mceo_00ctpp_HBW.doc

1	HBW	Estimated	Auto Driver
2	HBW	Estimated	Transit
3	HBW	Estimated	Auto Person
4	HBW	Estimated	Auto Pax
5	HBW	Estimated	Person
6	HBW	Estimated	Pct Transit
7	HBW	Estimated	Car Occupancy
8	HBW	Observed	Auto Driver
9	HBW	Observed	Transit
10	HBW	Observed	Auto Person
11	HBW	Observed	Auto Pax
12	HBW	Observed	Person
13	HBW	Observed	Pct Transit
14	HBW	Observed	Car Occupancy
15	HBW	Difference (Est-Obs)	Auto Driver
16	HBW	Difference (Est-Obs)	Transit
17	HBW	Difference (Est-Obs)	Auto Person
18	HBW	Difference (Est-Obs)	Auto Pax
19	HBW	Difference (Est-Obs)	Person
20	HBW	Difference (Est-Obs)	Pct Transit
21	HBW	Difference (Est-Obs)	Car Occupancy
22	HBW	Ratio (Est-to-Obs)	Auto Driver
23	HBW	Ratio (Est-to-Obs)	Transit
24	HBW	Ratio (Est-to-Obs)	Auto Person
25	HBW	Ratio (Est-to-Obs)	Auto Pax
26	HBW	Ratio (Est-to-Obs)	Person
27	HBW	Ratio (Est-to-Obs)	Pct Transit
28	HBW	Ratio (Est-to-Obs)	Car Occupancy

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Estimated Auto Driver

ORIGIN \ DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	4298	3007	768	688	496	800	349	1377	38	24	0	0	0	0	0	0	2	0	3	0	0	0	0	11850
2 DC NC	45312	32214	14382	13014	3971	5921	2293	8413	160	67	32	0	0	0	14	2	65	3	0	0	0	1	0	125864
3 MTG	47985	27018	270773	24862	3864	6271	1574	20223	645	84	5320	0	0	0	9	1	21	4	2	162	1	0	0	408819
4 PG	57595	64785	32714	157060	5792	10039	5348	11972	105	58	51	0	0	0	742	300	3972	0	3	0	1	93	0	350630
5 ARLCR	1000	266	140	51	579	416	136	564	20	5	0	0	0	0	0	0	0	0	0	0	0	0	0	3177
6 ARNCR	17106	5480	3126	938	5377	18808	5044	23770	616	188	9	0	0	0	0	0	5	18	7	0	7	0	0	80499
7 ALX	10021	3305	1221	1049	2937	8224	12894	20178	207	262	1	0	0	0	2	1	18	6	19	0	13	1	0	60359
8 FFX	47064	18589	13425	4739	11844	29553	28827	322857	23747	11172	111	0	0	0	7	1	60	879	286	58	298	8	0	513525
9 LDN	948	603	2222	94	504	1083	432	47632	42764	1157	2157	0	0	0	0	0	1	425	5	1452	2	0	0	101481
10 PW	3868	683	551	320	949	2678	4869	64165	3902	78061	20	0	0	0	0	0	0	2961	3215	37	2973	75	0	169327
11 FRD	258	473	20528	491	66	88	16	848	2906	18	75010	0	0	0	0	0	0	7	0	2067	0	0	0	102776
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	1070	1800	272	6832	110	177	116	163	0	1	0	0	0	0	17824	8620	1468	0	2	0	1	96	0	38552
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	3470	4842	398	16210	364	618	526	713	1	4	0	0	0	0	1270	2243	30682	1	20	0	69	1636	0	63067
18 FAU	8	3	24	1	9	30	31	5914	1703	6291	13	0	0	0	0	0	0	13638	1071	132	979	25	0	29872
19 STA	115	52	18	26	100	281	608	5486	39	9117	0	0	0	0	1	4	27	1401	19551	0	13569	736	0	51131
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	240118	163120	360562	226375	36962	84987	63063	534275	76853	106509	82724	0	0	0	19869	11172	36321	19343	24184	3908	17913	2671	0	2110929

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Estimated Transit

ORIGIN \ DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	13713	3790	1260	465	1042	1527	399	1222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23418
2 DC NC	83136	24602	9549	4053	3606	5146	1165	3169	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	134432
3 MTG	45592	7769	29825	2040	1790	2502	336	2124	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	91979
4 PG	51828	15854	6675	13171	3152	4787	960	1531	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97958
5 ARLCR	2228	187	95	16	203	418	70	285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3502
6 ARNCR	21435	2145	1017	168	3570	4254	1506	5701	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39798
7 ALX	11345	1276	455	102	1877	4589	3259	3475	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	26381
8 FFX	41127	4287	2111	260	5406	11295	4941	14300	25	82	0	0	0	0	0	0	0	0	0	0	0	0	0	83834
9 LDN	404	55	139	2	115	197	13	2219	324	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3468
10 PW	5716	254	118	11	636	1185	1352	4065	0	2683	0	0	0	0	0	0	0	0	0	0	0	0	0	16020
11 FRD	160	73	1292	6	19	14	0	0	0	0	234	0	0	0	0	0	0	0	0	0	0	0	0	1798
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	1539	478	0	106	81	108	26	23	0	0	0	0	0	0	43	0	0	0	0	0	0	0	0	2404
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	4493	1234	144	330	246	382	75	70	0	0	0	0	0	0	0	0	63	0	0	0	0	0	0	7037
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	119	16	5	1	47	98	110	222	0	8	0	0	0	0	0	0	0	0	10	0	3	0	0	639
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	282835	62020	52685	20731	21790	36502	14212	38406	351	2783	234	0	0	0	43	0	63	0	10	0	3	0	0	532668

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Estimated Auto Person

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	4956	3438	882	817	570	934	405	1616	57	29	0	0	0	0	0	0	3	1	3	0	0	0	0	13711
2 DC NC	52588	35461	16363	14972	4535	6886	2621	9778	210	76	38	0	0	0	22	3	81	4	1	0	0	1	0	143640
3 MTG	56643	30294	298793	27703	4498	7391	1818	23093	767	100	6024	0	0	0	11	1	27	5	3	195	2	0	0	457368
4 PG	67394	72251	37161	171481	6644	11737	6045	13716	132	69	68	0	0	0	829	353	4420	0	3	0	2	118	0	392423
5 ARLCR	1158	298	162	60	606	475	157	639	23	7	0	0	0	0	0	0	0	0	0	0	0	0	0	3585
6 ARNCR	20027	6164	3579	1062	6086	21254	5608	26589	730	233	9	0	0	0	0	0	5	18	8	0	8	0	0	91380
7 ALX	12037	3765	1451	1196	3379	9392	14062	22621	254	304	2	0	0	0	2	1	21	7	23	0	14	1	0	68532
8 FFX	62128	22131	15660	5486	14628	35813	32345	355753	26305	12403	141	0	0	0	11	1	73	1007	328	77	361	8	0	584659
9 LDN	1622	836	2743	130	782	1662	612	55714	46398	1326	2424	0	0	0	0	0	2	474	8	1630	3	0	0	116366
10 PW	8295	1136	800	459	1732	4442	6310	74627	4410	84238	23	0	0	0	0	0	1	3330	3619	48	3429	92	0	196991
11 FRD	364	586	23619	593	94	122	18	1149	3385	23	79715	0	0	0	0	0	0	10	0	2375	0	0	0	112053
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	1348	2104	336	7788	134	222	137	197	0	1	1	0	0	0	18892	9620	1691	0	2	0	1	125	0	42599
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	4292	5569	488	18252	435	757	607	835	2	5	0	0	0	0	1436	2549	32556	1	26	0	94	1926	0	69830
18 FAU	17	6	31	3	12	46	43	6950	1951	7049	16	0	0	0	0	0	0	14406	1200	151	1113	32	0	33026
19 STA	298	106	40	46	215	577	901	7018	56	10169	0	0	0	0	1	7	36	1593	20577	0	14898	837	0	57375
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	293167	184145	402108	250048	44350	101710	71689	600295	84680	116032	88461	0	0	0	21204	12535	38916	20856	25801	4476	19925	3140	0	2383538

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Estimated Auto Pax

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	658	431	114	129	74	134	56	239	19	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1859
2 DC NC	7276	3247	1981	1958	564	965	328	1365	50	9	6	0	0	0	0	1	16	1	1	0	0	0	0	17768
3 MTG	8658	3276	28020	2841	634	1120	244	2870	122	16	704	0	0	0	2	0	6	0	1	0	1	0	0	48515
4 PG	9799	7466	4447	14421	852	1698	697	1744	27	11	17	0	0	0	87	53	448	0	0	0	1	25	0	41793
5 ARLCR	158	32	22	0	27	59	21	75	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	397
6 ARNCR	2921	684	453	124	709	2446	564	2819	114	45	0	0	0	0	0	0	0	0	1	0	1	0	0	10881
7 ALX	2016	460	230	147	442	1168	1168	2443	47	42	0	0	0	0	0	0	0	1	4	0	1	0	0	8169
8 FFX	15064	3542	2235	747	2784	6260	3518	32896	2558	1231	30	0	0	0	4	0	13	128	42	19	63	0	0	71134
9 LDN	674	233	521	36	278	579	180	8082	3634	169	267	0	0	0	0	0	1	49	0	178	1	0	0	14882
10 PW	4427	453	249	139	783	1764	1441	10462	508	6177	3	0	0	0	0	0	1	369	404	11	456	17	0	27664
11 FRD	106	113	3091	102	28	34	2	301	479	5	4705	0	0	0	0	0	0	3	0	308	0	0	0	9277
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	278	304	64	956	24	45	21	34	0	0	0	0	0	0	1068	1000	223	0	0	0	0	29	0	4046
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	822	727	90	2042	71	139	81	122	1	1	0	0	0	0	166	306	1874	0	6	0	25	290	0	6763
18 FAU	9	3	7	2	3	16	12	1036	248	758	0	0	0	0	0	0	0	768	129	19	134	0	0	3144
19 STA	183	54	22	20	115	296	293	1532	17	1052	0	0	0	0	0	0	9	192	1026	0	1329	101	0	6241
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	53049	21025	41546	23664	7388	16723	8626	66020	7827	9521	5732	0	0	0	1327	1360	2591	1511	1614	535	2012	462	0	272533

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Estimated Person

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	18669	7228	2142	1282	1612	2461	804	2838	57	31	0	0	0	0	0	0	3	1	3	0	0	0	0	37131
2 DC NC	135724	60063	25912	19025	8141	12032	3786	12947	210	82	38	0	0	0	22	3	81	4	1	0	0	1	0	278072
3 MTG	102235	38063	328618	29743	6288	9893	2154	25217	767	101	6024	0	0	0	11	1	27	5	3	195	2	0	0	549347
4 PG	119222	88105	43836	184652	9796	16524	7005	15247	132	69	68	0	0	0	829	353	4420	0	3	0	2	118	0	490381
5 ARLCR	3386	485	257	76	809	893	227	924	24	7	0	0	0	0	0	0	0	0	0	0	0	0	0	7088
6 ARNCR	41462	8309	4596	1230	9656	25508	7114	32290	732	233	9	0	0	0	0	0	5	18	8	0	8	0	0	131178
7 ALX	23382	5041	1906	1298	5256	13981	17321	26096	254	307	2	0	0	0	2	1	21	7	23	0	14	1	0	94913
8 FFX	103255	26418	17771	5746	20034	47108	37286	370053	26330	12485	141	0	0	0	11	1	73	1007	328	77	361	8	0	668493
9 LDN	2026	891	2882	132	897	1859	625	57933	46722	1326	2424	0	0	0	0	0	2	474	8	1630	3	0	0	119834
10 PW	14011	1390	918	470	2368	5627	7662	78692	4410	86921	23	0	0	0	0	0	1	3330	3619	48	3429	92	0	213011
11 FRD	524	659	24911	599	113	136	18	1152	3385	23	79949	0	0	0	0	0	0	10	0	2375	0	0	0	113854
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	2887	2582	394	7894	215	330	163	220	0	1	1	0	0	0	18935	9620	1691	0	2	0	1	125	0	45061
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	8785	6803	632	18582	681	1139	682	905	2	5	0	0	0	0	1436	2549	32619	1	26	0	94	1926	0	76867
18 FAU	17	6	31	3	12	46	43	6950	1951	7049	16	0	0	0	0	0	0	14406	1200	151	1113	32	0	33026
19 STA	417	122	45	47	262	675	1011	7240	56	10177	0	0	0	0	1	7	36	1593	20587	0	14901	837	0	58014
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	576002	246165	454851	270779	66140	138212	85901	638704	85032	118817	88695	0	0	0	21247	12535	38979	20856	25811	4476	19928	3140	0	2916270

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Estimated Pct Transit

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	73.5	52.4	58.8	36.3	64.6	62.0	49.6	43.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63.1
2 DC NC	61.3	41.0	36.9	21.3	44.3	42.8	30.8	24.5	0	7.3	0	0	0	0	0	0	0	0	0	0	0	0	0	48.3
3 MTG	44.6	20.4	9.1	6.9	28.5	25.3	15.6	8.4	0	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.7
4 PG	43.5	18.0	15.2	7.1	32.2	29.0	13.7	10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.0
5 ARLCR	65.8	38.6	37.0	21.1	25.1	46.8	30.8	30.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.4
6 ARNCR	51.7	25.8	22.1	13.7	37.0	16.7	21.2	17.7	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30.3
7 ALX	48.5	25.3	23.9	7.9	35.7	32.8	18.8	13.3	0	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.8
8 FFX	39.8	16.2	11.9	4.5	27.0	24.0	13.3	3.9	0.1	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	12.5
9 LDN	19.9	6.2	4.8	1.5	12.8	10.6	2.1	3.8	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9
10 PW	40.8	18.3	12.9	2.3	26.9	21.1	17.6	5.2	0	3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	7.5
11 FRD	30.5	11.1	5.2	1.0	16.8	10.3	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	1.6
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	53.3	18.5	0	1.3	37.7	32.7	16.0	10.5	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	5.3
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	51.1	18.1	22.8	1.8	36.1	33.5	11.0	7.7	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	9.2
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	28.5	13.1	11.1	2.1	17.9	14.5	10.9	3.1	0	0.1	0	0	0	0	0	0	0	0	0.0	0	0.0	0	0	1.1
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	49.1	25.2	11.6	7.7	32.9	26.4	16.5	6.0	0.4	2.3	0.3	0	0	0	0.2	0	0.2	0	0.0	0	0.0	0	0	18.3

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2 Purpose: HBW Table: Estimated Car Occupancy

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	1.15	1.14	1.15	1.19	1.15	1.17	1.16	1.17	1.50	1.21	0	0	0	0	0	0	1.50	0	1.00	0	0	0	0	1.16
2 DC NC	1.16	1.10	1.14	1.15	1.14	1.16	1.14	1.16	1.31	1.13	1.19	0	0	0	1.57	1.50	1.25	1.33	0	0	0	1.00	0	1.14
3 MTG	1.18	1.12	1.10	1.11	1.16	1.18	1.16	1.14	1.19	1.19	1.13	0	0	0	1.22	1.00	1.29	1.25	1.50	1.20	2.00	0	0	1.12
4 PG	1.17	1.12	1.14	1.09	1.15	1.17	1.13	1.15	1.26	1.19	1.33	0	0	0	1.12	1.18	1.11	0	1.00	0	2.00	1.27	0	1.12
5 ARLCR	1.16	1.12	1.16	1.18	1.05	1.14	1.15	1.13	1.15	1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	1.13
6 ARNCR	1.17	1.12	1.14	1.13	1.13	1.13	1.11	1.12	1.19	1.24	1.00	0	0	0	0	0	1.00	1.00	1.14	0	1.14	0	0	1.14
7 ALX	1.20	1.14	1.19	1.14	1.15	1.14	1.09	1.12	1.23	1.16	2.00	0	0	0	1.00	1.00	1.17	1.17	1.21	0	1.08	1.00	0	1.14
8 FFX	1.32	1.19	1.17	1.16	1.24	1.21	1.12	1.10	1.11	1.11	1.27	0	0	0	1.57	1.00	1.22	1.15	1.15	1.33	1.21	1.00	0	1.14
9 LDN	1.71	1.39	1.23	1.38	1.55	1.53	1.42	1.17	1.08	1.15	1.12	0	0	0	0	0	2.00	1.12	1.60	1.12	1.50	0	0	1.15
10 PW	2.14	1.66	1.45	1.43	1.83	1.66	1.30	1.16	1.13	1.08	1.15	0	0	0	0	0	0	1.12	1.13	1.30	1.15	1.23	0	1.16
11 FRD	1.41	1.24	1.15	1.21	1.42	1.39	1.13	1.35	1.16	1.28	1.06	0	0	0	0	0	0	1.43	0	1.15	0	0	0	1.09
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	1.26	1.17	1.24	1.14	1.22	1.25	1.18	1.21	0	1.00	0	0	0	0	1.06	1.12	1.15	0	1.00	0	1.00	1.30	0	1.10
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	1.24	1.15	1.23	1.13	1.20	1.22	1.15	1.17	2.00	1.25	0	0	0	0	1.13	1.14	1.06	1.00	1.30	0	1.36	1.18	0	1.11
18 FAU	2.13	2.00	1.29	3.00	1.33	1.53	1.39	1.18	1.15	1.12	1.23	0	0	0	0	0	0	1.06	1.12	1.14	1.14	1.28	0	1.11
19 STA	2.59	2.04	2.22	1.77	2.15	2.05	1.48	1.28	1.44	1.12	0	0	0	0	1.00	1.75	1.33	1.14	1.05	0	1.10	1.14	0	1.12
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1.22	1.13	1.12	1.10	1.20	1.20	1.14	1.12	1.10	1.09	1.07	0	0	0	1.07	1.12	1.07	1.08	1.07	1.15	1.11	1.18	0	1.13

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2 Purpose: HBW Table: Observed Auto Driver

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	3920	2597	1179	881	190	565	432	1667	127	37	0	0	0	0	0	0	14	13	5	0	0	0	0	11627
2 DC NC	44412	35299	13086	10708	2187	4640	2915	10056	586	393	122	0	0	0	51	85	236	43	34	14	81	20	0	124968
3 MTG	43610	33053	259040	30408	2991	6623	2982	27928	2135	859	4720	0	0	0	220	120	502	80	206	11	166	20	0	415674
4 PG	62232	48319	40876	150696	4633	10074	8232	21573	1088	822	401	0	0	0	722	395	4231	75	175	0	233	72	0	354849
5 ARLCR	790	206	300	82	617	504	227	1116	109	25	0	0	0	0	0	19	0	0	16	0	0	10	0	4021
6 ARNCR	17105	6046	4150	1822	4656	17042	4579	22011	1223	764	29	0	0	0	0	36	96	68	105	0	69	5	0	79806
7 ALX	13647	4618	2539	1950	2966	7214	14907	17028	778	667	18	0	0	0	20	55	120	27	113	3	76	6	0	66752
8 FFX	54062	20792	20385	11112	14901	34982	33120	327030	19576	11332	254	0	0	0	65	175	594	843	714	83	670	104	0	550794
9 LDN	4790	1342	3432	734	1014	1995	977	47229	40307	1495	526	0	0	0	4	16	37	368	60	174	49	5	0	104554
10 PW	9164	3513	2385	1910	3414	5927	7520	66609	5658	71136	63	0	0	0	24	99	103	1122	1967	53	1074	20	0	181761
11 FRD	1779	1016	26970	1390	122	436	189	2294	1427	167	65409	0	0	0	27	3	12	13	47	377	4	12	0	101694
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	2490	1561	1069	10125	266	509	413	1086	98	42	11	0	0	0	15734	4473	1415	27	15	0	5	14	0	39353
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	6785	4159	1536	16936	1023	1339	1370	3215	393	182	11	0	0	0	739	2620	27192	3	57	0	85	407	0	68052
18 FAU	911	274	338	162	238	500	334	7173	1929	5313	20	0	0	0	0	10	0	11634	376	31	211	13	0	29467
19 STA	1676	505	358	448	700	1243	1346	8839	432	9808	10	0	0	0	12	41	9	185	14091	0	8767	1225	0	49695
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	267373	163300	377643	239364	39918	93593	79543	564854	75866	103042	71594	0	0	0	17618	8147	34561	14501	17981	746	11490	1933	0	2183067

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Observed Transit

ORIGIN	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	13950	3904	1978	523	833	1583	409	842	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	24040
2 DC NC	85492	25193	9359	3773	2490	4724	1444	2837	159	151	0	0	0	0	31	0	77	13	28	0	26	7	0	135804
3 MTG	54753	7383	29546	2096	1392	2572	545	827	22	81	56	0	0	0	0	0	24	0	9	0	7	0	0	99313
4 PG	42780	8478	7135	13296	2570	3417	1023	1656	24	54	0	0	0	0	7	24	93	21	22	0	0	0	0	80600
5 ARLCR	3142	466	96	27	367	338	112	327	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4875
6 ARNCR	27073	2212	948	406	2457	4485	926	2414	46	20	0	0	0	0	0	0	22	0	8	0	73	0	0	41090
7 ALX	11371	932	473	132	1372	2140	3278	1602	0	12	0	0	0	0	0	0	0	0	27	0	22	0	0	21361
8 FFX	37807	3131	1035	349	4711	7654	2197	10654	277	78	0	0	0	0	0	32	15	0	0	0	91	0	0	68031
9 LDN	1158	173	28	7	205	295	22	69	178	0	7	0	0	0	0	0	0	0	12	0	0	0	0	2154
10 PW	4549	426	101	122	565	1277	396	469	14	852	0	0	0	0	0	0	0	0	0	0	28	0	0	8799
11 FRD	989	65	395	24	18	18	4	0	10	0	618	0	0	0	0	0	0	0	0	0	0	0	0	2141
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	669	37	0	12	13	9	9	35	0	0	0	0	0	0	78	14	0	0	0	0	0	0	0	876
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	1978	102	83	75	9	31	14	22	0	0	0	0	0	0	0	24	217	10	0	0	0	0	0	2565
18 FAU	145	64	0	0	16	46	64	0	0	19	0	0	0	0	0	0	0	64	0	0	0	0	0	418
19 STA	943	97	39	12	131	417	186	119	0	47	0	0	0	0	0	0	0	0	100	0	14	10	0	2115
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	286799	52663	51216	20854	17149	29006	10629	21873	730	1314	681	0	0	0	116	112	448	108	206	0	261	17	0	494182

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Observed Auto Person

ORIGIN	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	4640	2992	1316	1015	210	654	454	1828	134	50	0	0	0	0	0	0	14	13	5	0	0	0	0	13325
2 DC NC	53432	41420	14484	12363	2498	5205	3228	11149	613	420	135	0	0	0	51	148	260	50	40	14	89	20	0	145619
3 MTG	50106	36160	278844	32679	3244	7198	3208	29359	2206	1018	5149	0	0	0	234	132	597	80	251	11	174	20	0	450670
4 PG	74525	54516	45290	167032	5214	11585	9003	23643	1246	954	462	0	0	0	826	467	4589	125	199	0	238	78	0	399992
5 ARLCR	950	235	332	82	709	568	256	1179	116	25	0	0	0	0	0	19	0	0	16	0	0	10	0	4497
6 ARNCR	20229	6562	4431	2028	5227	19006	4969	23510	1318	929	51	0	0	0	0	41	104	82	112	0	84	5	0	88688
7 ALX	15840	5127	2725	2150	3344	7952	16545	18281	825	808	18	0	0	0	20	67	120	38	117	7	82	6	0	74072
8 FFX	68266	23462	21525	12257	17674	39679	35478	347621	21120	12229	293	0	0	0	77	224	680	910	754	109	750	121	0	603229
9 LDN	5636	1443	3661	791	1116	2216	1034	49395	42802	1546	536	0	0	0	4	16	52	432	60	185	56	5	0	110986
10 PW	13920	4587	2697	2404	5192	8080	8677	72330	6169	78152	69	0	0	0	28	132	109	1205	2214	62	1176	26	0	207229
11 FRD	2275	1097	29813	1539	151	562	204	2497	1519	202	69662	0	0	0	27	3	16	19	52	400	4	12	0	110054
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	3121	1797	1158	10913	334	606	481	1195	117	62	11	0	0	0	17163	4895	1566	27	21	0	5	18	0	43490
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	8652	4618	1736	18191	1179	1601	1492	3493	442	199	11	0	0	0	835	2863	29378	9	76	0	87	431	0	75293
18 FAU	1048	321	356	177	287	574	360	7908	2065	5658	20	0	0	0	0	10	0	12455	409	39	219	13	0	31919
19 STA	2832	811	431	495	1209	1897	1643	9930	471	10536	10	0	0	0	21	41	13	191	15223	0	9194	1340	0	56288
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	325472	185148	408799	264116	47588	107383	87032	603318	81163	112788	76427	0	0	0	19286	9058	37498	15636	19549	827	12158	2105	0	2415351

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Observed Auto Pax

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	720	395	137	134	20	89	22	161	7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	1698
2 DC NC	9020	6121	1398	1655	311	565	313	1093	27	27	13	0	0	0	0	63	24	7	6	0	8	0	0	20651
3 MTG	6496	3107	19804	2271	253	575	226	1431	71	159	429	0	0	0	14	12	95	0	45	0	8	0	0	34996
4 PG	12293	6197	4414	16336	581	1511	771	2070	158	132	61	0	0	0	104	72	358	50	24	0	5	6	0	45143
5 ARLCR	160	29	32	0	92	64	29	63	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	476
6 ARNCR	3124	516	281	206	571	1964	390	1499	95	165	22	0	0	0	0	5	8	14	7	0	15	0	0	8882
7 ALX	2193	509	186	200	378	738	1638	1253	47	141	0	0	0	0	0	12	0	11	4	4	6	0	0	7320
8 FFX	14204	2670	1140	1145	2773	4697	2358	20591	1544	897	39	0	0	0	12	49	86	67	40	26	80	17	0	52435
9 LDN	846	101	229	57	102	221	57	2166	2495	51	10	0	0	0	0	0	15	64	0	11	7	0	0	6432
10 PW	4756	1074	312	494	1778	2153	1157	5721	511	7016	6	0	0	0	4	33	6	83	247	9	102	6	0	25468
11 FRD	496	81	2843	149	29	126	15	203	92	35	4253	0	0	0	0	0	4	6	5	23	0	0	0	8360
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	631	236	89	788	68	97	68	109	19	20	0	0	0	0	1429	422	151	0	6	0	0	4	0	4137
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	1867	459	200	1255	156	262	122	278	49	17	0	0	0	0	96	243	2186	6	19	0	2	24	0	7241
18 FAU	137	47	18	15	49	74	26	735	136	345	0	0	0	0	0	0	0	821	33	8	8	0	0	2452
19 STA	1156	306	73	47	509	654	297	1091	39	728	0	0	0	0	9	0	4	6	1132	0	427	115	0	6593
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	58099	21848	31156	24752	7670	13790	7489	38464	5297	9746	4833	0	0	0	1668	911	2937	1135	1568	81	668	172	0	232284

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Observed Person

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	18590	6896	3294	1538	1043	2237	863	2670	134	50	0	0	0	0	0	18	14	13	5	0	0	0	0	37365
2 DC NC	138924	66613	23843	16136	4988	9929	4672	13986	772	571	135	0	0	0	82	148	337	63	68	14	115	27	0	281423
3 MTG	104859	43543	308390	34775	4636	9770	3753	30186	2228	1099	5205	0	0	0	234	132	621	80	260	11	181	20	0	549983
4 PG	117305	62994	52425	180328	7784	15002	10026	25299	1270	1008	462	0	0	0	833	491	4682	146	221	0	238	78	0	480592
5 ARLCR	4092	701	428	109	1076	906	368	1506	116	25	0	0	0	0	0	19	0	0	16	0	0	10	0	9372
6 ARNCR	47302	8774	5379	2434	7684	23491	5895	25924	1364	949	51	0	0	0	0	41	126	82	120	0	157	5	0	129778
7 ALX	27211	6059	3198	2282	4716	10092	19823	19883	825	820	18	0	0	0	20	67	120	38	144	7	104	6	0	95433
8 FFX	106073	26593	22560	12606	22385	47333	37675	358275	21397	12307	293	0	0	0	77	256	695	910	754	109	841	121	0	671260
9 LDN	6794	1616	3689	798	1321	2511	1056	49464	42980	1546	543	0	0	0	4	16	52	432	72	185	56	5	0	113140
10 PW	18469	5013	2798	2526	5757	9357	9073	72799	6183	79004	69	0	0	0	28	132	109	1205	2214	62	1204	26	0	216028
11 FRD	3264	1162	30208	1563	169	580	208	2497	1529	202	70280	0	0	0	27	3	16	19	52	400	4	12	0	112195
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	3790	1834	1158	10925	347	615	490	1230	117	62	11	0	0	0	17241	4909	1566	27	21	0	5	18	0	44366
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	10630	4720	1819	18266	1188	1632	1506	3515	442	199	11	0	0	0	835	2887	29595	19	76	0	87	431	0	77858
18 FAU	1193	385	356	177	303	620	424	7908	2065	5677	20	0	0	0	0	10	0	12519	409	39	219	13	0	32337
19 STA	3775	908	470	507	1340	2314	1829	10049	471	10583	10	0	0	0	21	41	13	191	15323	0	9208	1350	0	58403
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	612271	237811	460015	284970	64737	136389	97661	625191	81893	114102	77108	0	0	0	19402	9170	37946	15744	19755	827	12419	2122	0	2909533

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Observed Pct Transit

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	75.0	56.6	60.0	34.0	79.9	70.8	47.4	31.5	0	0	0	0	0	0	0	100.0	0	0	0	0	0	0	0	64.3
2 DC NC	61.5	37.8	39.3	23.4	49.9	47.6	30.9	20.3	20.6	26.4	0	0	0	0	37.8	0	22.8	20.6	41.2	0	22.6	25.9	0	48.3
3 MTG	52.2	17.0	9.6	6.0	30.0	26.3	14.5	2.7	1.0	7.4	1.1	0	0	0	0	0	3.9	0	3.5	0	3.9	0	0	18.1
4 PG	36.5	13.5	13.6	7.4	33.0	22.8	10.2	6.5	1.9	5.4	0	0	0	0	0.8	4.9	2.0	14.4	10.0	0	0	0	0	16.8
5 ARLCR	76.8	66.5	22.4	24.8	34.1	37.3	30.4	21.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52.0
6 ARNCR	57.2	25.2	17.6	16.7	32.0	19.1	15.7	9.3	3.4	2.1	0	0	0	0	0	0	17.5	0	6.7	0	46.5	0	0	31.7
7 ALX	41.8	15.4	14.8	5.8	29.1	21.2	16.5	8.1	0	1.5	0	0	0	0	0	0	0	0	18.8	0	21.2	0	0	22.4
8 FFX	35.6	11.8	4.6	2.8	21.0	16.2	5.8	3.0	1.3	0.6	0	0	0	0	0	12.5	2.2	0	0	0	10.8	0	0	10.1
9 LDN	17.0	10.7	0.8	0.9	15.5	11.7	2.1	0.1	0.4	0	1.3	0	0	0	0	0	0	0	16.7	0	0	0	0	1.9
10 PW	24.6	8.5	3.6	4.8	9.8	13.6	4.4	0.6	0.2	1.1	0	0	0	0	0	0	0	0	0	0	2.3	0	0	4.1
11 FRD	30.3	5.6	1.3	1.5	10.7	3.1	1.9	0	0.7	0	0.9	0	0	0	0	0	0	0	0	0	0	0	0	1.9
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	17.7	2.0	0	0.1	3.7	1.5	1.8	2.8	0	0	0	0	0	0	0.5	0.3	0	0	0	0	0	0	0	2.0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	18.6	2.2	4.6	0.4	0.8	1.9	0.9	0.6	0	0	0	0	0	0	0	0.8	0.7	52.6	0	0	0	0	0	3.3
18 FAU	12.2	16.6	0	0	5.3	7.4	15.1	0	0	0.3	0	0	0	0	0	0	0	0.5	0	0	0	0	0	1.3
19 STA	25.0	10.7	8.3	2.4	9.8	18.0	10.2	1.2	0	0.4	0	0	0	0	0	0	0	0	0.7	0	0.2	0.7	0	3.6
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	46.8	22.1	11.1	7.3	26.5	21.3	10.9	3.5	0.9	1.2	0.9	0	0	0	0.6	1.2	1.2	0.7	1.0	0	2.1	0.8	0	17.0

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Observed Car Occupancy

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	1.18	1.15	1.12	1.15	1.11	1.16	1.05	1.10	1.06	1.35	0	0	0	0	0	0	1.00	1.00	1.00	0	0	0	0	1.15
2 DC NC	1.20	1.17	1.11	1.15	1.14	1.12	1.11	1.11	1.05	1.07	1.11	0	0	0	1.00	1.74	1.10	1.16	1.18	1.00	1.10	1.00	0	1.17
3 MTG	1.15	1.09	1.08	1.07	1.08	1.09	1.08	1.05	1.03	1.19	1.09	0	0	0	1.06	1.10	1.19	1.00	1.22	1.00	1.05	1.00	0	1.08
4 PG	1.20	1.13	1.11	1.11	1.13	1.15	1.09	1.10	1.15	1.16	1.15	0	0	0	1.14	1.18	1.08	1.67	1.14	0	1.02	1.08	0	1.13
5 ARLCR	1.20	1.14	1.11	1.00	1.15	1.13	1.13	1.06	1.06	1.00	0	0	0	0	0	1.00	0	0	1.00	0	0	1.00	0	1.12
6 ARNCR	1.18	1.09	1.07	1.11	1.12	1.12	1.09	1.07	1.08	1.22	1.76	0	0	0	0	1.14	1.08	1.21	1.07	0	1.22	1.00	0	1.11
7 ALX	1.16	1.11	1.07	1.10	1.13	1.10	1.11	1.07	1.06	1.21	1.00	0	0	0	1.00	1.22	1.00	1.41	1.04	2.33	1.08	1.00	0	1.11
8 FFX	1.26	1.13	1.06	1.10	1.19	1.13	1.07	1.06	1.08	1.08	1.15	0	0	0	1.18	1.28	1.14	1.08	1.06	1.31	1.12	1.16	0	1.10
9 LDN	1.18	1.08	1.07	1.08	1.10	1.11	1.06	1.05	1.06	1.03	1.02	0	0	0	1.00	1.00	1.41	1.17	1.00	1.06	1.14	1.00	0	1.06
10 PW	1.52	1.31	1.13	1.26	1.52	1.36	1.15	1.09	1.09	1.10	1.10	0	0	0	1.17	1.33	1.06	1.07	1.13	1.17	1.09	1.30	0	1.14
11 FRD	1.28	1.08	1.11	1.11	1.24	1.29	1.08	1.09	1.06	1.21	1.07	0	0	0	1.00	1.00	1.33	1.46	1.11	1.06	1.00	1.00	0	1.08
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	1.25	1.15	1.08	1.08	1.26	1.19	1.16	1.10	1.19	1.48	1.00	0	0	0	1.09	1.09	1.11	1.00	1.40	0	1.00	1.29	0	1.11
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	1.28	1.11	1.13	1.07	1.15	1.20	1.09	1.09	1.12	1.09	1.00	0	0	0	1.13	1.09	1.08	3.00	1.33	0	1.02	1.06	0	1.11
18 FAU	1.15	1.17	1.05	1.09	1.21	1.15	1.08	1.10	1.07	1.06	1.00	0	0	0	0	1.00	0	1.07	1.09	1.26	1.04	1.00	0	1.08
19 STA	1.69	1.61	1.20	1.10	1.73	1.53	1.22	1.12	1.09	1.07	1.00	0	0	0	1.75	1.00	1.44	1.03	1.08	0	1.05	1.09	0	1.13
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1.22	1.13	1.08	1.10	1.19	1.15	1.09	1.07	1.07	1.09	1.07	0	0	0	1.09	1.11	1.08	1.08	1.09	1.11	1.06	1.09	0	1.11

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Difference (Est-Obs) Auto Driver

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	378	410	-411	-193	306	235	-83	-290	-89	-13	0	0	0	0	0	0	-12	-13	-2	0	0	0	0	223
2 DC NC	900	-3085	1296	2306	1784	1281	-622	-1643	-426	-326	-90	0	0	0	-37	-83	-171	-40	-34	-14	-81	-19	0	896
3 MTG	4375	-6035	11733	-5546	873	-352	-1408	-7705	-1490	-775	600	0	0	0	-211	-119	-481	-76	-204	151	-165	-20	0	-6855
4 PG	-4637	16466	-8162	6364	1159	-35	-2884	-9601	-983	-764	-350	0	0	0	20	-95	-259	-75	-172	0	-232	21	0	-4219
5 ARLCR	210	60	-160	-31	-38	-88	-91	-552	-89	-20	0	0	0	0	0	-19	0	0	-16	0	0	-10	0	-844
6 ARNCR	1	-566	-1024	-884	721	1766	465	1759	-607	-576	-20	0	0	0	0	-36	-91	-50	-98	0	-62	-5	0	693
7 ALX	-3626	-1313	-1318	-901	-29	1010	-2013	3150	-571	-405	-17	0	0	0	-18	-54	-102	-21	-94	-3	-63	-5	0	-6393
8 FFX	-6998	-2203	-6960	-6373	-3057	-5429	-4293	-4173	4171	-160	-143	0	0	0	-58	-174	-534	36	-428	-25	-372	-96	0	-37269
9 LDN	-3842	-739	-1210	-640	-510	-912	-545	403	2457	-338	1631	0	0	0	-4	-16	-36	57	-55	1278	-47	-5	0	-3073
10 PW	-5296	-2830	-1834	-1590	-2465	-3249	-2651	-2444	-1756	6925	-43	0	0	0	-24	-99	-103	1839	1248	-16	1899	55	0	-12434
11 FRD	-1521	-543	-6442	-899	-56	-348	-173	-1446	1479	-149	9601	0	0	0	-27	-3	-12	-6	-47	1690	-4	-12	0	1082
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	-1420	239	-797	-3293	-156	-332	-297	-923	-98	-41	-11	0	0	0	2090	4147	53	-27	-13	0	-4	82	0	-801
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	-3315	683	-1138	-726	-659	-721	-844	-2502	-392	-178	-11	0	0	0	531	-377	3490	-2	-37	0	-16	1229	0	-4985
18 FAU	-903	-271	-314	-161	-229	-470	-303	-1259	-226	978	-7	0	0	0	0	-10	0	2004	695	101	768	12	0	405
19 STA	-1561	-453	-340	-422	-600	-962	-738	-3353	-393	-691	-10	0	0	0	-11	-37	18	1216	5460	0	4802	-489	0	1436
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	-27255	-180	-17081	-12989	-2956	-8606	-16480	-30579	987	3467	11130	0	0	0	2251	3025	1760	4842	6203	3162	6423	738	0	-72138

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Difference (Est-Obs) Transit

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	-237	-114	-718	-58	209	-56	-10	380	0	0	0	0	0	0	0	-18	0	0	0	0	0	0	0	-622
2 DC NC	-2356	-591	190	280	1116	422	-279	332	-159	-145	0	0	0	0	-31	0	-77	-13	-28	0	-26	-7	0	-1372
3 MTG	-9161	386	279	-56	398	-70	-209	1297	-22	-80	-56	0	0	0	0	0	-24	0	-9	0	-7	0	0	-7334
4 PG	9048	7376	-460	-125	582	1370	-63	-125	-24	-54	0	0	0	0	-7	-24	-93	-21	-22	0	0	0	0	17358
5 ARLCR	-914	-279	-1	-11	-164	80	-42	-42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1373
6 ARNCR	-5638	-67	69	-238	1113	-231	580	3287	-44	-20	0	0	0	0	0	0	-22	0	-8	0	-73	0	0	-1292
7 ALX	-26	344	-18	-30	505	2449	-19	1873	0	-9	0	0	0	0	0	0	0	0	-27	0	-22	0	0	5020
8 FFX	3320	1156	1076	-89	695	3641	2744	3646	-252	4	0	0	0	0	0	-32	-15	0	0	0	-91	0	0	15803
9 LDN	-754	-118	111	-5	-90	-98	-9	2150	146	0	-7	0	0	0	0	0	0	0	-12	0	0	0	0	1314
10 PW	1167	-172	17	-111	71	-92	956	3596	-14	1831	0	0	0	0	0	0	0	0	0	0	-28	0	0	7221
11 FRD	-829	8	897	-18	1	-4	-4	0	-10	0	-384	0	0	0	0	0	0	0	0	0	0	0	0	-343
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	870	441	0	94	68	99	17	-12	0	0	0	0	0	0	-35	-14	0	0	0	0	0	0	0	1528
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	2515	1132	61	255	237	351	61	48	0	0	0	0	0	0	0	-24	-154	-10	0	0	0	0	0	4472
18 FAU	-145	-64	0	0	-16	-46	-64	0	0	-19	0	0	0	0	0	0	0	-64	0	0	0	0	0	-418
19 STA	-824	-81	-34	-11	-84	-319	-76	103	0	-39	0	0	0	0	0	0	0	0	-90	0	-11	-10	0	-1476
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	-3964	9357	1469	-123	4641	7496	3583	16533	-379	1469	-447	0	0	0	-73	-112	-385	-108	-196	0	-258	-17	0	38486

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2 Purpose: HBW Table: Difference (Est-Obs) Auto Person

ORIGIN	DESTINATION DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	316	446	-434	-198	360	280	-49	-212	-77	-21	0	0	0	0	0	0	-11	-12	-2	0	0	0	0	386
2 DC NC	-844	-5959	1879	2609	2037	1681	-607	-1371	-403	-344	-97	0	0	0	-29	-145	-179	-46	-39	-14	-89	-19	0	-1979
3 MTG	6537	-5866	19949	-4976	1254	193	-1390	-6266	-1439	-918	875	0	0	0	-223	-131	-570	-75	-248	184	-172	-20	0	6698
4 PG	-7131	17735	-8129	4449	1430	152	-2958	-9927	-1114	-885	-394	0	0	0	3	-114	-169	-125	-196	0	-236	40	0	-7569
5 ARLCR	208	63	-170	-22	-103	-93	-99	-540	-93	-18	0	0	0	0	0	-19	0	0	-16	0	0	-10	0	-912
6 ARNCR	-202	-398	-852	-966	859	2248	639	3079	-588	-696	-42	0	0	0	0	-41	-99	-64	-104	0	-76	-5	0	2692
7 ALX	-3803	-1362	-1274	-954	35	1440	-2483	4340	-571	-504	-16	0	0	0	-18	-66	-99	-31	-94	-7	-68	-5	0	-5540
8 FFX	-6138	-1331	-5865	-6771	-3046	-3866	-3133	8132	5185	174	-152	0	0	0	-66	-223	-607	97	-426	-32	-389	-113	0	-18570
9 LDN	-4014	-607	-918	-661	-334	-554	-422	6319	3596	-220	1888	0	0	0	-4	-16	-50	42	-52	1445	-53	-5	0	5380
10 PW	-5625	-3451	-1897	-1945	-3460	-3638	-2367	2297	-1759	6086	-46	0	0	0	-28	-132	-108	2125	1405	-14	2253	66	0	-10238
11 FRD	-1911	-511	-6194	-946	-57	-440	-186	-1348	1866	-179	10053	0	0	0	-27	-3	-16	-9	-52	1975	-4	-12	0	1999
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	-1773	307	-822	-3125	-200	-384	-344	-998	-117	-61	-10	0	0	0	1729	4725	125	-27	-19	0	-4	107	0	-891
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	-4360	951	-1248	61	-744	-844	-885	-2658	-440	-194	-11	0	0	0	601	-314	3178	-8	-50	0	7	1495	0	-5463
18 FAU	-1031	-315	-325	-174	-275	-528	-317	-958	-114	1391	-4	0	0	0	0	-10	0	1951	791	112	894	19	0	1107
19 STA	-2534	-705	-391	-449	-994	-1320	-742	-2912	-415	-367	-10	0	0	0	-20	-34	23	1402	5354	0	5704	-503	0	1087
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	-32305	-1003	-6691	-14068	-3238	-5673	-15343	-3023	3517	3244	12034	0	0	0	1918	3477	1418	5220	6252	3649	7767	1035	0	-31813

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2 Purpose: HBW Table: Difference (Est-Obs) Auto Pax

ORIGIN	DESTINATION DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	-62	36	-23	-5	54	45	34	78	12	-8	0	0	0	0	0	0	0	0	0	0	0	0	0	161
2 DC NC	-1744	-2874	583	303	253	400	15	272	23	-18	-7	0	0	0	0	-62	-8	-6	-5	0	-8	0	0	-2883
3 MTG	2162	169	8216	570	381	545	18	1439	51	-143	275	0	0	0	-12	-12	-89	0	-44	0	-7	0	0	13519
4 PG	-2494	1269	33	-1915	271	187	-74	-326	-131	-121	-44	0	0	0	-17	-19	90	-50	-24	0	-4	19	0	-3350
5 ARLCR	-2	3	-10	0	-65	-5	-8	12	-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-79
6 ARNCR	-203	168	172	-82	138	482	174	1320	19	-120	-22	0	0	0	0	-5	-8	-14	-6	0	-14	0	0	1999
7 ALX	-177	-49	44	-53	64	430	-470	1190	0	-99	0	0	0	0	0	-12	0	-10	0	-4	-5	0	0	849
8 FFX	860	872	1095	-398	11	1563	1160	12305	1014	334	-9	0	0	0	-8	-49	-73	61	2	-7	-17	-17	0	18699
9 LDN	-172	132	292	-21	176	358	123	5916	1139	118	257	0	0	0	0	0	-14	-15	0	167	-6	0	0	8450
10 PW	-329	-621	-63	-355	-995	-389	284	4741	-3	-839	-3	0	0	0	-4	-33	-5	286	157	2	354	11	0	2196
11 FRD	-390	32	248	-47	-1	-92	-13	98	387	-30	452	0	0	0	0	0	-4	-3	-5	285	0	0	0	917
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	-353	68	-25	168	-44	-52	-47	-75	-19	-20	0	0	0	0	-361	578	72	0	-6	0	0	25	0	-91
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	-1045	268	-110	787	-85	-123	-41	-156	-48	-16	0	0	0	0	70	63	-312	-6	-13	0	23	266	0	-478
18 FAU	-128	-44	-11	-13	-46	-58	-14	301	112	413	0	0	0	0	0	0	0	-53	96	11	126	0	0	692
19 STA	-973	-252	-51	-27	-394	-358	-4	441	-22	324	0	0	0	0	-9	0	5	186	-106	0	902	-14	0	-352
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	-5050	-823	10390	-1088	-282	2933	1137	27556	2530	-225	899	0	0	0	-341	449	-346	376	46	454	1344	290	0	40249

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2 Purpose: HBW Table: Difference (Est-Obs) Person

ORIGIN \ DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	79	332	-1152	-256	569	224	-59	168	-77	-19	0	0	0	0	0	-18	-11	-12	-2	0	0	0	0	-234
2 DC NC	-3200	-6550	2069	2889	3153	2103	-886	-1039	-562	-489	-97	0	0	0	-60	-145	-256	-59	-67	-14	-115	-26	0	-3351
3 MTG	-2624	-5480	20228	-5032	1652	123	-1599	-4969	-1461	-998	819	0	0	0	-223	-131	-594	-75	-257	184	-179	-20	0	-636
4 PG	1917	25111	-8589	4324	2012	1522	-3021	-10052	-1138	-939	-394	0	0	0	-4	-138	-262	-146	-218	0	-236	40	0	9789
5 ARLCR	-706	-216	-171	-33	-267	-13	-141	-582	-92	-18	0	0	0	0	0	-19	0	0	-16	0	0	-10	0	-2284
6 ARNCR	-5840	-465	-783	-1204	1972	2017	1219	6366	-632	-716	-42	0	0	0	0	-41	-121	-64	-112	0	-149	-5	0	1400
7 ALX	-3829	-1018	-1292	-984	540	3889	-2502	6213	-571	-513	-16	0	0	0	-18	-66	-99	-31	-121	-7	-90	-5	0	-520
8 FFX	-2818	-175	-4789	-6860	-2351	-225	-389	11778	4933	178	-152	0	0	0	-66	-255	-622	97	-426	-32	-480	-113	0	-2767
9 LDN	-4768	-725	-807	-666	-424	-652	-431	8469	3742	-220	1881	0	0	0	-4	-16	-50	42	-64	1445	-53	-5	0	6694
10 PW	-4458	-3623	-1880	-2056	-3389	-3730	-1411	5893	-1773	7917	-46	0	0	0	-28	-132	-108	2125	1405	-14	2225	66	0	-3017
11 FRD	-2740	-503	-5297	-964	-56	-444	-190	-1345	1856	-179	9669	0	0	0	-27	-3	-16	-9	-52	1975	-4	-12	0	1659
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	-903	748	-764	-3031	-132	-285	-327	-1010	-117	-61	-10	0	0	0	1694	4711	125	-27	-19	0	-4	107	0	695
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	-1845	2083	-1187	316	-507	-493	-824	-2610	-440	-194	-11	0	0	0	601	-338	3024	-18	-50	0	7	1495	0	-991
18 FAU	-1176	-379	-325	-174	-291	-574	-381	-958	-114	1372	-4	0	0	0	0	-10	0	1887	791	112	894	19	0	689
19 STA	-3358	-786	-425	-460	-1078	-1639	-818	-2809	-415	-406	-10	0	0	0	-20	-34	23	1402	5264	0	5693	-513	0	-389
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	-36269	8354	-5164	-14191	1403	1823	-11760	13513	3139	4715	11587	0	0	0	1845	3365	1033	5112	6056	3649	7509	1018	0	6737

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2 Purpose: HBW Table: Difference (Est-Obs) Pct Transit

ORIGIN \ DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	-1.6	-4.2	-1.2	2.3	-15.2	-8.7	2.2	11.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1.3
2 DC NC	-0.3	3.1	-2.4	-2.1	-5.6	-4.8	-0.1	4.2	-20.6	-19.1	0	0	0	0	-37.8	0	-22.8	-20.6	-41.2	0	0	-25.9	0	0.1
3 MTG	-7.6	3.5	-0.5	0.8	-1.6	-1.0	1.1	5.7	-1.0	-6.4	-1.1	0	0	0	0	0	-3.9	0	-3.5	0	-3.9	0	0	-1.3
4 PG	7.0	4.5	1.6	-0.2	-0.8	6.2	3.5	3.5	-1.9	-5.4	0	0	0	0	-0.8	-4.9	-2.0	0	-10.0	0	0	0	0	3.2
5 ARLCR	-11.0	-27.9	14.5	-3.7	-9.0	9.5	0.4	9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2.6
6 ARNCR	-5.5	0.6	4.5	-3.0	5.0	-2.4	5.5	8.3	-3.1	-2.1	0	0	0	0	0	0	-17.5	0	-6.7	0	-46.5	0	0	-1.3
7 ALX	6.7	9.9	9.1	2.1	6.6	11.6	2.3	5.3	0	-0.5	0	0	0	0	0	0	0	0	-18.8	0	-21.2	0	0	5.4
8 FFX	4.2	4.5	7.3	1.8	5.9	7.8	7.4	0.9	-1.2	0.0	0	0	0	0	0	-12.5	-2.2	0	0	0	-10.8	0	0	2.4
9 LDN	2.9	-4.5	4.1	0.6	-2.7	-1.2	-0.0	3.7	0.3	0	-1.3	0	0	0	0	0	0	0	-16.7	0	0	0	0	1.0
10 PW	16.2	9.8	9.2	-2.5	17.0	7.4	13.3	4.5	-0.2	2.0	0	0	0	0	0	0	0	0	0	0	-2.3	0	0	3.4
11 FRD	0.2	5.5	3.9	-0.5	6.2	7.2	-1.9	0	-0.7	0	-0.6	0	0	0	0	0	0	0	0	0	0	0	0	-0.3
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	35.7	16.5	0	1.2	33.9	31.3	14.1	7.6	0	0	0	0	0	0	-0.2	-0.3	0	0	0	0	0	0	0	3.4
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	32.5	16.0	18.2	1.4	35.4	31.6	10.1	7.1	0	0	0	0	0	0	0	-0.8	-0.5	-52.6	0	0	0	0	0	5.9
18 FAU	-12.2	-16.6	0	0	-5.3	-7.4	-15.1	0	0	-0.3	0	0	0	0	0	0	0	-0.5	0	0	0	0	0	-1.3
19 STA	3.6	2.4	2.8	-0.2	8.2	-3.5	0.7	1.9	0	-0.4	0	0	0	0	0	0	0	0	-0.6	0	-0.1	-0.7	0	-2.5
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	2.3	3.0	0.4	0.3	6.5	5.1	5.7	2.5	-0.5	1.2	-0.6	0	0	0	-0.4	-1.2	-1.0	-0.7	-1.0	0	-2.1	-0.8	0	1.3

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Difference (Est-Obs) Car Occupancy

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	-0.03	-0.01	0.03	0.04	0.04	0.01	0.11	0.08	0.44	-0.14	0	0	0	0	0	0	0.50	0	0	0	0	0	0	0.01
2 DC NC	-0.04	-0.07	0.03	-0.00	-0.00	0.04	0.04	0.05	0.27	0.07	0.08	0	0	0	0.57	-0.24	0.14	0.17	0	0	0	0	0	-0.02
3 MTG	0.03	0.03	0.03	0.04	0.08	0.09	0.08	0.09	0.16	0.01	0.04	0	0	0	0.16	-0.10	0.10	0.25	0.28	0.20	0.95	0	0	0.03
4 PG	-0.03	-0.01	0.03	-0.02	0.02	0.02	0.04	0.05	0.11	0.03	0.18	0	0	0	-0.03	-0.01	0.03	0	-0.14	0	0.98	0.19	0	-0.01
5 ARLCR	-0.04	-0.02	0.05	0.18	-0.10	0.01	0.03	0.08	0.09	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
6 ARNCR	-0.01	0.04	0.08	0.02	0.01	0.01	0.03	0.05	0.11	0.02	-0.76	0	0	0	0	0	-0.08	-0.21	0.08	0	-0.07	0	0	0.02
7 ALX	0.04	0.03	0.12	0.04	0.02	0.04	-0.02	0.05	0.17	-0.05	1.00	0	0	0	0	-0.22	0.17	-0.24	0.18	0	-0.00	0	0	0.03
8 FFX	0.06	0.06	0.11	0.05	0.05	0.08	0.05	0.04	0.03	0.03	0.12	0	0	0	0.39	-0.28	0.07	0.07	0.09	0.01	0.09	-0.16	0	0.04
9 LDN	0.53	0.31	0.17	0.31	0.45	0.42	0.36	0.12	0.02	0.11	0.10	0	0	0	0	0	0.59	-0.06	0.60	0.06	0.36	0	0	0.09
10 PW	0.63	0.36	0.32	0.18	0.30	0.30	0.14	0.08	0.04	-0.02	0.05	0	0	0	0	0	0	0.05	0.00	0.13	0.06	-0.07	0	0.02
11 FRD	0.13	0.16	0.05	0.10	0.19	0.10	0.05	0.27	0.10	0.07	-0.00	0	0	0	0	0	0	-0.03	0	0.09	0	0	0	0.01
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0.01	0.02	0.15	0.06	-0.04	0.06	0.02	0.11	0	-0.48	0	0	0	0	-0.03	0.02	0.05	0	-0.40	0	0	0.02	0	-0.00
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	-0.04	0.04	0.10	0.05	0.04	0.03	0.06	0.08	0.88	0.16	0	0	0	0	0.00	0.04	-0.02	-2.00	-0.03	0	0.34	0.12	0	0.00
18 FAU	0.97	0.83	0.24	1.91	0.13	0.39	0.31	0.07	0.08	0.06	0.23	0	0	0	0	0	0	-0.01	0.03	-0.11	0.10	0.28	0	0.02
19 STA	0.90	0.43	1.02	0.66	0.42	0.53	0.26	0.16	0.35	0.04	0	0	0	0	-0.75	0.75	-0.11	0.10	-0.03	0	0.05	0.04	0	-0.01
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0.00	-0.00	0.03	0.00	0.01	0.05	0.04	0.06	0.03	-0.01	0.00	0	0	0	-0.03	0.01	-0.01	-0.00	-0.02	0.04	0.05	0.09	0	0.02

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Ratio (Est-to-Obs) Auto Driver

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	1.10	1.16	0.65	0.78	2.61	1.42	0.81	0.83	0.30	0.65	0	0	0	0	0	0	0.14	0	0.60	0	0	0	0	1.02
2 DC NC	1.02	0.91	1.10	1.22	1.82	1.28	0.79	0.84	0.27	0.17	0.26	0	0	0	0.27	0.02	0.28	0.07	0	0	0	0.05	0	1.01
3 MTG	1.10	0.82	1.05	0.82	1.29	0.95	0.53	0.72	0.30	0.10	1.13	0	0	0	0.04	0.01	0.04	0.05	0.01	14.73	0.01	0	0	0.98
4 PG	0.93	1.34	0.80	1.04	1.25	1.00	0.65	0.55	0.10	0.07	0.13	0	0	0	1.03	0.76	0.94	0	0.02	0	0.00	1.29	0	0.99
5 ARLCR	1.27	1.29	0.47	0.62	0.94	0.83	0.60	0.51	0.18	0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0.79
6 ARNCR	1.00	0.91	0.75	0.51	1.15	1.10	1.10	1.08	0.50	0.25	0.31	0	0	0	0	0	0.05	0.26	0.07	0	0.10	0	0	1.01
7 ALX	0.73	0.72	0.48	0.54	0.99	1.14	0.86	1.18	0.27	0.39	0.06	0	0	0	0.10	0.02	0.15	0.22	0.17	0	0.17	0.17	0	0.90
8 FFX	0.87	0.89	0.66	0.43	0.79	0.84	0.87	0.99	1.21	0.99	0.44	0	0	0	0.11	0.01	0.10	1.04	0.40	0.70	0.44	0.08	0	0.93
9 LDN	0.20	0.45	0.65	0.13	0.50	0.54	0.44	1.01	1.06	0.77	4.10	0	0	0	0	0	0.03	1.15	0.08	8.34	0.04	0	0	0.97
10 PW	0.42	0.19	0.23	0.17	0.28	0.45	0.65	0.96	0.69	1.10	0.32	0	0	0	0	0	0	2.64	1.63	0.70	2.77	3.75	0	0.93
11 FRD	0.15	0.47	0.76	0.35	0.54	0.20	0.08	0.37	2.04	0.11	1.15	0	0	0	0	0	0	0.54	0	5.48	0	0	0	1.01
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0.43	1.15	0.25	0.67	0.41	0.35	0.28	0.15	0	0.02	0	0	0	0	1.13	1.93	1.04	0	0.13	0	0.20	6.86	0	0.98
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0.51	1.16	0.26	0.96	0.36	0.46	0.38	0.22	0.00	0.02	0	0	0	0	1.72	0.86	1.13	0.33	0.35	0	0.81	4.02	0	0.93
18 FAU	0.01	0.01	0.07	0.01	0.04	0.06	0.09	0.82	0.88	1.18	0.65	0	0	0	0	0	0	1.17	2.85	4.26	4.64	1.92	0	1.01
19 STA	0.07	0.10	0.05	0.06	0.14	0.23	0.45	0.62	0.09	0.93	0	0	0	0	0.08	0.10	3.00	7.57	1.39	0	1.55	0.60	0	1.03
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0.90	1.00	0.95	0.95	0.93	0.91	0.79	0.95	1.01	1.03	1.16	0	0	0	1.13	1.37	1.05	1.33	1.34	5.24	1.56	1.38	0	0.97

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Ratio (Est-to-Obs) Transit

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	0.98	0.97	0.64	0.89	1.25	0.96	0.98	1.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.97
2 DC NC	0.97	0.98	1.02	1.07	1.45	1.09	0.81	1.12	0	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0.99
3 MTG	0.83	1.05	1.01	0.97	1.29	0.97	0.62	2.57	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0.93
4 PG	1.21	1.87	0.94	0.99	1.23	1.40	0.94	0.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.22
5 ARLCR	0.71	0.40	0.99	0.59	0.55	1.24	0.63	0.87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.72
6 ARNCR	0.79	0.97	1.07	0.41	1.45	0.95	1.63	2.36	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.97
7 ALX	1.00	1.37	0.96	0.77	1.37	2.14	0.99	2.17	0	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	1.24
8 FFX	1.09	1.37	2.04	0.74	1.15	1.48	2.25	1.34	0.09	1.05	0	0	0	0	0	0	0	0	0	0	0	0	0	1.23
9 LDN	0.35	0.32	4.96	0.29	0.56	0.67	0.59	32.16	1.82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.61
10 PW	1.26	0.60	1.17	0.09	1.13	0.93	3.41	8.67	0	3.15	0	0	0	0	0	0	0	0	0	0	0	0	0	1.82
11 FRD	0.16	1.12	3.27	0.25	1.06	0.78	0	0	0	0	0.38	0	0	0	0	0	0	0	0	0	0	0	0	0.84
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	2.30	12.92	0	8.83	6.23	12.00	2.89	0.66	0	0	0	0	0	0	0.55	0	0	0	0	0	0	0	0	2.74
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	2.27	12.10	1.73	4.40	27.33	12.32	5.36	3.18	0	0	0	0	0	0	0	0	0.29	0	0	0	0	0	0	2.74
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0.13	0.16	0.13	0.08	0.36	0.24	0.59	1.87	0	0.17	0	0	0	0	0	0	0	0	0.10	0	0.21	0	0	0.30
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0.99	1.18	1.03	0.99	1.27	1.26	1.34	1.76	0.48	2.12	0.34	0	0	0	0.37	0	0.14	0	0.05	0	0.01	0	0	1.08

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Ratio (Est-to-Obs) Auto Person

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	1.07	1.15	0.67	0.80	2.71	1.43	0.89	0.88	0.43	0.58	0	0	0	0	0	0	0.21	0.08	0.60	0	0	0	0	1.03
2 DC NC	0.98	0.86	1.13	1.21	1.82	1.32	0.81	0.88	0.34	0.18	0.28	0	0	0	0.43	0.02	0.31	0.08	0.03	0	0	0.05	0	0.99
3 MTG	1.13	0.84	1.07	0.85	1.39	1.03	0.57	0.79	0.35	0.10	1.17	0	0	0	0.05	0.01	0.05	0.06	0.01	17.73	0.01	0	0	1.01
4 PG	0.90	1.33	0.82	1.03	1.27	1.01	0.67	0.58	0.11	0.07	0.15	0	0	0	1.00	0.76	0.96	0	0.02	0	0.01	1.51	0	0.98
5 ARLCR	1.22	1.27	0.49	0.73	0.85	0.84	0.61	0.54	0.20	0.28	0	0	0	0	0	0	0	0	0	0	0	0	0	0.80
6 ARNCR	0.99	0.94	0.81	0.52	1.16	1.12	1.13	1.13	0.55	0.25	0.18	0	0	0	0	0	0.05	0.22	0.07	0	0.10	0	0	1.03
7 ALX	0.76	0.73	0.53	0.56	1.01	1.18	0.85	1.24	0.31	0.38	0.11	0	0	0	0.10	0.01	0.17	0.18	0.20	0	0.17	0.17	0	0.93
8 FFX	0.91	0.94	0.73	0.45	0.83	0.90	0.91	1.02	1.25	1.01	0.48	0	0	0	0.14	0.00	0.11	1.11	0.44	0.71	0.48	0.07	0	0.97
9 LDN	0.29	0.58	0.75	0.16	0.70	0.75	0.59	1.13	1.08	0.86	4.52	0	0	0	0	0	0.04	1.10	0.13	8.81	0.05	0	0	1.05
10 PW	0.60	0.25	0.30	0.19	0.33	0.55	0.73	1.03	0.71	1.08	0.33	0	0	0	0	0	0.01	2.76	1.63	0.77	2.92	3.54	0	0.95
11 FRD	0.16	0.53	0.79	0.39	0.62	0.22	0.09	0.46	2.23	0.11	1.14	0	0	0	0	0	0	0.53	0	5.94	0	0	0	1.02
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0.43	1.17	0.29	0.71	0.40	0.37	0.28	0.16	0	0.02	0.09	0	0	0	1.10	1.97	1.08	0	0.10	0	0.20	6.94	0	0.98
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0.50	1.21	0.28	1.00	0.37	0.47	0.41	0.24	0.00	0.03	0	0	0	0	1.72	0.89	1.11	0.11	0.34	0	1.08	4.47	0	0.93
18 FAU	0.02	0.02	0.09	0.02	0.04	0.08	0.12	0.88	0.94	1.25	0.80	0	0	0	0	0	0	1.16	2.93	3.87	5.08	2.46	0	1.03
19 STA	0.11	0.13	0.09	0.09	0.18	0.30	0.55	0.71	0.12	0.97	0	0	0	0	0.05	0.17	2.77	8.34	1.35	0	1.62	0.62	0	1.02
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0.90	0.99	0.98	0.95	0.93	0.95	0.82	0.99	1.04	1.03	1.16	0	0	0	1.10	1.38	1.04	1.33	1.32	5.41	1.64	1.49	0	0.99

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Ratio (Est-to-Obs) Auto Pax

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	0.91	1.09	0.83	0.96	3.70	1.51	2.55	1.48	2.71	0.38	0	0	0	0	0	0	0	0	0	0	0	0	0	1.09
2 DC NC	0.81	0.53	1.42	1.18	1.81	1.71	1.05	1.25	1.85	0.33	0.46	0	0	0	0	0.02	0.67	0.14	0.17	0	0	0	0	0.86
3 MTG	1.33	1.05	1.41	1.25	2.51	1.95	1.08	2.01	1.72	0.10	1.64	0	0	0	0.14	0	0.06	0	0.02	0	0.13	0	0	1.39
4 PG	0.80	1.20	1.01	0.88	1.47	1.12	0.90	0.84	0.17	0.08	0.28	0	0	0	0.84	0.74	1.25	0	0	0	0.20	4.17	0	0.93
5 ARLCR	0.99	1.10	0.69	0	0.29	0.92	0.72	1.19	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.83
6 ARNCR	0.94	1.33	1.61	0.60	1.24	1.25	1.45	1.88	1.20	0.27	0	0	0	0	0	0	0	0	0.14	0	0.07	0	0	1.23
7 ALX	0.92	0.90	1.24	0.73	1.17	1.58	0.71	1.95	1.00	0.30	0	0	0	0	0	0	0	0.09	1.00	0	0.17	0	0	1.12
8 FFX	1.06	1.33	1.96	0.65	1.00	1.33	1.49	1.60	1.66	1.37	0.77	0	0	0	0.33	0	0.15	1.91	1.05	0.73	0.79	0	0	1.36
9 LDN	0.80	2.31	2.28	0.63	2.73	2.62	3.16	3.73	1.46	3.31	26.70	0	0	0	0	0	0.07	0.77	0	16.18	0.14	0	0	2.31
10 PW	0.93	0.42	0.80	0.28	0.44	0.82	1.25	1.83	0.99	0.88	0.50	0	0	0	0	0	0.17	4.45	1.64	1.22	4.47	2.83	0	1.09
11 FRD	0.21	1.40	1.09	0.68	0.97	0.27	0.13	1.48	5.21	0.14	1.11	0	0	0	0	0	0	0.50	0	13.39	0	0	0	1.11
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0.44	1.29	0.72	1.21	0.35	0.46	0.31	0.31	0	0	0	0	0	0	0.75	2.37	1.48	0	0	0	0	7.25	0	0.98
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0.44	1.58	0.45	1.63	0.46	0.53	0.66	0.44	0.02	0.06	0	0	0	0	1.73	1.26	0.86	0	0.32	0	12.50	12.08	0	0.93
18 FAU	0.07	0.06	0.39	0.13	0.06	0.22	0.46	1.41	1.82	2.20	0	0	0	0	0	0	0	0.94	3.91	2.38	16.75	0	0	1.28
19 STA	0.16	0.18	0.30	0.43	0.23	0.45	0.99	1.40	0.44	1.45	0	0	0	0	0	0	2.25	32.00	0.91	0	3.11	0.88	0	0.95
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0.91	0.96	1.33	0.96	0.96	1.21	1.15	1.72	1.48	0.98	1.19	0	0	0	0.80	1.49	0.88	1.33	1.03	6.60	3.01	2.69	0	1.17

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2   Purpose: HBW   Table: Ratio (Est-to-Obs) Person

ORIGIN | DESTINATION	DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	1.00	1.05	0.65	0.83	1.55	1.10	0.93	1.06	0.43	0.62	0	0	0	0	0	0	0.21	0.08	0.60	0	0	0	0	0.99
2 DC NC	0.98	0.90	1.09	1.18	1.63	1.21	0.81	0.93	0.27	0.14	0.28	0	0	0	0.27	0.02	0.24	0.06	0.01	0	0	0.04	0	0.99
3 MTG	0.97	0.87	1.07	0.86	1.36	1.01	0.57	0.84	0.34	0.09	1.16	0	0	0	0.05	0.01	0.04	0.06	0.01	17.73	0.01	0	0	1.00
4 PG	1.02	1.40	0.84	1.02	1.26	1.10	0.70	0.60	0.10	0.07	0.15	0	0	0	1.00	0.72	0.94	0	0.01	0	0.01	1.51	0	1.02
5 ARLCR	0.83	0.69	0.60	0.70	0.75	0.99	0.62	0.61	0.21	0.28	0	0	0	0	0	0	0	0	0	0	0	0	0	0.76
6 ARNCR	0.88	0.95	0.85	0.51	1.26	1.09	1.21	1.25	0.54	0.25	0.18	0	0	0	0	0	0.04	0.22	0.07	0	0.05	0	0	1.01
7 ALX	0.86	0.83	0.60	0.57	1.11	1.39	0.87	1.31	0.31	0.37	0.11	0	0	0	0.10	0.01	0.17	0.18	0.16	0	0.13	0.17	0	0.99
8 FFX	0.97	0.99	0.79	0.46	0.89	1.00	0.99	1.03	1.23	1.01	0.48	0	0	0	0.14	0.00	0.11	1.11	0.44	0.71	0.43	0.07	0	1.00
9 LDN	0.30	0.55	0.78	0.17	0.68	0.74	0.59	1.17	1.09	0.86	4.46	0	0	0	0	0	0.04	1.10	0.11	8.81	0.05	0	0	1.06
10 PW	0.76	0.28	0.33	0.19	0.41	0.60	0.84	1.08	0.71	1.10	0.33	0	0	0	0	0	0.01	2.76	1.63	0.77	2.85	3.54	0	0.99
11 FRD	0.16	0.57	0.82	0.38	0.67	0.23	0.09	0.46	2.21	0.11	1.14	0	0	0	0	0	0	0.53	0	5.94	0	0	0	1.01
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0.76	1.41	0.34	0.72	0.62	0.54	0.33	0.18	0	0.02	0.09	0	0	0	1.10	1.96	1.08	0	0.10	0	0.20	6.94	0	1.02
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0.83	1.44	0.35	1.02	0.57	0.70	0.45	0.26	0.00	0.03	0	0	0	0	1.72	0.88	1.10	0.05	0.34	0	1.08	4.47	0	0.99
18 FAU	0.01	0.02	0.09	0.02	0.04	0.07	0.10	0.88	0.94	1.24	0.80	0	0	0	0	0	0	1.15	2.93	3.87	5.08	2.46	0	1.02
19 STA	0.11	0.13	0.10	0.09	0.20	0.29	0.55	0.72	0.12	0.96	0	0	0	0	0.05	0.17	2.77	8.34	1.34	0	1.62	0.62	0	0.99
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0.94	1.04	0.99	0.95	1.02	1.01	0.88	1.02	1.04	1.04	1.15	0	0	0	1.10	1.37	1.03	1.32	1.31	5.41	1.60	1.48	0	1.00

Appendix C Year 2000 mode choice, Comparison of estimated and observed (2000 CTPP)

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2 Purpose: HBW Table: Ratio (Est-to-Obs) Pct Transit

ORIGIN	DESTINATION DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	0.98	0.93	0.98	1.07	0.81	0.88	1.05	1.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.98
2 DC NC	1.00	1.08	0.94	0.91	0.89	0.90	1.00	1.21	0	0.28	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00
3 MTG	0.85	1.20	0.95	1.14	0.95	0.96	1.07	3.07	0	0.13	0	0	0	0	0	0	0	0	0	0	0	0	0	0.93
4 PG	1.19	1.34	1.12	0.97	0.97	1.27	1.34	1.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.19
5 ARLCR	0.86	0.58	1.65	0.85	0.74	1.25	1.01	1.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.95
6 ARNCR	0.90	1.02	1.26	0.82	1.16	0.87	1.35	1.90	0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.96
7 ALX	1.16	1.65	1.61	1.36	1.23	1.55	1.14	1.65	0	0.67	0	0	0	0	0	0	0	0	0	0	0	0	0	1.24
8 FFX	1.12	1.38	2.59	1.63	1.28	1.48	2.27	1.30	0.07	1.04	0	0	0	0	0	0	0	0	0	0	0	0	0	1.24
9 LDN	1.17	0.58	6.35	1.73	0.83	0.90	1.00	27.46	1.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.52
10 PW	1.66	2.15	3.56	0.48	2.74	1.54	4.04	8.02	0	2.86	0	0	0	0	0	0	0	0	0	0	0	0	0	1.85
11 FRD	1.01	1.98	3.97	0.65	1.58	3.32	0	0	0	0	0.33	0	0	0	0	0	0	0	0	0	0	0	0	0.83
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	3.02	9.18	0	12.23	10.06	22.36	8.68	3.67	0	0	0	0	0	0	0.50	0	0	0	0	0	0	0	0	2.70
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	2.75	8.39	4.99	4.33	47.68	17.66	11.83	12.36	0	0	0	0	0	0	0	0	0.26	0	0	0	0	0	0	2.78
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	1.14	1.23	1.34	0.90	1.83	0.81	1.07	2.59	0	0.18	0	0	0	0	0	0	0	0	0.07	0	0.13	0	0	0.30
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1.05	1.14	1.04	1.05	1.24	1.24	1.52	1.72	0.46	2.03	0.30	0	0	0	0.34	0	0.14	0	0.04	0	0.01	0	0	1.08

Yr 2000 Est/Obs Mode Choice Anaylsis - Model V2.2 Purpose: HBW Table: Ratio (Est-to-Obs) Car Occupancy

ORIGIN	DESTINATION DC CR	DC NCR	MTG	PG	ARL CR	ARL NCR	ALX	FFX	LDN	PW	FRD	CAR	HOW	AAR	CAL	STM	CHS	FAU	STA	CL/JF	SP/FB	KGEO	EXTL	TOTAL
1 DC CR	0.97	0.99	1.03	1.03	1.04	1.01	1.10	1.07	1.42	0.89	0	0	0	0	0	0	1.50	0	1.00	0	0	0	0	1.01
2 DC NC	0.96	0.94	1.03	1.00	1.00	1.04	1.03	1.05	1.25	1.06	1.07	0	0	0	1.57	0.86	1.13	1.15	0	0	0	1.00	0	0.98
3 MTG	1.03	1.02	1.03	1.04	1.07	1.08	1.07	1.09	1.15	1.00	1.04	0	0	0	1.15	0.91	1.08	1.25	1.23	1.20	1.91	0	0	1.03
4 PG	0.98	0.99	1.03	0.99	1.02	1.02	1.03	1.05	1.10	1.03	1.16	0	0	0	0.98	1.00	1.03	0	0.88	0	1.96	1.17	0	0.99
5 ARLCR	0.96	0.98	1.05	1.18	0.91	1.01	1.02	1.07	1.08	1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	1.01
6 ARNCR	0.99	1.04	1.07	1.02	1.01	1.01	1.02	1.05	1.10	1.02	0.57	0	0	0	0	0	0.92	0.83	1.07	0	0.94	0	0	1.02
7 ALX	1.03	1.03	1.11	1.03	1.02	1.04	0.98	1.04	1.16	0.96	2.00	0	0	0	1.00	0.82	1.17	0.83	1.17	0	1.00	1.00	0	1.02
8 FFX	1.05	1.06	1.10	1.05	1.04	1.07	1.05	1.04	1.03	1.03	1.10	0	0	0	1.33	0.78	1.06	1.06	1.09	1.01	1.08	0.86	0	1.04
9 LDN	1.45	1.29	1.16	1.28	1.41	1.38	1.34	1.12	1.02	1.11	1.10	0	0	0	0	0	1.42	0.95	1.60	1.06	1.31	0	0	1.08
10 PW	1.41	1.27	1.28	1.14	1.20	1.22	1.12	1.07	1.04	0.98	1.05	0	0	0	0	0	0	1.05	1.00	1.11	1.05	0.94	0	1.02
11 FRD	1.10	1.15	1.04	1.09	1.15	1.08	1.04	1.24	1.09	1.06	1.00	0	0	0	0	0	0	0.98	0	1.08	0	0	0	1.01
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	1.01	1.02	1.14	1.06	0.97	1.05	1.01	1.10	0	0.68	0	0	0	0	0.97	1.02	1.04	0	0.71	0	1.00	1.01	0	1.00
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0.97	1.04	1.08	1.05	1.04	1.02	1.06	1.08	1.78	1.14	0	0	0	0	1.00	1.04	0.98	0.33	0.98	0	1.33	1.11	0	1.00
18 FAU	1.85	1.71	1.23	2.75	1.11	1.34	1.29	1.07	1.07	1.05	1.23	0	0	0	0	0	0	0.99	1.03	0.91	1.10	1.28	0	1.02
19 STA	1.53	1.27	1.85	1.60	1.24	1.35	1.21	1.14	1.32	1.04	0	0	0	0	0.57	1.75	0.92	1.10	0.97	0	1.05	1.04	0	0.99
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1.00	1.00	1.03	1.00	1.01	1.04	1.04	1.05	1.03	1.00	1.00	0	0	0	0.97	1.01	0.99	1.00	0.98	1.03	1.05	1.08	0	1.02

Appendix D. Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Ref: i6_mc_consummary2030with2010constr.tab

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW   MODE: LOV Auto Driver

DESTINATION

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
1 DC CR	4473	3267	765	912	420	787	374	1220	50	7	0	0	60	96	1	0	4	0	0	0	0	0	1611	14047
2 DC NC	45066	34805	14515	15982	3807	6980	2773	8293	199	19	28	0	903	1319	9	0	25	0	0	1	0	0	10024	144747
3 MTG	38167	23971	360686	36874	2875	5175	1423	16318	525	20	5477	118	12629	4088	0	0	4	0	0	24	0	0	31996	540370
4 PG	50838	72580	31297	231523	4429	9119	8657	12951	99	57	29	5	11561	30150	710	276	4364	0	2	0	0	49	24366	493063
5 ARLCR	776	257	128	51	1016	531	166	581	27	4	0	0	3	0	0	0	0	0	0	0	0	0	125	3665
6 ARNCR	13937	6103	3076	1076	5989	26304	6146	25592	865	117	3	0	26	22	0	0	3	1	5	0	6	0	1943	91213
7 ALX	8011	3762	1060	1844	3106	9447	19602	22349	244	212	0	0	7	29	1	0	16	0	6	0	3	1	1106	70807
8 FFX	25742	15394	9122	6617	8682	27075	34812	433687	47521	13196	30	0	57	56	2	1	53	187	194	8	124	0	9585	632146
9 LDN	250	251	2719	53	192	584	252	74325	170670	4155	5928	11	92	0	0	0	0	745	9	2481	5	0	6577	269299
10 PW	498	192	47	272	183	734	2433	81457	18414	146145	7	0	0	0	0	0	2	4583	4323	47	1703	19	4424	265483
11 FRD	52	139	20414	909	8	17	4	122	1264	2	148160	3268	11168	667	0	0	0	0	0	1087	0	0	16848	204130
12 CAR	0	21	3568	775	0	0	0	0	12	0	17477	77647	15500	991	0	0	0	0	0	24	0	0	21519	137534
13 HOW	981	1691	14622	14779	68	109	23	214	5	0	2220	323	91585	24819	0	0	1	0	0	10	0	0	36830	188280
14 AAR	2334	4580	2221	32552	160	290	143	199	2	0	8	1	9920	230636	704	18	78	0	0	0	0	0	45389	329235
15 CAL	496	1381	122	9934	36	83	87	115	0	0	0	0	24	4157	30727	9307	1447	0	0	0	0	40	221	58178
16 STM	66	195	18	2334	4	21	42	62	0	0	0	0	1	75	4081	63487	5570	0	4	0	7	966	138	77070
17 CHS	2273	6899	223	33000	146	391	1456	1464	2	1	0	0	14	590	2710	4487	58560	0	6	0	15	2106	411	114754
18 FAU	0	0	0	0	0	0	1	1510	2931	15947	4	0	0	0	0	0	0	41432	6792	304	1933	16	2790	73660
19 STA	13	11	1	11	13	29	117	3705	66	15280	0	0	0	0	1	5	12	842	54780	0	26235	1254	4629	107004
20 CL/JF	1	10	593	4	0	0	0	443	8057	47	4502	11	149	0	0	0	0	198	0	43712	0	0	10906	68633
21 SP/FB	4	3	0	0	1	1	5	319	2	2288	0	0	0	0	0	2	7	88	11000	0	92680	669	14182	121250
22 KGEO	0	0	0	26	0	0	0	3	0	74	0	0	0	0	12	89	357	2	809	0	1583	16836	551	20342
23 EXTL	5693	6353	25471	34085	1039	1746	1101	11305	12454	13522	52521	33698	45390	92303	1428	523	2145	15710	5520	26720	21809	1969	0	412505
TOTAL	199669	181865	490668	423613	32175	89423	79617	696234	263410	211093	236394	115082	199089	389998	40386	78195	72648	63788	83450	74418	146103	23925	246171	4437416

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW   MODE: LOV Auto Person

DESTINATION

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
1 DC CR	5251	3815	918	1090	523	941	447	1442	72	9	0	0	79	135	2	0	4	0	1	0	0	0	1848	16577
2 DC NC	53428	38540	16893	18502	4519	8273	3237	9462	233	25	37	0	1126	1680	11	0	32	0	0	1	0	0	11527	167525
3 MTG	44932	26782	399475	41759	3296	5882	1596	17819	574	23	6135	135	14308	4750	0	0	4	0	0	31	0	0	36781	604282
4 PG	59379	81311	35900	252171	5043	10345	9503	14200	106	70	46	6	12909	33663	796	316	4810	0	3	0	0	58	28008	548643
5 ARLCR	923	294	149	60	1067	616	191	667	32	4	0	0	2	0	1	0	0	0	0	0	0	0	148	4154
6 ARNCR	15685	6784	3522	1218	6892	29952	6919	28820	1038	131	3	0	29	25	1	0	3	1	6	0	6	0	2244	103279
7 ALX	8818	4161	1191	2076	3478	10642	21594	24971	322	247	1	0	5	33	1	0	17	0	8	0	5	1	1267	78838
8 FFX	27569	16645	9910	7328	9468	29999	38408	473943	52457	14589	29	0	67	54	3	1	65	220	232	11	136	0	10991	692125
9 LDN	274	276	2995	54	208	648	280	84018	185228	4614	6579	12	107	0	0	0	0	835	12	2755	5	0	7554	296454
10 PW	501	200	48	336	226	1383	3070	93007	20337	157833	8	0	0	0	0	0	3	5065	4843	54	1952	22	5089	293976
11 FRD	63	155	22312	1027	7	24	4	136	1447	2	156687	3661	12891	790	0	0	0	0	0	1226	0	0	19362	219794
12 CAR	0	24	4038	903	0	0	0	0	14	0	19787	81012	17540	1147	0	0	0	0	0	29	0	0	24732	149226
13 HOW	1218	1948	16643	16474	79	125	27	237	7	0	2529	355	97286	27349	1	0	1	0	0	12	0	0	42335	206627
14 AAR	2641	5080	2531	35756	184	327	162	227	0	0	9	1	11011	247030	784	23	89	0	0	0	0	0	52166	358021
15 CAL	602	1595	137	11169	43	97	100	131	0	0	0	0	27	4708	32537	10352	1648	0	0	0	0	51	252	63450
16 STM	83	230	22	2685	7	22	48	69	0	0	0	0	1	92	4578	67985	6245	0	4	0	8	1134	158	83372
17 CHS	2681	7911	263	36955	169	447	1614	1603	2	1	0	0	15	691	3046	5055	62210	0	7	0	19	2442	473	125604
18 FAU	0	0	0	0	0	0	1	1652	3256	17471	5	0	0	0	0	0	0	43491	7562	345	2186	19	3206	79194
19 STA	13	11	1	11	15	27	118	3776	72	16769	0	0	0	0	1	5	16	942	57992	0	28689	1409	5321	115188
20 CL/JF	1	13	668	5	1	0	0	582	9300	56	5093	15	187	0	0	0	0	226	0	45893	0	0	12536	74576
21 SP/FB	4	3	0	0	1	1	8	324	1	2567	0	0	0	0	0	2	8	99	12208	0	97222	767	16301	129516
22 KGEO	0	0	0	32	0	0	0	1	0	89	0	0	0	0	14	108	419	2	909	0	1787	17609	634	21604
23 EXTL	6543	7301	29276	39179	1191	2008	1264	12993	14313	15543	60372	38731	52174	106095	1644	602	2465	18059	6348	30715	25067	2262	0	474145
TOTAL	230610	203079	546893	468788	36419	101760	88591	770080	288810	230043	257320	123928	219764	428242	43420	84449	78039	68940	90135	81072	157082	25774	282933	4906172

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW MODE: Transit

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
	DESTINATION																							
1 DC CR	22347	7919	2548	1350	2064	2928	871	2378	40	1	0	0	28	6	0	0	0	0	0	0	0	0	0	42480
2 DC NC	97117	35095	14164	7052	5371	5992	1604	3759	37	2	3	0	70	25	0	0	0	0	0	0	0	0	0	170291
3 MTG	53314	11507	63587	6046	2805	2824	520	3429	30	0	95	0	403	27	0	0	0	0	0	0	0	0	0	144586
4 PG	59403	27648	10910	26014	4424	5185	1715	1967	15	0	2	0	422	138	0	0	1	0	0	0	0	0	0	137844
5 ARLCR	3021	348	185	35	445	854	142	610	9	1	0	0	1	0	0	0	0	0	0	0	0	0	0	5651
6 ARNCR	26186	2931	1373	254	6577	8658	3220	11657	124	3	0	0	1	0	0	0	0	0	0	0	0	0	0	60985
7 ALX	15474	1938	631	220	3328	7987	7372	6543	27	10	0	0	1	0	0	0	0	0	0	0	0	0	0	43530
8 FFX	46409	5376	2578	359	8738	17831	10638	27809	1922	188	0	0	0	0	0	0	0	0	0	0	1	0	0	121849
9 LDN	432	69	228	4	220	425	53	10811	12132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24376
10 PW	13299	633	94	35	1620	2506	2602	11940	25	8766	0	0	0	0	0	0	0	0	2	0	4	0	0	41527
11 FRD	123	84	4308	52	13	11	1	13	0	0	4171	0	15	1	0	0	0	0	0	0	0	0	0	8792
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	1179	454	2018	972	69	56	9	29	0	0	0	0	900	9	0	0	0	0	0	0	0	0	0	5695
14 AAR	4040	1582	544	1942	192	202	47	45	0	0	0	0	76	53	7	0	0	0	0	0	0	0	0	8731
15 CAL	1831	1181	102	1195	113	125	58	41	0	0	0	0	0	2	115	0	2	0	0	0	0	0	0	4764
16 STM	303	125	28	155	23	27	15	17	0	0	0	0	0	1	1	12	108	0	0	0	0	0	0	815
17 CHS	5055	2658	216	1285	282	332	276	173	1	0	0	0	0	1	2	0	1570	0	0	0	0	0	0	11850
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	1024	125	13	6	429	611	421	1664	1	348	0	0	0	0	0	0	0	0	7	0	257	0	0	4905
20 CL/JF	2	4	84	1	0	0	0	1	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	95
21 SP/FB	73	9	0	0	28	44	46	241	1	107	0	0	0	0	0	0	0	0	26	0	1195	0	0	1769
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	350630	99685	103612	46976	36742	56597	29610	83126	14368	9426	4271	0	1918	263	125	12	1681	0	35	0	1457	0	0	840533

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW MODE: HOV Auto Person

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
	DESTINATION																							
1 DC CR	0	0	0	0	0	0	0	31	3	2	0	0	0	0	0	0	0	0	1	0	0	0	0	37
2 DC NC	0	0	24	0	0	18	121	708	51	7	0	0	0	0	0	0	0	0	0	0	0	0	0	929
3 MTG	1939	705	8262	773	554	925	197	3058	179	6	0	0	6	2	0	0	0	0	0	0	0	0	0	16607
4 PG	2284	721	655	773	700	1406	1992	2837	76	10	1	0	3	0	0	0	0	0	0	0	0	0	0	11457
5 ARLCR	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6 ARNCR	1660	334	182	59	221	346	30	211	21	4	1	0	1	6	0	0	0	0	0	0	0	0	0	3075
7 ALX	2237	562	351	80	533	486	55	993	57	9	1	0	4	3	0	0	0	0	0	0	0	0	0	5371
8 FFX	35116	9742	5601	732	9325	13613	3630	18775	1014	45	7	0	22	6	0	0	1	0	0	1	1	0	0	97630
9 LDN	672	317	1048	54	477	829	268	8176	10	74	4	0	1	0	0	0	0	0	0	0	0	0	0	11929
10 PW	17915	2502	765	497	4414	7365	5659	25348	765	531	2	0	0	1	0	0	0	2	1	0	1	0	0	65768
11 FRD	164	218	6062	351	45	70	8	257	46	1	174	0	17	11	0	0	0	0	0	0	0	0	0	7424
12 CAR	0	3	257	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	264
13 HOW	11	10	166	0	13	18	7	62	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	289
14 AAR	1026	867	375	1989	59	96	98	106	0	0	0	0	8	13	0	0	0	0	0	0	0	0	0	4638
15 CAL	38	35	31	154	16	32	50	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	410
16 STM	15	5	6	8	5	10	20	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93
17 CHS	285	25	58	15	77	157	395	398	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1414
18 FAU	0	0	0	2	8	14	12	746	174	795	0	0	0	0	0	0	0	0	0	0	0	0	0	1751
19 STA	1707	623	137	118	1412	2337	1685	9558	44	398	0	0	0	0	0	0	0	0	0	0	0	0	0	18019
20 CL/JF	4	34	512	10	2	0	0	85	0	6	47	0	0	0	0	0	0	0	0	0	0	0	0	700
21 SP/FB	96	31	8	4	97	164	155	1073	6	162	0	0	0	0	0	0	0	0	0	0	0	0	0	1797
22 KGEO	0	0	0	0	0	0	0	7	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	10
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	65170	16732	24500	5623	17958	27885	14382	72510	2450	2056	237	0	62	42	0	0	1	2	2	1	2	0	0	249615

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW MODE: HOV AUTO Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7
2 DC NC	0	0	3	0	0	7	33	200	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0	258
3 MTG	529	212	2399	228	152	260	58	887	40	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4766
4 PG	630	215	183	228	205	399	576	822	21	4	0	0	1	0	0	0	0	0	0	0	0	0	0	3284
5 ARLCR	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6 ARNCR	473	103	50	20	63	99	14	63	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	890
7 ALX	642	164	103	23	157	142	16	289	18	1	2	0	0	3	0	0	0	0	0	0	0	0	0	1559
8 FFX	9841	2806	1620	208	2656	3923	1047	5420	280	9	1	0	6	1	0	0	0	0	0	0	0	0	0	27819
9 LDN	163	95	281	16	128	212	75	2204	3	19	3	0	2	0	0	0	0	0	0	0	0	0	0	3200
10 PW	4984	716	224	141	1245	2106	1636	7329	221	153	0	0	1	0	0	0	0	0	0	0	1	0	0	18756
11 FRD	46	58	1754	98	16	15	5	71	11	1	50	0	7	0	0	0	0	0	0	0	0	0	0	2132
12 CAR	0	0	74	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
13 HOW	3	1	49	0	1	7	2	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82
14 AAR	285	249	105	581	16	26	28	27	1	0	0	0	2	3	0	0	0	0	0	0	0	0	0	1322
15 CAL	10	9	10	44	4	8	15	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116
16 STM	2	3	3	1	2	2	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
17 CHS	78	6	17	5	23	42	114	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	399
18 FAU	0	0	0	1	2	3	3	214	48	233	0	0	0	0	0	0	0	0	0	0	0	0	0	504
19 STA	466	175	38	34	393	659	478	2729	14	115	0	0	0	0	0	0	0	0	0	0	0	0	0	5101
20 CL/JF	1	9	145	4	1	0	0	24	0	2	11	0	0	0	0	0	0	0	0	0	0	0	0	197
21 SP/FB	26	9	2	0	28	44	46	304	2	47	0	0	0	0	0	0	0	0	0	0	0	0	0	508
22 KGEO	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	18180	4830	7059	1632	5092	7955	4151	20739	679	591	67	0	19	7	0	0	0	0	0	0	1	0	0	71003

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW MODE: Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	4473	3267	765	912	420	787	374	1224	52	8	0	0	60	96	1	0	4	0	0	0	0	0	1611	14054
2 DC NC	45066	34805	14518	15982	3807	6987	2805	8493	212	21	28	0	903	1319	9	0	25	0	0	1	0	0	10024	145005
3 MTG	38696	24183	363085	37102	3026	5435	1481	17205	566	21	5477	118	12629	4088	0	0	4	0	0	24	0	0	31996	545136
4 PG	51468	72795	31480	231751	4635	9518	9233	13773	120	61	29	5	11562	30150	710	276	4364	0	2	0	0	49	24366	496347
5 ARLCR	776	257	128	51	1016	531	166	582	27	4	0	0	3	0	0	0	0	0	0	0	0	0	125	3666
6 ARNCR	14411	6205	3126	1096	6052	26403	6160	25655	869	118	3	0	26	22	0	0	3	1	5	0	6	0	1943	92103
7 ALX	8653	3926	1163	1866	3263	9589	19618	22638	262	213	2	0	7	32	1	0	16	0	6	0	3	1	1106	72366
8 FFX	35584	18200	10742	6825	11339	30998	35859	439107	47801	13205	31	0	63	57	2	1	53	187	194	8	124	0	9585	659965
9 LDN	412	346	3000	70	320	796	327	76529	170673	4174	5931	11	94	0	0	0	0	745	9	2481	5	0	6577	272500
10 PW	5482	908	271	413	1428	2840	4069	88786	18635	146298	7	0	1	0	0	0	2	4583	4323	47	1704	19	4424	284239
11 FRD	98	197	22168	1007	24	33	9	193	1275	3	148210	3268	11175	667	0	0	0	0	0	1087	0	0	16848	206262
12 CAR	0	21	3642	776	0	0	0	0	12	0	17477	77647	15500	991	0	0	0	0	0	24	0	0	21519	137609
13 HOW	984	1692	14671	14779	70	116	25	232	5	0	2220	323	91585	24819	0	0	1	0	0	10	0	0	36830	188361
14 AAR	2619	4829	2326	33133	176	316	171	226	3	0	8	1	9922	230639	704	18	78	0	0	0	0	0	45389	330557
15 CAL	506	1390	132	9978	41	91	103	130	0	0	0	0	24	4157	30727	9307	1447	0	0	0	0	40	221	58293
16 STM	68	198	21	2335	6	23	48	67	0	0	0	0	1	75	4081	63487	5570	0	4	0	7	966	138	77095
17 CHS	2351	6905	240	33005	169	433	1570	1577	2	1	0	0	14	590	2710	4487	58560	0	6	0	15	2106	411	115153
18 FAU	0	0	0	1	2	3	4	1724	2979	16180	4	0	0	0	0	0	0	41432	6792	304	1933	16	2790	74164
19 STA	479	186	39	45	406	688	595	6434	80	15395	0	0	0	0	1	5	12	842	54780	0	26235	1254	4629	112105
20 CL/JF	2	19	738	8	1	0	0	467	8057	49	4513	11	149	0	0	0	0	198	0	43712	0	0	10906	68830
21 SP/FB	30	12	2	0	29	45	51	623	4	2335	0	0	0	0	0	2	7	88	11000	0	92680	669	14182	121758
22 KGEO	0	0	0	26	0	0	0	4	0	76	0	0	0	0	12	89	357	2	809	0	1583	16836	551	20345
23 EXTL	5693	6353	25471	34085	1039	1746	1101	11305	12454	13522	52521	33698	45390	92303	1428	523	2145	15710	5520	26720	21809	1969	0	412505
TOTAL	217850	186694	497728	425246	37267	97378	83768	716974	264089	211684	236461	115082	199108	390005	40386	78195	72648	63788	83450	74418	146104	23925	246171	4508419

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW MODE: Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	5251	3815	918	1090	523	941	447	1473	75	11	0	0	79	135	2	0	4	0	2	0	0	0	1848	16614
2 DC NC	53428	38540	16917	18502	4519	8290	3357	10170	284	32	37	0	1126	1680	11	0	32	0	0	1	0	0	11527	168454
3 MTG	46872	27487	407737	42532	3850	6807	1793	20878	753	29	6135	135	14314	4752	0	0	4	0	0	31	0	0	36781	620889
4 PG	61663	82032	36555	252944	5743	11751	11495	17037	182	80	47	6	12912	33663	796	316	4810	0	3	0	0	58	28008	560100
5 ARLCR	923	294	149	60	1067	616	191	669	32	6	0	0	2	0	1	0	0	0	0	0	0	0	148	4158
6 ARNCR	17345	7118	3704	1277	7113	30298	6949	29031	1059	135	4	0	30	31	1	0	3	1	6	0	6	0	2244	106354
7 ALX	11054	4722	1543	2155	4012	11128	21649	25964	379	256	2	0	9	36	1	0	17	0	8	0	5	1	1267	84209
8 FFX	62685	26387	15512	8059	18793	43612	42038	492718	53471	14634	36	0	89	60	3	1	66	220	232	12	137	0	10991	789756
9 LDN	946	593	4043	108	685	1477	548	92194	185238	4688	6583	12	108	0	0	0	0	835	12	2755	5	0	7554	308383
10 PW	18416	2702	813	833	4640	8748	8729	118355	21102	158364	10	0	0	1	0	0	3	5067	4844	54	1953	22	5089	359744
11 FRD	227	373	28374	1378	52	94	12	393	1493	3	156861	3661	12908	801	0	0	0	0	0	1226	0	0	19362	227218
12 CAR	0	27	4295	907	0	0	0	0	14	0	19787	81012	17540	1147	0	0	0	0	0	29	0	0	24732	149490
13 HOW	1230	1958	16809	16474	92	143	34	299	9	0	2529	355	97286	27349	1	0	1	0	0	12	0	0	42335	206916
14 AAR	3668	5947	2906	37745	244	423	261	333	0	0	9	1	11019	247043	784	23	89	0	0	0	0	0	52166	362660
15 CAL	641	1630	168	11323	60	129	150	184	0	0	0	0	27	4708	32537	10352	1648	0	0	0	0	51	252	63860
16 STM	98	235	28	2693	12	32	68	94	0	0	0	0	1	92	4578	67985	6245	0	4	0	8	1134	158	83465
17 CHS	2966	7936	321	36970	247	604	2009	2001	4	2	0	0	15	691	3046	5055	62210	0	7	0	19	2442	473	127018
18 FAU	0	0	0	2	8	14	13	2398	3430	18266	5	0	0	0	0	0	0	43491	7562	345	2186	19	3206	80945
19 STA	1720	633	138	129	1427	2364	1803	13334	116	17167	0	0	0	0	1	5	16	942	57992	0	28689	1409	5321	133207
20 CL/JF	5	46	1180	15	3	0	0	667	9300	62	5140	15	187	0	0	0	0	226	0	45893	0	0	12536	75276
21 SP/FB	100	34	8	4	98	165	163	1397	7	2729	0	0	0	0	0	2	8	99	12208	0	97222	767	16301	131313
22 KGEO	0	0	0	32	0	0	0	8	0	92	0	0	0	0	14	108	419	2	909	0	1787	17609	634	21614
23 EXTL	6543	7301	29276	39179	1191	2008	1264	12993	14313	15543	60372	38731	52174	106095	1644	602	2465	18059	6348	30715	25067	2262	0	474145
TOTAL	295779	219812	571392	474412	54377	129644	102973	842590	291260	232099	257557	123928	219826	428284	43420	84449	78040	68942	90137	81073	157084	25774	282933	5155786

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW MODE: Total Motorized Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	27598	11734	3466	2440	2587	3869	1318	3851	115	12	0	0	107	141	2	0	4	0	2	0	0	0	1848	59094
2 DC NC	150545	73635	31081	25554	9890	14282	4962	13928	321	34	40	0	1196	1705	11	0	32	0	0	1	0	0	11527	338744
3 MTG	100186	38994	471324	48578	6654	9631	2313	24307	783	29	6230	135	14717	4779	0	0	4	0	0	31	0	0	36781	765475
4 PG	121066	109680	47465	278958	10167	16936	13210	19004	197	80	49	6	13334	33801	796	316	4811	0	3	0	0	58	28008	697944
5 ARLCR	3944	642	334	95	1512	1470	333	1279	41	7	0	0	3	0	1	0	0	0	0	0	0	0	148	9809
6 ARNCR	43531	10049	5077	1531	13690	38956	10169	40688	1183	138	4	0	31	31	1	0	3	1	6	0	6	0	2244	167339
7 ALX	26529	6660	2174	2375	7339	19115	29021	32507	406	266	2	0	10	36	1	0	17	0	8	0	5	1	1267	127739
8 FFX	109093	31763	18090	8418	27531	61443	52676	520527	55393	14822	36	0	89	60	3	1	66	220	232	12	138	0	10991	911605
9 LDN	1379	662	4271	112	905	1902	601	103005	197370	4688	6583	12	108	0	0	0	0	835	12	2755	5	0	7554	332759
10 PW	31715	3335	907	868	6260	11254	11331	130295	21127	167130	10	0	0	1	0	0	3	5067	4846	54	1957	22	5089	401271
11 FRD	350	457	32682	1430	65	105	13	406	1493	3	161032	3661	12923	802	0	0	0	0	0	1226	0	0	19362	236010
12 CAR	0	27	4295	907	0	0	0	0	14	0	19787	81012	17540	1147	0	0	0	0	0	29	0	0	24732	149490
13 HOW	2409	2412	18827	17446	161	199	43	328	9	0	2529	355	98186	27358	1	0	1	0	0	12	0	0	42335	212611
14 AAR	7708	7529	3450	39687	436	625	308	378	0	0	9	1	11095	247096	791	23	89	0	0	0	0	0	52166	371390
15 CAL	2471	2811	270	12518	173	254	208	225	0	0	0	0	27	4710	32652	10352	1650	0	0	0	0	51	252	68624
16 STM	401	360	56	2848	35	59	83	111	0	0	0	0	1	93	4579	67997	6353	0	4	0	8	1134	158	84280
17 CHS	8020	10594	537	38255	529	936	2285	2174	5	2	0	0	15	692	3048	5055	63780	0	7	0	19	2442	473	138868
18 FAU	0	0	0	2	8	14	13	2398	3430	18266	5	0	0	0	0	0	0	43491	7562	345	2186	19	3206	80945
19 STA	2744	758	151	135	1856	2975	2224	14998	117	17515	0	0	0	0	1	5	16	942	57999	0	28946	1409	5321	138112
20 CL/JF	7	50	1263	16	3	0	0	668	9304	62	5140	15	188	0	0	0	0	226	0	45893	0	0	12536	75371
21 SP/FB	173	43	8	4	126	209	209	1638	8	2836	0	0	0	0	0	2	8	99	12234	0	98417	767	16301	133082
22 KGEO	0	0	0	32	0	0	0	8	0	92	0	0	0	0	14	108	419	2	909	0	1787	17609	634	21614
23 EXTL	6543	7301	29276	39179	1191	2008	1264	12993	14313	15543	60372	38731	52174	106095	1644	602	2465	18059	6348	30715	25067	2262	0	474145
TOTAL	646410	319496	675004	521388	91119	186241	132583	925716	305629	241525	261828	123928	221744	428547	43545	84461	79721	68942	90172	81073	158541	25774	282933	5996319

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW MODE: Transit Percentage

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	81.0	67.5	73.5	55.3	79.8	75.7	66.1	61.8	34.8	8.3	0	0	26.2	4.3	0	0	0	0	0	0	0	0	0	71.9
2 DC NC	64.5	47.7	45.6	27.6	54.3	42.0	32.3	27.0	11.6	4.8	7.5	0	5.9	1.5	0	0	0	0	0	0	0	0	0	50.3
3 MTG	53.2	29.5	13.5	12.4	42.1	29.3	22.5	14.1	3.8	0	1.5	0	2.7	0.6	0	0	0	0	0	0	0	0	0	18.9
4 PG	49.1	25.2	23.0	9.3	43.5	30.6	13.0	10.4	7.8	0	4.1	0	3.2	0.4	0	0	0.0	0	0	0	0	0	0	19.7
5 ARLCR	76.6	54.2	55.4	36.8	29.4	58.1	42.6	47.7	22.0	14.3	0	0	33.3	0	0	0	0	0	0	0	0	0	0	57.6
6 ARNCR	60.2	29.2	27.0	16.6	48.0	22.2	31.7	28.6	10.5	2.2	0	0	4.6	0	0	0	0	0	0	0	0	0	0	36.4
7 ALX	58.3	29.1	29.0	9.2	45.3	41.8	25.4	20.1	6.7	3.8	0	0	7.2	0	0	0	0	0	0	0	0	0	0	34.1
8 FFX	42.5	16.9	14.3	4.3	31.7	29.0	20.2	5.3	3.5	1.3	0	0	0	0	0	0	0	0	0	0	0.7	0	0	13.4
9 LDN	31.4	10.4	5.3	3.9	24.4	22.3	8.8	10.5	6.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.3
10 PW	41.9	19.0	10.4	4.1	25.9	22.3	23.0	9.2	0.1	5.2	0	0	0	0	0	0	0	0	0.0	0	0.2	0	0	10.3
11 FRD	35.1	18.4	13.2	3.6	20.5	10.8	6.2	3.2	0	0	2.6	0	0.1	0.1	0	0	0	0	0	0	0	0	0	3.7
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	48.9	18.8	10.7	5.6	42.6	28.1	20.7	8.9	0	0	0	0	0.9	0.0	0	0	0	0	0	0	0	0	0	2.7
14 AAR	52.4	21.0	15.8	4.9	44.1	32.3	15.3	12.0	0	0	0	0	0.7	0.0	0.9	0	0	0	0	0	0	0	0	2.4
15 CAL	74.1	42.0	37.8	9.5	65.6	49.2	27.7	18.0	0	0	0	0	0	0.0	0.4	0	0.1	0	0	0	0	0	0	6.9
16 STM	75.5	34.7	50.0	5.4	65.3	45.3	18.6	15.3	0	0	0	0	0	1.1	0.0	0.0	1.7	0	0	0	0	0	0	1.0
17 CHS	63.0	25.1	40.2	3.4	53.3	35.4	12.1	7.9	16.2	0	0	0	0	0.1	0.1	0	2.5	0	0	0	0	0	0	8.5
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	37.3	16.4	8.6	4.3	23.1	20.5	18.9	11.1	0.9	2.0	0	0	0	0	0	0	0	0	0.0	0	0.9	0	0	3.6
20 CL/JF	26.6	7.2	6.6	4.5	0	0	0	0.1	0.0	0	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0.1
21 SP/FB	41.9	20.1	0	0	22.1	21.1	22.0	14.7	12.5	3.8	0	0	0	0	0	0	0	0	0.2	0	1.2	0	0	1.3
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	54.2	31.2	15.3	9.0	40.3	30.4	22.3	9.0	4.7	3.9	1.6	0	0.9	0.1	0.3	0.0	2.1	0	0.0	0	0.9	0	0	14.0

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBW MODE: Avg. Auto Occupancy

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	1.17	1.17	1.20	1.20	1.25	1.20	1.20	1.20	1.44	1.38	0	0	1.32	1.41	2.00	0	1.00	0	2.00	0	0	0	1.15	1.18
2 DC NC	1.19	1.11	1.17	1.16	1.19	1.19	1.20	1.20	1.34	1.52	1.32	0	1.25	1.27	1.22	0	1.28	0	0	1.00	0	0	1.15	1.16
3 MTG	1.21	1.14	1.12	1.15	1.27	1.25	1.21	1.21	1.33	1.38	1.12	1.14	1.13	1.16	0	0	1.00	0	0	1.29	0	0	1.15	1.14
4 PG	1.20	1.13	1.16	1.09	1.24	1.23	1.25	1.24	1.51	1.31	1.62	1.20	1.12	1.12	1.12	1.14	1.10	0	1.50	0	0	1.18	1.15	1.13
5 ARLCR	1.19	1.14	1.16	1.18	1.05	1.16	1.15	1.15	1.19	1.50	0	0	0.67	0	1.00	0	0	0	0	0	0	0	1.18	1.13
6 ARNCR	1.20	1.15	1.18	1.17	1.18	1.15	1.13	1.13	1.22	1.14	1.33	0	1.16	1.41	1.00	0	1.00	1.00	1.20	0	1.00	0	1.15	1.15
7 ALX	1.28	1.20	1.33	1.15	1.23	1.16	1.10	1.15	1.45	1.20	1.00	0	1.27	1.13	1.00	0	1.06	0	1.33	0	1.67	1.00	1.15	1.16
8 FFX	1.76	1.45	1.44	1.18	1.66	1.41	1.17	1.12	1.12	1.11	1.16	0	1.41	1.05	1.50	1.00	1.25	1.18	1.20	1.50	1.10	0	1.15	1.20
9 LDN	2.30	1.71	1.35	1.55	2.14	1.86	1.68	1.20	1.09	1.12	1.11	1.09	1.15	0	0	0	0	1.12	1.33	1.11	1.00	0	1.15	1.13
10 PW	3.36	2.98	3.00	2.02	3.25	3.08	2.15	1.33	1.13	1.08	1.43	0	0	1.00	0	0	1.50	1.11	1.12	1.15	1.15	1.16	1.15	1.27
11 FRD	2.32	1.89	1.28	1.37	2.14	2.84	1.35	2.04	1.17	1.00	1.06	1.12	1.16	1.20	0	0	0	0	0	1.13	0	0	1.15	1.10
12 CAR	0	1.29	1.18	1.17	0	0	0	0	1.17	0	1.13	1.04	1.13	1.16	0	0	0	0	0	1.21	0	0	1.15	1.09
13 HOW	1.25	1.16	1.15	1.11	1.33	1.23	1.39	1.29	1.80	0	1.14	1.10	1.06	1.10	1.00	0	1.00	0	0	1.20	0	0	1.15	1.10
14 AAR	1.40	1.23	1.25	1.14	1.38	1.34	1.53	1.47	0	0	1.13	1.00	1.11	1.07	1.11	1.28	1.14	0	0	0	0	0	1.15	1.10
15 CAL	1.27	1.17	1.27	1.13	1.47	1.42	1.47	1.42	0	0	0	0	1.13	1.13	1.06	1.11	1.14	0	0	0	0	1.27	1.14	1.10
16 STM	1.44	1.19	1.33	1.15	1.92	1.40	1.40	1.41	0	0	0	0	1.00	1.23	1.12	1.07	1.12	0	1.00	0	1.14	1.17	1.14	1.08
17 CHS	1.26	1.15	1.34	1.12	1.46	1.39	1.28	1.27	1.93	2.00	0	0	1.07	1.17	1.12	1.13	1.06	0	1.17	0	1.27	1.16	1.15	1.10
18 FAU	0	0	0	2.00	4.00	4.67	3.25	1.39	1.15	1.13	1.25	0	0	0	0	0	0	1.05	1.11	1.13	1.13	1.19	1.15	1.09
19 STA	3.59	3.41	3.50	2.90	3.51	3.44	3.03	2.07	1.45	1.12	0	0	0	0	1.00	1.00	1.33	1.12	1.06	0	1.09	1.12	1.15	1.19
20 CL/JF	2.47	2.46	1.60	1.89	3.00	0	0	1.43	1.15	1.27	1.14	1.36	1.25	0	0	0	0	1.14	0	1.05	0	0	1.15	1.09
21 SP/FB	3.36	2.90	4.00	4.00	3.43	3.67	3.20	2.24	1.75	1.17	0	0	0	0	0	1.00	1.14	1.13	1.11	0	1.05	1.15	1.15	1.08
22 KGEO	0	0	0	1.23	0	0	0	2.00	0	1.21	0	0	0	0	1.17	1.21	1.17	1.00	1.12	0	1.13	1.05	1.15	1.06
23 EXTL	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	0	1.15
TOTAL	1.36	1.18	1.15	1.12	1.46	1.33	1.23	1.18	1.10	1.10	1.09	1.08	1.10	1.10	1.08	1.08	1.07	1.08	1.08	1.09	1.08	1.08	1.15	1.14

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: LOV Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	4795	3518	386	1507	382	5967	460	396	40	41	23	1	29	141	16	78	52	7	100	26	368	1	10	18344
2 DC NC	6197	79529	16131	31126	1132	18476	1804	1486	158	127	80	6	114	649	60	328	194	30	509	93	1271	2	75	159577
3 MTG	410	11596	487561	46499	142	2929	246	2707	564	331	1059	43	3274	2428	84	229	254	78	722	189	2295	1	967	564609
4 PG	346	4975	7299	351504	36	1086	2471	1839	165	199	113	12	1645	14816	355	625	12725	57	774	95	2256	4	898	404295
5 ARLCR	52	61	21	23	2177	4268	153	250	3	2	1	0	0	8	2	1	2	1	6	0	21	0	1	7053
6 ARNCR	187	224	97	185	1193	86320	3913	7499	24	29	8	2	9	39	5	26	13	2	39	9	134	0	35	99991
7 ALX	134	194	75	1237	512	19943	55345	12665	34	103	11	2	16	90	8	66	38	4	125	19	294	0	33	90948
8 FFX	158	408	3214	5547	750	44896	16715	557095	30326	22440	428	33	301	2609	228	1226	895	265	2937	671	8773	7	298	700221
9 LDN	32	68	1212	1210	16	1002	183	7210	159660	1196	1222	34	188	1677	39	31	217	239	2083	4082	4363	0	1166	187131
10 PW	18	39	583	667	21	542	152	5626	1400	238068	147	5	92	928	59	159	190	5132	6721	303	4095	3	277	265227
11 FRD	53	137	4692	2131	32	1607	328	1391	1186	393	114758	858	669	1493	35	0	98	106	256	957	135	0	6336	137651
12 CAR	50	139	1296	2329	29	1332	270	1150	913	90	885	52218	1512	1401	25	1	86	4	8	122	0	0	22803	86663
13 HOW	5	22	2616	9507	5	210	38	161	65	63	609	263	82913	11776	38	43	57	11	173	104	162	0	10519	119360
14 AAR	23	80	532	10039	13	659	140	606	203	155	90	3	2386	230084	727	218	169	11	238	44	509	1	9743	256673
15 CAL	8	25	172	966	7	211	43	198	60	63	16	1	45	430	37520	2202	97	6	208	0	508	0	15	42801
16 STM	22	60	204	1064	10	544	99	460	57	91	0	0	71	347	344	47186	894	0	913	0	983	1	16	53366
17 CHS	17	40	191	3766	9	301	62	307	181	96	4	1	59	235	1083	1011	80078	15	528	1	713	2	35	88735
18 FAU	11	31	300	493	9	328	71	350	457	1886	54	0	36	45	1	1	61	40066	6530	70	2364	0	1217	54381
19 STA	1	1	10	15	0	8	2	7	5	1278	1	0	1	7	2	4	6	9	72253	1	21733	0	159	95503
20 CL/JF	13	42	330	561	9	316	51	488	1296	188	72	3	120	380	0	0	3	62	612	36760	271	0	13745	55322
21 SP/FB	0	2	1	5	0	4	0	9	6	7	0	0	0	0	1	1	2	0	1185	0	78731	0	1219	81173
22 KGEO	17	41	62	661	12	411	114	378	30	191	0	0	12	244	35	120	187	47	1864	0	2994	4199	511	12130
23 EXTL	15	112	859	1912	7	213	85	605	290	634	4646	10117	7799	24957	43	54	106	2901	873	2790	10271	463	0	69752
TOTAL	12566	101344	527843	472953	6503	191573	82745	602882	197123	267671	124227	63602	101291	294785	40710	53610	96425	49053	99657	46336	143244	4684	70078	3650906

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: LOV Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	5412	4403	478	1965	457	7221	576	520	62	62	38	2	38	205	22	125	79	13	170	38	647	1	18	22552
2 DC NC	7938	94563	20390	42588	1418	23224	2372	2020	255	208	116	8	160	968	94	546	304	51	918	161	2293	2	130	200728
3 MTG	513	14725	585693	62392	179	3819	351	3642	867	539	1466	63	4514	3481	147	371	408	123	1366	305	4267	2	1595	690830
4 PG	443	6593	9691	432308	47	1415	3241	2523	275	308	197	19	2246	20440	504	990	17484	85	1386	170	4014	7	1471	505858
5 ARLCR	61	75	29	30	2228	5071	189	310	5	3	1	0	2	10	3	3	4	2	10	0	36	0	4	8076
6 ARNCR	232	296	132	237	1439	97495	4967	9634	34	47	14	3	11	61	9	35	23	4	67	11	230	0	57	115037
7 ALX	177	255	98	1636	638	24923	62502	16247	52	148	21	2	23	141	9	98	58	5	195	33	469	0	59	107789
8 FFX	194	589	4449	7739	966	58309	21659	671366	40672	30438	679	63	465	4164	389	2110	1469	385	4687	1114	14206	11	504	866626
9 LDN	41	107	1857	2018	32	1486	287	9822	187256	1707	1737	56	318	2896	74	56	374	342	3486	5764	7320	0	1915	228952
10 PW	21	54	913	1066	20	749	216	7684	1946	284951	245	9	156	1577	100	279	326	7076	9485	498	6226	5	453	324056
11 FRD	79	218	6579	3469	50	2415	518	2202	1849	682	130455	1190	996	2455	62	0	169	184	512	1370	270	0	10389	166113
12 CAR	81	216	1935	3717	46	2078	443	1881	1533	164	1263	56087	2151	2222	49	1	147	6	17	202	0	0	37384	111623
13 HOW	6	33	3600	12800	6	302	57	245	111	113	866	363	93338	16019	63	80	95	16	345	177	322	0	17240	146197
14 AAR	34	118	802	13802	21	949	207	953	357	265	156	8	3264	260522	1013	361	273	20	438	77	949	3	15972	300565
15 CAL	10	40	270	1417	10	309	65	315	107	108	28	1	74	631	42656	3058	151	9	378	0	918	0	27	50582
16 STM	35	92	339	1729	16	836	150	752	103	156	0	0	121	584	489	53001	1252	0	1566	0	1656	1	24	62902
17 CHS	20	65	297	5287	10	429	86	458	324	151	7	1	93	375	1504	1403	90252	28	904	3	1187	3	58	102945
18 FAU	16	50	489	837	12	485	111	532	658	2659	88	1	67	75	3	3	109	44268	9294	111	3573	0	1996	65437
19 STA	1	1	19	24	0	13	3	12	7	1747	1	0	3	12	3	6	9	13	81542	1	29300	0	261	112978
20 CL/JF	20	71	523	977	11	516	87	801	1870	306	107	6	201	677	0	0	5	95	1070	39848	465	0	22534	70190
21 SP/FB	0	2	3	9	0	8	1	12	13	9	0	0	0	0	1	2	4	0	1613	0	85704	0	1995	89376
22 KGEO	29	68	105	1115	17	652	182	632	53	311	0	0	23	426	57	195	283	75	2722	0	4301	4409	839	16494
23 EXTL	25	183	1409	3129	12	348	144	989	476	1040	7620	16584	12789	40912	72	89	173	4755	1432	4575	16835	760	0	114351
TOTAL	15388	122816	640099	600291	7635	233054	98414	733552	238885	326122	145105	74466	121053	358853	47323	62812	113452	57555	123603	54458	185189	5204	114925	4480256

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: Transit

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	973	1058	156	375	195	2616	159	109	4	5	0	0	2	2	0	0	1	0	1	0	9	0	0	5665
2 DC NC	2127	8363	3714	4996	383	5192	361	239	5	11	0	0	5	5	1	0	6	0	0	0	17	0	0	25424
3 MTG	53	1023	18428	1303	31	326	19	122	6	6	0	0	14	6	0	0	3	0	0	0	19	0	0	21358
4 PG	40	399	464	5428	4	116	89	41	0	1	0	0	7	24	0	0	0	0	0	0	5	0	0	6617
5 ARLCR	11	10	4	1	54	752	20	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	877
6 ARNCR	11	12	5	5	71	4557	234	358	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	5257
7 ALX	7	10	7	17	25	1901	1754	531	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	4255
8 FFX	1	17	186	63	61	5131	950	8523	557	151	0	0	0	2	0	0	2	0	0	0	10	0	0	15655
9 LDN	0	1	51	12	1	120	7	109	1236	0	0	0	2	0	0	0	2	0	0	0	1	0	0	1541
10 PW	0	0	15	1	2	51	3	30	0	2020	0	0	0	0	0	0	0	0	0	0	1	0	0	2122
11 FRD	0	2	5	2	0	14	3	2	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	108
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	7	24	1	7	0	3	0	0	0	0	23	2	0	0	0	0	0	0	0	0	0	67
14 AAR	0	0	9	9	0	22	0	6	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	47
15 CAL	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	3
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	267	0	0	0	0	0	0	267
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	19
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3223	10896	23053	12236	828	20804	3598	10099	1808	2197	80	0	54	43	1	1	282	0	1	0	82	0	0	89285

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: HOV Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: HOV AUTO Driver

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
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: Auto Driver

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
1 DC CR	4795	3518	386	1507	382	5967	460	396	40	41	23	1	29	141	16	78	52	7	100	26	368	1	10	18344
2 DC NC	6197	79529	16131	31126	1132	18476	1804	1486	158	127	80	6	114	649	60	328	194	30	509	93	1271	2	75	159577
3 MTG	410	11596	487561	46499	142	2929	246	2707	564	331	1059	43	3274	2428	84	229	254	78	722	189	2295	1	967	564609
4 PG	346	4975	7299	351504	36	1086	2471	1839	165	199	113	12	1645	14816	355	625	12725	57	774	95	2256	4	898	404295
5 ARLCR	52	61	21	23	2177	4268	153	250	3	2	1	0	0	8	2	1	2	1	6	0	21	0	1	7053
6 ARNCR	187	224	97	185	1193	86320	3913	7499	24	29	8	2	9	39	5	26	13	2	39	9	134	0	35	99991
7 ALX	134	194	75	1237	512	19943	55345	12665	34	103	11	2	16	90	8	66	38	4	125	19	294	0	33	90948
8 FFX	158	408	3214	5547	750	44896	16715	557095	30326	22440	428	33	301	2609	228	1226	895	265	2937	671	8773	7	298	700221
9 LDN	32	68	1212	1210	16	1002	183	7210	159660	1196	1222	34	188	1677	39	31	217	239	2083	4082	4363	0	1166	187131
10 PW	18	39	583	667	21	542	152	5626	1400	238068	147	5	92	928	59	159	190	5132	6721	303	4095	3	277	265227
11 FRD	53	137	4692	2131	32	1607	328	1391	1186	393	114758	858	669	1493	35	0	98	106	256	957	135	0	6336	137651
12 CAR	50	139	1296	2329	29	1332	270	1150	913	90	885	52218	1512	1401	25	1	86	4	8	122	0	0	22803	86663
13 HOW	5	22	2616	9507	5	210	38	161	65	63	609	263	82913	11776	38	43	57	11	173	104	162	0	10519	119360
14 AAR	23	80	532	10039	13	659	140	606	203	155	90	3	2386	230084	727	218	169	11	238	44	509	1	9743	256673
15 CAL	8	25	172	966	7	211	43	198	60	63	16	1	45	430	37520	2202	97	6	208	0	508	0	15	42801
16 STM	22	60	204	1064	10	544	99	460	57	91	0	0	71	347	344	47186	894	0	913	0	983	1	16	53366
17 CHS	17	40	191	3766	9	301	62	307	181	96	4	1	59	235	1083	1011	80078	15	528	1	713	2	35	88735
18 FAU	11	31	300	493	9	328	71	350	457	1886	54	0	36	45	1	1	61	40066	6530	70	2364	0	1217	54381
19 STA	1	1	10	15	0	8	2	7	5	1278	1	0	1	7	2	4	6	9	72253	1	21733	0	159	95503
20 CL/JF	13	42	330	561	9	316	51	488	1296	188	72	3	120	380	0	0	3	62	612	36760	271	0	13745	55322
21 SP/FB	0	2	1	5	0	4	0	9	6	7	0	0	0	0	1	1	2	0	1185	0	78731	0	1219	81173
22 KGEO	17	41	62	661	12	411	114	378	30	191	0	0	12	244	35	120	187	47	1864	0	2994	4199	511	12130
23 EXTL	15	112	859	1912	7	213	85	605	290	634	4646	10117	7799	24957	43	54	106	2901	873	2790	10271	463	0	69752
TOTAL	12566	101344	527843	472953	6503	191573	82745	602882	197123	267671	124227	63602	101291	294785	40710	53610	96425	49053	99657	46336	143244	4684	70078	3650906

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: Auto Person

DESTINATION

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
1 DC CR	5412	4403	478	1965	457	7221	576	520	62	62	38	2	38	205	22	125	79	13	170	38	647	1	18	22552
2 DC NC	7938	94563	20390	42588	1418	23224	2372	2020	255	208	116	8	160	968	94	546	304	51	918	161	2293	2	130	200728
3 MTG	513	14725	585693	62392	179	3819	351	3642	867	539	1466	63	4514	3481	147	371	408	123	1366	305	4267	2	1595	690830
4 PG	443	6593	9691	432308	47	1415	3241	2523	275	308	197	19	2246	20440	504	990	17484	85	1386	170	4014	7	1471	505858
5 ARLCR	61	75	29	30	2228	5071	189	310	5	3	1	0	2	10	3	3	4	2	10	0	36	0	4	8076
6 ARNCR	232	296	132	237	1439	97495	4967	9634	34	47	14	3	11	61	9	35	23	4	67	11	230	0	57	115037
7 ALX	177	255	98	1636	638	24923	62502	16247	52	148	21	2	23	141	9	98	58	5	195	33	469	0	59	107789
8 FFX	194	589	4449	7739	966	58309	21659	671366	40672	30438	679	63	465	4164	389	2110	1469	385	4687	1114	14206	11	504	866626
9 LDN	41	107	1857	2018	32	1486	287	9822	187256	1707	1737	56	318	2896	74	56	374	342	3486	5764	7320	0	1915	228952
10 PW	21	54	913	1066	20	749	216	7684	1946	284951	245	9	156	1577	100	279	326	7076	9485	498	6226	5	453	324056
11 FRD	79	218	6579	3469	50	2415	518	2202	1849	682	130455	1190	996	2455	62	0	169	184	512	1370	270	0	10389	166113
12 CAR	81	216	1935	3717	46	2078	443	1881	1533	164	1263	56087	2151	2222	49	1	147	6	17	202	0	0	37384	111623
13 HOW	6	33	3600	12800	6	302	57	245	111	113	866	363	93338	16019	63	80	95	16	345	177	322	0	17240	146197
14 AAR	34	118	802	13802	21	949	207	953	357	265	156	8	3264	260522	1013	361	273	20	438	77	949	3	15972	300565
15 CAL	10	40	270	1417	10	309	65	315	107	108	28	1	74	631	42656	3058	151	9	378	0	918	0	27	50582
16 STM	35	92	339	1729	16	836	150	752	103	156	0	0	121	584	489	53001	1252	0	1566	0	1656	1	24	62902
17 CHS	20	65	297	5287	10	429	86	458	324	151	7	1	93	375	1504	1403	90252	28	904	3	1187	3	58	102945
18 FAU	16	50	489	837	12	485	111	532	658	2659	88	1	67	75	3	3	109	44268	9294	111	3573	0	1996	65437
19 STA	1	1	19	24	0	13	3	12	7	1747	1	0	3	12	3	6	9	13	81542	1	29300	0	261	112978
20 CL/JF	20	71	523	977	11	516	87	801	1870	306	107	6	201	677	0	0	5	95	1070	39848	465	0	22534	70190
21 SP/FB	0	2	3	9	0	8	1	12	13	9	0	0	0	0	1	2	4	0	1613	0	85704	0	1995	89376
22 KGEO	29	68	105	1115	17	652	182	632	53	311	0	0	23	426	57	195	283	75	2722	0	4301	4409	839	16494
23 EXTL	25	183	1409	3129	12	348	144	989	476	1040	7620	16584	12789	40912	72	89	173	4755	1432	4575	16835	760	0	114351
TOTAL	15388	122816	640099	600291	7635	233054	98414	733552	238885	326122	145105	74466	121053	358853	47323	62812	113452	57555	123603	54458	185189	5204	114925	4480256

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: Total Motorized Person

DESTINATION

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
1 DC CR	6385	5461	634	2340	652	9837	735	629	66	67	38	2	40	207	22	125	80	13	171	38	656	1	18	28217
2 DC NC	10065	102926	24104	47584	1801	28416	2733	2259	260	219	116	8	165	973	95	546	310	51	918	161	2310	2	130	226152
3 MTG	566	15748	604121	63695	210	4146	370	3764	873	545	1466	63	4528	3487	147	371	411	123	1366	305	4286	2	1595	712188
4 PG	483	6992	10155	437736	51	1531	3330	2564	275	309	197	19	2253	20464	504	990	17484	85	1386	170	4019	7	1471	512475
5 ARLCR	72	85	33	31	2282	5823	209	335	5	3	1	0	2	10	3	3	4	2	10	0	36	0	4	8953
6 ARNCR	243	308	137	242	1510	102052	5201	9992	34	48	14	3	11	61	9	35	23	4	67	11	232	0	57	120294
7 ALX	184	265	105	1653	663	26824	64256	16778	52	150	21	2	23	142	9	98	58	5	195	33	469	0	59	112044
8 FFX	195	606	4635	7802	1027	63440	22609	679889	41229	30589	679	63	465	4166	389	2110	1471	385	4687	1114	14216	11	504	882281
9 LDN	41	108	1908	2030	33	1606	294	9931	188492	1707	1737	56	320	2896	74	56	376	342	3486	5764	7321	0	1915	230493
10 PW	21	54	928	1067	22	800	219	7714	1946	286971	245	9	156	1577	100	279	326	7076	9485	498	6227	5	453	326178
11 FRD	79	220	6584	3471	50	2429	521	2204	1849	682	130535	1190	996	2455	62	0	169	184	512	1370	270	0	10389	166221
12 CAR	81	216	1935	3717	46	2078	443	1881	1533	164	1263	56087	2151	2222	49	1	147	6	17	202	0	0	37384	111623
13 HOW	6	33	3607	12824	7	309	57	248	111	113	866	363	93361	16021	63	80	95	16	345	177	322	0	17240	146264
14 AAR	34	118	811	13811	21	971	207	959	357	265	156	8	3265	260523	1013	361	273	20	438	77	949	3	15972	300612
15 CAL	10	40	271	1417	10	309	65	316	107	108	28	1	74	631	42656	3058	151	9	378	0	918	0	27	50584
16 STM	35	92	339	1729	16	836	150	752	103	156	0	0	121	584	489	53002	1254	0	1566	0	1656	1	24	62905
17 CHS	20	65	297	5287	10	429	86	458	324	151	7	1	93	375	1504	1403	90519	28	904	3	1187	3	58	103212
18 FAU	16	50	489	837	12	485	111	532	658	2659	88	1	67	75	3	3	109	44268	9294	111	3573	0	1996	65437
19 STA	1	1	19	24	0	13	3	12	7	1747	1	0	3	12	3	6	9	13	81542	1	29319	0	261	112997
20 CL/JF	20	71	523	977	11	516	87	801	1870	306	107	6	201	677	0	0	5	95	1070	39848	465	0	22534	70190
21 SP/FB	0	2	3	9	0	8	1	12	13	9	0	0	0	0	1	2	4	0	1613	0	85704	0	1995	89376
22 KGEO	29	68	105	1115	17	652	182	632	53	311	0	0	23	426	57	195	283	75	2722	0	4301	4409	839	16494
23 EXTL	25	183	1409	3129	12	348	144	989	476	1040	7620	16584	12789	40912	72	89	173	4755	1432	4575	16835	760	0	114351
TOTAL	18611	133712	663152	612527	8463	253858	102013	743651	240693	328319	145185	74466	121107	358896	47324	62813	113734	57555	123604	54458	185271	5204	114925	4569541

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: Transit Percentage

DESTINATION

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
1 DC CR	15.2	19.4	24.6	16.0	29.9	26.6	21.6	17.3	6.1	7.5	0	0	5.0	1.0	0	0	1.3	0	0.6	0	1.4	0	0	20.1
2 DC NC	21.1	8.1	15.4	10.5	21.3	18.3	13.2	10.6	1.9	4.9	0	0	3.0	0.5	1.1	0	1.9	0	0	0	0.7	0	0	11.2
3 MTG	9.4	6.5	3.1	2.0	14.6	7.9	5.0	3.2	0.7	1.1	0	0	0.3	0.2	0	0	0.7	0	0	0	0.4	0	0	3.0
4 PG	8.2	5.7	4.6	1.2	7.8	7.6	2.7	1.6	0	0.3	0	0	0.3	0.1	0	0	0	0	0	0	0.1	0	0	1.3
5 ARLCR	15.3	11.8	12.1	3.2	2.4	12.9	9.6	7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.8
6 ARNCR	4.6	4.1	4.0	1.9	4.7	4.5	4.5	3.6	0	2.1	0	0	0	0	0	0	0	0	0	0	0.9	0	0	4.4
7 ALX	3.8	3.8	6.7	1.0	3.8	7.1	2.7	3.2	0	1.3	0	0	0	0.5	0	0	0	0	0	0	0	0	0	3.8
8 FFX	0.5	2.8	4.0	0.8	6.0	8.1	4.2	1.3	1.4	0.5	0	0	0	0.1	0	0	0.1	0	0	0	0.1	0	0	1.8
9 LDN	1.1	0.7	2.7	0.6	2.8	7.5	2.4	1.1	0.7	0	0	0	0.5	0	0	0	0.4	0	0	0	0.0	0	0	0.7
10 PW	0	0	1.6	0.1	8.5	6.4	1.4	0.4	0	0.7	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0.7
11 FRD	0	0.9	0.1	0.1	0	0.6	0.6	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0.2	0.2	14.1	2.2	0	1.2	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0.0
14 AAR	0	0	1.1	0.1	0	2.2	0	0.6	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0.0
15 CAL	0	0	0.4	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.2	0	0	0	0	0	0	0.0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0.3
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	17.3	8.1	3.5	2.0	9.8	8.2	3.5	1.4	0.8	0.7	0.1	0	0.0	0.0	0.0	0.0	0.2	0	0.0	0	0.0	0	0	2.0

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBS MODE: Avg. Auto Occupancy

DESTINATION

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
1 DC CR	1.13	1.25	1.24	1.30	1.20	1.21	1.25	1.31	1.55	1.51	1.65	2.00	1.31	1.45	1.38	1.60	1.52	1.86	1.70	1.46	1.76	1.00	1.80	1.23
2 DC NC	1.28	1.19	1.26	1.37	1.25	1.26	1.32	1.36	1.61	1.64	1.45	1.33	1.40	1.49	1.57	1.66	1.57	1.70	1.80	1.73	1.80	1.00	1.73	1.26
3 MTG	1.25	1.27	1.20	1.34	1.26	1.30	1.43	1.35	1.54	1.63	1.38	1.47	1.38	1.43	1.75	1.62	1.61	1.58	1.89	1.61	1.86	2.00	1.65	1.22
4 PG	1.28	1.33	1.33	1.23	1.31	1.30	1.31	1.37	1.67	1.55	1.74	1.58	1.37	1.38	1.42	1.58	1.37	1.49	1.79	1.79	1.78	1.75	1.64	1.25
5 ARLCR	1.17	1.23	1.38	1.30	1.02	1.19	1.24	1.24	1.67	1.50	1.00	0	2.00	1.25	1.50	3.00	2.00	2.00	1.67	0	1.71	0	4.00	1.15
6 ARNCR	1.24	1.32	1.36	1.28	1.21	1.13	1.27	1.28	1.42	1.62	1.75	1.50	1.22	1.56	1.80	1.35	1.77	2.00	1.72	1.22	1.72	0	1.63	1.15
7 ALX	1.32	1.31	1.31	1.32	1.25	1.25	1.13	1.28	1.53	1.44	1.91	1.00	1.44	1.57	1.13	1.48	1.53	1.25	1.56	1.74	1.60	0	1.79	1.19
8 FFX	1.22	1.44	1.38	1.40	1.29	1.30	1.30	1.21	1.34	1.36	1.59	1.91	1.54	1.60	1.71	1.72	1.64	1.45	1.60	1.66	1.62	1.57	1.69	1.24
9 LDN	1.25	1.57	1.53	1.67	2.02	1.48	1.57	1.36	1.17	1.43	1.42	1.65	1.69	1.73	1.90	1.81	1.72	1.43	1.67	1.41	1.68	0	1.64	1.22
10 PW	1.17	1.38	1.57	1.60	0.97	1.38	1.42	1.37	1.39	1.20	1.67	1.80	1.70	1.70	1.69	1.75	1.72	1.38	1.41	1.64	1.52	1.67	1.64	1.22
11 FRD	1.49	1.59	1.40	1.63	1.56	1.50	1.58	1.58	1.56	1.74	1.14	1.39	1.49	1.64	1.77	0	1.72	1.74	2.00	1.43	2.00	0	1.64	1.21
12 CAR	1.62	1.55	1.49	1.60	1.59	1.56	1.64	1.64	1.68	1.82	1.43	1.07	1.42	1.59	1.96	1.00	1.71	1.50	2.13	1.66	0	0	1.64	1.29
13 HOW	1.20	1.50	1.38	1.35	1.20	1.44	1.50	1.52	1.71	1.79	1.42	1.38	1.13	1.36	1.66	1.86	1.67	1.45	1.99	1.70	1.99	0	1.64	1.22
14 AAR	1.48	1.48	1.51	1.37	1.62	1.44	1.48	1.57	1.76	1.71	1.73	2.67	1.37	1.13	1.39	1.66	1.62	1.82	1.84	1.75	1.86	3.00	1.64	1.17
15 CAL	1.25	1.60	1.57	1.47	1.43	1.46	1.51	1.59	1.78	1.71	1.75	1.00	1.64	1.47	1.14	1.39	1.56	1.50	1.82	0	1.81	0	1.80	1.18
16 STM	1.59	1.53	1.66	1.63	1.60	1.54	1.52	1.63	1.81	1.71	0	0	1.70	1.68	1.42	1.12	1.40	0	1.72	0	1.68	1.00	1.50	1.18
17 CHS	1.18	1.63	1.55	1.40	1.11	1.43	1.39	1.49	1.79	1.57	1.75	1.00	1.58	1.60	1.39	1.39	1.13	1.87	1.71	3.00	1.66	1.50	1.66	1.16
18 FAU	1.45	1.61	1.63	1.70	1.33	1.48	1.56	1.52	1.44	1.41	1.63	1.00	1.86	1.67	3.00	3.00	1.79	1.10	1.42	1.59	1.51	0	1.64	1.20
19 STA	1.00	1.00	1.90	1.60	0	1.63	1.50	1.71	1.40	1.37	1.00	0	3.00	1.71	1.50	1.50	1.50	1.44	1.13	1.00	1.35	0	1.64	1.18
20 CL/JF	1.54	1.69	1.58	1.74	1.22	1.63	1.71	1.64	1.44	1.63	1.49	2.00	1.68	1.78	0	0	1.67	1.53	1.75	1.08	1.72	0	1.64	1.27
21 SP/FB	0	1.00	3.00	1.80	0	2.00	1.00	1.33	2.17	1.29	0	0	0	0	1.00	2.00	2.00	0	1.36	0	1.09	0	1.64	1.10
22 KGEO	1.71	1.66	1.69	1.69	1.42	1.59	1.60	1.67	1.77	1.63	0	0	1.92	1.75	1.63	1.63	1.51	1.60	1.46	0	1.44	1.05	1.64	1.36
23 EXTL	1.67	1.63	1.64	1.64	1.71	1.63	1.69	1.63	1.64	1.64	1.64	1.64	1.64	1.64	1.67	1.65	1.63	1.64	1.64	1.64	1.64	1.64	0	1.64
TOTAL	1.22	1.21	1.21	1.27	1.17	1.22	1.19	1.22	1.21	1.22	1.17	1.17	1.20	1.22	1.16	1.17	1.18	1.17	1.24	1.18	1.29	1.11	1.64	1.23

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: LOV Auto Driver

DESTINATION

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
1 DC CR	18455	10628	1106	1381	390	1893	366	823	18	6	2	1	5	34	0	0	0	5	2	1	0	0	818	35934
2 DC NC	67815	309647	57034	43489	3301	15225	4547	10865	329	74	24	9	458	733	20	10	138	14	18	21	29	8	10499	524305
3 MTG	12852	51876	1350106	56786	1406	7721	1489	27700	1703	169	8163	555	18150	3663	16	13	46	52	91	181	127	11	36790	1579668
4 PG	28891	88729	45156	833281	1273	5689	12995	13133	252	177	47	27	10422	29947	863	262	14913	55	84	32	102	29	23315	1109675
5 ARLCR	1058	1004	275	107	6302	3900	532	1189	14	6	2	1	0	1	0	0	0	0	1	3	1	0	231	14627
6 ARNCR	14335	10837	3664	1728	8111	189128	20124	53295	713	233	5	10	16	43	2	5	10	9	19	9	10	3	4620	306928
7 ALX	6735	5292	984	2761	2408	22283	89954	33497	99	292	3	3	13	24	7	3	51	12	12	6	8	5	2317	166769
8 FFX	14608	12060	14046	8811	5132	62048	52913	1474957	76303	27419	62	26	134	304	22	39	206	578	490	109	159	32	25461	1775919
9 LDN	228	238	1202	207	66	626	162	36341	530902	3886	2543	31	74	137	2	4	36	812	46	6408	50	3	9349	593351
10 PW	1338	740	740	526	331	2892	3320	97265	25278	579382	53	9	126	326	16	17	51	3678	8112	182	1623	50	12449	738505
11 FRD	303	341	27466	542	49	285	180	964	3529	161	388197	6868	7154	616	7	0	30	91	19	5311	5	0	20939	463058
12 CAR	290	384	2727	517	59	314	172	631	245	30	7644	182921	7914	456	6	0	33	5	0	54	0	0	24849	229251
13 HOW	205	751	16971	12235	12	74	47	236	89	32	1872	1628	253632	20062	7	2	21	3	6	49	4	1	19986	327926
14 AAR	1227	3453	2897	38872	82	428	382	993	236	154	117	48	22908	609046	1643	93	309	10	49	39	22	11	45204	728224
15 CAL	317	705	416	5608	30	189	177	515	117	72	21	6	88	3856	121389	7562	1845	4	47	0	51	17	1148	144180
16 STM	257	335	353	941	36	277	83	507	53	55	0	0	83	251	2903	151975	5718	1	42	0	53	344	890	165157
17 CHS	1170	2262	389	20969	50	373	1316	1797	169	80	13	10	78	358	1537	4195	234231	60	58	6	90	1462	2469	273142
18 FAU	332	345	772	388	56	332	210	7380	4779	12964	63	1	91	71	1	5	81	106080	6688	598	1736	56	5683	148712
19 STA	73	64	123	78	12	108	87	893	76	5469	2	0	9	41	2	10	20	1204	185779	8	29655	218	6760	230691
20 CL/JF	298	453	879	369	55	297	168	777	8719	339	4726	30	150	145	0	0	3	921	31	108857	8	0	10709	137934
21 SP/FB	128	184	103	141	27	154	105	349	99	372	0	0	0	1	2	28	70	372	17944	2	195859	30	20930	236900
22 KGEO	327	437	160	449	58	313	177	567	43	307	0	0	8	79	23	149	973	489	1853	0	833	36974	1027	45246
23 EXTL	2478	6757	24122	15386	335	3069	1696	16677	7963	6731	14865	13715	17865	38079	588	522	1435	3028	4680	10156	16309	591	0	207047
TOTAL	173723	507520	1551690	1045572	29581	317618	191202	1781352	661728	638410	428424	205899	339378	708273	129056	164894	260220	117483	226071	132032	246734	39845	286443	10183148

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: LOV Auto Person

DESTINATION

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
1 DC CR	21883	14440	1489	1912	512	2494	488	1140	23	10	2	1	11	47	2	1	3	7	2	2	2	0	1317	45788
2 DC NC	95300	405661	82801	66142	4592	21443	6612	16125	499	110	37	13	702	1136	34	14	218	27	27	30	42	15	16930	718510
3 MTG	18308	76019	1754530	85868	1974	11178	2218	41740	2611	255	12578	871	27874	5618	26	32	79	87	131	304	190	19	59321	2101831
4 PG	41406	133066	67563	1078566	1841	8208	19314	19996	395	259	75	39	15914	46089	1330	405	23139	88	125	51	152	50	37604	1495676
5 ARLCR	1411	1354	378	144	6582	5145	730	1629	20	8	2	1	0	2	0	0	1	1	1	3	1	0	374	17787
6 ARNCR	19862	15243	5260	2505	11058	231048	28958	78064	1057	331	5	11	31	66	3	7	19	13	23	15	16	7	7440	401042
7 ALX	9447	7578	1420	4066	3366	31615	110512	48852	146	429	8	3	16	37	9	7	79	15	19	10	9	6	3737	221386
8 FFX	21114	17870	20942	13387	7305	90331	78203	1934487	116463	42006	97	45	200	458	32	62	309	894	757	166	223	51	41068	2386471
9 LDN	323	365	1833	326	85	916	252	55288	656922	5993	3952	46	120	213	6	5	60	1264	72	9997	76	4	15083	753200
10 PW	1944	1106	1109	813	482	4214	4946	148632	39023	731300	83	14	191	522	24	32	71	5695	12517	281	2492	81	20081	975653
11 FRD	440	513	42248	836	66	413	266	1471	5470	245	489577	10686	11105	957	13	0	52	152	27	8248	11	0	33773	606569
12 CAR	423	575	4195	804	84	452	263	971	383	51	11872	239693	12269	708	12	0	56	8	0	83	0	0	40079	312981
13 HOW	296	1128	26033	18690	16	107	70	358	133	51	2907	2531	298144	30833	11	5	36	4	13	78	5	1	32234	413685
14 AAR	1771	5225	4395	59833	119	616	564	1511	370	245	178	72	35122	789558	2555	143	481	16	73	64	33	23	72907	975875
15 CAL	459	1077	628	8700	45	269	268	789	182	118	35	9	133	6004	138840	11734	2866	6	76	0	82	23	1850	174193
16 STM	375	503	565	1456	56	410	124	791	81	92	0	0	143	396	4504	178722	8902	1	67	0	87	535	1434	199244
17 CHS	1702	3421	596	32429	74	544	1966	2749	265	127	26	12	123	558	2390	6534	272899	100	86	10	143	2275	3981	333010
18 FAU	485	518	1167	597	78	480	315	11343	7418	20098	103	3	146	125	4	8	131	116641	10419	930	2688	88	9168	182953
19 STA	110	93	184	123	18	156	129	1377	118	8476	4	0	14	65	6	18	29	1875	229460	17	45873	341	10902	299388
20 CL/JF	437	687	1326	580	79	429	253	1184	13502	526	7317	43	237	231	0	0	4	1431	58	120201	12	0	17271	165808
21 SP/FB	190	274	151	224	40	221	154	533	155	572	0	0	0	2	4	42	109	570	27595	2	261414	48	33758	326058
22 KGEO	479	658	238	693	84	452	264	887	80	475	0	0	14	124	33	233	1513	761	2880	0	1288	40671	1658	53485
23 EXTL	3995	10897	38903	24824	548	4947	2734	26897	12843	10860	23972	22119	28816	61416	955	841	2309	4881	7538	16379	26308	961	0	333943
TOTAL	242161	698272	2057954	1403517	39104	416089	259603	2396814	858159	822637	552830	276212	431325	945165	150793	198845	313365	134537	291966	156871	341147	45199	461970	13494535

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: Transit

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	14555	8362	1395	1309	812	2677	393	676	3	3	0	0	2	0	0	0	0	0	0	0	0	0	0	30187
2 DC NC	47149	37903	16219	9552	2197	6494	1493	2367	11	10	0	0	31	15	1	0	1	0	0	0	0	0	0	123444
3 MTG	7206	9843	49819	4036	517	1523	207	1399	15	5	1	0	116	6	0	0	1	0	0	0	2	0	0	74698
4 PG	9803	9045	4176	9537	378	900	516	358	1	3	0	0	59	29	1	0	4	0	0	0	0	0	0	34809
5 ARLCR	1511	510	158	45	454	1387	237	435	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4741
6 ARNCR	11854	2990	958	305	3726	16792	3451	7535	58	25	0	0	0	0	0	0	0	0	0	0	0	0	0	47694
7 ALX	3784	1033	203	167	940	4208	3716	2776	3	14	0	0	0	0	0	0	2	0	0	0	0	0	0	16846
8 FFX	4766	1340	1066	204	1387	8581	3287	19446	767	103	0	0	1	0	0	0	0	0	0	0	0	0	0	40948
9 LDN	34	14	21	5	11	83	9	1040	2278	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3496
10 PW	110	14	10	0	22	98	60	145	3	2377	0	0	0	0	0	0	0	0	0	0	2	0	0	2841
11 FRD	8	1	17	0	1	2	0	0	0	0	698	0	0	0	0	0	0	0	0	0	0	0	0	727
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	21	17	131	51	3	0	0	2	0	0	0	0	49	7	0	0	0	0	0	0	0	0	0	280
14 AAR	57	27	23	49	3	12	1	5	0	0	0	0	9	4	1	0	0	0	0	0	0	0	0	190
15 CAL	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	0	0	7
17 CHS	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	305	0	0	0	0	0	0	308
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	6
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	100862	71099	74197	25261	10451	42756	13371	36184	3140	2543	699	0	267	61	3	6	314	0	1	0	9	0	0	381224

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: HOV Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: HOV AUTO Driver

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
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: Auto Driver

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
1 DC CR	18455	10628	1106	1381	390	1893	366	823	18	6	2	1	5	34	0	0	0	5	2	1	0	0	818	35934
2 DC NC	67815	309647	57034	43489	3301	15225	4547	10865	329	74	24	9	458	733	20	10	138	14	18	21	29	8	10499	524305
3 MTG	12852	518761	350106	56786	1406	7721	1489	27700	1703	169	8163	555	18150	3663	16	13	46	52	91	181	127	11	36790	1579668
4 PG	28891	88729	45156	833281	1273	5689	12995	13133	252	177	47	27	10422	29947	863	262	14913	55	84	32	102	29	23315	1109675
5 ARLCR	1058	1004	275	107	6302	3900	532	1189	14	6	2	1	0	1	0	0	0	0	1	3	1	0	231	14627
6 ARNCR	14335	10837	3664	1728	8111	189128	20124	53295	713	233	5	10	16	43	2	5	10	9	19	9	10	3	4620	306928
7 ALX	6735	5292	984	2761	2408	22283	89954	33497	99	292	3	3	13	24	7	3	51	12	12	6	8	5	2317	166769
8 FFX	14608	12060	14046	8811	5132	62048	529131	474957	76303	27419	62	26	134	304	22	39	206	578	490	109	159	32	25461	1775919
9 LDN	228	238	1202	207	66	626	162	36341	530902	3886	2543	31	74	137	2	4	36	812	46	6408	50	3	9349	593351
10 PW	1338	740	740	526	331	2892	3320	97265	25278	579382	53	9	126	326	16	17	51	3678	8112	182	1623	50	12449	738505
11 FRD	303	341	27466	542	49	285	180	964	3529	161	388197	6868	7154	616	7	0	30	91	19	5311	5	0	20939	463058
12 CAR	290	384	2727	517	59	314	172	631	245	30	7644	182921	7914	456	6	0	33	5	0	54	0	0	24849	229251
13 HOW	205	751	16971	12235	12	74	47	236	89	32	1872	1628	253632	20062	7	2	21	3	6	49	4	1	19986	327926
14 AAR	1227	3453	2897	38872	82	428	382	993	236	154	117	48	22908	609046	1643	93	309	10	49	39	22	11	45204	728224
15 CAL	317	705	416	5608	30	189	177	515	117	72	21	6	88	3856	121389	7562	1845	4	47	0	51	17	1148	144180
16 STM	257	335	353	941	36	277	83	507	53	55	0	0	83	251	2903	151975	5718	1	42	0	53	344	890	165157
17 CHS	1170	2262	389	20969	50	373	1316	1797	169	80	13	10	78	358	1537	4195	234231	60	58	6	90	1462	2469	273142
18 FAU	332	345	772	388	56	332	210	7380	4779	12964	63	1	91	71	1	5	81	106080	6688	598	1736	56	5683	148712
19 STA	73	64	123	78	12	108	87	893	76	5469	2	0	9	41	2	10	20	1204	185779	8	29655	218	6760	230691
20 CL/JF	298	453	879	369	55	297	168	777	8719	339	4726	30	150	145	0	0	3	921	31	108857	8	0	10709	137934
21 SP/FB	128	184	103	141	27	154	105	349	99	372	0	0	0	1	2	28	70	372	17944	2	195859	30	20930	236900
22 KGEO	327	437	160	449	58	313	177	567	43	307	0	0	8	79	23	149	973	489	1853	0	833	36974	1027	45246
23 EXTL	2478	6757	24122	15386	335	3069	1696	16677	7963	6731	14865	13715	17865	38079	588	522	1435	3028	4680	10156	16309	591	0	207047
TOTAL	173723	507520	1551690	1045572	29581	317618	191202	1781352	661728	638410	428424	205899	339378	708273	129056	164894	260220	117483	226071	132032	246734	39845	286443	10183148

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	21883	14440	1489	1912	512	2494	488	1140	23	10	2	1	11	47	2	1	3	7	2	2	2	0	1317	45788
2 DC NC	95300	405661	82801	66142	4592	21443	6612	16125	499	110	37	13	702	1136	34	14	218	27	27	30	42	15	16930	718510
3 MTG	18308	76019	1754530	85868	1974	11178	2218	41740	2611	255	12578	871	27874	5618	26	32	79	87	131	304	190	19	59321	2101831
4 PG	41406	133066	67563	1078566	1841	8208	19314	19996	395	259	75	39	15914	46089	1330	405	23139	88	125	51	152	50	37604	1495676
5 ARLCR	1411	1354	378	144	6582	5145	730	1629	20	8	2	1	0	2	0	0	1	1	1	3	1	0	374	17787
6 ARNCR	19862	15243	5260	2505	11058	231048	28958	78064	1057	331	5	11	31	66	3	7	19	13	23	15	16	7	7440	401042
7 ALX	9447	7578	1420	4066	3366	31615	110512	48852	146	429	8	3	16	37	9	7	79	15	19	10	9	6	3737	221386
8 FFX	21114	17870	20942	13387	7305	90331	78203	1934487	116463	42006	97	45	200	458	32	62	309	894	757	166	223	51	41068	2386471
9 LDN	323	365	1833	326	85	916	252	55288	656922	5993	3952	46	120	213	6	5	60	1264	72	9997	76	4	15083	753200
10 PW	1944	1106	1109	813	482	4214	4946	148632	39023	731300	83	14	191	522	24	32	71	5695	12517	281	2492	81	20081	975653
11 FRD	440	513	42248	836	66	413	266	1471	5470	245	489577	10686	11105	957	13	0	52	152	27	8248	11	0	33773	606569
12 CAR	423	575	4195	804	84	452	263	971	383	51	11872	239693	12269	708	12	0	56	8	0	83	0	0	40079	312981
13 HOW	296	1128	26033	18690	16	107	70	358	133	51	2907	2531	298144	30833	11	5	36	4	13	78	5	1	32234	413685
14 AAR	1771	5225	4395	59833	119	616	564	1511	370	245	178	72	35122	789558	2555	143	481	16	73	64	33	23	72907	975875
15 CAL	459	1077	628	8700	45	269	268	789	182	118	35	9	133	6004	138840	11734	2866	6	76	0	82	23	1850	174193
16 STM	375	503	565	1456	56	410	124	791	81	92	0	0	143	396	4504	178722	8902	1	67	0	87	535	1434	199244
17 CHS	1702	3421	596	32429	74	544	1966	2749	265	127	26	12	123	558	2390	6534	272899	100	86	10	143	2275	3981	333010
18 FAU	485	518	1167	597	78	480	315	11343	7418	20098	103	3	146	125	4	8	131	116641	10419	930	2688	88	9168	182953
19 STA	110	93	184	123	18	156	129	1377	118	8476	4	0	14	65	6	18	29	1875	229460	17	45873	341	10902	299388
20 CL/JF	437	687	1326	580	79	429	253	1184	13502	526	7317	43	237	231	0	0	4	1431	58	120201	12	0	17271	165808
21 SP/FB	190	274	151	224	40	221	154	533	155	572	0	0	0	2	4	42	109	570	27595	2	261414	48	33758	326058
22 KGEO	479	658	238	693	84	452	264	887	80	475	0	0	14	124	33	233	1513	761	2880	0	1288	40671	1658	53485
23 EXTL	3995	10897	38903	24824	548	4947	2734	26897	12843	10860	23972	22119	28816	61416	955	841	2309	4881	7538	16379	26308	961	0	333943
TOTAL	242161	698272	2057954	1403517	39104	416089	259603	2396814	858159	822637	552830	276212	431325	945165	150793	198845	313365	134537	291966	156871	341147	45199	461970	13494535

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: Total Motorized Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	36438	22802	2884	3221	1324	5171	881	1816	26	13	2	1	13	47	2	1	3	7	2	2	2	0	1317	75975
2 DC NC	142449	443564	99020	75694	6789	27937	8105	18492	510	120	37	13	733	1151	35	14	219	27	27	30	42	15	16930	841953
3 MTG	25515	85862	1804349	89904	2491	12701	2425	43139	2626	260	12579	871	27990	5624	26	32	80	87	131	304	192	19	59321	2176528
4 PG	51209	142111	71739	1088103	2218	9108	19830	20354	396	262	75	39	15973	46118	1331	405	23143	88	125	51	152	50	37604	1530485
5 ARLCR	2922	1864	536	189	7036	6532	967	2064	21	11	2	1	0	2	0	0	1	1	1	3	1	0	374	22528
6 ARNCR	31716	18233	6218	2810	14784	247840	32409	85599	1115	356	5	11	31	66	3	7	19	13	23	15	16	7	7440	448736
7 ALX	13231	8611	1623	4233	4306	35823	114228	51628	149	443	8	3	16	37	9	7	81	15	19	10	9	6	3737	238233
8 FFX	25880	19210	22008	13591	8692	98912	81490	1953933	117230	42109	97	45	201	458	32	62	309	894	757	166	223	51	41068	2427418
9 LDN	357	379	1854	331	96	999	261	56328	659200	5993	3952	46	120	213	6	5	60	1264	72	9997	76	4	15083	756696
10 PW	2054	1120	1119	813	504	4312	5006	148777	39026	733677	83	14	191	522	24	32	71	5695	12517	281	2494	81	20081	978494
11 FRD	448	514	42265	836	67	415	266	1471	5470	245	490275	10686	11105	957	13	0	52	152	27	8248	11	0	33773	607296
12 CAR	423	575	4195	804	84	452	263	971	383	51	11872	239693	12269	708	12	0	56	8	0	83	0	0	40079	312981
13 HOW	317	1145	26164	18741	19	107	70	360	133	51	2907	2531	298193	30840	11	5	36	4	13	78	5	1	32234	413965
14 AAR	1828	5252	4418	59882	122	628	565	1516	370	245	178	72	35131	789562	2556	143	481	16	73	64	33	23	72907	976065
15 CAL	460	1077	628	8700	45	269	268	789	182	118	35	9	133	6004	138840	11734	2866	6	76	0	82	23	1850	174194
16 STM	375	503	565	1456	56	410	124	791	81	92	0	0	143	396	4504	178728	8903	1	67	0	87	535	1434	199251
17 CHS	1704	3422	596	32429	74	544	1966	2749	265	127	26	12	123	558	2390	6534	273204	100	86	10	143	2275	3981	333318
18 FAU	485	518	1167	597	78	480	315	11343	7418	20098	103	3	146	125	4	8	131	116641	10419	930	2688	88	9168	182953
19 STA	110	93	184	123	18	156	130	1377	118	8476	4	0	14	65	6	18	29	1875	229460	17	45878	341	10902	299394
20 CL/JF	437	687	1326	580	79	429	253	1184	13502	526	7317	43	237	231	0	0	4	1431	58	120201	12	0	17271	165808
21 SP/FB	190	274	152	224	40	221	154	533	155	572	0	0	0	2	4	42	109	570	27596	2	261414	48	33758	326060
22 KGEO	479	658	238	693	84	452	264	887	80	475	0	0	14	124	33	233	1513	761	2880	0	1288	40671	1658	53485
23 EXTL	3995	10897	38903	24824	548	4947	2734	26897	12843	10860	23972	22119	28816	61416	955	841	2309	4881	7538	16379	26308	961	0	333943
TOTAL	343023	769371	2132151	1428778	49555	458846	272974	2432998	861299	825180	553529	276212	431592	945226	150796	198851	313679	134537	291967	156871	341156	45199	461970	13875760

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: Transit Percentage

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	39.9	36.7	48.4	40.6	61.3	51.8	44.6	37.2	11.5	23.1	0	0	15.4	0	0	0	0	0	0	0	0	0	0	39.7
2 DC NC	33.1	8.5	16.4	12.6	32.4	23.2	18.4	12.8	2.1	8.3	0	0	4.2	1.3	2.9	0	0.5	0	0	0	0	0	0	14.7
3 MTG	28.2	11.5	2.8	4.5	20.8	12.0	8.6	3.2	0.6	2.1	0.0	0	0.4	0.1	0	0	1.3	0	0	0	0.9	0	0	3.4
4 PG	19.1	6.4	5.8	0.9	17.0	9.9	2.6	1.8	0.2	1.0	0	0	0.4	0.1	0.1	0	0.0	0	0	0	0	0	0	2.3
5 ARLCR	51.7	27.4	29.5	23.8	6.5	21.2	24.5	21.1	4.8	27.3	0	0	0	0	0	0	0	0	0	0	0	0	0	21.0
6 ARNCR	37.4	16.4	15.4	10.9	25.2	6.8	10.6	8.8	5.2	7.0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.6
7 ALX	28.6	12.0	12.5	4.0	21.8	11.7	3.3	5.4	2.0	3.2	0	0	0	0	0	0	2.1	0	0	0	0	0	0	7.1
8 FFX	18.4	7.0	4.8	1.5	16.0	8.7	4.0	1.0	0.7	0.2	0	0	0.4	0	0	0	0	0	0	0	0	0	0	1.7
9 LDN	9.6	3.6	1.1	1.5	11.6	8.3	3.4	1.8	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5
10 PW	5.3	1.2	0.9	0	4.4	2.3	1.2	0.1	0.0	0.3	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.3
11 FRD	1.9	0.2	0.0	0	1.4	0.4	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	6.5	1.5	0.5	0.3	14.8	0	0	0.5	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0.1
14 AAR	3.1	0.5	0.5	0.1	2.3	1.9	0.2	0.3	0	0	0	0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0.0
15 CAL	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
17 CHS	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0.0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0.0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	29.4	9.2	3.5	1.8	21.1	9.3	4.9	1.5	0.4	0.3	0.1	0	0.1	0.0	0.0	0.0	0.1	0	0.0	0	0.0	0	0	2.7

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: HBO MODE: Avg. Auto Occupancy

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	1.19	1.36	1.35	1.38	1.31	1.32	1.33	1.39	1.28	1.67	1.00	1.00	2.20	1.38	2.00	1.00	3.00	1.40	1.00	2.00	2.00	0	1.61	1.27
2 DC NC	1.41	1.31	1.45	1.52	1.39	1.41	1.45	1.48	1.52	1.49	1.54	1.44	1.53	1.55	1.70	1.40	1.58	1.93	1.50	1.43	1.45	1.88	1.61	1.37
3 MTG	1.42	1.47	1.30	1.51	1.40	1.45	1.49	1.51	1.53	1.50	1.54	1.57	1.54	1.53	1.63	2.46	1.72	1.67	1.44	1.68	1.50	1.73	1.61	1.33
4 PG	1.43	1.50	1.50	1.29	1.45	1.44	1.49	1.52	1.57	1.46	1.60	1.44	1.53	1.54	1.54	1.55	1.55	1.60	1.49	1.59	1.49	1.72	1.61	1.35
5 ARLCR	1.33	1.35	1.37	1.35	1.04	1.32	1.37	1.37	1.43	1.33	1.00	1.00	0	2.00	0	0	1.00	1.00	1.00	1.00	1.00	0	1.62	1.22
6 ARNCR	1.39	1.41	1.44	1.45	1.36	1.22	1.44	1.46	1.48	1.42	1.00	1.10	1.94	1.53	1.50	1.40	1.90	1.44	1.21	1.67	1.60	2.33	1.61	1.31
7 ALX	1.40	1.43	1.44	1.47	1.40	1.42	1.23	1.46	1.47	1.47	2.67	1.00	1.23	1.54	1.29	2.33	1.55	1.25	1.58	1.67	1.13	1.20	1.61	1.33
8 FFX	1.45	1.48	1.49	1.52	1.42	1.46	1.48	1.31	1.53	1.53	1.56	1.73	1.49	1.51	1.45	1.59	1.50	1.55	1.54	1.52	1.40	1.59	1.61	1.34
9 LDN	1.42	1.54	1.53	1.58	1.29	1.46	1.56	1.52	1.24	1.54	1.55	1.48	1.62	1.55	3.00	1.25	1.67	1.56	1.57	1.56	1.52	1.33	1.61	1.27
10 PW	1.45	1.50	1.50	1.55	1.45	1.46	1.49	1.53	1.54	1.26	1.57	1.56	1.52	1.60	1.50	1.88	1.39	1.55	1.54	1.54	1.54	1.62	1.61	1.32
11 FRD	1.45	1.50	1.54	1.54	1.35	1.45	1.48	1.53	1.55	1.52	1.26	1.56	1.55	1.55	1.86	0	1.73	1.67	1.42	1.55	2.20	0	1.61	1.31
12 CAR	1.46	1.50	1.54	1.56	1.42	1.44	1.53	1.54	1.56	1.70	1.55	1.31	1.55	1.55	2.00	0	1.70	1.60	0	1.54	0	0	1.61	1.37
13 HOW	1.44	1.50	1.53	1.53	1.33	1.45	1.49	1.52	1.49	1.59	1.55	1.55	1.18	1.54	1.57	2.50	1.71	1.33	2.17	1.59	1.25	1.00	1.61	1.26
14 AAR	1.44	1.51	1.52	1.54	1.45	1.44	1.48	1.52	1.57	1.59	1.52	1.50	1.53	1.30	1.56	1.54	1.56	1.60	1.49	1.64	1.50	2.09	1.61	1.34
15 CAL	1.45	1.53	1.51	1.55	1.50	1.42	1.51	1.53	1.56	1.64	1.67	1.50	1.51	1.56	1.14	1.55	1.55	1.50	1.62	0	1.61	1.35	1.61	1.21
16 STM	1.46	1.50	1.60	1.55	1.56	1.48	1.49	1.56	1.53	1.67	0	0	1.72	1.58	1.55	1.18	1.56	1.00	1.60	0	1.64	1.56	1.61	1.21
17 CHS	1.45	1.51	1.53	1.55	1.48	1.46	1.49	1.53	1.57	1.59	2.00	1.20	1.58	1.56	1.55	1.56	1.17	1.67	1.48	1.67	1.59	1.56	1.61	1.22
18 FAU	1.46	1.50	1.51	1.54	1.39	1.45	1.50	1.54	1.55	1.55	1.63	3.00	1.60	1.76	4.00	1.60	1.62	1.10	1.56	1.56	1.55	1.57	1.61	1.23
19 STA	1.51	1.45	1.50	1.58	1.50	1.44	1.48	1.54	1.55	1.55	2.00	0	1.56	1.59	3.00	1.80	1.45	1.56	1.24	2.13	1.55	1.56	1.61	1.30
20 CL/JF	1.47	1.52	1.51	1.57	1.44	1.44	1.51	1.52	1.55	1.55	1.55	1.43	1.58	1.59	0	0	1.33	1.55	1.87	1.10	1.50	0	1.61	1.20
21 SP/FB	1.48	1.49	1.47	1.59	1.48	1.44	1.47	1.53	1.57	1.54	0	0	0	2.00	2.00	1.50	1.56	1.53	1.54	1.00	1.33	1.60	1.61	1.38
22 KGEO	1.46	1.51	1.49	1.54	1.45	1.44	1.49	1.56	1.86	1.55	0	0	1.75	1.57	1.43	1.56	1.55	1.56	1.55	0	1.55	1.10	1.61	1.18
23 EXTL	1.61	1.61	1.61	1.61	1.64	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.62	1.61	1.61	1.61	1.61	1.61	1.61	1.63	0	1.61
TOTAL	1.39	1.38	1.33	1.34	1.32	1.31	1.36	1.35	1.30	1.29	1.29	1.34	1.27	1.33	1.17	1.21	1.20	1.15	1.29	1.19	1.38	1.13	1.61	1.33

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB MODE: LOV Auto Driver

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	46533	40273	9680	21604	2147	15829	7107	12178	139	192	13	1	240	695	51	1	332	2	5	4	0	0	1081	158107
2 DC NC	30084	84979	34049	50169	1944	12891	6514	12280	166	161	29	5	1080	2034	126	7	744	4	3	1	6	0	2091	239367
3 MTG	7828	35731	676894	54987	1016	7536	2170	24278	971	164	13185	1325	17806	4245	28	4	65	17	8	75	1	0	10399	858733
4 PG	17931	49256	54598	445123	908	6395	13026	17104	60	389	115	151	19176	38280	2401	282	13315	5	6	4	6	6	9826	688364
5 ARLCR	1930	2368	1079	1048	3353	6115	2138	4138	56	73	1	0	11	22	2	0	18	0	1	0	1	0	111	22465
6 ARNCR	12692	14121	7098	6695	5244	86722	20108	51649	837	857	12	4	46	128	10	4	125	10	5	3	0	2	903	207275
7 ALX	7008	7161	2176	10754	1988	19809	57306	45465	176	1519	3	4	23	128	34	5	580	3	17	1	3	0	590	154752
8 FFX	11427	12679	21696	16850	3739	51119	45881	748875	54232	49956	63	13	116	223	62	15	818	1053	449	35	62	3	4146	1023513
9 LDN	152	175	1032	76	46	780	220	57071	251621	10546	2078	29	33	19	1	0	6	923	13	2575	6	0	1763	329165
10 PW	326	252	186	466	113	1207	2029	53285	10279	290227	10	1	7	13	5	1	17	6752	5782	35	960	3	1848	373804
11 FRD	16	61	18542	152	1	24	8	100	2388	14	203152	5413	4095	164	0	0	3	3	0	1825	0	0	4518	240479
12 CAR	7	7	1930	197	1	6	4	20	25	2	6116	111704	4644	275	1	0	0	0	0	17	0	0	3606	128562
13 HOW	280	1177	19697	20309	9	45	28	126	29	10	3626	3810	152626	30322	10	2	8	3	0	14	0	1	14799	246931
14 AAR	836	2236	4606	39201	31	131	182	226	17	16	176	273	31855	358099	1623	14	241	3	2	3	0	1	28966	468738
15 CAL	68	194	37	3749	1	21	65	75	2	8	2	2	12	2286	48526	4352	1989	0	5	0	1	2	186	61583
16 STM	12	14	15	618	1	10	14	29	1	5	0	0	3	32	5167	78109	4798	0	4	0	2	93	103	89030
17 CHS	506	1064	81	16972	23	202	962	1051	11	22	0	1	11	319	1487	2949	104325	3	3	0	9	251	416	130668
18 FAU	2	4	9	7	1	15	5	1359	968	7787	1	0	3	1	0	0	0	36664	1111	95	254	0	580	48866
19 STA	5	5	10	12	0	9	32	643	8	6917	0	0	3	3	1	2	2	1336	69094	1	15732	214	748	94777
20 CL/JF	2	3	166	6	0	4	4	75	3951	54	2518	22	31	7	0	0	0	149	0	56004	2	0	3064	66062
21 SP/FB	6	4	9	10	1	7	4	92	9	1323	0	0	0	2	0	3	4	282	16368	0	164043	279	3901	186347
22 KGEO	2	4	3	23	0	4	3	11	1	12	0	0	2	5	6	129	570	2	515	0	677	17471	242	19682
23 EXTL	1138	2117	9908	9543	108	874	579	4111	1840	1768	4743	3757	17271	26839	176	101	380	551	772	3010	4121	245	0	93952
TOTAL	138790	253886	863501	698571	20675	209754	158388	1034241	327788	372023	235843	126515	249094	464141	59717	85980	128340	47765	94163	63702	185886	18571	93887	5931222

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB MODE: LOV Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	57373	53286	12754	28905	2793	20720	9421	16268	196	259	15	3	317	931	67	1	456	3	5	4	0	0	1392	205169
2 DC NC	39792	108487	45323	68059	2541	16908	8683	16540	221	221	46	8	1461	2779	168	7	1013	4	3	1	7	0	2686	314959
3 MTG	10305	47423	858419	74424	1338	9940	2881	32687	1328	212	18082	1829	24351	5796	35	5	86	22	11	105	3	0	13341	1102624
4 PG	24017	66851	74073	563117	1210	8508	17556	23354	86	526	151	204	26290	52618	3307	387	18340	8	8	8	6	9	12595	893229
5 ARLCR	2496	3086	1404	1388	3510	7818	2794	5411	72	99	2	0	13	30	3	0	24	0	1	0	1	0	142	28294
6 ARNCR	16532	18438	9308	8854	6717	103995	26344	68270	1121	1138	15	5	58	169	16	5	169	14	5	3	1	2	1159	262338
7 ALX	9282	9530	2897	14470	2605	26027	70162	60890	240	2043	6	5	27	176	46	5	789	3	24	1	3	0	760	199991
8 FFX	15279	17069	29218	22999	4921	67836	61513	955028	73991	68309	86	16	154	305	82	18	1132	1450	621	54	84	3	5309	1325478
9 LDN	206	241	1405	109	66	1046	291	77899	308785	14491	2865	34	43	30	1	0	10	1273	15	3555	10	0	2259	414634
10 PW	441	344	249	640	150	1601	2744	72881	14122	361209	13	2	9	21	5	2	27	9304	7960	45	1316	3	2375	475464
11 FRD	20	83	25424	210	3	31	10	139	3288	18	245405	7470	5649	222	0	0	4	6	0	2522	0	0	5790	296294
12 CAR	7	14	2652	275	1	6	5	28	36	2	8438	123183	6408	381	1	0	0	0	0	23	0	0	4624	146084
13 HOW	374	1602	26949	27841	9	64	35	173	39	12	4996	5255	179067	41662	12	5	12	3	0	24	0	1	18972	307107
14 AAR	1125	3045	6296	53891	39	171	250	311	22	24	235	378	43776	421923	2246	19	332	3	2	6	1	2	37134	571231
15 CAL	90	268	51	5171	3	27	88	105	2	9	2	3	19	3156	56313	6005	2746	0	5	0	3	3	240	74309
16 STM	14	22	22	851	2	11	17	44	1	6	0	0	5	45	7131	92890	6628	0	4	0	3	128	133	107957
17 CHS	683	1454	109	23369	31	270	1303	1439	11	31	0	3	14	442	2054	4073	122767	4	4	0	10	352	534	158957
18 FAU	2	4	15	10	2	18	5	1868	1334	10728	1	0	4	2	0	0	1	40386	1533	130	349	0	743	57135
19 STA	5	6	16	17	1	9	45	886	12	9528	0	0	3	3	1	3	5	1848	78981	2	21644	293	959	114267
20 CL/JF	2	3	229	12	0	5	4	102	5451	78	3470	31	43	12	0	0	0	206	0	62889	2	0	3929	76468
21 SP/FB	7	8	11	13	1	8	6	126	11	1819	0	0	0	2	0	5	8	386	22519	0	182602	384	5003	212919
22 KGEO	3	5	4	33	1	4	4	16	1	17	0	0	2	7	7	180	787	4	710	0	933	19351	310	22379
23 EXTL	1460	2713	12699	12241	139	1121	742	5270	2357	2268	6076	4820	22142	34409	225	129	487	706	988	3860	5284	316	0	120452
TOTAL	179514	333982	1109527	906899	26084	266145	204902	1339735	412727	473048	289904	143249	309855	565121	71720	103739	155823	55633	113399	73232	212262	20847	120389	7487738

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB   MODE: Transit

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	31158	6130	4852	2779	2312	7821	2021	2635	9	11	0	0	4	1	1	0	0	0	0	0	0	0	0	59734
2 DC NC	18277	3674	6616	2222	937	2854	789	981	5	2	0	0	4	0	0	0	0	0	0	0	0	0	0	36360
3 MTG	7193	4841	28246	1705	525	1723	342	1148	4	2	1	0	7	0	0	0	0	0	0	0	1	0	0	45737
4 PG	7761	2929	3013	1919	290	908	427	334	1	2	0	0	3	2	1	0	0	0	0	0	0	0	0	17590
5 ARLCR	2546	430	331	106	277	1066	366	503	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5628
6 ARNCR	12415	1826	1320	396	2105	5875	1714	3945	29	7	0	0	0	1	0	0	0	0	0	0	0	0	0	29632
7 ALX	4200	665	321	215	692	2666	1766	1313	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0	11849
8 FFX	5236	970	1217	231	1074	6462	1966	9393	389	6	0	0	0	0	0	0	0	0	0	0	0	0	0	26944
9 LDN	40	10	18	2	15	120	10	1245	324	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1784
10 PW	14	2	1	0	3	17	22	15	0	183	0	0	0	0	0	0	0	0	0	0	0	0	0	256
11 FRD	0	0	0	0	0	0	0	0	0	0	142	0	0	0	0	0	0	0	0	0	0	0	0	142
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	19	8	50	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81
14 AAR	16	1	9	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	13
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	88875	21485	45993	9579	8230	29514	9424	21513	766	221	143	0	18	4	2	0	13	0	0	0	1	0	0	235781

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB   MODE: HOV Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB MODE: HOV AUTO Driver

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 DC NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 MTG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ARLCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ARNCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 ALX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 FFX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 LDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 PW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 FRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 AAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB MODE: Auto Driver

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	46533	40273	9680	21604	2147	15829	7107	12178	139	192	13	1	240	695	51	1	332	2	5	4	0	0	1081	158107
2 DC NC	30084	84979	34049	50169	1944	12891	6514	12280	166	161	29	5	1080	2034	126	7	744	4	3	1	6	0	2091	239367
3 MTG	7828	35731	676894	54987	1016	7536	2170	24278	971	164	13185	1325	17806	4245	28	4	65	17	8	75	1	0	10399	858733
4 PG	17931	49256	54598	445123	908	6395	13026	17104	60	389	115	151	19176	38280	2401	282	13315	5	6	4	6	6	9826	688364
5 ARLCR	1930	2368	1079	1048	3353	6115	2138	4138	56	73	1	0	11	22	2	0	18	0	1	0	1	0	111	22465
6 ARNCR	12692	14121	7098	6695	5244	86722	20108	51649	837	857	12	4	46	128	10	4	125	10	5	3	0	2	903	207275
7 ALX	7008	7161	2176	10754	1988	19809	57306	45465	176	1519	3	4	23	128	34	5	580	3	17	1	3	0	590	154752
8 FFX	11427	12679	21696	16850	3739	51119	45881	748875	54232	49956	63	13	116	223	62	15	818	1053	449	35	62	3	4146	1023513
9 LDN	152	175	1032	76	46	780	220	57071	251621	10546	2078	29	33	19	1	0	6	923	13	2575	6	0	1763	329165
10 PW	326	252	186	466	113	1207	2029	53285	10279	290227	10	1	7	13	5	1	17	6752	5782	35	960	3	1848	373804
11 FRD	16	61	18542	152	1	24	8	100	2388	14	203152	5413	4095	164	0	0	3	3	0	1825	0	0	4518	240479
12 CAR	7	7	1930	197	1	6	4	20	25	2	6116	111704	4644	275	1	0	0	0	0	17	0	0	3606	128562
13 HOW	280	1177	19697	20309	9	45	28	126	29	10	3626	3810	152626	30322	10	2	8	3	0	14	0	1	14799	246931
14 AAR	836	2236	4606	39201	31	131	182	226	17	16	176	273	31855	358099	1623	14	241	3	2	3	0	1	28966	468738
15 CAL	68	194	37	3749	1	21	65	75	2	8	2	2	12	2286	48526	4352	1989	0	5	0	1	2	186	61583
16 STM	12	14	15	618	1	10	14	29	1	5	0	0	3	32	5167	78109	4798	0	4	0	2	93	103	89030
17 CHS	506	1064	81	16972	23	202	962	1051	11	22	0	1	11	319	1487	2949	104325	3	3	0	9	251	416	130668
18 FAU	2	4	9	7	1	15	5	1359	968	7787	1	0	3	1	0	0	0	36664	1111	95	254	0	580	48866
19 STA	5	5	10	12	0	9	32	643	8	6917	0	0	3	3	1	2	2	1336	69094	1	15732	214	748	94777
20 CL/JF	2	3	166	6	0	4	4	75	3951	54	2518	22	31	7	0	0	0	149	0	56004	2	0	3064	66062
21 SP/FB	6	4	9	10	1	7	4	92	9	1323	0	0	0	2	0	3	4	282	16368	0	164043	279	3901	186347
22 KGEO	2	4	3	23	0	4	3	11	1	12	0	0	2	5	6	129	570	2	515	0	677	17471	242	19682
23 EXTL	1138	2117	9908	9543	108	874	579	4111	1840	1768	4743	3757	17271	26839	176	101	380	551	772	3010	4121	245	0	93952
TOTAL	138790	253886	863501	698571	20675	209754	158388	1034241	327788	372023	235843	126515	249094	464141	59717	85980	128340	47765	94163	63702	185886	18571	93887	5931222

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB MODE: Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	57373	53286	12754	28905	2793	20720	9421	16268	196	259	15	3	317	931	67	1	456	3	5	4	0	0	1392	205169
2 DC NC	39792	108487	45323	68059	2541	16908	8683	16540	221	221	46	8	1461	2779	168	7	1013	4	3	1	7	0	2686	314959
3 MTG	10305	47423	858419	74424	1338	9940	2881	32687	1328	212	18082	1829	24351	5796	35	5	86	22	11	105	3	0	13341	1102624
4 PG	24017	66851	74073	563117	1210	8508	17556	23354	86	526	151	204	26290	52618	3307	387	18340	8	8	8	6	9	12595	893229
5 ARLCR	2496	3086	1404	1388	3510	7818	2794	5411	72	99	2	0	13	30	3	0	24	0	1	0	1	0	142	28294
6 ARNCR	16532	18438	9308	8854	6717	103995	26344	68270	1121	1138	15	5	58	169	16	5	169	14	5	3	1	2	1159	262338
7 ALX	9282	9530	2897	14470	2605	26027	70162	60890	240	2043	6	5	27	176	46	5	789	3	24	1	3	0	760	199991
8 FFX	15279	17069	29218	22999	4921	67836	61513	955028	73991	68309	86	16	154	305	82	18	1132	1450	621	54	84	3	5309	1325478
9 LDN	206	241	1405	109	66	1046	291	77899	308785	14491	2865	34	43	30	1	0	10	1273	15	3555	10	0	2259	414634
10 PW	441	344	249	640	150	1601	2744	72881	14122	361209	13	2	9	21	5	2	27	9304	7960	45	1316	3	2375	475464
11 FRD	20	83	25424	210	3	31	10	139	3288	18	245405	7470	5649	222	0	0	4	6	0	2522	0	0	5790	296294
12 CAR	7	14	2652	275	1	6	5	28	36	2	8438	123183	6408	381	1	0	0	0	0	23	0	0	4624	146084
13 HOW	374	1602	26949	27841	9	64	35	173	39	12	4996	5255	179067	41662	12	5	12	3	0	24	0	1	18972	307107
14 AAR	1125	3045	6296	53891	39	171	250	311	22	24	235	378	43776	421923	2246	19	332	3	2	6	1	2	37134	571231
15 CAL	90	268	51	5171	3	27	88	105	2	9	2	3	19	3156	56313	6005	2746	0	5	0	3	3	240	74309
16 STM	14	22	22	851	2	11	17	44	1	6	0	0	5	45	7131	92890	6628	0	4	0	3	128	133	107957
17 CHS	683	1454	109	23369	31	270	1303	1439	11	31	0	3	14	442	2054	4073	122767	4	4	0	10	352	534	158957
18 FAU	2	4	15	10	2	18	5	1868	1334	10728	1	0	4	2	0	0	1	40386	1533	130	349	0	743	57135
19 STA	5	6	16	17	1	9	45	886	12	9528	0	0	3	3	1	3	5	1848	78981	2	21644	293	959	114267
20 CL/JF	2	3	229	12	0	5	4	102	5451	78	3470	31	43	12	0	0	0	206	0	62889	2	0	3929	76468
21 SP/FB	7	8	11	13	1	8	6	126	11	1819	0	0	0	2	0	5	8	386	22519	0	182602	384	5003	212919
22 KGEO	3	5	4	33	1	4	4	16	1	17	0	0	2	7	7	180	787	4	710	0	933	19351	310	22379
23 EXTL	1460	2713	12699	12241	139	1121	742	5270	2357	2268	6076	4820	22142	34409	225	129	487	706	988	3860	5284	316	0	120452
TOTAL	179514	333982	1109527	906899	26084	266145	204902	1339735	412727	473048	289904	143249	309855	565121	71720	103739	155823	55633	113399	73232	212262	20847	120389	7487738

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB MODE: Total Motorized Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	88531	59416	17606	31684	5105	28541	11442	18903	205	270	15	3	321	932	68	1	456	3	5	4	0	0	1392	264903
2 DC NC	58068	112161	51939	70281	3478	19762	9472	17521	226	223	46	8	1465	2779	168	7	1013	4	3	1	7	0	2686	351319
3 MTG	17498	52264	886665	76129	1863	11663	3223	33835	1332	214	18083	1829	24358	5796	35	5	86	22	11	105	4	0	13341	1148361
4 PG	31778	69780	77086	565036	1500	9416	17983	23688	87	528	151	204	26293	52620	3308	387	18340	8	8	8	6	9	12595	910819
5 ARLCR	5042	3516	1735	1494	3787	8884	3160	5914	74	100	2	0	13	30	3	0	24	0	1	0	1	0	142	33922
6 ARNCR	28947	20264	10628	9250	8822	109870	28058	72215	1150	1145	15	5	58	170	16	5	169	14	5	3	1	2	1159	291970
7 ALX	13482	10195	3218	14685	3297	28693	71928	62203	243	2051	6	5	27	176	46	5	789	3	24	1	3	0	760	211840
8 FFX	20516	18039	30435	23230	5995	74298	63479	964421	74380	68315	86	16	154	305	82	18	1132	1450	621	54	84	3	5309	1352421
9 LDN	246	251	1423	111	81	1166	301	79144	309109	14491	2865	34	43	30	1	0	10	1273	15	3555	10	0	2259	416418
10 PW	455	346	250	640	153	1618	2766	72896	14122	361392	13	2	9	21	5	2	27	9304	7960	45	1316	3	2375	475720
11 FRD	20	83	25424	210	3	31	10	139	3288	18	245547	7470	5649	222	0	0	4	6	0	2522	0	0	5790	296436
12 CAR	7	14	2652	275	1	6	5	28	36	2	8438	123183	6408	381	1	0	0	0	0	23	0	0	4624	146084
13 HOW	393	1610	26999	27843	10	65	35	173	39	12	4996	5255	179067	41662	12	5	12	3	0	24	0	1	18972	307188
14 AAR	1141	3046	6305	53893	39	172	250	312	22	24	235	378	43776	421923	2246	19	332	3	2	6	1	2	37134	571261
15 CAL	90	268	51	5171	3	27	88	105	2	9	2	3	19	3156	56313	6005	2746	0	5	0	3	3	240	74309
16 STM	14	22	22	851	2	11	17	44	1	6	0	0	5	45	7131	92890	6628	0	4	0	3	128	133	107957
17 CHS	683	1454	109	23369	31	270	1303	1439	11	31	0	3	14	442	2054	4073	122780	4	4	0	10	352	534	158970
18 FAU	2	4	15	10	2	18	5	1868	1334	10728	1	0	4	2	0	0	1	40386	1533	130	349	0	743	57135
19 STA	5	6	16	17	1	9	45	886	12	9528	0	0	3	3	1	3	5	1848	78981	2	21644	293	959	114267
20 CL/JF	2	3	229	12	0	5	4	102	5451	78	3470	31	43	12	0	0	0	206	0	62889	2	0	3929	76468
21 SP/FB	7	8	11	13	1	8	6	126	11	1819	0	0	0	2	0	5	8	386	22519	0	182602	384	5003	212919
22 KGEO	3	5	4	33	1	4	4	16	1	17	0	0	2	7	7	180	787	4	710	0	933	19351	310	22379
23 EXTL	1460	2713	12699	12241	139	1121	742	5270	2357	2268	6076	4820	22142	34409	225	129	487	706	988	3860	5284	316	0	120452
TOTAL	268389	355468	1155521	916478	34314	295659	214326	1361248	413493	473269	290047	143249	309873	565125	71722	103739	155836	55633	113399	73232	212263	20847	120389	7723519

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB MODE: Transit Percentage

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	35.2	10.3	27.6	8.8	45.3	27.4	17.7	13.9	4.4	4.1	0	0	1.2	0.1	1.5	0	0	0	0	0	0	0	0	22.5
2 DC NC	31.5	3.3	12.7	3.2	26.9	14.4	8.3	5.6	2.3	0.8	0	0	0.3	0	0	0	0	0	0	0	0	0	0	10.3
3 MTG	41.1	9.3	3.2	2.2	28.2	14.8	10.6	3.4	0.3	0.8	0.0	0	0.0	0	0	0	0	0	0	0	22.0	0	0	4.0
4 PG	24.4	4.2	3.9	0.3	19.3	9.6	2.4	1.4	1.0	0.3	0	0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	1.9
5 ARLCR	50.5	12.2	19.1	7.1	7.3	12.0	11.6	8.5	2.7	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.6
6 ARNCR	42.9	9.0	12.4	4.3	23.9	5.3	6.1	5.5	2.5	0.6	0	0	0	0.5	0	0	0	0	0	0	0	0	0	10.1
7 ALX	31.1	6.5	10.0	1.5	21.0	9.3	2.5	2.1	1.2	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	5.6
8 FFX	25.5	5.4	4.0	1.0	17.9	8.7	3.1	1.0	0.5	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0
9 LDN	16.4	4.0	1.2	1.5	18.6	10.3	3.3	1.6	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4
10 PW	3.1	0.5	0.3	0	1.8	1.1	0.8	0.0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
11 FRD	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.0
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	4.9	0.5	0.2	0.0	9.6	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
14 AAR	1.4	0.0	0.1	0.0	0	0.5	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
15 CAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 STM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 CHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0.0
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 CL/JF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 SP/FB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	33.1	6.0	4.0	1.0	24.0	10.0	4.4	1.6	0.2	0.0	0.0	0	0.0	0.0	0.0	0	0.0	0	0	0	0.0	0	0	3.1

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: NHB MODE: Avg. Auto Occupancy

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	1.23	1.32	1.32	1.34	1.30	1.31	1.33	1.34	1.41	1.35	1.15	3.00	1.32	1.34	1.31	1.00	1.37	1.50	1.00	1.00	0	0	1.29	1.30
2 DC NC	1.32	1.28	1.33	1.36	1.31	1.31	1.33	1.35	1.33	1.37	1.59	1.60	1.35	1.37	1.33	1.00	1.36	1.00	1.00	1.00	1.17	0	1.28	1.32
3 MTG	1.32	1.33	1.27	1.35	1.32	1.32	1.33	1.35	1.37	1.29	1.37	1.38	1.37	1.37	1.25	1.25	1.32	1.29	1.38	1.40	2.84	0	1.28	1.28
4 PG	1.34	1.36	1.36	1.27	1.33	1.33	1.35	1.37	1.43	1.35	1.31	1.35	1.37	1.37	1.38	1.37	1.38	1.60	1.33	2.00	1.00	1.50	1.28	1.30
5 ARLCR	1.29	1.30	1.30	1.32	1.05	1.28	1.31	1.31	1.29	1.36	2.00	0	1.18	1.36	1.50	0	1.33	0	1.00	0	1.00	0	1.28	1.26
6 ARNCR	1.30	1.31	1.31	1.32	1.28	1.20	1.31	1.32	1.34	1.33	1.25	1.25	1.26	1.32	1.60	1.25	1.35	1.40	1.00	1.00	1.00	1.00	1.28	1.27
7 ALX	1.32	1.33	1.33	1.35	1.31	1.31	1.22	1.34	1.36	1.34	2.00	1.25	1.17	1.38	1.35	1.00	1.36	1.00	1.41	1.00	1.00	0	1.29	1.29
8 FFX	1.34	1.35	1.35	1.36	1.32	1.33	1.34	1.28	1.36	1.37	1.37	1.23	1.33	1.37	1.32	1.20	1.38	1.38	1.38	1.54	1.35	1.00	1.28	1.30
9 LDN	1.35	1.37	1.36	1.44	1.44	1.34	1.32	1.36	1.23	1.37	1.38	1.17	1.30	1.58	1.00	0	1.67	1.38	1.15	1.38	1.67	0	1.28	1.26
10 PW	1.35	1.37	1.34	1.37	1.33	1.33	1.35	1.37	1.37	1.24	1.30	2.00	1.29	1.62	1.00	2.00	1.59	1.38	1.38	1.29	1.37	1.00	1.29	1.27
11 FRD	1.25	1.36	1.37	1.38	3.00	1.29	1.25	1.39	1.38	1.29	1.21	1.38	1.38	1.35	0	0	1.33	2.00	0	1.38	0	0	1.28	1.23
12 CAR	1.00	2.00	1.37	1.40	1.00	1.00	1.25	1.40	1.44	1.00	1.38	1.10	1.38	1.39	1.00	0	0	0	0	1.35	0	0	1.28	1.14
13 HOW	1.34	1.36	1.37	1.37	1.00	1.42	1.25	1.37	1.34	1.20	1.38	1.38	1.17	1.37	1.20	2.50	1.50	1.00	0	1.71	0	1.00	1.28	1.24
14 AAR	1.35	1.36	1.37	1.37	1.26	1.31	1.37	1.38	1.29	1.50	1.34	1.38	1.37	1.18	1.38	1.36	1.38	1.00	1.00	2.00	1.00	2.00	1.28	1.22
15 CAL	1.32	1.38	1.38	1.38	3.00	1.29	1.35	1.40	1.00	1.13	1.00	1.50	1.58	1.38	1.16	1.38	1.38	0	1.00	0	3.00	1.50	1.29	1.21
16 STM	1.17	1.57	1.47	1.38	2.00	1.10	1.21	1.52	1.00	1.20	0	0	1.67	1.41	1.38	1.19	1.38	0	1.00	0	1.50	1.38	1.29	1.21
17 CHS	1.35	1.37	1.35	1.38	1.35	1.34	1.35	1.37	1.00	1.41	0	3.00	1.27	1.39	1.38	1.38	1.18	1.33	1.33	0	1.11	1.40	1.28	1.22
18 FAU	1.00	1.00	1.67	1.43	2.00	1.20	1.00	1.37	1.38	1.38	1.00	0	1.33	2.00	0	0	1.00	1.10	1.38	1.37	1.37	0	1.28	1.17
19 STA	1.00	1.20	1.60	1.42	1.00	1.00	1.41	1.38	1.50	1.38	0	0	1.00	1.00	1.00	1.50	2.50	1.38	1.14	2.00	1.38	1.37	1.28	1.21
20 CL/JF	1.00	1.00	1.38	2.00	0	1.25	1.00	1.36	1.38	1.44	1.38	1.41	1.39	1.71	0	0	0	1.38	0	1.12	1.00	0	1.28	1.16
21 SP/FB	1.17	2.00	1.22	1.30	1.00	1.14	1.50	1.37	1.22	1.37	0	0	0	1.00	0	1.67	2.00	1.37	1.38	0	1.11	1.38	1.28	1.14
22 KGEO	1.50	1.25	1.33	1.43	1.00	1.00	1.33	1.45	1.00	1.42	0	0	1.00	1.40	1.17	1.40	1.38	2.00	1.38	0	1.38	1.11	1.28	1.14
23 EXTL	1.28	1.28	1.28	1.28	1.29	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.29	0	1.28
TOTAL	1.29	1.32	1.28	1.30	1.26	1.27	1.29	1.30	1.26	1.27	1.23	1.13	1.24	1.22	1.20	1.21	1.21	1.16	1.20	1.15	1.14	1.12	1.28	1.26

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: LOV Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	74256	57686	11937	25404	3339	24476	8307	14617	247	246	38	3	334	966	68	79	388	14	107	31	368	1	3520	226432
2 DC NC	149161	508960	121729	140766	10184	53571	15637	32924	852	381	161	20	2555	4735	215	345	1101	48	530	116	1306	10	22689	1067996
3 MTG	59258	123174	2875247	195146	5439	23362	5329	71002	3764	684	27884	2041	51859	14424	128	246	369	147	821	469	2423	12	80152	3543381
4 PG	98007	215540	138350	1861431	6647	22288	37150	45027	576	822	304	195	42804	113193	4329	1445	45317	117	866	131	2364	88	58405	2695396
5 ARLCR	3816	3690	1503	1229	12848	14814	2989	6158	100	85	4	1	14	31	4	1	20	1	8	3	23	0	468	47810
6 ARNCR	41151	31284	13935	9684	20536	388474	50291	138035	2439	1236	28	16	97	232	17	35	151	22	68	21	150	5	7501	705407
7 ALX	21889	16409	4294	16596	8014	71482	222207	113976	553	2126	17	9	59	271	50	74	685	19	160	26	308	6	4046	483277
8 FFX	51936	40541	48078	37825	18303	185138	150321	3214614	208382	113011	583	72	608	3192	314	1281	1972	2083	4070	823	9118	42	39490	4131798
9 LDN	662	732	6165	1546	320	2992	817	174947	1112853	19783	11771	105	387	1833	42	35	259	2719	2151	15546	4424	3	18855	1378946
10 PW	2180	1223	1556	1932	648	5375	7934	237633	55371	1253822	217	15	225	1267	80	177	260	20145	24938	567	8381	75	18998	1643019
11 FRD	424	678	71114	3734	90	1934	520	2577	8367	570	854267	16407	23086	2940	42	0	131	200	275	9180	140	0	48641	1045318
12 CAR	347	551	9521	3818	89	1652	446	1801	1195	122	32122	424490	29570	3123	32	1	119	9	8	217	0	0	72777	582010
13 HOW	1471	3641	53906	56830	95	438	136	737	188	105	8327	6024	580756	86979	55	47	87	17	179	177	166	2	82134	882496
14 AAR	4420	10349	10256	120664	286	1508	847	2025	458	325	391	325	67069	1427865	4697	343	797	24	289	86	531	13	129302	1782870
15 CAL	889	2305	747	20257	74	504	372	903	179	143	39	9	169	10729	238162	23423	5378	10	260	0	560	59	1570	306742
16 STM	357	604	590	4957	51	852	238	1058	111	151	0	0	158	705	12495	340757	16980	1	963	0	1045	1404	1147	384623
17 CHS	3966	10265	884	74707	228	1267	3796	4619	363	199	17	12	162	1502	6817	12642	477194	78	595	7	827	3821	3331	607299
18 FAU	345	380	1081	888	66	675	287	10599	9135	38584	122	1	130	117	2	6	142	224242	21121	1067	6287	72	10270	325619
19 STA	92	81	144	116	25	154	238	5248	155	28944	3	0	13	51	6	21	40	3391	381906	10	93355	1686	12296	527975
20 CL/JF	314	508	1968	940	64	617	223	1783	22023	628	11818	66	450	532	0	0	6	1330	643	245333	281	0	38424	327951
21 SP/FB	138	193	113	156	29	166	114	769	116	3990	0	0	0	3	3	34	83	742	46497	2	531313	978	40232	625671
22 KGEO	346	482	225	1159	70	728	294	959	74	584	0	0	22	328	76	487	2087	540	5041	0	6087	75480	2331	97400
23 EXTL	9324	15339	60360	60926	1489	5902	3461	32698	22547	22655	76775	61287	88325	182178	2235	1200	4066	22190	11845	42676	52510	3268	0	783256
TOTAL	524748	1044614	3433703	2640710	88933	808369	511953	4114710	1450049	1489197	1024888	511098	888853	1857197	269869	382679	557633	278089	503341	316488	721968	87025	696579	24202692

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: LOV Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	89919	75944	15639	33872	4285	31376	10932	19370	353	340	55	6	445	1318	93	127	542	23	178	44	649	1	4575	290086
2 DC NC	196459	647251	165407	195291	13070	69848	20904	44146	1208	565	236	29	3449	6563	307	567	1567	82	948	193	2342	17	31273	1401721
3 MTG	74058	164949	3598117	264443	6788	30820	7045	95889	5380	1029	38261	2898	71047	19645	208	408	577	232	1508	745	4461	21	111038	4499567
4 PG	125246	287821	187227	2326162	8141	28477	49614	60073	862	1164	469	268	57359	152810	5937	2098	63773	181	1522	229	4172	124	79678	3443405
5 ARLCR	4891	4809	1960	1622	13387	18650	3904	8017	129	114	5	1	17	42	7	3	29	3	12	3	38	0	668	58311
6 ARNCR	52311	40760	18222	12814	26107	462490	67188	184788	3250	1647	37	19	129	321	29	47	214	32	101	29	253	9	10900	881696
7 ALX	27724	21524	5606	22247	10087	93207	264770	150960	760	2867	36	10	71	387	65	110	943	23	246	44	486	7	5823	608004
8 FFX	64157	52174	64519	51453	22659	246475	199783	4034824	283583	155342	891	124	886	4981	506	2191	2975	2949	6297	1345	14649	65	57872	5270700
9 LDN	843	990	8090	2507	391	4096	1110	227027	1338191	26805	15133	148	588	3139	81	61	444	3714	3585	22071	7411	4	26811	1693240
10 PW	2907	1704	2319	2855	878	7947	10976	322204	75428	1535293	349	25	356	2120	129	313	427	27140	34805	878	11986	111	27998	2069148
11 FRD	602	969	96563	5542	126	2883	798	3948	12054	947	1022124	23007	30641	4424	75	0	225	342	539	13366	281	0	69314	1288770
12 CAR	511	829	12820	5699	131	2536	711	2880	1966	217	41360	499975	38368	4458	62	1	203	14	17	337	0	0	106819	719914
13 HOW	1895	4711	73225	75805	110	599	189	1013	290	176	11298	8504	667835	115863	87	90	144	23	358	291	327	2	110781	1073616
14 AAR	5571	13468	14024	163282	363	2063	1184	3002	749	534	578	459	93173	1719033	6598	546	1175	39	513	147	983	28	178179	2205691
15 CAL	1161	2980	1086	26457	101	702	521	1340	291	235	65	13	253	14499	270346	31149	7411	15	459	0	1003	77	2369	362534
16 STM	507	847	948	6721	81	1279	339	1656	185	254	0	0	270	1117	16702	392598	23027	1	1641	0	1754	1798	1749	453475
17 CHS	5086	12851	1265	98040	284	1690	4969	6249	602	310	33	16	245	2066	8994	17065	548128	132	1001	13	1359	5072	5046	720516
18 FAU	503	572	1671	1444	92	983	432	15395	12666	50956	197	4	217	202	7	11	241	244786	28808	1516	8796	107	15113	384719
19 STA	129	111	220	175	34	205	295	6051	209	36520	5	0	20	80	11	32	59	4678	447975	20	125506	2043	17443	641821
20 CL/JF	460	774	2746	1574	91	950	344	2669	30123	966	15987	95	668	920	0	0	9	1958	1128	268831	479	0	56270	387042
21 SP/FB	201	287	165	246	42	238	169	995	180	4967	0	0	0	4	5	51	129	1055	63935	2	626942	1199	57057	757869
22 KGEO	511	731	347	1873	102	1108	450	1536	134	892	0	0	39	557	111	716	3002	842	7221	0	8309	82040	3441	113962
23 EXTL	12023	21094	82287	79373	1890	8424	4884	46149	29989	29711	98040	82254	115921	242832	2896	1661	5434	28401	16306	55529	73494	4299	0	1042891
TOTAL	667673	1358150	4354473	3379497	109242	1017047	651511	5240182	1798581	1851850	1245159	617855	1081998	2297381	313256	449845	660679	316665	619103	365633	895680	97024	980217	30368701

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: Transit

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	69033	23469	8951	5813	5383	16042	3444	5798	56	20	0	0	36	9	1	0	1	0	1	0	9	0	0	138066
2 DC NC	164669	85035	40713	23822	8888	20532	4247	7346	58	24	3	0	110	45	2	0	7	0	0	0	17	0	0	355519
3 MTG	67767	27214	160080	13090	3877	6396	1088	6098	55	13	97	0	540	39	0	0	4	0	0	0	21	0	0	286379
4 PG	77007	40021	18563	42898	5096	7109	2747	2700	17	5	2	0	491	193	2	0	5	0	0	0	5	0	0	196861
5 ARLCR	7089	1298	678	187	1230	4059	765	1573	12	5	0	0	1	0	0	0	0	0	0	0	0	0	0	16897
6 ARNCR	50466	7760	3657	960	12479	35882	8619	23495	211	36	0	0	1	1	0	0	0	0	0	0	2	0	0	143568
7 ALX	23465	3645	1163	619	4985	16762	14608	11163	33	34	0	0	1	1	0	0	2	0	0	0	0	0	0	76480
8 FFX	56412	7703	5047	857	11261	38005	16841	65171	3635	448	0	0	1	2	0	0	2	0	0	0	11	0	0	205396
9 LDN	508	94	319	23	248	748	79	13205	15970	0	0	0	2	0	0	0	2	0	0	0	1	0	0	31196
10 PW	13423	648	120	36	1647	2672	2687	12130	28	13346	0	0	0	0	0	0	0	0	2	0	7	0	0	46746
11 FRD	131	87	4330	54	14	27	4	15	0	0	5091	0	15	1	0	0	0	0	0	0	0	0	0	9769
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	1219	479	2206	1049	73	64	9	34	0	0	0	0	972	18	0	0	0	0	0	0	0	0	0	6123
14 AAR	4114	1610	585	2002	195	236	48	57	0	0	0	0	86	58	8	0	0	0	0	0	0	0	0	8999
15 CAL	1832	1181	103	1195	113	125	58	41	0	0	0	0	0	2	115	0	2	0	0	0	0	0	0	4767
16 STM	303	125	28	155	23	27	15	17	0	0	0	0	0	1	1	19	111	0	0	0	0	0	0	825
17 CHS	5057	2659	216	1285	282	332	276	173	1	0	0	0	0	1	2	0	2155	0	0	0	0	0	0	12437
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	1024	125	13	6	429	611	422	1664	1	348	0	0	0	0	0	0	0	0	7	0	281	0	0	4930
20 CL/JF	2	4	84	1	0	0	0	1	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	95
21 SP/FB	73	9	1	0	28	44	46	241	1	107	0	0	0	0	0	0	0	0	27	0	1195	0	0	1771
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	543591	203165	246856	94051	56251	149672	56003	150921	20082	14387	5193	0	2256	371	131	19	2290	0	37	0	1549	0	0	1546824

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: HOV Auto Person

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	31	3	2	0	0	0	0	0	0	0	0	1	0	0	0	0	37
2 DC NC	0	0	24	0	0	18	121	708	51	7	0	0	0	0	0	0	0	0	0	0	0	0	0	929
3 MTG	1939	705	8262	773	554	925	197	3058	179	6	0	0	6	2	0	0	0	0	0	0	0	0	0	16607
4 PG	2284	721	655	773	700	1406	1992	2837	76	10	1	0	3	0	0	0	0	0	0	0	0	0	0	11457
5 ARLCR	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6 ARNCR	1660	334	182	59	221	346	30	211	21	4	1	0	1	6	0	0	0	0	0	0	0	0	0	3075
7 ALX	2237	562	351	80	533	486	55	993	57	9	1	0	4	3	0	0	0	0	0	0	0	0	0	5371
8 FFX	35116	9742	5601	732	9325	13613	3630	18775	1014	45	7	0	22	6	0	0	1	0	0	1	1	0	0	97630
9 LDN	672	317	1048	54	477	829	268	8176	10	74	4	0	1	0	0	0	0	0	0	0	0	0	0	11929
10 PW	17915	2502	765	497	4414	7365	5659	25348	765	531	2	0	0	1	0	0	0	2	1	0	1	0	0	65768
11 FRD	164	218	6062	351	45	70	8	257	46	1	174	0	17	11	0	0	0	0	0	0	0	0	0	7424
12 CAR	0	3	257	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	264
13 HOW	11	10	166	0	13	18	7	62	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	289
14 AAR	1026	867	375	1989	59	96	98	106	0	0	0	0	8	13	0	0	0	0	0	0	0	0	0	4638
15 CAL	38	35	31	154	16	32	50	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	410
16 STM	15	5	6	8	5	10	20	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93
17 CHS	285	25	58	15	77	157	395	398	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1414
18 FAU	0	0	0	2	8	14	12	746	174	795	0	0	0	0	0	0	0	0	0	0	0	0	0	1751
19 STA	1707	623	137	118	1412	2337	1685	9558	44	398	0	0	0	0	0	0	0	0	0	0	0	0	0	18019
20 CL/JF	4	34	512	10	2	0	0	85	0	6	47	0	0	0	0	0	0	0	0	0	0	0	0	700
21 SP/FB	96	31	8	4	97	164	155	1073	6	162	0	0	0	0	0	0	0	0	0	0	0	0	0	1797
22 KGEO	0	0	0	0	0	0	0	7	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	10
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	65170	16732	24500	5623	17958	27885	14382	72510	2450	2056	237	0	62	42	0	0	1	2	2	1	2	0	0	249615

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: HOV AUTO Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	0	0	0	0	0	0	0	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7
2 DC NC	0	0	3	0	0	7	33	200	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0	258
3 MTG	529	212	2399	228	152	260	58	887	40	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4766
4 PG	630	215	183	228	205	399	576	822	21	4	0	0	1	0	0	0	0	0	0	0	0	0	0	3284
5 ARLCR	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6 ARNCR	473	103	50	20	63	99	14	63	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	890
7 ALX	642	164	103	23	157	142	16	289	18	1	2	0	0	3	0	0	0	0	0	0	0	0	0	1559
8 FFX	9841	2806	1620	208	2656	3923	1047	5420	280	9	1	0	6	1	0	0	0	0	0	0	0	0	0	27819
9 LDN	163	95	281	16	128	212	75	2204	3	19	3	0	2	0	0	0	0	0	0	0	0	0	0	3200
10 PW	4984	716	224	141	1245	2106	1636	7329	221	153	0	0	1	0	0	0	0	0	0	0	1	0	0	18756
11 FRD	46	58	1754	98	16	15	5	71	11	1	50	0	7	0	0	0	0	0	0	0	0	0	0	2132
12 CAR	0	0	74	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
13 HOW	3	1	49	0	1	7	2	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82
14 AAR	285	249	105	581	16	26	28	27	1	0	0	0	2	3	0	0	0	0	0	0	0	0	0	1322
15 CAL	10	9	10	44	4	8	15	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116
16 STM	2	3	3	1	2	2	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
17 CHS	78	6	17	5	23	42	114	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	399
18 FAU	0	0	0	1	2	3	3	214	48	233	0	0	0	0	0	0	0	0	0	0	0	0	0	504
19 STA	466	175	38	34	393	659	478	2729	14	115	0	0	0	0	0	0	0	0	0	0	0	0	0	5101
20 CL/JF	1	9	145	4	1	0	0	24	0	2	11	0	0	0	0	0	0	0	0	0	0	0	0	197
21 SP/FB	26	9	2	0	28	44	46	304	2	47	0	0	0	0	0	0	0	0	0	0	0	0	0	508
22 KGEO	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	18180	4830	7059	1632	5092	7955	4151	20739	679	591	67	0	19	7	0	0	0	0	0	0	1	0	0	71003

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: Auto Driver

ORIGIN | DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	74256	57686	11937	25404	3339	24476	8307	14621	249	247	38	3	334	966	68	79	388	14	107	31	368	1	3520	226439
2 DC NC	149161	508960	121732	140766	10184	53578	15669	33124	866	383	161	20	2555	4735	215	345	1101	48	530	116	1306	10	22689	1068254
3 MTG	59787	123386	2877646	195374	5591	23621	5386	71889	3805	685	27884	2041	51859	14424	128	246	369	147	821	469	2423	12	80152	3548147
4 PG	98637	215755	138533	1861659	6852	22687	37725	45849	598	826	304	195	42805	113193	4329	1445	45317	117	866	131	2364	88	58405	2698681
5 ARLCR	3816	3690	1503	1229	12848	14814	2989	6159	100	85	4	1	14	31	4	1	20	1	8	3	23	0	468	47811
6 ARNCR	41624	31387	13985	9703	20599	388573	50305	138098	2443	1237	28	16	97	232	17	35	151	22	68	21	150	5	7501	706297
7 ALX	22531	16573	4397	16618	8170	71624	222223	114265	571	2127	19	9	59	274	50	74	685	19	160	26	308	6	4046	484835
8 FFX	61778	43347	49698	38034	20959	189061	151368	3220034	208662	113020	584	72	614	3193	314	1281	1972	2083	4070	823	9118	42	39490	4159618
9 LDN	824	828	6445	1562	447	3204	892	177151	1112856	19802	11774	105	389	1833	42	35	259	2719	2151	15546	4424	3	18855	1382147
10 PW	7164	1939	1780	2072	1893	7481	9570	244962	55592	1253975	217	15	226	1267	80	177	260	20145	24938	567	8382	75	18998	1661774
11 FRD	470	736	72868	3832	106	1949	525	2648	8378	571	854317	16407	23093	2940	42	0	131	200	275	9180	140	0	48641	1047450
12 CAR	347	551	9595	3819	89	1652	446	1801	1195	122	32122	424490	29570	3123	32	1	119	9	8	217	0	0	72777	582085
13 HOW	1474	3642	53955	56830	96	445	138	756	188	105	8327	6024	580756	86979	55	47	87	17	179	177	166	2	82134	882578
14 AAR	4705	10598	10361	121245	302	1534	875	2052	459	325	391	325	67071	1427868	4697	343	797	24	289	86	531	13	129302	1784192
15 CAL	899	2314	757	20301	79	512	388	918	179	143	39	9	169	10729	238162	23423	5378	10	260	0	560	59	1570	306857
16 STM	359	607	593	4958	53	854	244	1063	111	151	0	0	158	705	12495	340757	16980	1	963	0	1045	1404	1147	384648
17 CHS	4044	10271	901	74712	251	1309	3910	4732	363	199	17	12	162	1502	6817	12642	477194	78	595	7	827	3821	3331	607698
18 FAU	345	380	1081	889	68	678	290	10813	9183	38817	122	1	130	117	2	6	142	224242	21121	1067	6287	72	10270	326123
19 STA	558	256	182	150	418	813	716	7977	169	29059	3	0	13	51	6	21	40	3391	381906	10	93355	1686	12296	533076
20 CL/JF	315	517	2113	944	65	617	223	1807	22023	630	11829	66	450	532	0	0	6	1330	643	245333	281	0	38424	328148
21 SP/FB	164	202	115	156	57	210	160	1073	118	4037	0	0	0	3	3	34	83	742	46497	2	531313	978	40232	626179
22 KGEO	346	482	225	1159	70	728	294	960	74	586	0	0	22	328	76	487	2087	540	5041	0	6087	75480	2331	97403
23 EXTL	9324	15339	60360	60926	1489	5902	3461	32698	22547	22655	76775	61287	88325	182178	2235	1200	4066	22190	11845	42676	52510	3268	0	783256
TOTAL	542928	1049444	3440762	2642342	94026	816324	516104	4135449	1450728	1489788	1024955	511098	888872	1857204	269869	382679	557633	278089	503341	316488	721969	87025	696579	24273695

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: Auto Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	89919	75944	15639	33872	4285	31376	10932	19401	356	342	55	6	445	1318	93	127	542	23	179	44	649	1	4575	290123
2 DC NC	196459	647251	165431	195291	13070	69866	21024	44855	1259	572	236	29	3449	6563	307	567	1567	82	948	193	2342	17	31273	1402650
3 MTG	75997	165654	3606379	265216	7342	31745	7242	98947	5559	1035	38261	2898	71053	19647	208	408	577	232	1508	745	4461	21	111038	4516174
4 PG	127529	288542	187882	2326935	8841	29882	51605	62910	938	1174	470	268	57362	152810	5937	2098	63773	181	1522	229	4172	124	79678	3454863
5 ARLCR	4891	4809	1960	1622	13387	18650	3904	8019	129	116	5	1	17	42	7	3	29	3	12	3	38	0	668	58315
6 ARNCR	53971	41094	18403	12873	26328	462836	67218	184999	3271	1651	38	19	130	327	29	47	214	32	101	29	253	9	10900	884772
7 ALX	29961	22086	5957	22327	10621	93693	264825	151953	817	2876	37	10	75	390	65	110	943	23	246	44	486	7	5823	613375
8 FFX	99272	61915	70120	52184	31984	260088	203413	4053599	284597	155387	898	124	908	4987	506	2191	2976	2949	6297	1346	14650	65	57872	5368330
9 LDN	1515	1306	9137	2561	868	4925	1378	235203	1338201	26879	15137	148	589	3139	81	61	444	3714	3585	22071	7411	4	26811	1705169
10 PW	20822	4207	3084	3352	5292	15312	16635	347552	76193	1535824	351	25	356	2121	129	313	427	27142	34806	878	11987	111	27998	2134916
11 FRD	766	1187	102625	5893	171	2953	806	4205	12100	948	1022298	23007	30658	4435	75	0	225	342	539	13366	281	0	69314	1296194
12 CAR	511	832	13077	5703	131	2536	711	2880	1966	217	41360	499975	38368	4458	62	1	203	14	17	337	0	0	106819	720178
13 HOW	1906	4721	73391	75805	124	616	196	1075	292	176	11298	8504	667835	115863	87	90	144	23	358	291	327	2	110781	1073905
14 AAR	6597	14335	14399	165271	423	2160	1282	3108	749	534	578	459	93181	1719046	6598	546	1175	39	513	147	983	28	178179	2210330
15 CAL	1200	3015	1117	26611	118	734	571	1393	291	235	65	13	253	14499	270346	31149	7411	15	459	0	1003	77	2369	362944
16 STM	522	852	954	6729	86	1289	359	1681	185	254	0	0	270	1117	16702	392598	23027	1	1641	0	1754	1798	1749	453568
17 CHS	5371	12876	1323	98055	362	1847	5364	6647	604	311	33	16	245	2066	8994	17065	548128	132	1001	13	1359	5072	5046	721930
18 FAU	503	572	1671	1446	100	997	444	16141	12840	51751	197	4	217	202	7	11	241	244786	28808	1516	8796	107	15113	386470
19 STA	1836	733	357	293	1446	2542	1980	15609	253	36918	5	0	20	80	11	32	59	4678	447975	20	125506	2043	17443	659840
20 CL/JF	464	807	3258	1584	93	950	344	2754	30123	972	16034	95	668	920	0	0	9	1958	1128	268831	479	0	56270	387742
21 SP/FB	297	318	173	250	139	402	324	2068	186	5129	0	0	0	4	5	51	129	1055	63935	2	626942	1199	57057	759666
22 KGEO	511	731	347	1873	102	1108	450	1543	134	895	0	0	39	557	111	716	3002	842	7221	0	8309	82040	3441	113972
23 EXTL	12023	21094	82287	79373	1890	8424	4884	46149	29989	29711	98040	82254	115921	242832	2896	1661	5434	28401	16306	55529	73494	4299	0	1042891
TOTAL	732842	1374883	4378972	3385120	127200	1044932	665892	5312692	1801032	1853906	1245396	617855	1082060	2297423	313256	449845	660680	316667	619105	365634	895682	97024	980217	30618315

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: Total Motorized Person

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	158952	99413	24590	39685	9668	47418	14376	25199	412	362	55	6	481	1327	94	127	543	23	180	44	658	1	4575	428189
2 DC NC	361127	732286	206144	219113	21958	90398	25272	52200	1317	596	239	29	3559	6608	309	567	1574	82	948	193	2359	17	31273	1758169
3 MTG	143764	192868	3766459	278306	11219	38141	8331	105045	5614	1048	38358	2898	71593	19686	208	408	581	232	1508	745	4482	21	111038	4802553
4 PG	204536	328563	206445	2369833	13936	36991	54353	65610	955	1179	472	268	57853	153003	5939	2098	63778	181	1522	229	4177	124	79678	3651723
5 ARLCR	11980	6107	2638	1809	14617	22709	4669	9592	141	121	5	1	18	42	7	3	29	3	12	3	38	0	668	75212
6 ARNCR	104436	48854	22060	13833	38806	498718	75837	208494	3482	1687	38	19	131	328	29	47	214	32	101	29	255	9	10900	1028339
7 ALX	53426	25731	7120	22946	15605	110455	279433	163116	850	2910	37	10	76	391	65	110	945	23	246	44	486	7	5823	689855
8 FFX	155684	69618	75168	53041	43245	298093	220254	4118770	288232	155835	898	124	909	4989	506	2191	2978	2949	6297	1346	14661	65	57872	5573725
9 LDN	2023	1400	9456	2584	1115	5673	1457	248408	1354171	26879	15137	148	591	3139	81	61	446	3714	3585	22071	7412	4	26811	1736366
10 PW	34245	4855	3204	3388	6939	17984	19322	359682	76221	1549170	351	25	356	2121	129	313	427	27142	34808	878	11994	111	27998	2181663
11 FRD	897	1274	106955	5947	185	2980	810	4220	12100	948	1027389	23007	30673	4436	75	0	225	342	539	13366	281	0	69314	1305963
12 CAR	511	832	13077	5703	131	2536	711	2880	1966	217	41360	499975	38368	4458	62	1	203	14	17	337	0	0	106819	720178
13 HOW	3125	5200	75597	76854	197	680	205	1109	292	176	11298	8504	668807	115881	87	90	144	23	358	291	327	2	110781	1080028
14 AAR	10711	15945	14984	167273	618	2396	1330	3165	749	534	578	459	93267	1719104	6606	546	1175	39	513	147	983	28	178179	2219328
15 CAL	3031	4196	1220	27806	231	859	629	1435	291	235	65	13	253	14501	270461	31149	7413	15	459	0	1003	77	2369	367711
16 STM	825	977	982	6884	109	1316	374	1698	185	254	0	0	270	1118	16703	392617	23138	1	1641	0	1754	1798	1749	454393
17 CHS	10427	15535	1539	99340	644	2179	5640	6820	605	311	33	16	245	2067	8996	17065	550283	132	1001	13	1359	5072	5046	734368
18 FAU	503	572	1671	1446	100	997	444	16141	12840	51751	197	4	217	202	7	11	241	244786	28808	1516	8796	107	15113	386470
19 STA	2860	858	370	299	1875	3153	2402	17273	254	37266	5	0	20	80	11	32	59	4678	447982	20	125787	2043	17443	664770
20 CL/JF	466	811	3341	1585	93	950	344	2755	30127	972	16034	95	669	920	0	0	9	1958	1128	268831	479	0	56270	387837
21 SP/FB	370	327	174	250	167	446	370	2309	187	5236	0	0	0	4	5	51	129	1055	63962	2	628137	1199	57057	761437
22 KGEO	511	731	347	1873	102	1108	450	1543	134	895	0	0	39	557	111	716	3002	842	7221	0	8309	82040	3441	113972
23 EXTL	12023	21094	82287	79373	1890	8424	4884	46149	29989	29711	98040	82254	115921	242832	2896	1661	5434	28401	16306	55529	73494	4299	0	1042891
TOTAL	1276433	1578047	4625828	3479171	183451	1194604	721895	5463613	1821114	1868293	1250589	617855	1084316	2297794	313387	449864	662970	316667	619142	365634	897231	97024	980217	32165139

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: Transit Percentage

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	43.4	23.6	36.4	14.6	55.7	33.8	24.0	23.0	13.6	5.5	0	0	7.5	0.7	1.1	0	0.2	0	0.6	0	1.4	0	0	32.2
2 DC NC	45.6	11.6	19.7	10.9	40.5	22.7	16.8	14.1	4.4	4.1	1.3	0	3.1	0.7	0.6	0	0.4	0	0	0	0.7	0	0	20.2
3 MTG	47.1	14.1	4.3	4.7	34.6	16.8	13.1	5.8	1.0	1.3	0.3	0	0.8	0.2	0	0	0.7	0	0	0	0.5	0	0	6.0
4 PG	37.6	12.2	9.0	1.8	36.6	19.2	5.1	4.1	1.8	0.5	0.4	0	0.8	0.1	0.0	0	0.0	0	0	0	0.1	0	0	5.4
5 ARLCR	59.2	21.3	25.7	10.3	8.4	17.9	16.4	16.4	8.5	4.1	0	0	5.6	0	0	0	0	0	0	0	0	0	0	22.5
6 ARNCR	48.3	15.9	16.6	6.9	32.2	7.2	11.4	11.3	6.1	2.1	0	0	1.1	0.3	0	0	0	0	0	0	0.8	0	0	14.0
7 ALX	43.9	14.2	16.3	2.7	31.9	15.2	5.2	6.8	3.9	1.2	0	0	0.9	0.2	0	0	0.2	0	0	0	0	0	0	11.1
8 FFX	36.2	11.1	6.7	1.6	26.0	12.7	7.6	1.6	1.3	0.3	0	0	0.1	0.0	0	0	0.1	0	0	0	0.1	0	0	3.7
9 LDN	25.1	6.7	3.4	0.9	22.2	13.2	5.4	5.3	1.2	0	0	0	0.3	0	0	0	0.3	0	0	0	0.0	0	0	1.8
10 PW	39.2	13.4	3.8	1.1	23.7	14.9	13.9	3.4	0.0	0.9	0	0	0	0	0	0	0	0	0.0	0	0.1	0	0	2.1
11 FRD	14.6	6.8	4.0	0.9	7.7	0.9	0.5	0.4	0	0	0.5	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0.7
12 CAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 HOW	39.0	9.2	2.9	1.4	37.2	9.4	4.3	3.1	0	0	0	0	0.1	0.0	0	0	0	0	0	0	0	0	0	0.6
14 AAR	38.4	10.1	3.9	1.2	31.6	9.9	3.6	1.8	0	0	0	0	0.1	0.0	0.1	0	0	0	0	0	0	0	0	0.4
15 CAL	60.4	28.1	8.4	4.3	49.1	14.5	9.2	2.9	0	0	0	0	0	0.0	0.0	0	0.0	0	0	0	0	0	0	1.3
16 STM	36.7	12.8	2.9	2.3	21.0	2.0	4.1	1.0	0	0	0	0	0	0.1	0.0	0.0	0.5	0	0	0	0	0	0	0.2
17 CHS	48.5	17.1	14.0	1.3	43.8	15.2	4.9	2.5	0.1	0	0	0	0	0.0	0.0	0	0.4	0	0	0	0	0	0	1.7
18 FAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 STA	35.8	14.5	3.5	1.9	22.9	19.4	17.6	9.6	0.4	0.9	0	0	0	0	0	0	0	0	0.0	0	0.2	0	0	0.7
20 CL/JF	0.4	0.4	2.5	0.0	0	0	0	0.0	0.0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.0
21 SP/FB	19.6	2.6	0.5	0	16.7	9.9	12.4	10.4	0.5	2.0	0	0	0	0	0	0	0	0	0.0	0	0.2	0	0	0.2
22 KGEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 EXTL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	42.6	12.9	5.3	2.7	30.7	12.5	7.8	2.8	1.1	0.8	0.4	0	0.2	0.0	0.0	0.0	0.3	0	0.0	0	0.2	0	0	4.8

Simulation - Year: 2030 Alt: Version2.2 Iter. i6 * W/Tran.Constraint *
Purpose: ALL MODE: Avg. Auto Occupancy

ORIGIN \ DESTINATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1 DC CR	1.21	1.32	1.31	1.33	1.28	1.28	1.32	1.33	1.43	1.38	1.45	2.00	1.33	1.36	1.37	1.61	1.40	1.64	1.67	1.42	1.76	1.00	1.30	1.28
2 DC NC	1.32	1.27	1.36	1.39	1.28	1.30	1.34	1.35	1.45	1.49	1.47	1.45	1.35	1.39	1.43	1.64	1.42	1.71	1.79	1.66	1.79	1.70	1.38	1.31
3 MTG	1.27	1.34	1.25	1.36	1.31	1.34	1.34	1.38	1.46	1.51	1.37	1.42	1.37	1.36	1.63	1.66	1.56	1.58	1.84	1.59	1.84	1.75	1.39	1.27
4 PG	1.29	1.34	1.36	1.25	1.29	1.32	1.37	1.37	1.57	1.42	1.55	1.37	1.34	1.35	1.37	1.45	1.41	1.55	1.76	1.75	1.76	1.41	1.36	1.28
5 ARLCR	1.28	1.30	1.30	1.32	1.04	1.26	1.31	1.30	1.29	1.36	1.25	1.00	1.21	1.35	1.75	3.00	1.45	3.00	1.50	1.00	1.65	0	1.43	1.22
6 ARNCR	1.30	1.31	1.32	1.33	1.28	1.19	1.34	1.34	1.34	1.33	1.36	1.19	1.34	1.41	1.71	1.34	1.42	1.45	1.49	1.38	1.69	1.80	1.45	1.25
7 ALX	1.33	1.33	1.35	1.34	1.30	1.31	1.19	1.33	1.43	1.35	1.95	1.11	1.27	1.42	1.30	1.49	1.38	1.21	1.54	1.69	1.58	1.17	1.44	1.27
8 FFX	1.61	1.43	1.41	1.37	1.53	1.38	1.34	1.26	1.36	1.37	1.54	1.72	1.48	1.56	1.61	1.71	1.51	1.42	1.55	1.64	1.61	1.55	1.47	1.29
9 LDN	1.84	1.58	1.42	1.64	1.94	1.54	1.54	1.33	1.20	1.36	1.29	1.41	1.51	1.71	1.93	1.74	1.71	1.37	1.67	1.42	1.68	1.33	1.42	1.23
10 PW	2.91	2.17	1.73	1.62	2.80	2.05	1.74	1.42	1.37	1.22	1.62	1.67	1.58	1.67	1.61	1.77	1.64	1.35	1.40	1.55	1.43	1.48	1.47	1.28
11 FRD	1.63	1.61	1.41	1.54	1.61	1.51	1.54	1.59	1.44	1.66	1.20	1.40	1.33	1.51	1.79	0	1.72	1.71	1.96	1.46	2.01	0	1.43	1.24
12 CAR	1.47	1.51	1.36	1.49	1.47	1.54	1.59	1.60	1.65	1.78	1.29	1.18	1.30	1.43	1.94	1.00	1.71	1.56	2.13	1.55	0	0	1.47	1.24
13 HOW	1.29	1.30	1.36	1.33	1.29	1.38	1.43	1.42	1.55	1.68	1.36	1.41	1.15	1.33	1.58	1.91	1.66	1.35	2.00	1.64	1.97	1.00	1.35	1.22
14 AAR	1.40	1.35	1.39	1.36	1.40	1.41	1.47	1.51	1.63	1.64	1.48	1.41	1.39	1.20	1.40	1.59	1.47	1.63	1.78	1.71	1.85	2.15	1.38	1.24
15 CAL	1.33	1.30	1.48	1.31	1.50	1.43	1.47	1.52	1.63	1.64	1.67	1.44	1.50	1.35	1.14	1.33	1.38	1.50	1.77	0	1.79	1.31	1.51	1.18
16 STM	1.45	1.40	1.61	1.36	1.62	1.51	1.47	1.58	1.67	1.68	0	0	1.71	1.58	1.34	1.15	1.36	1.00	1.70	0	1.68	1.28	1.52	1.18
17 CHS	1.33	1.25	1.47	1.31	1.44	1.41	1.37	1.40	1.66	1.56	1.94	1.33	1.51	1.38	1.32	1.35	1.15	1.69	1.68	1.86	1.64	1.33	1.51	1.19
18 FAU	1.46	1.51	1.55	1.63	1.47	1.47	1.53	1.49	1.40	1.33	1.61	4.00	1.67	1.73	3.50	1.83	1.70	1.09	1.36	1.42	1.40	1.49	1.47	1.19
19 STA	3.29	2.87	1.96	1.96	3.46	3.13	2.77	1.96	1.50	1.27	1.67	0	1.54	1.57	1.83	1.52	1.48	1.38	1.17	2.00	1.34	1.21	1.42	1.24
20 CL/JF	1.47	1.56	1.54	1.68	1.43	1.54	1.54	1.52	1.37	1.54	1.36	1.44	1.48	1.73	0	0	1.50	1.47	1.75	1.10	1.70	0	1.46	1.18
21 SP/FB	1.81	1.58	1.50	1.60	2.46	1.91	2.02	1.93	1.58	1.27	0	0	0	1.33	1.67	1.50	1.55	1.42	1.38	1.00	1.18	1.23	1.42	1.21
22 KGEO	1.48	1.52	1.54	1.62	1.46	1.52	1.53	1.61	1.81	1.53	0	0	1.77	1.70	1.46	1.47	1.44	1.56	1.43	0	1.37	1.09	1.48	1.17
23 EXTL	1.29	1.38	1.36	1.30	1.27	1.43	1.41	1.41	1.33	1.31	1.28	1.34	1.31	1.33	1.30	1.38	1.34	1.28	1.38	1.30	1.40	1.32	0	1.33
TOTAL	1.35	1.31	1.27	1.28	1.35	1.28	1.29	1.28	1.24	1.24	1.22	1.21	1.22	1.24	1.16	1.18	1.18	1.14	1.23	1.16	1.24	1.11	1.41	1.26

Appendix D Year 2030 mode choice summary with 2010 transit constraint through the regional core (final, i6, iteration)

Appendix E. TP+ Scripts

1 Auto_Access.s

```
;-----------------------------------------------------------------------
;Auto_Access.s
;MWCOG VERSION 2.2 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(1/10ths of mi)
;                                           3- tolls   (1994 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   ;
```

2 CV_Time-of-Day.S

```
;---------------------------------------------------------------------------
; CV_Time-of-Day.S
;  Version 2.2 Model
;  MWCOG Light Commercial Vehicle Model
;   1/11/07
;   By Bill Allen, Modified by Milone for application in V2.2 model
;
;
;---------------------------------------------------------------------------
maxzones = 2191
intzones = 2144
fext     = intzones + 1
out_tab  = '%_iter_%tmcom.trp'
run pgm=matrix

  id = "Commercial time of day

  mati[1] =  com.trp
  mati[2] =  inputs\xxcv.vtt
  mati[3] = ..\support\CV_delta.trp
  mato    = @out_tab@, mo=5-7, name=AMCOM,PMCOM,OPCOM, dec = 3*S

; I/I trips are already balanced, so we can apply a single factor
;  to all trips.  Apply separate P/A and A/P factors to externals.
;  Assume externals are 70/30 inbound (X/I, or A/P) in the morning,
;  70/30 outbound (I/X, P/A) in the evening.  Off-peak is 50/50.
  mw[1] = mi.1.COMII
  mw[2] = mi.1.COMEXT           ; P/A (outbound)
  mw[3] = mi.1.COMEXT.t         ; A/P (inbound)

; Also add in the X/X's.
  mw[4] = mi.2.1

; Read and transpose the external delta
  mw[11] = mi.3.1
  mw[12] = mi.3.2
  mw[13] = mi.3.2.t

; Add in the deltas.  First, for I/I and Ext (I/X).
  if (i = 1-@intzones@)
    jloop
      mw[21] = max(mw[1] + mw[11],0)
      mw[22] = max(mw[2] + mw[12],0)
    endjloop
  endif

  if (i > @intzones@)
; Now for Ext transposed (X/I).
    mw[23] = max(mw[3] + mw[13],0), include = 1-@intzones@

; Now for X/X.
    mw[24] = max(mw[4] + mw[12],0), include = @fext@-@maxzones@
  endif

; Use proposed new COM TOD factors
  mw[5] = 0.23 * (mw[21] + mw[24] + 0.7 * mw[23] + 0.3 * mw[22])  ; AM
  mw[6] = 0.27 * (mw[21] + mw[24] + 0.3 * mw[23] + 0.7 * mw[22])  ; PM
  mw[7] = 0.50 * (mw[21] + mw[24] + 0.5 * mw[23] + 0.5 * mw[22])  ; OP

endrun
```

3 CV_Trip_Distributions.S

```
;---------------------------------------------------------------------------
; CV_Trip_Distributions.S
;  Version 2.2 Model
;  MWCOG Light Commercial Vehicle Model
;   1/11/07
;   By Bill Allen, Modified by Milone for application in V2.2 model
;
;
;---------------------------------------------------------------------------

maxzones = 2191
intzones = 2144
fext     = intzones + 1

;---------------------------------------------------------------------
run pgm=tripdist

  id = "Commercial Trip Distribution

; Skims
  mati = SOVOPTT.SKF

; Trip ends
  zdati = comte.txt z=#1,p1=#2,a1=#3,p2=#4,a2=#5

; Output
  mato = com.trp, mo=1,2, name = COMII,COMEXT, dec=2*S

; Set maximum iterations, unless RMSE for all purposes is met.
  maxiters = 20, maxrmse = 10

; Set productions and attractions
  setpa p[1]=p1, a[1]=a1, p[2]=p2, a[2]=a2

; Get skims.
  mw[5] = mi.1.1

; Look up friction factors.  QRFM F's will be used for BOTH I/I & Extl trips
;                            per Allen/Milone discussion on 1/12/07
  lookup file=..\support\CV_Int_Ext.ffs, name=ff,
    lookup[1]=1, result=2,
    lookup[2]=1, result=2,
    interpolate=y,
    fail=1800,0,0

; Distribute trips on off-peak skim time.
  gravity purpose=1, los = mw[5], ffactors=ff
  gravity purpose=2, los = mw[5], ffactors=ff

; Trip end report
  report margins = 1,2

endrun
;---------------------------------------------------------------------
run pgm=matrix
```

```
  id = "Commercial TLFDs

;  Input files: trips, skims
  mati[1] = com.trp
  mati[2] = SOVOPTT.SKF

; Get trips.
  mw[1] = mi.1.1       ; COM I/I
  mw[2] = mi.1.2       ; COM Ext

; Time.
  mw[3] = mi.2.1

; TLF
  frequency basemw=3, valuemw=1, range=0-90-2,
  title='Est Commercial I/I Trips vs. Off-Peak Hwy Time'
  frequency basemw=3, valuemw=2, range=0-90-2,
  title='Est Commercial Ext Trips vs. Off-Peak Hwy Time'

endrun
```

4 CV_Trip_ Generation.S

```
;-----------------------------------------------------------------------
; CV_Trip_Generation.S
;  Version 2.2 Model
;  MWCOG Light Commercial Vehicle Model
;   1/11/07
;   By Bill Allen, Modified by Milone for application in V2.2 model
;
;-----------------------------------------------------------------------
;
maxzones = 2191
intzones = 2144
fext     = intzones + 1


run pgm=tripgen

  id = "Commercial Trip Generation

; Input Zonal Data and special generator factors

  zdati[1] = inputs\zone.asc, z=1-4, hh=10-15, hhpop=16-23, gqpop=24-31,
    totpop=32-39, totemp=40-47, indemp=48-55, retemp=56-63,
    offemp=64-71, othemp=72-79, jur=80-81, area=82-92, incrat=93-95,
    extdist=96-98

; COM external and X/X trip ends (forecasted with FCASTXX.S)
  zdati[2] = inputs\CV_ExtThru_Ends.asc, z = #1, extte = #2

; Zonal area type
  zdati[3] = atype.asc, z = #1, atype = #11

; Output P/A file: 1 = I/I, 2 = external
  pao = comte.txt form=8.0 list= z(5.0), p[1],a[1],p[2],a[2]  print=y

  zones = @maxzones@

; Look up area type factors
  lookup name=atcom, interpolate=n, fail=1.0,1.0,1.0,
    r = '1.05  1',
        '0.90  2',
        '1.20  6',
        '1.15  7'

; Apply equation to internal zones
  if (i <= @intzones@)

; AT-based adjustment factor.
    atfac = atcom(atype)

; Calculate commercial productions
; Incorporate adjustments from the delta trip end analysis
    cmp = (0.056 * indemp + 0.168 * offemp +
           0.494 * retemp + 0.082 * othemp + 0.130 * HH) * ATFAC
;  Apply external trip end share model.
;  External share is a declining function of the zone's distance to the
;   nearest cordon station (in miles).  This particular model is an
;   amalgam of the Berks Co, PA purpose-specific models, modified
;   to produce the correct number of external trips in 2000.
    extpct = 0.0
    if (extdist > 0) extpct = 1.73 * extdist^-1.2
    extpct = max(min(extpct,1.0),0)
    intpct = 1.0 - extpct

; Apply internal trip end shares; set A's equal to P's
    p[1] = cmp * intpct
    a[1] = p[1]

; Define all external trip ends as "Productions" at the internal
;  zones and "Attractions" at the external stations.  Calculate
;  these (initially) for internal zones as what's left over
;  after the above calculation.
    p[2] = cmp * extpct
  endif

; External trip ends.  These were calculated externally, in
;  COM Externals.xls  These are defined as
;  Attractions, at the external stations.
  if (i > @intzones@)
    p[1] = 0
    p[2] = 0
    a[1] = 0
    a[2] = extte
  endif

  phase = adjust

; Normalize external trips to the attractions (input at the external
;  stations).
    p[2] = p[2] * a[2][0]/p[2][0]

  endphase

endrun
```

5 Demo_Models.s

```
;=================================================================
;  Demo_Models.S
;
;   Version 2.2  Demographic Model
;
;   The models have been updated using the 2000 CTPP data.
;   Program to Allocate total zonal households among 64 classes:
;   4 HH Size groups by 4 Income Groups by 4 Veh. Avail. groups
;
;   Programmer: Milone
;   Date:      01/11/07
;   refinements to income curves on 11/09/06 rm/ms
;=================================================================
;
;
ZONESIZE    =  2191                  ;  No. of TAZs
LastIZn     =  2144                  ;  Last Internal TAZ no.

JURSIZE     =  24                    ;  Transformed JURIS. Code  ( 0-23 becomes 1-
24)
Areasize    =   7                    ;  No. of Area Types
SzCl        =   4                    ;  No. of HH Size   Classes
InCl        =   4                    ;  No. of Income    Classes
VaCl        =   4                    ;  No. of Veh Avail Classes

SICells     =   SzCl*10    + InCl    ;  No. of Size by Inc matrix cells
SIVCells    =   SICells*10 + VaCl    ;  No. of Size by Inc. by Veh Avail. matrix
cells
VSCells     =   VaCl*10    + SzCl    ;  No. of VA   by Size matrix cells
VICells     =   VaCl*10    + InCl    ;  No. of VA   by Inc. matrix cells

JSCells     =   JURSIZE*10 + SzCl    ;  No. of Juris by Size matrix cells
JICells     =   JURSIZE*10 + InCl    ;  No. of Juris by Inc. matrix cells
JVCells     =   JURSIZE*10 + VaCl    ;  No. of Juris by Va. matrix cells

ASCells     =   Areasize  *10 + SzCl ;  No. of Area Types  by Size matrix cells
AICells     =   Areasize  *10 + InCl ;  No. of Area Types  by Inc. matrix cells
AVCells     =   Areasize  *10 + VaCl ;  No. of Area Types  by Va. matrix cells

ZNFILE_IN1  = 'INPUTS\ZONE.ASC'      ;  Input  Zonal Land Use File

ZNFILE_IN2  = 'BASEZON.DAT'          ;  Input  Zonal Area Type File from network
building

Rept        = 'Demo_Models.txt'      ;  Summary Reports

ZNFILE_IN3  = 'JOBACC.ASC'           ;  Input  Zonal Transit Accessibility to Jobs

ZNFILE_OU1  = 'HHI1_SV.ASC'          ;  Output Zonal Income 1 HH by Size& VehAv
Classes: i1s1v1,i1s1v2,...,i1s4v4
ZNFILE_OU2  = 'HHI2_SV.ASC'          ;  Output Zonal Income 2 HH by Size& VehAv
Classes: i2s1v1,i2s1v2,...,i2s4v4
ZNFILE_OU3  = 'HHI3_SV.ASC'          ;  Output Zonal Income 3 HH by Size& VehAv
Classes: i3s1v1,i3s1v2,...,i3s4v4
ZNFILE_OU4  = 'HHI4_SV.ASC'          ;  Output Zonal Income 4 HH by Size& VehAv
Classes: i4s1v1,i4s1v2,...,i4s4v4

ZNFILE_OU5  = 'HH_Veh.Dat'           ;  Output zonal file for Mode Choice: HHs by
Veh. Av. groups (HHw/0, HHw/1, HHw/2+ Vehs)

Ofmt        = '(12.2)'               ;  Format of Output file data  Note:
Integer/real Spec. Here!
```

```
RUN PGM=MATRIX
ZONES=@ZONESIZE@

;
; Set up zone arrays for accumulating I/O variables
;
;


ARRAY ISZA     = @SzCl@,            ;  Initial  Marginal HH Totals by size levels
      IINA     = @InCl@,            ;  Initial  Marginal HH Totals by income levels
      CSZA     = @SzCl@,            ;  Computed Marginal HH Totals by size levels
      CINA     = @InCl@,            ;  Computed Marginal HH Totals by income levels
      CSZAdjA  = @Incl@,            ;  Marginal HH  adjustment ftr by Income class
      CINAdjA  = @SzCl@,            ;  Marginal Inc adjustment ftr by HH size class
      CSZINA   = @SICells@,         ;  HH Size by Income level Matrix,
11,12,13,...,44
      P_VA     = @VaCl@,            ;  Veh Avail  probabilities
      CVAA     = @VaCl@,            ;  Veh Avail  Totals
      CSZINVAA = @SIVCells@,        ;  Veh Avail by HH Size by Inc Matrix,
111,112,113,...,444

      JurA    = @Jursize@,          ;  Juris. HH Totals  array
      JurSzA  = @JSCells@,          ;  Juris. HH by size array
      JurInA  = @JICells@,          ;  Juris. HH by Inc  array
      JurVaA  = @JVCells@,          ;  Juris. HH by VeAv array

      RegSzA  = @SzCl@,             ;  Regional HH by Size array
      RegInA  = @InCl@,             ;  Regional HH by Inc  array
      RegVaA  = @VaCl@,             ;  Regional HH by VeAv array

      RegSzInA   = @SIcells@,       ;  Regional Size by Inc  array
      RegSzInVaA = @SIVcells@,      ;  Regional Size by Inc  by vehav array

      RegVaSzA   = @VScells@,       ;  Regional V    by S    matrix
      RegVaInA   = @VScells@,       ;  Regional V1   by S2   matrix


      HH_ArS1A = @AreaSize@, HH_ArS2A= @AreaSize@, HH_ArS3A= @AreaSize@,
HH_ArS4A=@AreaSize@, HH_ArSTA=@AreaSize@,
      HH_ArI1A = @AreaSize@, HH_ArI2A= @AreaSize@, HH_ArI3A= @AreaSize@,
HH_ArI4A=@AreaSize@, HH_ArITA=@AreaSize@,
      HH_ArV1A = @AreaSize@, HH_ArV2A= @AreaSize@, HH_ArV3A= @AreaSize@,
HH_ArV4A=@AreaSize@, HH_ArVTA=@AreaSize@,
      HH_ArCoopT =  @AreaSize@

;=========================
; Define Loop-up Tables  =
;=========================
;
;============================================================
; HH Size Distribution from 2000 CTPP                       =
;============================================================
;
      LOOKUP Name=SZPCTA,
             LOOKUP[1]   = 1,Result = 2,
             LOOKUP[2]   = 1,Result = 3,
             LOOKUP[3]   = 1,Result = 4,
             LOOKUP[4]   = 1,Result = 5,
             Interpolate = N, FAIL=0,0,0,
 ;     Avg HHSize   PctHH1psn PctHH2psn PctHH3Psn PctHH4+Psn

   R="   1.0,          100.0,     0.0,      0.0,      0.0",
     "   1.1,           86.7,    10.5,      1.0,      1.8",
     "   1.2,           78.2,    15.8,      4.1,      1.9",
     "   1.3,           72.7,    20.4,      4.9,      2.0",
```

```
   "   1.4,          67.1,    24.7,     5.8,     2.4",
   "   1.5,          63.0,    27.1,     6.7,     3.2",
   "   1.6,          59.0,    28.9,     7.9,     4.2",
   "   1.7,          55.2,    30.2,     8.7,     5.9",
   "   1.8,          50.9,    31.1,    10.1,     7.9",
   "   1.9,          46.7,    31.7,    11.5,    10.1",
   "   2.0,          42.8,    32.1,    12.7,    12.4",
   "   2.1,          39.0,    32.3,    14.0,    14.7",
   "   2.2,          35.5,    32.4,    15.0,    17.1",
   "   2.3,          32.2,    32.4,    16.0,    19.4",
   "   2.4,          29.1,    32.3,    16.9,    21.7",
   "   2.5,          26.3,    32.1,    17.6,    24.0",
   "   2.6,          23.8,    31.9,    18.2,    26.1",
   "   2.7,          21.5,    31.5,    18.7,    28.3",
   "   2.8,          19.4,    31.1,    19.2,    30.3",
   "   2.9,          17.4,    30.5,    19.8,    32.3",
   "   3.0,          15.6,    29.8,    20.3,    34.3",
   "   3.1,          14.0,    28.9,    20.7,    36.4",
   "   3.2,          12.6,    27.9,    20.8,    38.7",
   "   3.3,          11.3,    26.6,    20.9,    41.2",
   "   3.4,          10.2,    25.0,    20.8,    44.0",
   "   3.5,          09.2,    23.2,    20.4,    47.2",
   "   3.6,          08.3,    21.2,    19.6,    50.9",
   "   3.7,          07.5,    18.9,    18.4,    55.2",
   "   3.8,          06.7,    15.6,    17.4,    60.3",
   "   3.9,          05.9,    11.2,    16.5,    66.4"


;==============================================================
;    income level distribution from 2000 CTPP                 =
;==============================================================
;
      LOOKUP Name=INPCTA,
             LOOKUP[1]   = 1,Result = 2,
             LOOKUP[2]   = 1,Result = 3,
             LOOKUP[3]   = 1,Result = 4,                    ;
             LOOKUP[4]   = 1,Result = 5,                    ;  proportion of
             Interpolate = N, FAIL=0,0,0,                   ;  zonal median inc.
; inc level:   QRT1      QRT2     QRT3     QRT4             ; to regional median
income
  R="   0,    100.0,     0.0,      0.0,     0.0",     ; 0.0  inc ratio
    "   1,     87.9,     7.2,      3.9,     1.0",     ; 0.1  inc ratio
    "   2,     79.4,    12.9,      5.2,     2.5",     ; 0.2  inc ratio
    "   3,     72.1,    17.7,      7.0,     3.2",     ; 0.3  inc ratio
    "   4,     63.3,    21.9,     10.5,     4.3",     ; 0.4  inc ratio
    "   5,     54.1,    25.3,     14.9,     5.7",     ; 0.5  inc ratio
    "   6,     45.2,    27.5,     19.5,     7.8",     ; 0.6  inc ratio
    "   7,     37.2,    28.7,     23.8,    10.3",     ; 0.7  inc ratio
    "   8,     30.2,    28.7,     27.4,    13.7",     ; 0.8  inc ratio
    "   9,     24.4,    27.7,     30.2,    17.7",     ; 0.9  inc ratio
    "  10,     19.9,    26.0,     32.1,    22.0",     ; 1.0  inc ratio
    "  11,     16.4,    23.8,     33.1,    26.7",     ; 1.1  inc ratio
    "  12,     13.8,    21.2,     33.2,    31.8",     ; 1.2  inc ratio
    "  13,     12.0,    18.6,     32.6,    36.8",     ; 1.3  inc ratio
    "  14,     10.7,    16.1,     31.3,    41.9",     ; 1.4  inc ratio
    "  15,      9.8,    13.8,     29.7,    46.7",     ; 1.5  inc ratio
    "  16,      9.1,    11.9,     27.7,    51.3",     ; 1.6  inc ratio
    "  17,      8.4,    10.4,     25.6,    55.6",     ; 1.7  inc ratio
    "  18,      7.7,     9.4,     23.5,    59.4",     ; 1.8  inc ratio
    "  19,      7.0,     8.7,     21.5,    62.8",     ; 1.9  inc ratio
    "  20,      6.4,     8.4,     19.7,    65.5",     ; 2.0  inc ratio
    "  21,      5.7,     8.2,     18.2,    67.9",     ; 2.1  inc ratio
    "  22,      5.2,     8.1,     16.8,    69.9",     ; 2.2  inc ratio
    "  23,      5.0,     8.0,     15.7,    71.3",     ; 2.3  inc ratio
    "  24,      4.7,     7.8,     15.1,    72.4",     ; 2.4  inc ratio
    "  25,      4.6,     7.6,     14.5,    73.3",     ; 2.5  inc ratio
    "  26,      4.5,     7.0,     14.3,    74.2",     ; 2.6  inc ratio
    "  27,      4.3,     6.8,     14.0,    74.9",     ; 2.7  inc ratio
    "  28,      4.3,     6.6,     13.3,    75.8",     ; 2.8  inc ratio
    "  29,      4.0,     6.0,     13.3,    76.7",     ; 2.9  inc ratio
    "  30,      3.6,     5.4,     13.4,    77.6",     ; 3.0  inc ratio
    "  31,      3.1,     4.9,     13.5,    78.5",     ; 3.1  inc ratio
    "  32,      3.1,     4.6,     12.9,    79.4",     ; 3.2  inc ratio
    "  33,      2.9,     4.3,     12.5,    80.3",     ; 3.3  inc ratio
    "  34,      2.7,     3.9,     12.2,    81.2",     ; 3.4  inc ratio
    "  35,      2.5,     3.5,     11.9,    82.1",     ; 3.5  inc ratio
    "  36,      2.2,     3.1,     11.7,    83.0",     ; 3.6  inc ratio
    "  37,      2.0,     2.7,     11.4,    83.9"      ; 3.7  inc ratio

;==============================================================
; Initial Joint HH Size x Income Distribution from 2000 CTPP  =
;==============================================================

      LOOKUP Name=I_SPCTA, LOOKUP[1] = 1,Result = 2,
             Interpolate = N, FAIL=0,0,0,
;            Size_Inc Initial
;             Class   Pct
;             -----   ----
          R="  11,    45.51 ",  ;  Pct of Size 1 HHs in Inc 1 Group
            "  12,    29.18 ",  ;             1            2
            "  13,    18.47 ",  ;             1            3
            "  14,     6.84 ",  ;             .            .
            "  21,    18.77 ",  ;             .            .
            "  22,    22.26 ",  ;        .    .            .
            "  23,    29.81 ",  ;
            "  24,    29.16 ",  ;
            "  31,    16.61 ",  ;     .
            "  32,    20.66 ",  ;
            "  33,    31.27 ",  ;
            "  34,    31.46 ",  ;
            "  41,    13.32 ",  ;     .
            "  42,    19.65 ",  ;             4            2
            "  43,    32.53 ",  ;             4            3
            "  44,    34.50 "   ;             4            4


;==============================================================
; Final Size and Income factors based on area type            =
; Factors are Unused (set to 1.0) but available if needed     =
;==============================================================

      LOOKUP Name=AreaSizFtr,
       LOOKUP[1] = 1,Result = 2,
       LOOKUP[2] = 1,Result = 3,
       LOOKUP[3] = 1,Result = 4,
       LOOKUP[4] = 1,Result = 5,
             Interpolate = N, FAIL=0,0,0,
;             Area    Size1  Size2  Size3  Size4
;             Type    Factor Factor Factor Factor
;             -----   -----  -----  -----  -----
          R="  1,     1.00    1.00   1.00   1.00   ",
            "  2,     1.00    1.00   1.00   1.00   ",
            "  3,     1.00    1.00   1.00   1.00   ",
            "  4,     1.00    1.00   1.00   1.00   ",
            "  5,     1.00    1.00   1.00   1.00   ",
            "  6,     1.00    1.00   1.00   1.00   ",
            "  7,     1.00    1.00   1.00   1.00   "

      LOOKUP Name=AreaIncFtr,
       LOOKUP[1] = 1,Result = 2,
       LOOKUP[2] = 1,Result = 3,
       LOOKUP[3] = 1,Result = 4,
       LOOKUP[4] = 1,Result = 5,
             Interpolate = N, FAIL=0,0,0,
;             Area    Inc1   Inc2   Inc3   Inc4
;             Type    Factor Factor Factor Factor
```

```
;           -----  -----  -----  -----  -----
         R="  1,     1.00   1.00   1.00   1.00    ",
           "  2,     1.00   1.00   1.00   1.00    ",
           "  3,     1.00   1.00   1.00   1.00    ",
           "  4,     1.00   1.00   1.00   1.00    ",
           "  5,     1.00   1.00   1.00   1.00    ",
           "  6,     1.00   1.00   1.00   1.00    ",
           "  7,     1.00   1.00   1.00   1.00    "


;====================================================================================
==
;   Coefficients for the Veh Avail Model - provided as variables instead of lookups
=
;====================================================================================
==
; Original V2.1D#50 Alt-Specific Constants:
;v1_constant= 0.0  v2_constant= 1.598800000   v3_constant= -1.460800000
v4_constant= -4.302100000

; Final/adjusted Alt-Specific Constants (to match 2000 CTPP totals):
 v1_constant= 0.0  v2_constant= 1.013800000   v3_constant= -2.338100000
v4_constant= -5.171000000
 v1_idum1   = 0.0  v2_idum1   =  .000000000   v3_idum1   =   .000000000   v4_idum1
=   .000000000
 v1_idum2   = 0.0  v2_idum2   = 1.237600000   v3_idum2   =  1.789200000   v4_idum2
=  1.822100000
 v1_idum3   = 0.0  v2_idum3   = 1.328500000   v3_idum3   =  2.483100000   v4_idum3
=  2.739500000
 v1_idum4   = 0.0  v2_idum4   = 1.999100000   v3_idum4   =  3.737200000   v4_idum4
=  4.198700000
 v1_hh      = 0.0  v2_hh      =  .000000000   v3_hh      =   .870000000   v4_hh
=  1.302600000
 v1_TrnAcc  = 0.0  v2_TrnAcc  = -.000001095   v3_TrnAcc  =  -.000001815   v4_TrnAcc
=  -.000002053
 v1_Atype   = 0.0  v2_Atype   =  .066800000   v3_Atype   =   .278300000   v4_Atype
=   .409300000
 v1_DcDum   = 0.0  v2_DcDum   = -.924600000   v3_DcDum   = -1.075100000   v4_DcDum
= -1.633400000



;====================================================================================
==================
;
=
; End of LookUps  Now read the input files
=
;====================================================================================
==================

;
; read Zonal land use files  into Z-File
;

ZDATI[1] = @ZNFILE_IN1@,Z       =  1- 4,
                        HH      =  8-15,
                        HHPOP   = 16-23,
                        JURCODE = 80-81,
                        INCRAT  = 93-95

; Zonal Area Type File
ZDATI[2] = @ZNFILE_IN2@,Z       =  1- 5,
                        ATYPE   = 58-59
                        Atype   = zi.2.ATYPE[I]
```

```
; Zonal Transit Acces. File
ZDATI[3] = @ZNFILE_IN3@,Z        =  1- 5,
                        TrnAcc    = 32-40



;
; establish variables
;
                       HH      =  zi.1.HH[I]
                       HHPOP   =  zi.1.HHPOP[I]
                       IncRat  =  zi.1.INCRAT[I]
                       Atype   =  zi.2.ATYPE[I]
                       TrnAcc  =  zi.3.TrnAcc[I]

                       IF( HH>HHPOP)
                           HH=HHPOP
                       ENDIF

                       HH_IP_Total = HH_IP_Total + HH  ; Input HH Total (to check
O/P Total)

; Compute HH Size rounded to nearest 1/10th (K.Vaughn fix)
                       If (HH == 0)
                              AvHHSz = 1.0
                          Else
                              AvHHSz10ths = Round(HHPOP/HH * 10.0)
; compute Avg HH Size in tenths
                              AvHHSztrue  = AvHHSz10ths/10.0
; compute Avg HH Size actual
                              AvHHSz      = MIN(AvHHSztrue,3.9)
;
                       Endif


; Compute Juris. index 1-24 / compute DC dummy code for VA model

                       Jdx = zi.1.JURCODE + 1

                       IF (zi.1.JURCODE  = 0)
                            DCDUM = 1
                          ELSE
                            DCDUM = 0
                       ENDIF

; Accumulate jurisdiction level & total land use values
;

;-----------------------------------------------------------------------
;Begin Matrix Work Now ...
;-----------------------------------------------------------------------


; Clear all initial/computed arrays, establish initial marginal controls

Loop sz = 1, @SzCl@
     Loop in = 1, @InCl@
          IDX = sz * 10.0 + in ; 2-digit index, 1st=HHsize& 2nd=Inc.level
          CSZINA[IDX] = 0      ; initial matrix cell value
     EndLoop
EndLoop

Loop IDX=1,@SzCl@
         ISZA[IDX] = 0
         CSZA[IDX] = 0
         ISZA[IDX] = HH * (SZPCTA(IDX,AvHHSz)/100.0)
EndLOOP
```

```
Loop IDX=1,@InCl@
         IInA[IDX] = 0
         CInA[IDX] = 0
         IInA[IDX] = HH * (INPCTA(IDX,IncRat)/100.0)
EndLOOP

;** Debug 1 On **
;* if (I==1)
;*     Print List = I(5),HHPOP(10),HH(10.0),Incrat(10.2),
AvHHSz(10.2),file=debug.txt
;*  loop idx = 1,4
;*      spct =SZPCTA(IDX,AvHHSz)
;*      ipct =INPCTA(IDX,IncRat)
;*      Print List = HH(10),
AvHHSz(10.2),Incrat(10.2),SPCT,IPCT,ISZA[IDX],IINA[IDX], file=debug.txt
;*  endloop
;* endif
;** Debug 1 Off**


;
; Setup Initial HH Size by Income Matrix with PUMS seed Pcts
;   and accumulate Size, Income marginals

Loop sz = 1, @SzCl@
     Loop in = 1, @InCl@
          IDX = sz * 10.0 + in ; 2-digit index, 1st=HHsize& 2nd=Inc.level
          CSZINA[IDX] = ISZA[sz] * (I_SPCTA(1,IDX)/100.00)  ; initial matrix cell
value
          CSZA[SZ]    = CSZA[sz] + CSZINA[IDX]    ; initial/'control' marginal size
total
          CINA[in]    = CINA[in] + CSZINA[IDX]    ; initial/'control' marginal Inc
total

;** Debug 2 On **
;* if (I==1)
;*      IF (sz <= 4 &&  in<=4)
;*         print list =' init matrix: inc: ', in(3),' hhs: ', sz(3),
cszina[idx](7.3) , file=debug.txt
;*      Endif
;* endif
;*
;*
;** Debug 2 Off**
     EndLoop
EndLoop


; Initial matrix now established, now
; begin fratar process
;
;

LOOP FRAT= 1,3
  OddEve   = FRAT%2  ; Modulo function to check Odd/Even
iteration:0=even/nonzero=odd
  IF (OddEve != 0) ; if an odd iteration then adjust cols ...
;
       Loop in=1,@InCl@
            IF  (CINA[in] == 0 )
                     CINADJA[in] = 0
               ELSE
                     CINADJA[in] = IINA[in] / CINA[in]
            ENDIF
       EndLoop


       Loop IDX=1,@SzCl@
                CSZA[IDX] = 0
       EndLOOP

       Loop IDX=1,@InCl@
                CINA[IDX] = 0
       EndLOOP

       Loop sz= 1,@SzCl@
         Loop in= 1,@InCl@
                 IDX = sz * 10.0 + in
                 CSZINA[IDX] = CSZINA[IDX] * CINADJA[in]
                 CSZA[sz]    = CSZA[sz]    + CSZINA[IDX]    ; computed/current
marginal size total
                 CINA[in]    = CINA[in]    + CSZINA[IDX]    ; computed/current
marginal Inc  total
         EndLoop
       EndLoop
       ;
    ELSE
       ; begin computing of row (size) adjustments
       ; and apply adjustments to the matrix...
       ;

       Loop sz=1,@SzCl@
            IF  (CSZA[sz] == 0 )
                     CSZADJA[sz] = 0
               ELSE
                     CSZADJA[sz] = ISZA[sz] / CSZA[sz]
            ENDIF
       EndLoop

       Loop IDX=1,@SzCl@
                CSZA[IDX] = 0
       EndLOOP

       Loop IDX=1,@InCl@
                CINA[IDX] = 0
       EndLOOP

       Loop sz= 1,@SzCl@
         Loop in= 1,@InCl@
                 IDX = sz * 10.0 + in
                 CSZINA[IDX] = CSZINA[IDX] * CSZADJA[sz]
                 CSZA[sz]    = CSZA[sz]    + CSZINA[IDX]    ; computed/current
marginal size total
                 CINA[in]    = CINA[in]    + CSZINA[IDX]    ; computed/current
marginal Inc  total
         EndLoop
       EndLoop
  ENDIF
ENDLOOP

;
==================================================================================
========
; Apply final Size/Income adjustments (if desired) and then
; accumulate final Jurisdictional/ Regional marginals and totals
;
==================================================================================
========

       Loop sz= 1,@SzCl@
         Loop in= 1,@InCl@
                 si  = sz  * 10.0 + in
                 js  = jdx * 10.0 + sz
                 ji  = jdx * 10.0 + in
```

```
                 temp         =  CSZINA[si] * AreaSizFtr(Sz,Atype) *
AreaIncFtr(In,Atype) ; Apply Final Size/Income Adjustment
                 CSZINA[si]   =  temp                         ; and store back in
CSZINA array
                 RegSzInA[si] =  RegSzInA[si]  +  CSZINA[si]
                 JurSzA[js]   =  JurSzA[js]    +  CSZINA[si]
                 JurInA[ji]   =  JurInA[ji]    +  CSZINA[si]
                 RegSzA[sz]   =  RegSzA[sz]    +  CSZINA[si]
                 RegInA[in]   =  RegInA[in]    +  CSZINA[si]
                 JurA[Jdx]    =  JurA[Jdx]     +  CSZINA[si]
                 SITotal      =  SITotal       +  CSZINA[si]
         EndLoop
       EndLoop

;
===================================================================================
========
; Summarize/Print HHs by size groups and HHs by Income groups for zonal checking
;
;
===================================================================================
========
        HH_Sz1   =  CSZINA[11] + CSZINA[12] + CSZINA[13] + CSZINA[14]
        HH_Sz2   =  CSZINA[21] + CSZINA[22] + CSZINA[23] + CSZINA[24]
        HH_Sz3   =  CSZINA[31] + CSZINA[32] + CSZINA[33] + CSZINA[34]
        HH_Sz4   =  CSZINA[41] + CSZINA[42] + CSZINA[43] + CSZINA[44]
;
        HH_In1   =  CSZINA[11] + CSZINA[21] + CSZINA[31] + CSZINA[41]
        HH_In2   =  CSZINA[12] + CSZINA[22] + CSZINA[32] + CSZINA[42]
        HH_In3   =  CSZINA[13] + CSZINA[23] + CSZINA[33] + CSZINA[43]
        HH_In4   =  CSZINA[14] + CSZINA[24] + CSZINA[34] + CSZINA[44]
;
;
    Print List=
I(4),HH_Sz1@ofmt@,HH_Sz2@ofmt@,HH_Sz3@ofmt@,HH_Sz4@ofmt@,file=Est_Zonal_HH_Size.TXT
    Print List=
I(4),HH_In1@ofmt@,HH_In2@ofmt@,HH_In3@ofmt@,HH_In4@ofmt@,file=Est_Zonal_HH_Inc.TXT

;==================================================================================
==========
; All Done with Size and Income computations - Now apply Veh. Availability Model
; Loop through size and income cell and further disggregate among veh.av. groups
;==================================================================================
========

  Loop sz=1,@SzCl@
    Loop in=1,@InCl@

                  SI=  Sz * 10.0 + In              ;Size/Income index 11...44

                  P_VA[1] = 0
                  P_VA[2] = 0
                  P_VA[3] = 0
                  P_VA[4] = 0
                  IncDum1 = 0
                  IncDum2 = 0
                  IncDum3 = 0
                  IncDum4 = 0
                  If (in == 1)  IncDum1 = 1
                  If (in == 2)  IncDum2 = 1
                  If (in == 3)  IncDum3 = 1
                  If (in == 4)  IncDum4 = 1

                   u_1  = v1_constant                    +
                          v1_idum1     * IncDum1         +
                          v1_idum2     * IncDum2         +
                          v1_idum3     * IncDum3         +
                          v1_idum4     * IncDum4         +
                          v1_hh        * SZ              +
                          v1_TrnAcc    * TrnAcc          +
                          v1_Atype     * AType           +
                          v1_DcDum     * DCDUM

                   u_2  = v2_constant                    +
                          v2_idum1     * IncDum1         +
                          v2_idum2     * IncDum2         +
                          v2_idum3     * IncDum3         +
                          v2_idum4     * IncDum4         +
                          v2_hh        * SZ              +
                          v2_TrnAcc    * TrnAcc          +
                          v2_Atype     * AType           +
                          v2_DcDum     * DCDUM

                   u_3  = v3_constant                    +
                          v3_idum1     * IncDum1         +
                          v3_idum2     * IncDum2         +
                          v3_idum3     * IncDum3         +
                          v3_idum4     * IncDum4         +
                          v3_hh        * SZ              +
                          v3_TrnAcc    * TrnAcc          +
                          v3_Atype     * AType           +
                          v3_DcDum     * DCDUM

                   u_4  = v4_constant                    +
                          v4_idum1     * IncDum1         +
                          v4_idum2     * IncDum2         +
                          v4_idum3     * IncDum3         +
                          v4_idum4     * IncDum4         +
                          v4_hh        * SZ              +
                          v4_TrnAcc    * TrnAcc          +
                          v4_Atype     * AType           +
                          v4_DcDum     * DCDUM


                    P_VA[1] =  exp(u_1) / (exp(u_1) + exp(u_2) + exp(u_3) +
exp(u_4))
                    P_VA[2] =  exp(u_2) / (exp(u_1) + exp(u_2) + exp(u_3) +
exp(u_4))
                    P_VA[3] =  exp(u_3) / (exp(u_1) + exp(u_2) + exp(u_3) +
exp(u_4))
                    P_VA[4] =  exp(u_4) / (exp(u_1) + exp(u_2) + exp(u_3) +
exp(u_4))


                    SIV = SI*10.0                        + 1  ;  Create 3D index
SIV(Siz,Inc,Vav)
                    CSZINVAA[SIV]  =   CSZINA[SI]  *  P_VA[1] ;
from 111 to 444

                    SIV = SI*10.0                        + 2  ;
                    CSZINVAA[SIV]  =   CSZINA[SI]  *  P_VA[2] ;

                    SIV = SI*10.0                        + 3  ;
                    CSZINVAA[SIV]  =   CSZINA[SI]  *  P_VA[3] ;

                    SIV = SI*10.0                        + 4  ;
                    CSZINVAA[SIV]  =   CSZINA[SI]  *  P_VA[4] ;

         EndLoop
       EndLoop


      ; accumulate HHs in Vehicle Available groups (0,1,2+) for current TAZ
      ; also accumulate regional totals for checking
```

```
                    HHw0Vehs =  CSZINVAA[111] +  CSZINVAA[121] +  CSZINVAA[131] +
CSZINVAA[141] +
                                CSZINVAA[211] +  CSZINVAA[221] +  CSZINVAA[231] +
CSZINVAA[241] +
                                CSZINVAA[311] +  CSZINVAA[321] +  CSZINVAA[331] +
CSZINVAA[341] +
                                CSZINVAA[411] +  CSZINVAA[421] +  CSZINVAA[431] +
CSZINVAA[441]


                    HHw1Vehs =  CSZINVAA[112] +  CSZINVAA[122] +  CSZINVAA[132] +
CSZINVAA[142] +
                                CSZINVAA[212] +  CSZINVAA[222] +  CSZINVAA[232] +
CSZINVAA[242] +
                                CSZINVAA[312] +  CSZINVAA[322] +  CSZINVAA[332] +
CSZINVAA[342] +
                                CSZINVAA[412] +  CSZINVAA[422] +  CSZINVAA[432] +
CSZINVAA[442]


                    HHw2Vehs =  CSZINVAA[113] +  CSZINVAA[123] +  CSZINVAA[133] +
CSZINVAA[143] +
                                CSZINVAA[213] +  CSZINVAA[223] +  CSZINVAA[233] +
CSZINVAA[243] +
                                CSZINVAA[313] +  CSZINVAA[323] +  CSZINVAA[333] +
CSZINVAA[343] +
                                CSZINVAA[413] +  CSZINVAA[423] +  CSZINVAA[433] +
CSZINVAA[443]


                    HHw3Vehs =  CSZINVAA[114] +  CSZINVAA[124] +  CSZINVAA[134] +
CSZINVAA[144] +
                                CSZINVAA[214] +  CSZINVAA[224] +  CSZINVAA[234] +
CSZINVAA[244] +
                                CSZINVAA[314] +  CSZINVAA[324] +  CSZINVAA[334] +
CSZINVAA[344] +
                                CSZINVAA[414] +  CSZINVAA[424] +  CSZINVAA[434] +
CSZINVAA[444]

                    HHw2PVehs = HHw2Vehs + HHw3Vehs


                   Tot_HHw0Vehs =  Tot_HHw0Vehs +  HHw0Vehs
                   Tot_HHw1Vehs =  Tot_HHw1Vehs +  HHw1Vehs
                   Tot_HHw2Vehs =  Tot_HHw2Vehs +  HHw2Vehs
                   Tot_HHw3Vehs =  Tot_HHw3Vehs +  HHw3Vehs

                   Tot_HHw2PVehs =  Tot_HHw2PVehs +  HHw2PVehs

;==================================================================================
========
;  --Print out
;     zonal Household file for Mode Choice Model HHs by 0 , 1, 2+     Groups
;     and   Household file for Mode Choice Model HHs by 0 , 1, 2, 3+  Groups
;==================================================================================
========

    Print List=  I(5),
                 HHw0Vehs(6),HHw1Vehs(6),HHw2PVehs(6),file=@ZNFILE_OU5@

    Print List=  I(4), HHw0Vehs@ofmt@, HHw1Vehs@ofmt@, HHw2Vehs@ofmt@,
HHw3Vehs@ofmt@,file=Est_Zonal_HH_VehAv.TXT

;==================================================================================
========
; The Calculations are complete for the current zone
; and let's accumulate Veh Av. related Jurisdictional/ Regional marginals and totals
```

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


  Loop sz=1,@SzCl@
    Loop in=1,@InCl@
      Loop Va=1,@VaCl@
                    SIV = (SZ*10+IN)*10.0 + Va
                    VS  = Va*10 + sz
                    VI  = Va*10 + in
                    JV  = Jdx*10+ Va
                    RegSzInVaA[SIV] = RegSzInVaA[SIV] +  CSZINVAA[SIV]
                    JurVaA[JV]      = JurVaA[JV]      +  CSZINVAA[SIV]
                    RegVaA[VA]      = RegVaA[VA]      +  CSZINVAA[SIV]
                    RegVaSzA[vs]    = RegVaSzA[vs]    +  CSZINVAA[SIV]
                    RegVaInA[vi]    = RegVaInA[vi]    +  CSZINVAA[SIV]
                    SIVTotal        = SIVTotal        +  CSZINVAA[SIV]
     EndLoop
   EndLoop
 EndLoop




;==================================================================================
========
; Now We're at the end of the Iloop
;  --Print out input files to Trip Generation
;     4 income based files written in form TAZ, HH by size&VeAv s1v1,s1v2,...,s4v4
;==================================================================================
========

;Income 1 file with HHs by Size and VehAv:
    Print List=  I(4),
                 CSZINVAA[111]@ofmt@, CSZINVAA[112]@ofmt@, CSZINVAA[113]@ofmt@,
CSZINVAA[114]@ofmt@,
                 CSZINVAA[211]@ofmt@, CSZINVAA[212]@ofmt@, CSZINVAA[213]@ofmt@,
CSZINVAA[214]@ofmt@,
                 CSZINVAA[311]@ofmt@, CSZINVAA[312]@ofmt@, CSZINVAA[313]@ofmt@,
CSZINVAA[314]@ofmt@,
                 CSZINVAA[411]@ofmt@, CSZINVAA[412]@ofmt@, CSZINVAA[413]@ofmt@,
CSZINVAA[414]@ofmt@,file=@ZNFILE_OU1@

;Income 2 file with HHs by Size and VehAv:
    Print List=  I(4),
                 CSZINVAA[121]@ofmt@, CSZINVAA[122]@ofmt@, CSZINVAA[123]@ofmt@,
CSZINVAA[124]@ofmt@,
                 CSZINVAA[221]@ofmt@, CSZINVAA[222]@ofmt@, CSZINVAA[223]@ofmt@,
CSZINVAA[224]@ofmt@,
                 CSZINVAA[321]@ofmt@, CSZINVAA[322]@ofmt@, CSZINVAA[323]@ofmt@,
CSZINVAA[324]@ofmt@,
                 CSZINVAA[421]@ofmt@, CSZINVAA[422]@ofmt@, CSZINVAA[423]@ofmt@,
CSZINVAA[424]@ofmt@,file=@ZNFILE_OU2@

;Income 3 file with HHs by Size and VehAv:
    Print List=  I(4),
                 CSZINVAA[131]@ofmt@, CSZINVAA[132]@ofmt@, CSZINVAA[133]@ofmt@,
CSZINVAA[134]@ofmt@,
                 CSZINVAA[231]@ofmt@, CSZINVAA[232]@ofmt@, CSZINVAA[233]@ofmt@,
CSZINVAA[234]@ofmt@,
                 CSZINVAA[331]@ofmt@, CSZINVAA[332]@ofmt@, CSZINVAA[333]@ofmt@,
CSZINVAA[334]@ofmt@,
                 CSZINVAA[431]@ofmt@, CSZINVAA[432]@ofmt@, CSZINVAA[433]@ofmt@,
CSZINVAA[434]@ofmt@,file=@ZNFILE_OU3@

;Income 4 file with HHs by Size and VehAv:
    Print List=  I(4),
```

```
               CSZINVAA[141]@ofmt@, CSZINVAA[142]@ofmt@, CSZINVAA[143]@ofmt@,
CSZINVAA[144]@ofmt@,
               CSZINVAA[241]@ofmt@, CSZINVAA[242]@ofmt@, CSZINVAA[243]@ofmt@,
CSZINVAA[244]@ofmt@,
               CSZINVAA[341]@ofmt@, CSZINVAA[342]@ofmt@, CSZINVAA[343]@ofmt@,
CSZINVAA[344]@ofmt@,
               CSZINVAA[441]@ofmt@, CSZINVAA[442]@ofmt@, CSZINVAA[443]@ofmt@,
CSZINVAA[444]@ofmt@,file=@ZNFILE_OU4@


;=================================================================================
========
; Finally accumulate Size, Inc, Veh.Av variables by area type for reporting
;=================================================================================
========


If (ATYPE >=1 && Atype<=7 &&  I <= @LastIZN@)

   HH_ArS1A[ATYPE] = HH_ArS1A[ATYPE] + CSZINA[11] + CSZINA[12] + CSZINA[13] +
CSZINA[14]
   HH_ArS2A[ATYPE] = HH_ArS2A[ATYPE] + CSZINA[21] + CSZINA[22] + CSZINA[23] +
CSZINA[24]
   HH_ArS3A[ATYPE] = HH_ArS3A[ATYPE] + CSZINA[31] + CSZINA[32] + CSZINA[33] +
CSZINA[34]
   HH_ArS4A[ATYPE] = HH_ArS4A[ATYPE] + CSZINA[41] + CSZINA[42] + CSZINA[43] +
CSZINA[44]
   HH_ArSTA[ATYPE] = HH_ArSTA[ATYPE] + CSZINA[11] + CSZINA[12] + CSZINA[13] +
CSZINA[14] +
                                       CSZINA[21] + CSZINA[22] + CSZINA[23] +
CSZINA[24] +
                                       CSZINA[31] + CSZINA[32] + CSZINA[33] +
CSZINA[34] +
                                       CSZINA[41] + CSZINA[42] + CSZINA[43] +
CSZINA[44]

   HH_ArI1A[ATYPE] = HH_ArI1A[ATYPE] + CSZINA[11] + CSZINA[21] + CSZINA[31] +
CSZINA[41]
   HH_ArI2A[ATYPE] = HH_ArI2A[ATYPE] + CSZINA[12] + CSZINA[22] + CSZINA[32] +
CSZINA[42]
   HH_ArI3A[ATYPE] = HH_ArI3A[ATYPE] + CSZINA[13] + CSZINA[23] + CSZINA[33] +
CSZINA[43]
   HH_ArI4A[ATYPE] = HH_ArI4A[ATYPE] + CSZINA[14] + CSZINA[24] + CSZINA[34] +
CSZINA[44]
   HH_ArITA[ATYPE] = HH_ArITA[ATYPE] + CSZINA[11] + CSZINA[21] + CSZINA[31] +
CSZINA[41] +
                                       CSZINA[12] + CSZINA[22] + CSZINA[32] +
CSZINA[42] +
                                       CSZINA[13] + CSZINA[23] + CSZINA[33] +
CSZINA[43] +
                                       CSZINA[14] + CSZINA[24] + CSZINA[34] +
CSZINA[44]

   HH_ArV1A[ATYPE] = HH_ArV1A[ATYPE] + HHw0Vehs
   HH_ArV2A[ATYPE] = HH_ArV2A[ATYPE] + HHw1Vehs
   HH_ArV3A[ATYPE] = HH_ArV3A[ATYPE] + HHw2Vehs
   HH_ArV4A[ATYPE] = HH_ArV4A[ATYPE] + HHw3Vehs
   HH_ArVTA[ATYPE] = HH_ArVTA[ATYPE] + HHw0Vehs + HHw1Vehs + HHw2Vehs + HHw3Vehs


   HH_S1  = HH_S1     + CSZINA[11] + CSZINA[12] + CSZINA[13] + CSZINA[14]
   HH_S2  = HH_S2     + CSZINA[21] + CSZINA[22] + CSZINA[23] + CSZINA[24]
   HH_S3  = HH_S3     + CSZINA[31] + CSZINA[32] + CSZINA[33] + CSZINA[34]
   HH_S4  = HH_S4     + CSZINA[41] + CSZINA[42] + CSZINA[43] + CSZINA[44]

   HH_I1  = HH_I1     + CSZINA[11] + CSZINA[21] + CSZINA[31] + CSZINA[41]
   HH_I2  = HH_I2     + CSZINA[12] + CSZINA[22] + CSZINA[32] + CSZINA[42]
   HH_I3  = HH_I3     + CSZINA[13] + CSZINA[23] + CSZINA[33] + CSZINA[43]
   HH_I4  = HH_I4     + CSZINA[14] + CSZINA[24] + CSZINA[34] + CSZINA[44]

   HH_V1  = HH_V1     + HHw0Vehs
   HH_V2  = HH_V2     + HHw1Vehs
   HH_V3  = HH_V3     + HHw2Vehs
   HH_V4  = HH_V4     + HHw3Vehs

   HH_S   = HH_S      + CSZINA[11] + CSZINA[12] + CSZINA[13] + CSZINA[14] +
                        CSZINA[21] + CSZINA[22] + CSZINA[23] + CSZINA[24] +
                        CSZINA[31] + CSZINA[32] + CSZINA[33] + CSZINA[34] +
                        CSZINA[41] + CSZINA[42] + CSZINA[43] + CSZINA[44]

   HH_I   = HH_I      + CSZINA[11] + CSZINA[21] + CSZINA[31] + CSZINA[41] +
                        CSZINA[12] + CSZINA[22] + CSZINA[32] + CSZINA[42] +
                        CSZINA[13] + CSZINA[23] + CSZINA[33] + CSZINA[43] +
                        CSZINA[14] + CSZINA[24] + CSZINA[34] + CSZINA[44]



   HH_V   = HH_V      + HHw0Vehs +
                        HHw1Vehs +
                        HHw2Vehs +
                        HHw3Vehs


Endif

;=================================================================================
========
;  If we're at the last Zone, it's time to printout the listings and we're done.
;=================================================================================
========

IF (I=@ZONESIZE@)

   Print LIST= '  Demographic Model Report ', file=@Rept@ ;
   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@

   Print LIST= '   ',file=@Rept@
   Print LIST= '      Untransformed - Household Total from the Input File:',
HH_IP_Total(12.0),file=@Rept@ ;
   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@
   PRINT LIST =' Regional Households by Size and Income Summary ',file=@Rept@
   PRINT LIST ='   Size      Inc_1         Inc_2      Inc_3       Inc_4      Total
',file=@Rept@
   PRINT LIST ='          ------------ ----------- ----------- ----------- ---------
--   ',file=@Rept@

   Print form=12.csv LIST= '      1
',RegSzInA[11],RegSzInA[12],RegSzInA[13],RegSzInA[14],RegSzA[1],file=@Rept@ ;
   Print form=12.csv LIST= '      2
',RegSzInA[21],RegSzInA[22],RegSzInA[23],RegSzInA[24],RegSzA[2],file=@Rept@ ;
   Print form=12.csv LIST= '      3
',RegSzInA[31],RegSzInA[32],RegSzInA[33],RegSzInA[34],RegSzA[3],file=@Rept@ ;
   Print form=12.csv LIST= '      4+
',RegSzInA[41],RegSzInA[42],RegSzInA[43],RegSzInA[44],RegSzA[4],file=@Rept@ ;
   Print LIST= '   ',file=@Rept@
   Print form=12.csv LIST= ' Total    ',RegInA[1],   RegInA[2],   RegInA[3],
RegInA[4],   SITotal,file=@Rept@ ;
   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@

;=================================================================================
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```
   PRINT LIST =' Jurisdictional Households by Size ',file=@Rept@
   PRINT LIST ='  Juris.    Size_1        Size_2     Size_3      Size_4      Total
',file=@Rept@
   PRINT LIST ='          ------------ ----------- ----------- ----------- ---------
--   ',file=@Rept@

   Print form=12.csv LIST= '    0_DC
',JurSzA[011],JurSzA[012],JurSzA[013],JurSzA[014],JurA[01],file=@Rept@ ;
   Print form=12.csv LIST= '    1_Mtg
',JurSzA[021],JurSzA[022],JurSzA[023],JurSzA[024],JurA[02],file=@Rept@ ;
   Print form=12.csv LIST= '    2_PG
',JurSzA[031],JurSzA[032],JurSzA[033],JurSzA[034],JurA[03],file=@Rept@ ;
   Print form=12.csv LIST= '    3_Arl
',JurSzA[041],JurSzA[042],JurSzA[043],JurSzA[044],JurA[04],file=@Rept@ ;
   Print form=12.csv LIST= '    4_Alx
',JurSzA[051],JurSzA[052],JurSzA[053],JurSzA[054],JurA[05],file=@Rept@ ;
   Print form=12.csv LIST= '    5_Ffx
',JurSzA[061],JurSzA[062],JurSzA[063],JurSzA[064],JurA[06],file=@Rept@ ;
   Print form=12.csv LIST= '    6_Ldn
',JurSzA[071],JurSzA[072],JurSzA[073],JurSzA[074],JurA[07],file=@Rept@ ;
   Print form=12.csv LIST= '    7_PW
',JurSzA[081],JurSzA[082],JurSzA[083],JurSzA[084],JurA[08],file=@Rept@ ;
   Print form=12.csv LIST= '    8_ -
',JurSzA[091],JurSzA[092],JurSzA[093],JurSzA[094],JurA[09],file=@Rept@ ;
   Print form=12.csv LIST= '    9_Frd
',JurSzA[101],JurSzA[102],JurSzA[103],JurSzA[104],JurA[10],file=@Rept@ ;
   Print form=12.csv LIST= '   10_How
',JurSzA[111],JurSzA[112],JurSzA[113],JurSzA[114],JurA[11],file=@Rept@ ;
   Print form=12.csv LIST= '   11_AA
',JurSzA[121],JurSzA[122],JurSzA[123],JurSzA[124],JurA[12],file=@Rept@ ;
   Print form=12.csv LIST= '   12_Chs
',JurSzA[131],JurSzA[132],JurSzA[133],JurSzA[134],JurA[13],file=@Rept@ ;
   Print form=12.csv LIST= '   13_ -
',JurSzA[141],JurSzA[142],JurSzA[143],JurSzA[144],JurA[14],file=@Rept@ ;
   Print form=12.csv LIST= '   14_Car
',JurSzA[151],JurSzA[152],JurSzA[153],JurSzA[154],JurA[15],file=@Rept@ ;
   Print form=12.csv LIST= '   15_Cal
',JurSzA[161],JurSzA[162],JurSzA[163],JurSzA[164],JurA[16],file=@Rept@ ;
   Print form=12.csv LIST= '   16_SM
',JurSzA[171],JurSzA[172],JurSzA[173],JurSzA[174],JurA[17],file=@Rept@ ;
   Print form=12.csv LIST= '
17_KGeo',JurSzA[181],JurSzA[182],JurSzA[183],JurSzA[184],JurA[18],file=@Rept@ ;
   Print form=12.csv LIST= '   18_Fbg
',JurSzA[191],JurSzA[192],JurSzA[193],JurSzA[194],JurA[19],file=@Rept@ ;
   Print form=12.csv LIST= '   19_Sta
',JurSzA[201],JurSzA[202],JurSzA[203],JurSzA[204],JurA[20],file=@Rept@ ;
   Print form=12.csv LIST= '   20_Spt
',JurSzA[211],JurSzA[212],JurSzA[213],JurSzA[214],JurA[21],file=@Rept@ ;
   Print form=12.csv LIST= '   21_Fau
',JurSzA[221],JurSzA[222],JurSzA[223],JurSzA[224],JurA[22],file=@Rept@ ;
   Print form=12.csv LIST= '   22_Clk
',JurSzA[231],JurSzA[232],JurSzA[233],JurSzA[234],JurA[23],file=@Rept@ ;
   Print form=12.csv LIST= '   23_Jef
',JurSzA[241],JurSzA[242],JurSzA[243],JurSzA[244],JurA[24],file=@Rept@ ;

   Print LIST= '   ',file=@Rept@
   Print form=12.csv LIST= ' Total    ',RegSzA[1],  RegSzA[2],  RegSzA[3],
RegSzA[4],  SITotal,file=@Rept@ ;
   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@
;=================================================================================
=======================

   PRINT LIST =' Jurisdictional Households by Income ',file=@Rept@
   PRINT LIST ='  Juris.    Inc_1         Inc_2       Inc_3       Inc_4      Total
',file=@Rept@
   PRINT LIST ='          ------------ ----------- ----------- ----------- ---------
--   ',file=@Rept@

   Print form=12.csv LIST= '    0_DC
',JurInA[011],JurInA[012],JurInA[013],JurInA[014],JurA[01],file=@Rept@ ;
   Print form=12.csv LIST= '    1_Mtg
',JurInA[021],JurInA[022],JurInA[023],JurInA[024],JurA[02],file=@Rept@ ;
   Print form=12.csv LIST= '    2_PG
',JurInA[031],JurInA[032],JurInA[033],JurInA[034],JurA[03],file=@Rept@ ;
   Print form=12.csv LIST= '    3_Arl
',JurInA[041],JurInA[042],JurInA[043],JurInA[044],JurA[04],file=@Rept@ ;
   Print form=12.csv LIST= '    4_Alx
',JurInA[051],JurInA[052],JurInA[053],JurInA[054],JurA[05],file=@Rept@ ;
   Print form=12.csv LIST= '    5_Ffx
',JurInA[061],JurInA[062],JurInA[063],JurInA[064],JurA[06],file=@Rept@ ;
   Print form=12.csv LIST= '    6_Ldn
',JurInA[071],JurInA[072],JurInA[073],JurInA[074],JurA[07],file=@Rept@ ;
   Print form=12.csv LIST= '    7_PW
',JurInA[081],JurInA[082],JurInA[083],JurInA[084],JurA[08],file=@Rept@ ;
   Print form=12.csv LIST= '    8_ -
',JurInA[091],JurInA[092],JurInA[093],JurInA[094],JurA[09],file=@Rept@ ;
   Print form=12.csv LIST= '    9_Frd
',JurInA[101],JurInA[102],JurInA[103],JurInA[104],JurA[10],file=@Rept@ ;
   Print form=12.csv LIST= '   10_How
',JurInA[111],JurInA[112],JurInA[113],JurInA[114],JurA[11],file=@Rept@ ;
   Print form=12.csv LIST= '   11_AA
',JurInA[121],JurInA[122],JurInA[123],JurInA[124],JurA[12],file=@Rept@ ;
   Print form=12.csv LIST= '   12_Chs
',JurInA[131],JurInA[132],JurInA[133],JurInA[134],JurA[13],file=@Rept@ ;
   Print form=12.csv LIST= '   13_ -
',JurInA[141],JurInA[142],JurInA[143],JurInA[144],JurA[14],file=@Rept@ ;
   Print form=12.csv LIST= '   14_Car
',JurInA[151],JurInA[152],JurInA[153],JurInA[154],JurA[15],file=@Rept@ ;
   Print form=12.csv LIST= '   15_Cal
',JurInA[161],JurInA[162],JurInA[163],JurInA[164],JurA[16],file=@Rept@ ;
   Print form=12.csv LIST= '   16_SM
',JurInA[171],JurInA[172],JurInA[173],JurInA[174],JurA[17],file=@Rept@ ;
   Print form=12.csv LIST= '
17_KGeo',JurInA[181],JurInA[182],JurInA[183],JurInA[184],JurA[18],file=@Rept@ ;
   Print form=12.csv LIST= '   18_Fbg
',JurInA[191],JurInA[192],JurInA[193],JurInA[194],JurA[19],file=@Rept@ ;
   Print form=12.csv LIST= '   19_Sta
',JurInA[201],JurInA[202],JurInA[203],JurInA[204],JurA[20],file=@Rept@ ;
   Print form=12.csv LIST= '   20_Spt
',JurInA[211],JurInA[212],JurInA[213],JurInA[214],JurA[21],file=@Rept@ ;
   Print form=12.csv LIST= '   21_Fau
',JurInA[221],JurInA[222],JurInA[223],JurInA[224],JurA[22],file=@Rept@ ;
   Print form=12.csv LIST= '   22_Clk
',JurInA[231],JurInA[232],JurInA[233],JurInA[234],JurA[23],file=@Rept@ ;
   Print form=12.csv LIST= '   23_Jef
',JurInA[241],JurInA[242],JurInA[243],JurInA[244],JurA[24],file=@Rept@ ;

   Print LIST= '   ',file=@Rept@
   Print form=12.csv LIST= ' Total    ',RegInA[1],  RegInA[2],  RegInA[3],
RegInA[4],  SITotal,file=@Rept@ ;

   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@

;=================================================================================
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   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@
   PRINT LIST =' Regional Households by Vehicles Available and Size Summary
',file=@Rept@
   PRINT LIST ='   VeAv     Size_1        Size_2     Size_3      Size_4      Total
',file=@Rept@
   PRINT LIST ='          ------------ ----------- ----------- ----------- ---------
--   ',file=@Rept@
```

```
   Print form=12.csv LIST= '      1
',RegVaSzA[11],RegVaSzA[12],RegVaSzA[13],RegVaSzA[14],RegVaA[1],file=@Rept@ ;
   Print form=12.csv LIST= '      2
',RegVaSzA[21],RegVaSzA[22],RegVaSzA[23],RegVaSzA[24],RegVaA[2],file=@Rept@ ;
   Print form=12.csv LIST= '      3
',RegVaSzA[31],RegVaSzA[32],RegVaSzA[33],RegVaSzA[34],RegVaA[3],file=@Rept@ ;
   Print form=12.csv LIST= '      4+
',RegVaSzA[41],RegVaSzA[42],RegVaSzA[43],RegVaSzA[44],RegVaA[4],file=@Rept@ ;
   Print LIST= '   ',file=@Rept@
   Print form=12.csv LIST= ' Total    ',RegSzA[1],   RegSzA[2],   RegSzA[3],
RegSzA[4],   SITotal,file=@Rept@ ;

   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@

   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@
   PRINT LIST =' Regional Households by Vehicles Available Groups 1, 2, 3&4  ','\n',
               ' HHs w/ 0 Vehs:  ', Tot_HHw0Vehs(12.0),'\n',
               ' HHs w/ 1 Vehs:  ', Tot_HHw1Vehs(12.0),'\n',
               ' HHs w/ 2+Vehs:  ', Tot_HHw2PVehs(12.0),'\n', file=@Rept@
;=================================================================================
========================

   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@
   PRINT LIST =' Regional Households by Vehicles Available and Income Summary
',file=@Rept@
   PRINT LIST ='   VeAv      Inc_1         Inc_2      Inc_3       Inc_4      Total
',file=@Rept@
   PRINT LIST ='          ------------ ----------- ----------- ----------- ---------
--   ',file=@Rept@

   Print form=12.csv LIST= '      1
',RegVaInA[11],RegVaInA[12],RegVaInA[13],RegVaInA[14],RegVaA[1],file=@Rept@ ;
   Print form=12.csv LIST= '      2
',RegVaInA[21],RegVaInA[22],RegVaInA[23],RegVaInA[24],RegVaA[2],file=@Rept@ ;
   Print form=12.csv LIST= '      3
',RegVaInA[31],RegVaInA[32],RegVaInA[33],RegVaInA[34],RegVaA[3],file=@Rept@ ;
   Print form=12.csv LIST= '      4+
',RegVaInA[41],RegVaInA[42],RegVaInA[43],RegVaInA[44],RegVaA[4],file=@Rept@ ;
   Print form=12.csv LIST= '   ',file=@Rept@
   Print form=12.csv LIST= ' Total    ',RegInA[1],   RegInA[2],   RegInA[3],
RegInA[4],   SITotal,file=@Rept@ ;

   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@

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

   PRINT LIST =' Jurisdictional Households by Vehicles Available ',file=@Rept@
   PRINT LIST ='  Juris.    Veh_0         Veh_1       Veh_2       Veh_3+     Total
',file=@Rept@
   PRINT LIST ='          ------------ ----------- ----------- ----------- ---------
--   ',file=@Rept@

   Print form=12.csv LIST= '    0_DC
',JurVaA[011],JurVaA[012],JurVaA[013],JurVaA[014],JurA[01],file=@Rept@ ;
   Print form=12.csv LIST= '    1_Mtg
',JurVaA[021],JurVaA[022],JurVaA[023],JurVaA[024],JurA[02],file=@Rept@ ;
   Print form=12.csv LIST= '    2_PG
',JurVaA[031],JurVaA[032],JurVaA[033],JurVaA[034],JurA[03],file=@Rept@ ;
   Print form=12.csv LIST= '    3_Arl
',JurVaA[041],JurVaA[042],JurVaA[043],JurVaA[044],JurA[04],file=@Rept@ ;
   Print form=12.csv LIST= '    4_Alx
',JurVaA[051],JurVaA[052],JurVaA[053],JurVaA[054],JurA[05],file=@Rept@ ;
   Print form=12.csv LIST= '    5_Ffx
',JurVaA[061],JurVaA[062],JurVaA[063],JurVaA[064],JurA[06],file=@Rept@ ;
   Print form=12.csv LIST= '    6_Ldn
',JurVaA[071],JurVaA[072],JurVaA[073],JurVaA[074],JurA[07],file=@Rept@ ;
   Print form=12.csv LIST= '    7_PW
',JurVaA[081],JurVaA[082],JurVaA[083],JurVaA[084],JurA[08],file=@Rept@ ;
   Print form=12.csv LIST= '    8_ -
',JurVaA[091],JurVaA[092],JurVaA[093],JurVaA[094],JurA[09],file=@Rept@ ;
   Print form=12.csv LIST= '    9_Frd
',JurVaA[101],JurVaA[102],JurVaA[103],JurVaA[104],JurA[10],file=@Rept@ ;
   Print form=12.csv LIST= '   10_How
',JurVaA[111],JurVaA[112],JurVaA[113],JurVaA[114],JurA[11],file=@Rept@ ;
   Print form=12.csv LIST= '   11_AA
',JurVaA[121],JurVaA[122],JurVaA[123],JurVaA[124],JurA[12],file=@Rept@ ;
   Print form=12.csv LIST= '   12_Chs
',JurVaA[131],JurVaA[132],JurVaA[133],JurVaA[134],JurA[13],file=@Rept@ ;
   Print form=12.csv LIST= '   13_ -
',JurVaA[141],JurVaA[142],JurVaA[143],JurVaA[144],JurA[14],file=@Rept@ ;
   Print form=12.csv LIST= '   14_Car
',JurVaA[151],JurVaA[152],JurVaA[153],JurVaA[154],JurA[15],file=@Rept@ ;
   Print form=12.csv LIST= '   15_Cal
',JurVaA[161],JurVaA[162],JurVaA[163],JurVaA[164],JurA[16],file=@Rept@ ;
   Print form=12.csv LIST= '   16_SM
',JurVaA[171],JurVaA[172],JurVaA[173],JurVaA[174],JurA[17],file=@Rept@ ;
   Print form=12.csv LIST= '
17_KGeo',JurVaA[181],JurVaA[182],JurVaA[183],JurVaA[184],JurA[18],file=@Rept@ ;
   Print form=12.csv LIST= '   18_Fbg
',JurVaA[191],JurVaA[192],JurVaA[193],JurVaA[194],JurA[19],file=@Rept@ ;
   Print form=12.csv LIST= '   19_Sta
',JurVaA[201],JurVaA[202],JurVaA[203],JurVaA[204],JurA[20],file=@Rept@ ;
   Print form=12.csv LIST= '   20_Spt
',JurVaA[211],JurVaA[212],JurVaA[213],JurVaA[214],JurA[21],file=@Rept@ ;
   Print form=12.csv LIST= '   21_Fau
',JurVaA[221],JurVaA[222],JurVaA[223],JurVaA[224],JurA[22],file=@Rept@ ;
   Print form=12.csv LIST= '   22_Clk
',JurVaA[231],JurVaA[232],JurVaA[233],JurVaA[234],JurA[23],file=@Rept@ ;
   Print form=12.csv LIST= '   23_Jef
',JurVaA[241],JurVaA[242],JurVaA[243],JurVaA[244],JurA[24],file=@Rept@ ;

   Print LIST= '   ',file=@Rept@
   Print form=12.csv LIST= ' Total    ',RegVaA[1],  RegVaA[2],  RegVaA[3],
RegVaA[4],  SITotal,file=@Rept@ ;

   Print LIST= '   ',file=@Rept@
   Print LIST= '   ',file=@Rept@


   PRINT LIST =' Estimated Households By Size Level by Area Type  ','\n',
file=@Rept@

   PRINT LIST =           '   Area_Tp  HHs_Size1    HHs_Size2   HHs_Size3
HHs_Size4    Total     ',file=@Rept@
   PRINT LIST =           '    ----   ----------- ----------- ----------- --------
--- ----------  ',file=@Rept@
   Print form=12.csv LIST= '      1   ',HH_ArS1A[1], HH_ArS2A[1] , HH_ArS3A[1],
HH_ArS4A[1] , HH_ArSTA[1],file =@Rept@ ;
   Print form=12.csv LIST= '      2   ',HH_ArS1A[2], HH_ArS2A[2] , HH_ArS3A[2],
HH_ArS4A[2] , HH_ArSTA[2],file =@Rept@ ;
   Print form=12.csv LIST= '      3   ',HH_ArS1A[3], HH_ArS2A[3] , HH_ArS3A[3],
HH_ArS4A[3] , HH_ArSTA[3],file =@Rept@ ;
   Print form=12.csv LIST= '      4   ',HH_ArS1A[4], HH_ArS2A[4] , HH_ArS3A[4],
HH_ArS4A[4] , HH_ArSTA[4],file =@Rept@ ;
   Print form=12.csv LIST= '      5   ',HH_ArS1A[5], HH_ArS2A[5] , HH_ArS3A[5],
HH_ArS4A[5] , HH_ArSTA[5],file =@Rept@ ;
   Print form=12.csv LIST= '      6   ',HH_ArS1A[6], HH_ArS2A[6] , HH_ArS3A[6],
HH_ArS4A[6] , HH_ArSTA[6],file =@Rept@ ;
   Print form=12.csv LIST= '      7   ',HH_ArS1A[7], HH_ArS2A[7] , HH_ArS3A[7],
HH_ArS4A[7] , HH_ArSTA[7],file =@Rept@ ;
```

```
   Print LIST= '    ',file=@Rept@
   Print form=12.csv LIST= '     Sum  ',HH_S1, HH_S2, HH_S3, HH_S4, HH_S,file
=@Rept@ ;
   Print LIST= '   ','\n',file=@Rept@



   PRINT LIST =' Estimated Households By Income Level by Area Type  ','\n',
file=@Rept@

   PRINT LIST =           '   Area_Tp  Income_1     Income_2    Income_3
Income_4     Total      ',file=@Rept@
   PRINT LIST =           '    ----   ----------- ------------ ---------- --------
--- -----------  ',file=@Rept@
   Print form=12.csv LIST= '      1   ',HH_ArI1A[1], HH_ArI2A[1] , HH_ArI3A[1],
HH_ArI4A[1] , HH_ArITA[1],file =@Rept@ ;
   Print form=12.csv LIST= '      2   ',HH_ArI1A[2], HH_ArI2A[2] , HH_ArI3A[2],
HH_ArI4A[2] , HH_ArITA[2],file =@Rept@ ;
   Print form=12.csv LIST= '      3   ',HH_ArI1A[3], HH_ArI2A[3] , HH_ArI3A[3],
HH_ArI4A[3] , HH_ArITA[3],file =@Rept@ ;
   Print form=12.csv LIST= '      4   ',HH_ArI1A[4], HH_ArI2A[4] , HH_ArI3A[4],
HH_ArI4A[4] , HH_ArITA[4],file =@Rept@ ;
   Print form=12.csv LIST= '      5   ',HH_ArI1A[5], HH_ArI2A[5] , HH_ArI3A[5],
HH_ArI4A[5] , HH_ArITA[5],file =@Rept@ ;
   Print form=12.csv LIST= '      6   ',HH_ArI1A[6], HH_ArI2A[6] , HH_ArI3A[6],
HH_ArI4A[6] , HH_ArITA[6],file =@Rept@ ;
   Print form=12.csv LIST= '      7   ',HH_ArI1A[7], HH_ArI2A[7] , HH_ArI3A[7],
HH_ArI4A[7] , HH_ArITA[7],file =@Rept@ ;
   Print LIST= '    ',file=@Rept@
   Print form=12.csv LIST= '     Sum  ',HH_I1, HH_I2, HH_I3, HH_I4, HH_I,file
=@Rept@ ;
   Print LIST= '   ','\n',file=@Rept@



   PRINT LIST =' Estimated Households By Vehicle Availability Level by Area Type
','\n', file=@Rept@

   PRINT LIST =           '   Area_Tp  0 Vehs.Av.   1 Veh.Av.   2 Vehs.Av.  3+
Vehs.Av.  Total      ',file=@Rept@
   PRINT LIST =           '    ----   ----------- ------------ ---------- --------
--- -----------  ',file=@Rept@
   Print form=12.csv LIST= '      1   ',HH_ArV1A[1], HH_ArV2A[1] , HH_ArV3A[1],
HH_ArV4A[1] , HH_ArVTA[1],file =@Rept@ ;
   Print form=12.csv LIST= '      2   ',HH_ArV1A[2], HH_ArV2A[2] , HH_ArV3A[2],
HH_ArV4A[2] , HH_ArVTA[2],file =@Rept@ ;
   Print form=12.csv LIST= '      3   ',HH_ArV1A[3], HH_ArV2A[3] , HH_ArV3A[3],
HH_ArV4A[3] , HH_ArVTA[3],file =@Rept@ ;
   Print form=12.csv LIST= '      4   ',HH_ArV1A[4], HH_ArV2A[4] , HH_ArV3A[4],
HH_ArV4A[4] , HH_ArVTA[4],file =@Rept@ ;
   Print form=12.csv LIST= '      5   ',HH_ArV1A[5], HH_ArV2A[5] , HH_ArV3A[5],
HH_ArV4A[5] , HH_ArVTA[5],file =@Rept@ ;
   Print form=12.csv LIST= '      6   ',HH_ArV1A[6], HH_ArV2A[6] , HH_ArV3A[6],
HH_ArV4A[6] , HH_ArVTA[6],file =@Rept@ ;
   Print form=12.csv LIST= '      7   ',HH_ArV1A[7], HH_ArV2A[7] , HH_ArV3A[7],
HH_ArV4A[7] , HH_ArVTA[7],file =@Rept@ ;
   Print LIST= '    ',file=@Rept@
   Print form=12.csv LIST= '     Sum  ',HH_V1, HH_V2, HH_V3, HH_V4, HH_V,file
=@Rept@ ;
   Print LIST= '   ','\n',file=@Rept@

ENDIF   ; -end of printing section


;
;
;
ENDRUN
```

6 Highway_Assignment.s

```
; ===================================================================
;
; Highway_Assignment.S  - Version 2.2
;  developed from the assignment process from 2.1D#50  with changes:
;  2/16/06  Formal Conical functions now called from an external file in the SUPPORT
;                  Subdir.  (filename: Conical_VDF_V22.txt)
;  3/ 8/06  reduced capacity and freeflow speed assumptions for ramps
;  4/14/06  Queuing time now added to freeways and ramps with high VCs
;           file in the \SUPPORT subdir. named 'QEUEING_Time.TXT' specifies
;            added times reflecting queuing. Times used in the speed flow
;            spec.in traffic assignment and in the volume averaging stage.
;   1/11/07  Now explicitly adding in Commercial Vehicle trips (<iter>tmcom.trp)
;            (NHB trip rates have been reduced)
;   6/14/07 > QEUEING_Time.TXT file in \Support renamed to QUEUING_Time.TXT
;           > New network link attribute named 'AllowQue' invoked in the queuing
;            delay calculation (0/disallow Que Delay, 1/Allow queuing delay
;           > corrected regional time of day vehicles (amvehs, pmvehs, opvehs)
;            calculation (Per JCP review)
;   7/26/07 > 20 iterations in equilib. assignment changed to 40 (RM for DV)
;   7/30/07 > 40 iterations changed to 60
;   10/1/07 > MISC??.TT updated to MISC??<iter>.TT  to reflect iterations for trucks
;-----------------------------------------------------------------------------
;
;   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 including commercial vehicles
;                2) 2-occ adrs
;                3) 3+ occ adrs
;                4) Trucks (Medium and Heavy)
;                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%_iter_%.TT'     ; AM     Non-Modeled Trips        //
MISCPM  = 'MISCPM%_iter_%.TT'     ; PM     Non-Modeled Trips        //
MISCOP  = 'MISCOP%_iter_%.TT'     ; Off-Pk Non-Modeled Trips        //
;                                                                    //
```

```
;                                                                    //
CVtrips = '%_iter_%tmcom.trp'     ;  Comm. Veh. trips t1/AM, t2/PM, T3/OP   //
;                                                                    //
; 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@    ;
    MATI[7]=@CVTrips@   ;
;
 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


; 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


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

 MW[45] =  MI.7.1           ; AM Commercial Vehicles
 MW[55] =  MI.7.2           ; PM Commercial Vehicles
 MW[65] =  MI.7.3           ; OP Commercial Vehicles

;  Add up vehicle tables into the appropriate categories
;  AM
 MW[40] =  MW[1]  + MW[12] + MW[17] + MW[45]  ; AM SOV   Vehicle Trips w/CommVehs
 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] + MW[55]  ; PM SOV   Vehicle Trips w/CommVehs
 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] + MW[65]  ; OP SOV   Vehicle Trips w/CommVehs
 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])   ;

      comveh = comveh + mw[45] + mw[55] + mw[65]                   ; daily CVs


;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
   amcomveh = amcomveh + MW[45]                        ; am int,ext,xx ComVeh
```

```
;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
   pmcomveh = pmcomveh + MW[55]                         ; pm int,ext,xx ComVeh

;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
   opcomveh = opcomveh + MW[65]                         ; op int,ext,xx ComVeh
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 = '                ',' AM     ,PM     ,OP , Total Commercial Vehs. ',
     amcomveh(8.0),' ',pmcomveh(8.0),' ',opcomveh(8.0),' ',comveh(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'                  ; toll param file
VDF_File = '..\support\Conical_VDF_V22.txt'   ; Volume Delay Functions file
Que_File = '..\support\Queuing_Time.TXT'      ; Queing Time  specification
;$

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]=1000 1000 1000 1000 2000 2000 2000  ; rmp
  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]= 20   20   30   30   35   40   50    ; rmp
  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
  ;=================================================================
  ;
  ;-----------------------------------------------------$
  ;   Queuing Penalty Function (qtime = f(V/C))         $
  ;-----------------------------------------------------$
  ;   Time Penalty is a function of VC ratio
  ;
  LOOKUP NAME=QTIME,
         lookup[1] = 1,result = 2,  ;Centroids   Queuing Time (MIN)
         lookup[2] = 1,result = 3,  ;Fwys        Queuing Time (MIN)
         lookup[3] = 1,result = 4,  ;MajArts     Queuing Time (MIN)
         lookup[4] = 1,result = 5,  ;MinArts     Queuing Time (MIN)
         lookup[5] = 1,result = 6,  ;Colls       Queuing Time (MIN)
         lookup[6] = 1,result = 7,  ;Expways     Queuing Time (MIN)
         lookup[7] = 1,result = 8,  ;Ramps       Queuing Time (MIN)
         FAIL=0,0,0, INTERPOLATE=T, file= @Que_File@
  ;
  ;-----------------------------------------------------$
  ;    VDF (Volume Delay Function) establishment:       $
  ;-----------------------------------------------------$
  ; Note:  curves updated 2/16/06 rjm/msm
  ;
  LOOKUP NAME=VCRV,
         lookup[1] = 1,result = 2,  ;Centroids   old VCRV1
         lookup[2] = 1,result = 3,  ;Fwys        old VCRV2
         lookup[3] = 1,result = 4,  ;MajArts     old VCRV3
         lookup[4] = 1,result = 5,  ;MinArts     old VCRV4
         lookup[5] = 1,result = 6,  ;Colls       old VCRV5
         lookup[6] = 1,result = 7,  ;Expways     old VCRV6
         lookup[7] = 1,result = 8,  ;Ramps       old VCRV2
         FAIL=0.00,0.00,0.00, INTERPOLATE=T,file=@VDF_File@

  FUNCTION {                               ; Congested Time (TC)specification:
    TC[1]= T0*VCRV(1,VC) + (QTIME(1,VC) * LI.AllowQue)  ; TC(LINKCLASS) =
    TC[2]= T0*VCRV(2,VC) + (QTIME(2,VC) * LI.AllowQue)  ;   Uncongested Time(T0) *
    TC[3]= T0*VCRV(3,VC) + (QTIME(3,VC) * LI.AllowQue)  ;   Volume Delay
Funtion(VDF)Value
    TC[4]= T0*VCRV(4,VC) + (QTIME(4,VC) * LI.AllowQue)  ;   VDF function is based on
VC
    TC[5]= T0*VCRV(5,VC) + (QTIME(5,VC) * LI.AllowQue)  ; Note: the LINKCLASS is
defined
    TC[6]= T0*VCRV(6,VC) + (QTIME(6,VC) * LI.AllowQue)  ; during the LINKREAD phase
below.
    TC[7]= T0*VCRV(7,VC) + (QTIME(7,VC) * LI.AllowQue)  ; during the LINKREAD phase
below.
  }
  ;
  ;
  ;
  CAPFAC=@CAPFAC@  ;
  ; 10 iterations changed to 20 (RM) 3/09/04 / GAP,AAD, RMSE,&RAAD params set to
zero
  ; 20 iterations changed to 40 (RM) 7/26/07
  ; 40 iterations changed to 60 (DV) 7/30/07
  ;  to ensure 'maxiters' iterations are completely executed (RM) 6/15/04 .
  MAXITERS=60     ;
  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 1994 cents
        LW.HV2@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(2,LI.TOLLGRP) ; HOV 2 occ TOLLS
in 1994 cents
        LW.HV3@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(3,LI.TOLLGRP) ; HOV 3+occ TOLLS
in 1994 cents
        LW.TRK@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(4,LI.TOLLGRP) ; Truck     TOLLS
in 1994 cents
        LW.APX@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(5,LI.TOLLGRP) ; AP Pax    TOLLS
in 1994 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 related to TC[?] above
       LINKCLASS = 1       ;
    ELSEIF (LI.FTYPE = 1)  ;
       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        ;
    ELSEIF (LI.FTYPE = 6)  ;
       LINKCLASS= 7        ;
    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


  ;
  ;-----------------------------------------------------$
  ;    VDF (Volume Delay Function) establishment:       $
  ;-----------------------------------------------------$
  ; Note:  curves updated 2/16/06 rjm/msm
  ;
  LOOKUP NAME=VCRV,
         lookup[1] = 1,result = 2,  ;Centroids   old VCRV1
         lookup[2] = 1,result = 3,  ;Fwys        old VCRV2
         lookup[3] = 1,result = 4,  ;MajArts     old VCRV3
         lookup[4] = 1,result = 5,  ;MinArts     old VCRV4
         lookup[5] = 1,result = 6,  ;Colls       old VCRV5
         lookup[6] = 1,result = 7,  ;Expways     old VCRV6
         lookup[7] = 1,result = 8,  ;Rmps
         FAIL=0.00,0.00,0.00, INTERPOLATE=T,file=@VDF_File@


  ;-----------------------------------------------------$
  ;   Queuing Penalty Function (qtime = f(V/C))         $
  ;-----------------------------------------------------$
  ;   Time Penalty is a function of VC ratio
  ;
  ;
  LOOKUP NAME=QTIME,
         lookup[1] = 1,result = 2,  ;Centroids   Queuing Time (MIN)
         lookup[2] = 1,result = 3,  ;Fwys        Queuing Time (MIN)
         lookup[3] = 1,result = 4,  ;MajArts     Queuing Time (MIN)
         lookup[4] = 1,result = 5,  ;MinArts     Queuing Time (MIN)
         lookup[5] = 1,result = 6,  ;Colls       Queuing Time (MIN)
```

```
        lookup[6] = 1,result = 7,  ;Expways     Queuing Time (MIN)
        lookup[7] = 1,result = 8,  ;Ramps       Queuing Time (MIN)
        FAIL=0,0,0, INTERPOLATE=T, file= @Que_File@
  ;
  ; 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')
;
       FTPlus1 = Ftype + 1
       %_iter_%@prd@VDF = VCRV(FTPlus1, %_iter_%@prd@VC)


; 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

; -------------------------------------------------
;  Consider Queuing Time  if Appropriate
; -------------------------------------------------

      _BaseSpeed                   =  %_iter_%@prd@SPD
      _BaseTime                    =  Distance / _Basespeed  * 60.0
      %_iter_%@prd@QTimePen        =  QTIME(FTPlus1, %_iter_%@prd@VC) * AllowQue
      _FinalTime                   =  _BaseTime +  %_iter_%@prd@QTimePen
      _FinalSpeed                  =  Distance / _FinalTime * 60.0
      %_iter_%@prd@SPD             = _FinalSpeed

      IF (%_iter_%@prd@QTimePen > 0.0)
         Print list = a(6),b(6), Distance(5.2),' ',_BaseSpeed(6.2),' ',
_BaseTime(6.2),' ', %_iter_%@prd@VC(6.3),' ',
                     %_iter_%@prd@QTimePen(6.2), _FinalTime(6.2),' ',
_FinalSpeed(5.1),' ',%_iter_%@prd@SPD(5.1),
                     ' ',AllowQue(2),
                     ' <-- a,b, Dst, base speed,time, BaseVCRatio, TimePen, final
time,speed(2x) AllowQue',
                     file = %_iter_%@prd@QTimePen.txt
      ENDIF
; End Time Penalty section

; 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
```

7 Highway_Build_Toll.s

```
;=================================================================
;  HIGHWAY_BUILD_TOLL.S
;
;  MWCOG Version 2.2 Model  - Highway Network Building Program
;
;  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
;
;=======================================================================
;; Updates:
; modified by DV to allow for tollgrp=10; 8/16/2005
; tollgrp now takes up fields 66-67, not just 67; 8/16/2005
;
;; V2.2 Updates:
;  11/7/06/RM  - Steps 1.1 and 1.2 changed to read and process RECI
;                file inputs.
;              - Toll Group code field expanded from  66-67 to
;                66-69 to accommodate HOT lane Work (now is 4 digits)
;              - Cnt_Type link attribute added to further clarify COUNT;
;                The codes will be: 0/ no count or unknown count type
;                                   1/ Permanent Count, full year operation
;                                   2/ Permanent Count, part year operation
;                                   6/ Program count collected during current yr
;                                   7/ Program count collected previous year,
;                                          but adjusted to current year
;                HWY_Deflator.txt is now used - as a default deflation factor
;
;  6/14/07/RM  - Added script section to create ALLOWQUE link attribute.
;                (=1/ to allow queuing delay; 0/to disallow queuing)
;                The new section begins at ';; AllowQue Begin ;; '
;                and ends at:              ';; AllowQue End ;;  '
;
;                AREA TYPE OVERRIDE LOOKUP in the TOLL.ESC File (TG_ATOVR)
;                is now used to aover ride area types for any tolled facility.
;=======================================================================
;
; PARAMETERS / Files DEFINED in TP MAIN:
;


  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
  HWY_Defl  = 'HWY_Deflator.txt'    ; INPUT Default Highway Deflator not defined in
toll.esc 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

RECI=@NODEFILE@, Fields= 1-6, 7-14, 15-22  ; node/xCRD/yCRD
;
; If current node is within the TAZ number range, print out XY Coords.
;
   IF (RECI.NFIELD[1]  <=  @ZONESIZE@)

      PRINT
LIST=reci.nfield[1](5),reci.nfield[2](10),reci.nfield[3](10),FILE=TAZCRD.ASC

   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
RECI=@NODEFILE@, Fields= 1-6, 7-14, 15-22  ; node/xCRD/yCRD
;
; 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     (reci.nfield[1] <= @ZONESIZE@ )
             NODE_TAZ = reci.nfield[1]
             NODEXCRD = reci.nfield[2]
             NODEYCRD = reci.nfield[3]
             MINDIST  = 0

          PRINT LIST=reci.nfield[1](6),reci.nfield[2](8) ,reci.nfield[3](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.
;

ELSE

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

     LOOP IDX=1,@ZONESIZE@
                CURDIST=  SQRT((reci.nfield[2] - TAZCRD(1,IDX))**2 +
                               (reci.nfield[3] - TAZCRD(2,IDX))**2)/5280.

                IF (CURDIST    < MiNDIST)
                    NODEXCRD    = reci.nfield[2]
                    NODEYCRD    = reci.nfield[3]
                    MINDIST     = CURDIST
                    NODE_TAZ    = IDX

                ENDIF

     ENDLOOP

      PRINT LIST=reci.nfield[1](6),reci.nfield[2](8) ,reci.nfield[3](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@

READ FILE=@IN_TESC@

; 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=CNT_TYPE,35-36,  ; Count Type 0,1,2,6,7
        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,66-69,   ; Toll Group code (1-10)
        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
           AREATP   =  ZNAT(1,TAZ)            ;  Area Type
;
;
;  Here we will over ride the standard default Area Type code
;  if the user specifies an area type override range (Min, Max)
;  (via TG_ATOVR lookup table in the TOLL.ESC file)

           _TG_ATMin  =    TG_ATOVR(1,TOLLGRP)
           _TG_ATMax  =    TG_ATOVR(2,TOLLGRP)
           _DefaultAT =    AREATP

           IF (_TG_ATMin > 0 && _DefaultAT < _TG_ATMin) AREATP = _TG_ATMin
           IF (_TG_ATMax > 0 && _DefaultAT > _TG_ATMax) AREATP = _TG_ATMax


           IF (AREATP < 1 || AREATP > 7)  ABORT
;
;
; With the TAZ designated, now the speed/capacity class is defined as
; a two-digit code-- facility type & areatype
;
           SPDCLASS =  FTYPE*10 + AREATP      ;  Speed Class
           CAPCLASS =  FTYPE*10 + AREATP      ;  Capacity Class


;
;
; 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=ZONEHWY.tem

READ FILE=@IN_TESC@
READ FILE=@HWY_Defl@
;
; Compute AM, PM, Off-Peak Tolls
; The tolls are read in as undeflated, based on the coded TOLL value on the
;  link and/or as a function of a distance based rate;
;  The defaltion is handled below.  If the 'escfac' lookup (in the TOLL.ESC file)
;  is non-zero, then it is used to deflate.  If it is zero, then the the default
;  highway deflator 'DEFLATION' (calculated in the SET_Factors.s script) is used.
;  The recommended appraoch is to set the 'escfac' lookup array to zero and use
;  HWY_Deflator
;

; deflated toll based on escfac:
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)


; if escfac set to zero then deflate based on HWY_Deflator:
  IF (AMTOLL = 0)
      AMTOLL=(TOLL+(DSTFAC(1,tollgrp)*DISTANCE))*TTFAC(1,tollgrp)*DEFLATIONFTR
  ENDIF
  IF (PMTOLL = 0)
      PMTOLL=(TOLL+(DSTFAC(1,tollgrp)*DISTANCE))*TTFAC(2,tollgrp)*DEFLATIONFTR
  ENDIF
  IF (OPTOLL = 0)
      OPTOLL=(TOLL+(DSTFAC(1,tollgrp)*DISTANCE))*TTFAC(3,tollgrp)*DEFLATIONFTR
  ENDIF
; ---------------------------------------------------------------------------



;
; 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 Exprwy  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 Exprwy  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 Exprwy  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 Exprwy  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


;; AllowQue Begin ;;
; -------------------------------------------------------------------------------
;  Script section to identify links to be excluded from queuing.
;  The define/adds a new variable to the highway network:
;          AllowQue (=1/Allow queuing and 0/disallow from queuing).
;  Links disallowed from queing are one-way links that don't connect with
;  intersections.  They are directional links with one adjacent one-way link
;  entering the Anode and one adjacent one-way link leaving the Bnode.
;  Additionally, the laneage of the link both adjacent links must be uniform.
;
; ---------------------------------------------------------------------------
;    - same # of lanes -
; (?)----->A----->B-----(?)
;
; ---------------------------------------------------------------------------

FstHwyNode = 3000
;-----------------------------------------------------
; Step 1 - write out node list and AB list from network
;-----------------------------------------------------
RUN PGM=HWYNET
  NETI  = zonehwy.tem   ; output network from previous step
  NODEO = NODE.txt, FORMAT=TXT,
                  varform=n(8.0),
                  include = n
  LINKO = LINK.txt, FORMAT=TXT,
                  varform =a(8.0),b(8.0),amlane(8.0),pmlane(8.0),oplane(8.0),
                  include=a,b, amlane, pmlane, oplane
ENDRUN


;-----------------------------------------------------
; Step 2 - write out indexed highway node list
;-----------------------------------------------------
RUN PGM=MATRIX
    RECI=NODE.TXT, Fields= 1-8  ; List of Nodes

       IF (RECI.NFIELD[1] >= @FstHwyNode@)
         _NDX= _NDX + 1
         Print LIST=_ndx(8.0),            ; Seq. no.
                 RECI.NFIELD[1](8.0),  ; hwy node
                 file=NodeIDX.txt

    ENDIF
    LOG PREFIX=MATRIX, VAR= _NDX  ;  save max hwy node seq. no. for reference later
ENDRUN


;-----------------------------------------------------
; Step 3 - write out indexed (total) link list
;-----------------------------------------------------
RUN PGM=MATRIX
    RECI=LINK.TXT, Fields= 1-8,9-16,17-24,25-32,33-40 ; a,b,amln,pmln,opln

      _LDX= _LDX + 1
      Print LIST=_LDX(8.0),            ; Seq. No.
                 RECI.NFIELD[1](8.0),  ; Anode
                 RECI.NFIELD[2](8.0),  ; Bnode
                 RECI.NFIELD[3](8.0),  ; am lane
                 RECI.NFIELD[4](8.0),  ; pm lane
                 RECI.NFIELD[5](8.0),  ; op lane
                 file=LinkIDX.txt

    LOG PREFIX=MATRIX, VAR= _LDX   ;  save max hwy link no. for reference later
ENDRUN

    MAXNODE=MATRIX._NDX  ;  define max node no. from hwy node list (used later)
    MAXLINK=MATRIX._LDX  ;  define max link no. from hwy link list (used later)

;-----------------------------------------------------
; Step 4 - evaluate each highway node against the hwy link list
;  accum. the no. of times each node appears as an anode (forematch) & save the
;  last bnode (forenode)  accum. the no. of times each node appears as a  bnode
;  (backmatch) & save the last anode (backnode) write out the node list with its
;  forematch, forenode, backmatch, backnode for all nodes with forematch
```

```
;  values of 1 or backmatch values of 1 (BNF.txt).  This is a list of nodes having
;  either 1 directional entry link and/or 1 directional exit link.
;  We don't care about nodes with multiple entry and exit links.
;-------------------------------------------------------
;
 run pgm=MATRIX

 lookup name=NodeList,
 lookup[1] = 1, result = 2, ; Node No.
 interpolate=N, Fail=0,0,0, File= NodeIDX.txt

 lookup name=LinkList,
 lookup[1] = 1, result = 2, ; A_Node
 lookup[2] = 1, result = 3, ; B_Node
 lookup[3] = 1, result = 4, ; AM_Lane
 lookup[4] = 1, result = 5, ; PM_Lane
 lookup[5] = 1, result = 6, ; OP_Lane
 interpolate=N, Fail=0,0,0, File= LinkIDX.txt

  zones=1


  loop  NDX=@FstHwyNode@,@MAXNODE@   ; evaluate each and every node

    BACKMATCH = 0  BACKNODE = 0
    BACKAMLN  = 0  BACKPMLN = 0 BACKOPLN  = 0
    FOREMATCH = 0  FORENODE = 0
    FOREAMLN  = 0  FOREPMLN = 0 FOREOPLN  = 0

    CURR_NODE = NodeList(1,NDX)


        loop LDX=1,@MAXLINK@

            IF (FOREMATCH > 1 && BACKMATCH > 1)  goto NextLink

             CURR_A = LinkList(1,LDX)
             CURR_B = LinkList(2,LDX)
             CURR_AL= LinkList(3,LDX)
             CURR_PL= LinkList(4,LDX)
             CURR_OL= LinkList(5,LDX)

             IF (CURR_A = Curr_Node)
                    FOREMATCH =  FOREMATCH + 1
                    FORENODE  =  CURR_B
                    FOREAMLN  =  CURR_AL
                    FOREPMLN  =  CURR_PL
                    FOREOPLN  =  CURR_OL
             ENDIF

             IF (CURR_B = Curr_Node)
                    BACKMATCH =  BACKMATCH + 1
                    BACKNODE  =  CURR_A
                    BACKAMLN  =  CURR_AL
                    BACKPMLN  =  CURR_PL
                    BACKOPLN  =  CURR_OL
             ENDIF

        :NextLink
        endloop

      ; At the end of current node- write out all nodes that have a single
      ; entry (back-) node connecion OR a single exit (fore-) node connection
      ; A unique link list will be established from this list in the following
      ; program

      IF ((FOREMATCH = 1 ||  BACKMATCH = 1) && (BACKNODE != FORENODE))
          _Seq = _Seq + 1   ;     sequence no.
```

```
          print form =8.0
               list  =  _Seq, BACKMATCH, BACKNODE, BACKAMLN, BACKPMLN, BACKOPLN,
                              CURR_Node,
                              FOREMATCH, FORENODE, FOREAMLN, FOREPMLN, FOREOPLN,
                              file =  BNF.txt
      ENDIF


  endloop   ; end of NODE loop

    LOG PREFIX=MATRIX, VAR= _Seq
 endrun
;
    MAXBNF = MATRIX._SEQ



;-------------------------------------------------------
;  Step 5. Evalute each hwy link list against the BNF.txt list.
;    If the current Anode (Cur_A) has a single entry and a single exit node AND
;    the Current Bnode (Cur_B) has a single entry and a single exit node THEN
;    the link is considered to be exempt from queuing, and is printed out to a file
;    to be later merged back to the network (NoQLink.txt)
;-------------------------------------------------------
RUN PGM=MATRIX
ZONES = 1
LOOKUP NAME= BNFList, ; List of all nodes with 1 entry link (where
                      ; BackMatch=1) OR with 1 exit link (where ForeMatch=1)
       LOOKUP[01] = 1, Result = 2,    ; BackMatch 1,2
       LOOKUP[02] = 1, Result = 3,    ; BackNode
       LOOKUP[03] = 1, Result = 4,    ; BackAMln
       LOOKUP[04] = 1, Result = 5,    ; BackPMLn
       LOOKUP[05] = 1, Result = 6,    ; BackOPLn
       LOOKUP[06] = 1, Result = 7,    ; Reference Node
       LOOKUP[07] = 1, Result = 8,    ; ForeMatch
       LOOKUP[08] = 1, Result = 9,    ; Forenode
       LOOKUP[09] = 1, Result =10,    ; ForeAMln
       LOOKUP[10] = 1, Result =11,    ; ForePMln
       LOOKUP[11] = 1, Result =12,    ; ForeOPln
       Interpolate = N, Fail= 0,0,0, File=BNF.txt

LOOKUP NAME= LinkList,  ; List of all non-centroid links
       LOOKUP[1] = 1, Result = 2, ; Anode
       LOOKUP[2] = 1, Result = 3, ; Bnode
       Interpolate = N, Fail= 0,0,0, File=LINKIDX.Txt


LOOP LDX=1,@MaxLink@

     Cur_A=LinkList(1,LDX)
     Cur_B=LinkList(2,LDX)
     AQtest=0
     BQtest=0
     XQflag=0


     LOOP NDX = 1, @MAXBNF@
          BackMatch = BNFList(1,NDX)
          BackNode  = BNFList(2,NDX)
          BackAMln  = BNFList(3,NDX)
          BackPMln  = BNFList(4,NDX)
          BackOPln  = BNFList(5,NDX)
          Node      = BNFList(6,NDX)
          ForeMatch = BNFList(7,NDX)
          ForeNode  = BNFList(8,NDX)
          ForeAMln  = BNFList(9,NDX)
          ForePMln  = BNFList(10,NDX)
          ForeOPln  = BNFList(11,NDX)
```

```
        IF (Cur_A  = Node && BackMatch = 1 && ForeMatch = 1  &&
            BACKAMln = ForeAMln                             &&
            BACKPMln = ForePMln                             &&
            BACKOPln = ForeOPln)
               AQtest = 1
        ENDIF

        IF (Cur_B  = Node && BackMatch = 1 && ForeMatch = 1  &&
            BACKAMln = ForeAMln                             &&
            BACKPMln = ForePMln                             &&
            BACKOPln = ForeOPln)
               BQtest = 1
        ENDIF

        ; If BOTH the Anode and Bnode of the current link have:
        ;  1) ONE directional entry link
        ;  2) ONE directional exit  link
        ;  3) No capacity differential between adjacent links
        ;     for all time periods
        ;  Then queuing delay is disallowed

        IF (AQtest = 1 && BQtest = 1)
            XQflag = 1
            Print form= 8.0 List= Cur_A Cur_B XQFlag, File = NoQLink.txt
            goto NextLink     ; current link passes test, go on to next link
        ENDIF

     ENDLOOP

    :NextLink

 ENDLOOP
 ENDRUN

;-------------------------------------------------------
;  Step 6. Merge 'No queuing' link list to network and define
;  AllowQue variable
;  (=1/allow queuing, =0/disallow queuing)
;-------------------------------------------------------
 RUN PGM=HWYNET
 ZONES = 2191
 NETI[1]  = zonehwy.tem
 LINKI[2] = NoQLink.txt,var  = A,       1-8,
                       var  = B,      9-16,
                       var  = XQFLAG,17-24
 merge record = T
 NETO     = @OU_BSNET@, EXCLUDE = XQFLAG

  IF (XQFlag= 1 )
         AllowQue = 0
      ELSE
         AllowQue = 1
  ENDIF
ENDRUN
*del zonehwy.tem

;; AllowQue End ;;

;--------------------------------------------------------------------------
; 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
```

8 Highway_Skims.s

```
;//////////////////////////////////////////////////////////////;
;  Highway_Skims.S                                            //;
;  MWCOG Version 2.2 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 1994 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 1994 cents
       LW.HV2@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(2,LI.TOLLGRP)           ;  HOV 2
occ TOLLS in 1994 cents
       LW.HV3@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(3,LI.TOLLGRP)           ;  HOV
3+occ TOLLS in 1994 cents
       LW.TRK@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(4,LI.TOLLGRP)           ;  Truck
TOLLS in 1994 cents
       LW.APX@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(5,LI.TOLLGRP)           ;  AP Pax
TOLLS in 1994 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 1994
     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
```

9 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


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
```

10 MC_Constraint.s

```
;//////////////////////////////////////////////////////////////////
; Updated 8/14/2006 RM bucket rounding of constrained mode choice file
;    is removed
; ==================================================================
; Transit Constraint Process -Applied to modeled mode choice output
;         file for forecast years beyond the year 2010.
;         The process constrains Peak Period Transit trips heading
;         TO or THROUGH the regional core to be constrained to
;         2010 levels and adjusts auto person/driver trips accordingly.
;
; The process consists of 3 Steps:
; Step 1. 2010 & 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.  2010 & 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.
;         2010 & future year peak/off-peak transit trips are calculated
;         for each purpose using 1994 HTS time period factors.
;-----------------------------------------------------------------------
LOOP Time  = 1, 2            ; Time '1' = 2010/ Time '2' = Future year

 IF (Time = 1)
  PATHSPECHBW = '%_path10HBW_%'    ; path specification of 2010 HBW transit trips
  PATHSPECHBS = '%_path10HBS_%'    ; path specification of 2010 HBS transit trips
  PATHSPECHBO = '%_path10HBO_%'    ; path specification of 2010 HBO transit trips
  PATHSPECNHB = '%_path10NHB_%'    ; path specification of 2010 NHB transit trips
  YR       = 'con'           ; constraint indicator    (for file naming)
  title    = ' 2010 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 2010) 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


;------------------------------------------------------------------------
; 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
;         2010 & 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 2010 / 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 ->> 2010     Peak  HBW,HBS,HBO,NHB Transit trips
         ;  5- 8 ->> 2010     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
;


;
;
; Override the bucket-rounded trips
; to make sure the unconstrained trips are unaffected!
; rm 8/11/06
JLOOP
 TFTR = tconftr(1,MW[30])
 IF (TFTR = 1.00)
      MW[17] = MW[1]     ; UnConstrained SOV Auto Drivers
      MW[15] = MW[2]     ; UnConstrained SOV Auto Persons

      MW[10] = MW[3]     ; UnConstrained Walk  transit
      MW[11] = MW[4]     ; UnConstrained Drive transit

      MW[14] = MW[6]     ; UnConstrained HOV Auto Persons
      MW[18] = MW[7]     ; UnConstrained HOV3 Auto Drivers
 ENDIF
ENDJLOOP
;
;
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
```

11 MC_Consummary.s

```
; -----------------------------------------------------------------
; MC_ConSummary.s - Juris. Summary of constrained transit trips
;              by Purpose and Mode
;
;
; Now summarize total purpose trip tables, by mode
; Update 8/10/2006 - Jurisdiction-TAZ equivalenced changed in Jur Summary
; (for Mtg and PG) to be consistent with jurisdiction change in land use file
; -----------------------------------------------------------------

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=320-639,648,650              ; MTG MD
D 4=640-647,649,651-1029         ; 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
```

12 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)
; Update 8/10/2006 - Jurisdiction-TAZ equivalenced changed in Jur Summary
; (for Mtg and PG) to be consistent with jurisdiction change in land use file
;--------------------------------------------------------------------
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=320-639,648,650              ; MTG MD
D 4=640-647,649,651-1029         ; 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
```

13 Metrorail_skims.s

```
;=================================================================
;  Metrorail_skims.S
;  MWCOG Version 2.2 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
;=================================================================
; max 'zones' (stations changed from 116 to 150)

;  Global variables:

NZONES = 150           ; Max. no. of Stations

NODIN='METNODM1.TB'    ; Input Station nodes
LNKIN='METLNKM1.TB'    ; Input Station links
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
```

14 MFARE1.S

```
;=================================================================
;  MFARE1.S
;   V2.2 Model
;   TP+ Script Version of MFARE1 script
;   Walk and Drive Access Metrorail Sta. to Sta. fares developed
;    for AM Peak and off-peak periods
;
;   Programmer: Milone
;   Date:      1/11/07
;   Metro station XY file name corrected (12/13/2006)
;=================================================================
;


STATSIZE        =   150              ;  No. of Metrorail Stations (Note: Max is
999)
MR_DST_FTR      =  0.01              ;  Factor to convert input skimmed Metrorail
distance units to whole miles

;-------------------------------------------------------------------
;  Filenames:

MSTA_XYs        = 'MFARE1.A1'                  ;  Metrorail Sta XYs coords scaled
so computed units are in 1/100ths of miles
MSTA_Dst_Skims  = 'RLDIST.SKM'                 ;  Metrorail Sta/Sta Distance Skims
(Distance units:        1/100ths of miles
MSTA_Discount   = 'INPUTS\mfare1_Sta_Disc.ASC'  ;  Metrorail Sta fare discount array
in cents
MSTA_Tariff     = 'INPUTS\tariff.txt'          ;  WMATA tariff policy

AM_Sta_Fares    = 'AM_Metrorail_Fares.TXT'     ;  Output AM Station-to-Station
Fares -text file
OP_Sta_Fares    = 'OP_Metrorail_Fares.TXT'     ;  Output OP Station-to-Station
Fares -text file


RUN PGM=MATRIX
ZONES=@STATSIZE@
read FILE=@MSTA_Tariff@


;
; Set up zone arrays for accumulating I/O variables
;
;
;
;=============================================================
; Read Station Coordinate file                               =
;=============================================================
;
      LOOKUP Name=StaXYS,
             LOOKUP[1]   = 1,Result = 2, ; Xcrds
             LOOKUP[2]   = 1,Result = 3, ; YCrds
             Interpolate = N, FAIL=0,0,0,list=Y,file=@MSTA_XYS@

;
;=============================================================
; Read Station Fare Discount Lookup                          =
;   - The station-specific discount values are in cents.     =
;     The discounts are subtracted from the final            =
;     computed fares to/from the station                     =
;=============================================================
;
      LOOKUP Name=StaDSC,
             LOOKUP[1]   = 1,Result = 2,   ;  AM Fare Discount in cents
             LOOKUP[2]   = 1,Result = 3,   ;  OP Fare Discount in cents
             Interpolate = N, FAIL=0,0,0,list=Y,file=@MSTA_Discount@


;=============================================================
; Over-the Rail Distance Skims                               =
;=============================================================


     FILEI MATI = RLDIST.SKM
           MW[1]= MI.1.1     ;   (Over-the-rail distance in 1/100s mi)

           ROWSUM1 = ROWSUM(1)
;=============================================================
; Now, loop through each station i/j, compute composite distance,
;      and compute AM and Off peak fares.  Use generalized cost
;      calculation:
;
; FARE = (incremental cost + Rate*Distance) <-Per short  Distance  +
;        (incremental cost + Rate*Distance) <-Per medium Distance  +
;        (incremental cost + Rate*Distance) <-Per long   Distance
```

```
;
;==============================================================
  IF (rowsum1 > 0)      ; exclude unused stations
    JLOOP

     IF (MW[1] !=0 || I=J )   ; exclude station i/js that are 'unused

;     Calculate airline distance (MW[2]) in 100s of miles
      IxCrd  = StaXYS(1,I)
      JxCrd  = StaXYS(1,J)
      IyCrd  = StaXYS(2,I)
      JyCrd  = StaXYS(2,J)
      MW[2]  = ((IxCrd-JxCrd)^2 + (IyCrd-JyCrd)^2 )^ 0.5

;     Calculate Composite (airline/over-the rail) distance MW[3] in whole miles
      MW[3]  =          ((MW[1]  + MW[2]) / 2.0) * @MR_Dst_Ftr@

;     Calculate peak (MW[10]) and off-peak fares (MW[20]) based on comp distance
;     Fares computed units in non-defalted cents


;   Peak Fare Calculation:  -------------------------------------------------------
----------------

      PkDist1 = Pk_Fare_Dist1
      PkDist2 = Pk_Fare_Dist1 + Pk_Fare_Dist2


      IF       (MW[3] <= PkDist1)

                 MW[10] = Pk_Fare_Incr1 + (Pk_Fare_Rate1 * MW[3])

        ELSEIF (MW[3] >  PkDist1 && MW[3] <= PkDist2)

                 MW[10] = Pk_Fare_Incr1 + (Pk_Fare_Rate1 *  Pk_Fare_Dist1)   +
                          Pk_Fare_Incr2 + (Pk_Fare_Rate2 * (MW[3] - PkDist1))

        ELSEIF (MW[3] >  PkDist2)

                 MW[10] = Pk_Fare_Incr1 + (Pk_Fare_Rate1 *  Pk_Fare_Dist1)   +
                          Pk_Fare_Incr2 + (Pk_Fare_Rate2 *  Pk_Fare_Dist2)   +
                          Pk_Fare_Incr3 + (Pk_Fare_Rate3 * (MW[3] - PkDist2))
      ENDIF

;     Round computed AM fare MW[10] to nearest nickle as in original program Final
Fare
;     is 'FinAMFare'
                    FARE        = MW[10]
                    temp1       = INT(Fare/10.0)
                    temp2       = temp1  * 10.0
                    DiffCheck   = Fare - temp2
                    IF        (DiffCheck < 2.5)
                         FinAMFare = temp2
                      ELSEIF  (DiffCheck > 7.5)
                         FinAMFare = temp2 + 10.0
                      ElSE
                         FinAMFare = temp2 +  5.0
                    ENDIF

;     Impose Max Fare rule
                 If (FinAMFare > Pk_Fare_Max)  FinAMFare = Pk_Fare_Max

;     Apply AM station discounts if used
                    FinAMFare = FinAMFare - StaDSC(1,I) - StaDsc(1,J)

;     Compute IJ Index so station-to-station fares can be read in as a lookup
;     Index merges separate I/J numbers into one number (index for  station 1 to
station 1 is '1001')
```

```
                    IJindex = (I * 1000.0)  + J

;    Write out the AM Fares:
      Print List =  I(5),J(5), FinAMFare(6),IJindex(7),' ; ', MW[10](6),
MW[1](10.0),MW[2](10.0),MW[3](10.2),
                    IxCrd(7), JxCrd(7), IyCrd(7), JyCrd(7),
                    PkDist1(10.2),PkDist2(10.2),
               ';<
I/J/AM_Fare_n5/AM_Fare/R_Dst100s/A_Dst100s/CmpDstMi/iXcrd/jXcrd/iYcrd/jYcrdI/Dist1/D
ist2',
                File=@AM_Sta_Fares@



;     END of Peak Fare Calculation ------------------------------------------------
---------------

;    Off-Peak Calculation:  -------------------------------------------------------
----------------

      OpDist1 = Op_Fare_Dist1
      OpDist2 = Op_Fare_Dist1 + Op_Fare_Dist2


      IF       (MW[3] <= OpDist1)

                 MW[20] = Op_Fare_Incr1 + (Op_Fare_Rate1 * MW[3])

        ELSEIF (MW[3] >  OpDist1 && MW[3] <= OpDist2)

                 MW[20] = Op_Fare_Incr1 + (Op_Fare_Rate1 *  Op_Fare_Dist1)   +
                          Op_Fare_Incr2 + (Op_Fare_Rate2 * (MW[3] - OpDist1))

        ELSEIF (MW[3] >  OpDist2)

                 MW[20] = Op_Fare_Incr1 + (Op_Fare_Rate1 *  Op_Fare_Dist1)   +
                          Op_Fare_Incr2 + (Op_Fare_Rate2 *  Op_Fare_Dist2)   +
                          Op_Fare_Incr3 + (Op_Fare_Rate3 * (MW[3] - OpDist2))
      ENDIF

;     Round computed Off-peak fare MW[20] to nearest nickle as in original program
Final Fare
;     is 'FinOPFare'
                    FARE        = MW[20]
                    temp1       = INT(Fare/10.0)
                    temp2       = temp1  * 10.0
                    DiffCheck   = Fare - temp2
                    IF        (DiffCheck < 2.5)
                         FinOPFare = temp2
                      ELSEIF  (DiffCheck > 7.5)
                         FinOPFare = temp2 + 10.0
                      ElSE
                         FinOPFare = temp2 +  5.0
                    ENDIF


;     Impose Max Fare rule
                 If (FinOPFare > Op_Fare_Max)  FinOPFare = Op_Fare_Max

;     Apply Off-pk station discounts if used
                    FinOPFare = FinOPFare - StaDSC(2,I) - StaDsc(2,J)

;     Compute IJ Index so station-to-station fares can be read in as a lookup
;     Index merges separate I/J numbers into one number (index for  station 1 to
station 1 is '1001')
                    IJindex = (I * 1000.0)  + J

;     Write out the Off-Pk Fares:
```

```
      Print List =  I(5),J(5),FinOPFare(6),IJindex(7),' ; ', MW[20](6),
MW[1](10.0),MW[2](10.0),MW[3](10.2),
                    IxCrd(7), JxCrd(7), IyCrd(7), JyCrd(7),
                    OpDist1(10.2),OpDist2(10.2),
               ';<
I/J/OP_Fare/R_Dst100s/A_Dst100s/CmpDstMi/iXcrd/jXcrd/iYcrd/jYcrdI/Dist1/Dist2',
                File=@OP_Sta_Fares@


;     END of Off Peak Fare Calculation -------------------------------------------
-----------------


     ENDIF
    ENDJLOOP
   endif
ENDRUN
```

15 MFARE2.S

```
;=================================================================
;  MFARE2.S
;   Version 2.2 Model
;   TP+ Script Version of MFARE2 Program
;   Walk and Drive Access Zonal Fares Developed for AM Peak and Off-Peak Periods
;
;   Programmer: Milone
;   Date:      1/11/07
;=================================================================
;
ZONESIZE        =  2191               ;  No. of TAZs
LastIZn         =  2144               ;  Last Internal TAZ No.
STATSIZE        =   150               ;  Max No. of Metrorail Stations
BFZ_Size        =    21               ;  No. of Bus Fare Zones
; ---------------------------------------------------------------------

MSTA_Tariff     = 'INPUTS\tariff.txt'
TRN_Defl        = 'TRN_Deflator.txt'
; LOOP Through the Time Period/Access Mode combinations
;      - define I/P & O/P files:
;
LOOP PRDACC = 1,4
    IF (PRDACC = 1)                                  ;  ------ AM Walk Access cycle:
------
       USTOSFile       = '%_iter_%_AM_WK.STA '       ;   Input:  Walk Acc. Station
to Station Matrix (Brd Sta/T1, Ali Stat/T2)
       MR_FareFile     = 'AM_Metrorail_Fares.TXT '   ;           Metrorail Fares in
Current Year Cents
       BusFareMTX      = 'INPUTS\BUSFARAM.ASC'       ;           Bus Fare matrix
21x21 (Bus fares zones '1' to '21')
       MF2ZonalDeck    = 'FARE_A2.ASC'               ;           Zonal A2 Deck
(Bus fares zones referenced as '1' to '21')
       OutputMatrix    = '%_iter_%_AM_WK.FAR '       ;   Output: Total Fare Matrix
       OutputMatrix5   = '%_iter_%_AM_WK.FR5 '       ;           Fare Matrix (T1-5
Total,bus onlr, rail, acc, egr fare file)
       OutputText      = '%_iter_%_AM_WK.TXT '       ;           Fare text file for
checking fare components / selected ijs
    ELSEIF (PRDACC = 2)                              ;  ------ AM Drive Access
cycle: ------
       USTOSFile       = '%_iter_%_AM_DR.STA '       ;   Input:  Walk Acc. Station
to Station Matrix (Brd Sta/T1, Ali Stat/T2)
       MR_FareFile     = 'AM_Metrorail_Fares.TXT '   ;           Metrorail Fares in
Current Year Cents
       BusFareMTX      = 'INPUTS\BUSFARAM.ASC'       ;           Bus Fare matrix
21x21 (Bus fares zones '1' to '21')
       MF2ZonalDeck    = 'FARE_A2.ASC'               ;           Zonal A2 Deck
(Bus fares zones referenced as '1' to '21')
       OutputMatrix    = '%_iter_%_AM_DR.FAR '       ;   Output: Total Fare Matrix
       OutputMatrix5   = '%_iter_%_AM_DR.FR5 '       ;           Fare Matrix (T1-5
Total,bus onlr, rail, acc, egr fare file)
       OutputText      = '%_iter_%_AM_DR.TXT '       ;           Fare text file for
checking fare components / selected ijs
    ELSEIF (PRDACC = 3)                              ;  ------ Off-Pk Walk  Access
cycle: ------
       USTOSFile       = '%_iter_%_OP_WK.STA '       ;   Input:  Walk Acc. Station
to Station Matrix (Brd Sta/T1, Ali Stat/T2)
       MR_FareFile     = 'OP_Metrorail_Fares.TXT '   ;           Metrorail Fares in
Current Year Cents
       BusFareMTX      = 'INPUTS\BUSFAROP.ASC'       ;           Bus Fare matrix
21x21 (Bus fares zones '1' to '21')
       MF2ZonalDeck    = 'FARE_A2.ASC'               ;           Zonal A2 Deck
(Bus fares zones referenced as '1' to '21')
       OutputMatrix    = '%_iter_%_OP_WK.FAR '       ;   Output: Total Fare Matrix
       OutputMatrix5   = '%_iter_%_OP_WK.FR5 '       ;           Fare Matrix (T1-5
Total,bus onlr, rail, acc, egr fare file)
       OutputText      = '%_iter_%_OP_WK.TXT '       ;           Fare text file for
checking fare components / selected ijs
    ELSEIF (PRDACC = 4)                              ;  ------ Off-Pk Walk  Access
cycle: ------
       USTOSFile       = '%_iter_%_OP_DR.STA '       ;   Input:  Walk Acc. Station
to Station Matrix (Brd Sta/T1, Ali Stat/T2)
       MR_FareFile     = 'OP_Metrorail_Fares.TXT '   ;           Metrorail Fares in
Current Year Cents
       BusFareMTX      = 'INPUTS\BUSFAROP.ASC'       ;           Bus Fare matrix
21x21 (Bus fares zones '1' to '21')
       MF2ZonalDeck    = 'FARE_A2.ASC'               ;           Zonal A2 Deck
(Bus fares zones referenced as '1' to '21')
       OutputMatrix    = '%_iter_%_OP_DR.FAR '       ;   Output: Total Fare Matrix
       OutputMatrix5   = '%_iter_%_OP_DR.FR5 '       ;           Fare Matrix (T1-5
Total,bus onlr, rail, acc, egr fare file)
       OutputText      = '%_iter_%_OP_DR.TXT '       ;           Fare text file for
checking fare components / selected ijs
    ENDIF


RUN PGM=MATRIX
ZONES=@ZONESIZE@
;
read FILE=@MSTA_Tariff@
read FILE=@TRN_Defl@
;=============================================================
; Read Station-to-Station Metrorail Fares as lookups         =
; Fares read in based on IJ index                            =
;    e.g., '1001' means 1 to 1 and '150150' means 150 to 150  =
;                                                            =
;=============================================================
;
      LOOKUP Name=STA_Fares,
             LOOKUP[1]   = 4,Result = 3,   ;  station to station fares
             Interpolate = N, FAIL=0,0,0,list=N,file=@MR_FareFile@
;
;=============================================================
; Read Bus Fare zone to Bus fare zone matrix                 =
; Fares are indexed to origin-end bus fare zone 'row';lookup  =
; no. corresponds to a destin-end bus fare zone 'column'      =
;=============================================================
;
```

```
      LOOKUP Name=BusFrMTX,
             LOOKUP[01]   = 1,Result = 2,   ;
             LOOKUP[02]   = 1,Result = 3,   ;
             LOOKUP[03]   = 1,Result = 4,   ;
             LOOKUP[04]   = 1,Result = 5,   ;
             LOOKUP[05]   = 1,Result = 6,   ;
             LOOKUP[06]   = 1,Result = 7,   ;
             LOOKUP[07]   = 1,Result = 8,   ;
             LOOKUP[08]   = 1,Result = 9,   ;
             LOOKUP[09]   = 1,Result =10,   ;
             LOOKUP[10]   = 1,Result =11,   ;
             LOOKUP[11]   = 1,Result =12,   ;
             LOOKUP[12]   = 1,Result =13,   ;
             LOOKUP[13]   = 1,Result =14,   ;
             LOOKUP[14]   = 1,Result =15,   ;
             LOOKUP[15]   = 1,Result =16,   ;
             LOOKUP[16]   = 1,Result =17,   ;
             LOOKUP[17]   = 1,Result =18,   ;
             LOOKUP[18]   = 1,Result =19,   ;
             LOOKUP[19]   = 1,Result =20,   ;
             LOOKUP[20]   = 1,Result =21,   ;
             LOOKUP[21]   = 1,Result =22,   ;
             Interpolate  = N, FAIL=0,0,0,list=N,file=@BusFareMTX@


;;   read Zone data file
      LOOKUP Name=TAZLook,
             LOOKUP[01]   = 1,Result = 2,   ;  BusFare Zn 1 (1-21)
             LOOKUP[02]   = 1,Result = 3,   ;  BusFare Zn 2 (1-21)
             LOOKUP[03]   = 1,Result = 4,   ;  Orig Walk Pct in 10ths of pcts
('1000'=100%)
             LOOKUP[04]   = 1,Result = 5,   ;  Dest Walk Pct in 10ths of pcts
('1000'=100%)
             LOOKUP[05]   = 1,Result = 6,   ;  BusFare Zn 1 associated w/ Metro
station  (1-21)
             LOOKUP[06]   = 1,Result = 7,   ;  BusFare Zn 2 associated w/ Metro
station  (1-21)
             LOOKUP[07]   = 1,Result = 8,   ;  Jurcode: 0/DC, 1/MD, 2/VA Area1, 3/VA
Area2
             LOOKUP[08]   = 1,Result = 9,   ;  Origin-end Bus Fare Override value
(in current yr cents)
             LOOKUP[09]   = 1,Result =10,   ;  Destin-end Bus Fare Override value
(in current yr cents
             Interpolate  = N, FAIL=0,0,0,list=N,file=@MF2ZonalDeck@

           ;
           ; Establish Discount Array
           ;
             ARRAY RB_Disc = 4

                   RB_Disc[1] = DC_RailBus_Disc
                   RB_Disc[2] = MD_RailBus_Disc
                   RB_Disc[3] = VA1_RailBusDisc
                   RB_Disc[4] = VA2_RailBusDisc

             IF (TAZLook(7,I) > 3 || TAZLook(7,I) < 0)
                LIST = 'Jurisdiction Code NOT within convention values; I Quit'
                ABORT
             ENDIF

             IF (TAZLook(3,I) < 0  || TAZLook(3,I) > 1000.0  )
                LIST = 'Orig. Walk Pcts NOT within tolerances(0.0 to 1000.0) ; I
Quit'
                ABORT
             ENDIF

             IF (TAZLook(4,I) < 0  || TAZLook(4,I) > 1000.0  )
                LIST = 'Destin. Walk Pcts NOT within tolerances(0.0 to 1000.0) ; I
Quit'
                ABORT
             ENDIF


             IF (TAZLook(1,I) > @BFZ_SIZE@ || TAZLook(2,I) > @BFZ_SIZE@ ||
                 TAZLook(5,I) > @BFZ_SIZE@ || TAZLook(6,I) > @BFZ_SIZE@)
                LIST = 'Zonal / Metrorail Bus Fare Zn No. equivalence exceeds:
','@BFZ_SIZE@',': I Quit'
                ABORT
             ENDIF

;==============================================================
; Read in the USTOS files here & Declare output matrix       =
;==============================================================

           MATI[1] = @USTOSFile@
             MW[11] = MI.1.1    ;  On-Station
             MW[12] = MI.1.2    ;  Off-Station

             MATO[1]= @OutputMatrix@,MO=21,FORMAT=MINUTP; total deflated fare/t1)

             MATO[2]= @OutputMatrix5@,MO=41-45    ; total deflated fare/t1,
                                                  ; busonly(undefl)    /t2,
                                                  ; rail(undef)        /t3,
                                                  ; acc(undef)         /t4,
                                                  ; egr(undef)         /t5

;==============================================================
;==============================================================
; Now begin  i/j level fare calculation process              =
;==============================================================
;==============================================================


  JLOOP
    IF (I > @LastIZN@ || J > @LastIZN@)  Continue                 ; Skip current
i/j if either is external
     ; Start afresh all fare related variables at the current i/j

          BusFare        = 0.0
          RailFare       = 0.0
          RailAccFare    = 0.0
          RailEgrFare    = 0.0
          TotalFare      = 0.0
          TotalFareDef   = 0.0
          IBFZ1          = 0.0
          IBFZ2          = 0.0
          JBFZ1          = 0.0
          JBFZ2          = 0.0
          Acc_NoWlk_Prop = 0.0
          Egr_NoWlk_Prop = 0.0
          ISTA           = 0.0
          JSTA           = 0.0
          IJIDX          = 0.0
          RailFare       = 0.0
          RIBFZ1         = 0.0
          RIBFZ2         = 0.0
          RJBFZ1         = 0.0
          RJBFZ2         = 0.0
          _AccFare1      = 0.0
          _AccFare2      = 0.0
          _AccFare12     = 0.0
          _EgrFare1      = 0.0
          _EgrFare2      = 0.0
          _EgrFare12     = 0.0
          RailAccFare    = 0.0
```

```
          RailEgrFare    = 0.0
          Acc_Discount   = 0.0
          Egr_Discount   = 0.0
          I_FareOvr      = 0.0
          J_FareOvr      = 0.0

     ; Make sure station numbers are appropriate:
          IF (MW[11] > @STATSIZE@ ||  MW[12] > @STATSIZE@ )
                LIST = 'USTOS Station number(s) are out of range; I Quit'
              ABORT
          ENDIF

      ;
      ; Define Rail-to-bus fare discount.  The discount will be applied
      ; at the acces end and egress - end on a 50/50 basis (per MFARE2)
      ;
        AccRBDx     =  TAZLook(7,I) + 1         ; convert JurCode 0-3 to Rail/Bus
discount array index 1-4
        EgrRBDx     =  TAZLook(7,J) + 1         ;
        Acc_Discount  =  RB_Disc[AccRBDx] * 0.50
        Egr_Discount  =  RB_Disc[EgrRBDx] * 0.50


     ; Lookup Bus Fares
     ;
     IBFZ1 = TAZLOOK(1,I)
     IBFZ2 = TAZLOOK(2,I)
     IF (IBFZ2 = 0) IBFZ2 = IBFZ1


     JBFZ1 = TAZLOOK(1,J)
     JBFZ2 = TAZLOOK(2,J)
     IF (JBFZ2 = 0) JBFZ2 = JBFZ1

     ;
     ;  Define Zonal Non-walk area percentages at
     ;  Access end and egress end:
     Acc_NoWlk_Prop = 1.0 - (TAZLOOK(3,I)/1000.0)    ; Zonal non-walk proportion to
station (Access-end)
     Egr_NoWlk_Prop = 1.0 - (TAZLOOK(4,J)/1000.0)    ; Zonal non-walk proportion to
station (Egress-end)


    ;-------------------------------------------------------------------
    ; If no rail stations used, compute Bus fare (BUSFARE)
    ;-------------------------------------------------------------------

    IF (MW[11][j] = 0  && MW[12][j] = 0)  ;
          BusFare = (BusFrMTX(JBFZ1,IBFZ1)  +
                     BusFrMTX(JBFZ2,IBFZ1)  +
                     BusFrMTX(JBFZ1,IBFZ2)  +
                     BusFrMTX(JBFZ2,IBFZ2))   * 0.250

         TotalFare     =  BusFare + RailFare + RailAccFare + RailEgrFare  ;
undeflated transit fare, Bus-Only paths
         TotalFareDef  =  Round(TotalFare * DeflationFTR)
         MW[21][j]     =  TotalFareDef

         MW[41][j]     = TotalFareDef
         MW[42][j]     = BusFare
         MW[43][j]     = RailFare
         MW[44][j]     = _AccFare12
         MW[45][j]     = _EgrFare12

     ELSE
    ;------------------------------------------------------------------
    ; ... Else compute rail related fares                             -
    ; if USTOS stations exist for current I/J                         -
    ;------------------------------------------------------------------

       ISTA     =  MW[11][J]                              ; Origin Metrorail
Station No.
       JSTA     =  MW[12][J]                              ; Destin Metrorail
Station No.
       IJIDX    =  ISTA*1000.0 + JSTA                     ; Sta I/J index,
('0001001' means from sta# 1 to sta#1)
       RailFare =  Sta_Fares(1,IJIDX)                     ; Fare from current Sta.I
to Sta.J

      ;
      ;  Define Station-related Bus Fare Zones
      ;  Access-End:

      RIBFZ1 = TAZLOOK(5,ISTA)
      RIBFZ2 = TAZLOOK(6,ISTA)
      IF (RIBFZ2 = 0) RIBFZ2 = RIBFZ1

      ;  Egress-End:

      RJBFZ1 = TAZLOOK(5,JSTA)
      RJBFZ2 = TAZLOOK(6,JSTA)
      IF (RJBFZ2 = 0) RJBFZ2 = RJBFZ1

       _AccFare1 = MIN(BusFrMTX(RIBFZ1,IBFZ1),BusFrMTX(RIBFZ2,IBFZ1))
       _AccFare2 = MIN(BusFrMTX(RIBFZ1,IBFZ2),BusFrMTX(RIBFZ2,IBFZ2))
       _AccFare12= ((_AccFare1 + _AccFare2) * 0.50) - Acc_Discount

       _EgrFare1 = MIN(BusFrMTX(JBFZ1,RJBFZ1),BusFrMTX(JBFZ1,RJBFZ2))
       _EgrFare2 = MIN(BusFrMTX(JBFZ2,RJBFZ1),BusFrMTX(JBFZ2,RJBFZ2))
       _EgrFare12= ((_EgrFare1 + _EgrFare2) * 0.50) - Egr_Discount

        RailAccFare = _AccFare12 *  Acc_NoWlk_Prop
        RailEgrFare = _EgrFare12 *  Egr_NoWlk_Prop

        TotalFare      =  BusFare + RailFare + RailAccFare + RailEgrFare ;
undeflated transit fare, Metrorail-Related paths

    ; If an I/J override value exists use it instead of the total computed fare
value

        IF ( TAZLOOK(8,I) > 0.0 )
             I_FareOvr = TAZLOOK(8,I)
             TotalFare = I_FareOvr
        ENDIF
        IF ( TAZLOOK(9,J) > 0.0 )
            J_FareOvr = TAZLOOK(9,J)
            TotalFare = J_FareOvr
        ENDIF

    ; Apply Deflator to Total fare to write out constant dollars

        TotalFareDef   =  Round(TotalFare * DeflationFTR)
         MW[21][j]     =  TotalFareDef

         MW[41][j]     = TotalFareDef
         MW[42][j]     = BusFare
         MW[43][j]     = RailFare
         MW[44][j]     = _AccFare12
         MW[45][j]     = _EgrFare12

    ENDIF


    ; write out the results of sample IJs here:
     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 Form=7.1 list= i(6),j(6),TotalFareDef(6), TotalFare, BusFare,
RailFare, _AccFare12,_EgrFare12,
                             I_FareOvr,J_FareOvr,
          ' <<-
I/J/DefFare/UnDefFare/BusFare/RailFare/AccFare/EgrFare/IOvrFare/JOvrFare/',
file=@Outputtext@
    ENDIF

  ENDJLOOP


ENDRUN

ENDLOOP
```

16 Misc_Time-of-Day.s

```
; ===================================================================
;  Misc_Time-of-Day.s
;  MWCOG Version 2.2 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'.
; Bucket rounding is removed per version 2.2
; Sept. 2007: Iteration spec. now used for internal trucks
; ===================================================================
;
; Environment Variable:
;              _iter_  (Iteration indicator = 'pp','i1'-'i6'
;
;////////////////////////////////////////////////////////////////////
;                                                                  //
; Input/Output filenames:                                          //
;                                                                  //
READ FILE=..\support\V2TODTPP.PAR  ; Time of Day Factor File       //
;                                                                  //
; I/P Truck & Exogenous 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 = 'MTKEST%_iter_%.VTT'        ;  Medium Truck Trips       //
HTKTDOUT = 'HTKEST%_iter_%.VTT'        ;  Heavy  Truck Trips       //
;
APXADR   = 'inputs\airpax.adr'         ;  Air Passenger Auto Dr.   //
;
; O/P Truck and Exogenous Tabs by time of day                      //
MISCAM  = 'MISCAM%_iter_%.TT'          ; AM     Non-Modeled Trips  //
MISCPM  = 'MISCPM%_iter_%.TT'          ; PM     Non-Modeled Trips  //
MISCOP  = 'MISCOP%_iter_%.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

; 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
;
```

17 PP_Auto_Drivers.s

```
; ====================================================================
;  PP_Auto_Drivers.s
;  MWCOG Version 2.2  Model
;        Note: Bucket Rounding is now removed
;
;  This program is used to develop 1-occ, 2-occ, and 3+occ auto driver
;  trip tables directly from 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            ;


 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
;
```

18 PREFARTP.S

```
;=================================================================
;  PREFARETP.S  -
;   Program to read Zone File Used for MFARE2 Program (without walk pcts)
;           and to merge in walk pct. information
;          (Conversion of FORTRAN program Prefaretp.FOR)
;
;   Programmer: Milone
;   Date:        11/08/06
;
;    The program reads 3 files:
;              - a GIS-based walk area file containing short and
;                long walk areas to all rail stations
;                (rail includes metro & commuter rail).  The file also
;                contains the sht,lng distances to the nearest metrorail
```

```
;                 station.  Note: the walk distance is based on 1.0 mile
;                 radius per the V2 models (NOT 7/10 mile per V1 models)
;               - a zone file containing bus fare zone/station equivs and
;                 jurisdiction code information.  This is essentially
;                 an A2 deck without walk percentages
;               - the 'final' zonal walk percentage file written
;                 by the wlklnktp.exe program.  This will suppress
;                 metrorail walk percentages to be consistent with
;                 the walk access links built previously
;    It writes out:
;               - A 'complete' A2 file for the MFARE2.S
;                  process
;
ZONESIZE        =  2144                ; internal zones
Fin_Area_File   = 'SHLGAM.FIN'         ; from output SD
GIS_Area_File   = 'INPUTS\GISWKAAM.ASC' ; from \INPUTS SD
Fare_Zone_File  = 'INPUTS\tazfrzn.asc'  ; from \INPUTS SD

out_file        = 'fare_a2.asc'

RUN PGM=MATRIX
ZONES=@ZONESIZE@


; Initialize current metrorail walk pct and final pct walk
metwkpct     =  0
finwkpct     =  0

ZDATI[1] = @Fin_Area_File@, Z        =  1- 5,
                            swpct    =  6-10, ; short walk area pct of TAZ
                            lwpct    = 11-15  ; long  walk area pct of TAZ

           finwkpct = zi.1.swpct + zi.1.lwpct
;; print list = I(5), ' ',swpct(10.7),' ',lwpct(10.7),' ',finwkpct(10.7)


ZDATI[2] = @GIS_Area_File@,  Z        =   4- 8,
                             larea    =   9-17,
                             swrarea  =  24-30,
                             lwrarea  =  36-42,
                             smetdst  =  85-91,
                             lmetdst  = 95-101

;
;  compute the total walk area (short and long) to metrorail station
;  we'll add the total 'rail' areas. If the sh/lg distance to metrorail
;  is nonzero, we'll assume 'rail' area pertains to metrorail.
;  5/23/02 change - also if wlklnktp-based final walk pct is zero
;  then metro walk pct will be zero

     if (((zi.2.smetdst = 0) && (zi.2.lmetdst = 0)) || (finwkpct = 0))
           metwkpct  =  0

       else
           metwkpct  =
           round( ((zi.2.swrarea + zi.2.lwrarea)/(zi.2.larea)) * 1000.0)
     endif

;  Lets double check that the computed metrorail walk pct (in tenths)
;  is within the expected range, if not then abort and write msg.

      if ((metwkpct <  0) || (metwkpct  > 1000.0)) ABORT

;;  print list = I(5),' ', larea(10.7),' ',swrarea(10.7),' ',lwrarea(10.7),' ',
;;                 smetdst(10.3),' ',lmetdst(10.3),
;;                       ' ',metwkpct(6.2)

ZDATI[3] = @Fare_Zone_File@,
           Z        =   4- 8,
           bfz1     =   9-16,
           bfz2     =  17-24,
           rfz1     =  41-48,
           rfz2     =  49-56,
           jur      =  57-64,
           pdsc     =  65-72,
           adsc     =  73-80


;
;  Print Out zonal data
;  -- Only if input bus fare zone 1 is nonzero
;     -this ensures that a consistent record count will be maintained w/ I&O
  IF (zi.3.bfz1 > 0)


       Print list = i(8), zi.3.bfz1(8),zi.3.bfz2(8),
                          metwkpct(8),metwkpct(8),
                          zi.3.rfz1(8),zi.3.rfz2(8),
                          zi.3.JUR(8),zi.3.pdsc(8),zi.3.adsc(8),file=@out_file@

  ENDIF

ENDRUN
```

19 PUMP_PRIME_SKIMS.S

```
;---------------------------------------------------------------------------
;PUMP_PRIME_SKIMS.S
;MWCOG VERSION 2.2 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   (1994 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 1994 cents
       LW.HV2@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(2,LI.TOLLGRP)           ;  HOV 2
occ TOLLS in 1994 cents
       LW.HV3@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(3,LI.TOLLGRP)           ;  HOV
3+occ TOLLS in 1994 cents
       LW.TRK@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(4,LI.TOLLGRP)           ;  Truck
TOLLS in 1994 cents
       LW.APX@PRD@TOLL = LI.@PRD@TOLL * @PRD@_TFAC(5,LI.TOLLGRP)           ;  AP Pax
TOLLS in 1994 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 1994$
       LW.HV2@PRD@_tm = (LW.HV2@PRD@TOLL / 100.0) *    H2@PRD@EQM  ;  HOV 2 occ
Time(min) equiv. of toll value in 1994$
```

```
       LW.HV3@PRD@_tm = (LW.HV3@PRD@TOLL / 100.0) *    H3@PRD@EQM  ;  HOV 3+occ
Time(min) equiv. of toll value in 1994$
       LW.TRK@PRD@_tm = (LW.TRK@PRD@TOLL / 100.0) *    TK@PRD@EQM  ;  Truck
Time(min) equiv. of toll value in 1994$
       LW.APX@PRD@_tm = (LW.APX@PRD@TOLL / 100.0) *    AP@PRD@EQM  ;  APAX
Time(min) equiv. of toll value in 1994$

   ; 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
                                            ; 1994 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   ;
```

20 set_CPI.s

```
;-------------------------------------------------------------------
; SET_CPI.S   Version 2.2 Model
;   Used to   define Transit and Highway Deflators consistently
;
;-------------------------------------------------------------------
CPI_File        =  'INPUTS\CPI_File.TXT'   ;  Input parameters from the \INPUTS
subdir.
ModeledYear     =  '%_year_%'              ;  Simulation Year (Defined in
RUNALL_????.bat file)
;----------------------------------------------------------------------

CPI_Rept        = 'MFARE2_CPI.TXT'                 ; Output Reporting file

;
RUN PGM=MATRIX
ZONES=1
READ file=@CPI_File@

IF (Defl_OverRide != 0 )              ; if explicit deflation factor is provided by
user
```

```
     DEFLATIONFTR  = Defl_OverRide     ; then use it, otherwise compute it using the
most recent CPI table
     Print List='Deflation Factor is based on Override (Defl_OverRide)  in the
CPI_File.txt file: ', DEFLATIONFTR(8.5), file=@CPI_rept@
   ELSE                                ;
;
;;
;;  Now establish the Deflation factor depending on the modeled year
;;  and available historic US BLS data
;;
       _BseCPI      = CPI_Table(1,BaseCPIYear)
       _CurCPI      = CPI_Table(1,CurrCPIYear)
       _CurCPIdefl  = CPI_Table(1,BaseCPIYear) / CPI_Table(1,CurrCPIYear)

       IF (@ModeledYear@ < BaseCPIYear)             ; Deflation ftr can't be
developed if yr < 1994
           LIST = 'Modeled Year is earlier than Base Year in CPI Lookup; I Quit'
           ABORT

         ELSEIF (@ModeledYear@ = BaseCPIYear)      ; If Modeled year is Base CPI
year
           _BseGrowRate = CPI_Table(2,@ModeledYear@) ;    then use the defaltion
rate from table
           _AltGrowRate = CPI_Table(2,@ModeledYear@)

           _FutBseCPI   = CPI_Table(1,@ModeledYear@)
           _FutAltCPI   = CPI_Table(1,@ModeledYear@)

           DEFLATIONFTR = CPI_Table(3,@ModeledYear@)


         ELSEIF (@ModeledYear@ > BaseCPIYear && @ModeledYear@ <= CurrCPIYear)   ; If
Modeled year is between base and current CPI year
           _BseGrowRate = CPI_Table(2,@ModeledYear@)                             ;
then use the defaltion rate from table
           _AltGrowRate = CPI_Table(2,@ModeledYear@) * INFLATIONFTR

           _FutBseCPI   = CPI_Table(1,BaseCPIYear) * ((1.0 +
_BseGrowRate)^(@ModeledYear@ - BaseCPIYear))
           _FutAltCPI   = CPI_Table(1,BaseCPIYear) * ((1.0 +
_AltGrowRate)^(@ModeledYear@ - BaseCPIYear))

           DEFLATIONFTR = (_FutAltCPI / _FutBseCPI)  *  CPI_Table(3,@ModeledYear@)


         ELSE                ; Modeled year greater than current CPI year
                             ;  Use current CPI year for computing the deflation
factor
           _BseGrowRate = ( (CPI_Table(1,CurrCPIYear) / CPI_Table(1,BaseCPIYear)) ^
(1.0/ (CurrCPIYear - BaseCPIYear)) ) - 1.0
           _AltGrowRate = _BseGrowRate * INFLATIONFTR

           _FutBseCPI   = CPI_Table(1,BaseCPIYear) * ((1.0 +
_BseGrowRate)^(@ModeledYear@ - BaseCPIYear))
           _FutAltCPI   = CPI_Table(1,BaseCPIYear) * ((1.0 +
_AltGrowRate)^(@ModeledYear@ - BaseCPIYear))

           DEFLATIONFTR =  (_FutAltCPI / _FutBseCPI)  *  CPI_Table(3,CurrCPIYear)
        ENDIF

               ;  print out small text file containing deflation factor deriviation:
           Print List='Modeled Year:                                       ',
@ModeledYear@(8.0) ,'\n',                          file=@CPI_rept@
           Print List='Base    Year & CPI:                                 ',
BaseCPIYear(8.0) , _BseCPI(8.1),'\n',              file=@CPI_rept@
           Print List='Current Year & CPI & deflator (Base CPI/Curr CPI):  ',
CurrCPIYear(8.0) , _CurCPI(8.1),_CurCPIdefl(8.5),'\n',file=@CPI_rept@
           Print List='Inflation Factor Assumption (1.00 = direct CPI):    ',
INFLATIONFTR(8.5),'\n',                            file=@CPI_rept@
           Print List='Modeled Year Growth rate & CPI w/  Full  CPI:    (A)',
_BseGrowRate(8.5)  , _FutBseCPI(8.1),'(forecasts years only)','\n',file=@CPI_rept@
           Print List='Modeled Year growth rate & CPI w/ Infla. Factor: (B)',
_AltGrowRate(8.5)  , _FutAltCPI(8.1),'(forecasts years only)','\n',file=@CPI_rept@
           Print List='Deflation Factor ((B)/(A) * Current Deflator :      ',
DEFLATIONFTR(8.5)  ,                                     file=@CPI_rept@

ENDIF
          Print List = 'DEFLATIONFTR  = ', DEFLATIONFTR(8.5),'  ;; Transit Deflation
Factor ',  File = TRN_Deflator.txt
          Print List = 'DEFLATIONFTR  = ', DEFLATIONFTR(8.5),'  ;; Highway Deflation
Factor ',  File = HWY_Deflator.txt



ENDRUN
;==============================================================
; End of CPI/Deflation section                                =
;==============================================================
```

21 set_factors.s

```
;-------------------------------------------------------------------
; SET_FACTORS.S   Version 2.2 Model
;-------------------------------------------------------------------

; MWCOG Version 2.2  Model
;  Set up time penalty & K-factor files used in Trip Distribution
; Income-based Time Penalty Files & Superzone-to-TAZ Equivalency File
;  have now been removed.  Null placemarker files are now used.
;
; K-Factors for HBW purpose have been modifed
;    HBS, HBO, NHB Ks are now removed
;
; 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  -----|
; |------------------------------------------------------------|
;; Note updated TAZ ranges for mtg/pg (Sept 2006)
;;   MTG MD    320-639,648,650
;;   PG  MD    640-647,649,651-1029

;; K-Factors per Ver 2.2I
IF      (I =   89-  319)
       MW[1] = 1700,  INCLUDE=             1-   88 ; dcncr - dc cr
  ELSEIF (I =    320-639,648,650)
       MW[1] = 1600,  INCLUDE=     320-639,648,650 ; Mtg - Mtg
       MW[1] = 2000,  INCLUDE=             1-   88 ; Mtg - Dc core

  ELSEIF (I = 1920- 2069)
       MW[1] = 3200,  INCLUDE=             1-   88 ; pw - dccr

  ELSEIF (I  = 1230- 1238)
       MW[1] = 2500,  INCLUDE=             1-   88 ; arl core - dccr

  ELSEIF (I  = 1239- 1329)
       MW[1] = 1700,  INCLUDE=             1-   88 ; arl non core - dccr

 ELSEIF  (I = 1330- 1399)
       MW[1] = 1600,  INCLUDE=             1-   88 ; alx   - dc cr

  ELSEIF (I = 1400- 1779)
       MW[1] = 2000,  INCLUDE=             1-   88 ; ffx- dccr
       MW[1] = 1400,  INCLUDE=            89-  319 ; ffx- dcncr
       MW[1] =  800,  INCLUDE=          1400- 1779 ; ffx- ffx

  ELSEIF  (I = 1030- 1059)
       MW[1] =  900,  INCLUDE=  1030- 1059 ; frd- frd

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
```

22 Time-of-Day.s

```
; ====================================================================
; Time-of-Day.s
; MWCOG Version 2.2 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.
;
;   Note: Bucket Rounding is now removed per V 2.2 (1/11/07)
;
;
;
;
;   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

;---------------------------------------------------------------------
; 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
;
```

23 Transit_Skims.s

```
;------------------------------------------------------------------------
;Transit_Skims.s
;MWCOG Version 2.1D Model
;    2005-02-16 Added pageheight=32767 to preclude insertion of page headers
;             - Metrorail station references changed from 116 to 150 2.14.05
;             - 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
;------------------------------------------------------------------------
pageheight=32767  ; Preclude header breaks
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
 maxnode = 30000

 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, support nodes, and transit links
fileo supporto = supl@access_mode@@time_period@.asc modes=11-16 oneway=t fixed=y
fileo nodeo    = supn@access_mode@@time_period@.dbf
fileo linko    = trnl@access_mode@@time_period@.dbf  ;can be used to create transit
shape files

;


;---- 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 (1-150)
 MW[11] = NODEL(3) - 7300.0,                  ;---- metro alight sta (1-150)
 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, 331, 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, 1539)
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 (1-150)
MW[11] = MI.1.11   ;   metro alight sta (1-150)

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] > 150 ) MW[10] = 0
 IF (MW[11] < 0 || MW[11] > 150 ) 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
```

24 Transit_Skims_Select_Paths.s

```
;-----------------------------------------------------------------------
;Transit_Skims_Select_Paths.s
;MWCOG Version 2.1D Model
;                        - PATHSTYLE changed from 1 to 0 on 3.9.04 (RM)
;                        - iteration (_iter_) global variables used
;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, IVNMT, IVMT, TOTT, ISTOS, JSTOS,
;; MW[1] = TIME(12,13,14,15)*0.01,             ;---- xfer walk time   (min)
;; MW[2] = TIME(11)*0.01,                      ;---- drv acc time     (min)
;; MW[3] = IWAIT*0.01,                         ;---- ini.wait time    (min)
;; MW[4] = XWAIT(1,2,3,4,5,6,7,8,9,10)*0.01,   ;---- xfr wait time    (min)
;; MW[5] = TIME(1,2,4,5,6,7,8,9,10)*0.01,      ;---- ivt-nonmetrorail (min)
;; MW[6] = TIME(3)*0.01,                       ;---- ivt-metrorail    (min)
;; MW[7] = (IWAIT + TIME (0) + XWAIT (0))*0.01,;---- total time       (min)
;; MW[8] = NODE0(3) - 7300.0,                  ;---- metro board  sta (1-116)
;; MW[9] = NODEL(3) - 7300.0                   ;---- metro alight sta (1-116)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

```
Select   i = 451, 692
trace = (i = 451, 692  &
         j = 8, 64)
;; REPORT LINES = NAME, MODE  ; added by rm 4/09/04 to ensure line listings
                           ; with or without 'RT=' commands in transit line files
ENDRUN

ENDLOOP

ENDLOOP
```

25 Trip_Distribution.s

```
;-------------------------------------------------------------------
; TRIP_DISTRIBUTION.S
;
; Version 2.2  Model
;  Note: Bucket rounding is maintained as MC model (COGMC) works with integer
;        trips.  Bucket rounding in the future (when a new MC model is used)
;$
; 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
;$ 12/23/05 Updated input Z-filenames to read TRIP_GENERATIONR.S outputs
;           (which are now decimal).  Bucket rounding of Trip Dist. output tabs.
;                                         maintained.
;$ 11/07/06 Jurisdiction-to TAZ equivalency file updated to reflect
;  change in Montgomery / prince Georges zone ranges (2-zone annexation)
;-------------------------------------------------------------------
;
;
;
;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:
;
itr = '%_iter_%'
LUFILE  = 'inputs\zone.asc'                         ;  LAND USE FILE
HWYTERM = 'ztermtm.asc'                             ;  Zonal HWY TERMINAL TIME

if (ITR='pp')
 AMSOVSKM = '%_iter_%_am.skm'                        ;  AM  HWY TIME SKIMS
 OPSOVSKM = '%_iter_%_op.skm'                        ;  OP  HWY TIME SKIMS
 AWTRNSKM = '%_iter_%_am_wk.ttt'                     ;  AM WK ACC TRN TIME SKIMS
 ADTRNSKM = '%_iter_%_am_dr.ttt'                     ;  AM DR ACC TRN TIME SKIMS
 OWTRNSKM = '%_iter_%_op_wk.ttt'                     ;  OP WK ACC TRN TIME SKIMS
 ODTRNSKM = '%_iter_%_op_dr.ttt'                     ;  OP DR ACC TRN TIME SKIMS
 else
 AMSOVSKM = 'SOV%_prev_%am.skm'                      ;  AM  HWY TIME SKIMS
 OPSOVSKM = 'SOV%_prev_%op.skm'                      ;  OP  HWY TIME SKIMS
 AWTRNSKM = '%_prev_%_am_wk.ttt'                     ;  AM WK ACC TRN TIME SKIMS
 ADTRNSKM = '%_prev_%_am_dr.ttt'                     ;  AM DR ACC TRN TIME SKIMS
 OWTRNSKM = '%_prev_%_op_wk.ttt'                     ;  OP WK ACC TRN TIME SKIMS
 ODTRNSKM = '%_prev_%_op_dr.ttt'                     ;  OP DR ACC TRN TIME SKIMS
ENDIF ;
; -------------------------------------------------------------------
; Trip-End (P/A) Input Files:
;
HBWPROINC= 'hbwpros_inc.txt'; HBW Productions - for four income levels (Intl only)
HBWPROALL= 'hbwpros_all.txt'; HBW Productions - Total/NonStratified    (Intl&Extl)

HBWATTINC= 'hbwattrs_inc.txt'; HBW Attractions - for four income levels (Intl only)
HBWATTALL= 'hbwattrs_all.txt'; HBW Attractions - Total/NonStratified    (Intl&Extl)

HBSPROINC= 'hbspros_inc.txt'; HBS Productions - for four income levels (Intl only)
HBSPROALL= 'hbspros_all.txt'; HBS Productions - Total/NonStratified    (Intl&Extl)

HBSATTINC= 'hbsattrs_inc.txt'; HBS Attractions - for four income levels (Intl only)
HBSATTALL= 'hbsattrs_all.txt'; HBS Attractions - Total/NonStratified    (Intl&Extl)

HBOPROINC= 'hbopros_inc.txt'; HBO Productions - for four income levels (Intl only)
HBOPROALL= 'hbopros_all.txt'; HBO Productions - Total/NonStratified    (Intl&Extl)

HBOATTINC= 'hboattrs_inc.txt'; HBO Attractions - for four income levels (Intl only)
HBOATTALL= 'hboattrs_all.txt'; HBO Attractions - Total/NonStratified    (Intl&Extl)

NHBPROINT= 'nhbattrs_int.txt'; NHB Productions (Same as final/scaled attractions)
- (Intl only)
NHBPROALL= 'nhbattrs_all.txt'; NHB Productions (Same as final/scaled attractions)
- (Intl&Extl)

NHBATTINT= 'nhbattrs_int.txt'; NHB Attractions     - (Intl only)
NHBATTALL= 'nhbattrs_all.txt'; NHB Attractions     - (Intl&Extl)

MTKPROINT= 'mtkpros_int.txt'; Med Trk Productions - (Intl only)
MTKPROALL= 'mtkpros_all.txt'; Med Trk Productions - (Intl&Extl)

MTKATTINT= 'mtkattrs_int.txt'; Med Trk Attractions - (Intl only)
MTKATTALL= 'mtkattrs_all.txt'; Med Trk Attractions - (Intl&Extl)

HTKPROINT= 'htkpros_int.txt'; Hvy Trk Productions - (Intl only)
HTKPROALL= 'htkpros_all.txt'; Hvy Trk Productions - (Intl&Extl)

HTKATTINT= 'htkattrs_int.txt'; Hvy Trk Attractions - (Intl only)
HTKATTALL= 'htkattrs_all.txt'; Hvy Trk Attractions - (Intl&Extl)

;$
; -------------------------------------------------------------------
; Equivalent minutes (min/'94$) 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)
;  terminal times are added to both the i and j ends of the trip
;
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))

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

;$
;-
; 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]  = @HBWPROINC@, Z=#1,P1=#2,    ; HBW Inc. 1    productions
                              P2=#3,    ; HBW Inc. 2    productions
                              P3=#4,    ; HBW Inc. 3    productions
                              P4=#5     ; HBW Inc. 4    productions
ZDATI[2]  = @HBWPROALL@, Z=#1,P5=#2     ; HBW Totl      productions

ZDATI[3]  = @HBWATTINC@, Z=#1,A1=#2,    ; HBW Inc. 1    attractions
                              A2=#3,    ; HBW Inc. 2    attractions
                              A3=#4,    ; HBW Inc. 3    attractions
                              A4=#5     ; HBW Inc. 4    attractions
ZDATI[4]  = @HBWATTALL@, Z=#1,A5=#2     ; 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


;  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]=@HBWPROALL@, Z=#1,RCNTL=#2     ; total trip gen. prod.totals
  ZDATI[2]=@HBWATTALL@, Z=#1,CCNTL=#2     ; total trip gen. attr.totals
  ZDATI[3]=IXCOLTOT.DAT, Z=#1,ICOLTOT=2

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

  ARRAY IROWTOTA= 2191

  ARRAY FROWTOT = 2191
  ARRAY FCOLTOT = 2191

  ARRAY ROWADJ  = 2191
  ARRAY COLADJ  = 2191

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

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

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

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


 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]  = @HBSPROINC@, Z=#1,P1=#2,    ; HBS Inc. 1    productions
                              P2=#3,    ; HBS Inc. 2    productions
                              P3=#4,    ; HBS Inc. 3    productions
                              P4=#5     ; HBS Inc. 4    productions
ZDATI[2]  = @HBSPROALL@, Z=#1,P5=#2     ; HBS Totl      productions

ZDATI[3]  = @HBSATTINC@, Z=#1,A1=#2,    ; HBS Inc. 1    attractions
                              A2=#3,    ; HBS Inc. 2    attractions
                              A3=#4,    ; HBS Inc. 3    attractions
                              A4=#5     ; HBS Inc. 4    attractions
ZDATI[4]  = @HBSATTALL@, Z=#1,A5=#2     ; 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
```

```
;  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]=@HBSPROALL@, Z=#1,RCNTL=#2       ; total trip gen. prod.totals
  ZDATI[2]=@HBSATTALL@, Z=#1,CCNTL=#2       ; total trip gen. attr.totals
  ZDATI[3]=IXCOLTOT.DAT, Z=#1,ICOLTOT=2

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

  ARRAY IROWTOTA= 2191

  ARRAY FROWTOT = 2191
  ARRAY FCOLTOT = 2191

  ARRAY ROWADJ  = 2191
  ARRAY COLADJ  = 2191

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

; -------------
IF (i=1-2144)
 JLOOP
    IF  (ICOLTOT[j]   = 0)
         COLADJ[J]    = 1.0
```

```
    ELSE
         COLADJ[J]    = CCNTL[j]/ICOLTOT[j]
    ENDIF
      MW[25] = ROUND (MW[15][J]*COLADJ[J])
      MW[26] = ROUND (MW[16][J]*COLADJ[J])
      FCOLTOT[J] = FCOLTOT[J]+ MW[25][J] + MW[26][J]
 endjloop
ELSE
    irowtota[i] = ROWSUM(15) + rowsum(16)


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

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

 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]  = @HBOPROINC@, Z=#1,P1=#2,    ; HBO Inc. 1    productions
                              P2=#3,    ; HBO Inc. 2    productions
                              P3=#4,    ; HBO Inc. 3    productions
                              P4=#5     ; HBO Inc. 4    productions
ZDATI[2]  = @HBOPROALL@, Z=#1,P5=#2     ; HBO Totl      productions

ZDATI[3]  = @HBOATTINC@, Z=#1,A1=#2,    ; HBO Inc. 1    attractions
                              A2=#3,    ; HBO Inc. 2    attractions
                              A3=#4,    ; HBO Inc. 3    attractions
                              A4=#5     ; HBO Inc. 4    attractions
ZDATI[4]  = @HBOATTALL@, Z=#1,A5=#2     ; 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


;  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]=@HBOPROALL@, Z=#1,RCNTL=#2       ; total trip gen. prod.totals
  ZDATI[2]=@HBOATTALL@, Z=#1,CCNTL=#2       ; total trip gen. attr.totals
  ZDATI[3]=IXCOLTOT.DAT, Z=#1,ICOLTOT=2

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

  ARRAY IROWTOTA= 2191

  ARRAY FROWTOT = 2191
  ARRAY FCOLTOT = 2191

  ARRAY ROWADJ  = 2191
  ARRAY COLADJ  = 2191

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

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


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

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


 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]  = @NHBPROINT@, Z=#1,P1=#2  ; Intl NHB      productions
ZDATI[2]  = @MTKPROINT@, Z=#1,P2=#2  ; Intl Med Trk  productions
ZDATI[3]  = @HTKPROINT@, Z=#1,P3=#2  ; Intl Hvy Trk  productions
ZDATI[4]  = @NHBPROALL@, Z=#1,P4=#2  ; Intl/Extl NHB productions
ZDATI[5]  = @MTKPROALL@, Z=#1,P5=#2  ; Intl/Extl MTK productions
ZDATI[6]  = @HTKPROALL@, Z=#1,P6=#2  ; 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.
;
;
;
;
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


;  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] = @NHBPROALL@, Z=#1,RCNTL=#2    ; NHB Trip Production Controls
  ZDATI[2] = @NHBATTALL@, Z=#1,CCNTL=#2    ; NHB Trip Attraction Controls
  ZDATI[3] = IXCOLTOT.DAT, Z=#1,ICOLTOT=2

  FILLMW MW[1]  = MI.2.1       ; mw 1   i-i nhb
  FILLMW MW[4]  = MI.1.1,2     ; mw 4-5 ext nhb(intst,art)

  ARRAY IROWTOTA = 2191
  ARRAY FROWTOT  = 2191
  ARRAY FCOLTOT  = 2191
  ARRAY ROWADJ   = 2191
  ARRAY COLADJ   = 2191

  MW[14] = MW[4]  ; Extr/Int. trips to be adj. --Start w/ initial trips
  MW[15] = MW[5]  ; Extr/Art. trips to be adj. --Start w/ initial trips

 IF (I=1-2144)
    JLOOP
     IF (ICOLTOT[J] = 0)
        COLADJ[J] = 1.0
     ELSE
        COLADJ[J] = CCNTL[J] / ICOLTOT[J]
     ENDIF

     MW[24] = ROUND (MW[14] * COLADJ[J])
     MW[25] = ROUND (MW[15] * COLADJ[J])
     FCOLTOT[J] = FCOLTOT[J] + MW[24] + MW[25]
    ENDJLOOP
ELSE
   IROWTOTA[I] = ROWSUM(14) + ROWSUM(15)

    JLOOP
     IF (IROWTOTA[I] = 0)
        ROWADJ[I] = 1.0
     ELSE
        ROWADJ[I] = RCNTL[I] / IROWTOTA[I]
     ENDIF

     MW[24] = ROUND (MW[14][J] * ROWADJ[I])
     MW[25] = ROUND (MW[15][J] * ROWADJ[I])
     FROWTOT[I] = FROWTOT[I] + MW[24][J] + MW[25][J]
    ENDJLOOP
ENDIF
```

```
  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] = @MTKPROALL@, Z=#1,RCNTL=#2    ; MTK Trip Production Controls
  ZDATI[2] = @MTKATTALL@, Z=#1,CCNTL=#2    ; MTK Trip Attraction Controls
  ZDATI[3] = IXCOLTOT.DAT, Z=#1,ICOLTOT=3

  FILLMW MW[1]  = MI.2.2       ;  i-i mtk
  FILLMW MW[4]  = MI.1.3       ;  ext mtk

  ARRAY IROWTOTA = 2191
  ARRAY FROWTOT  = 2191
  ARRAY FCOLTOT  = 2191
  ARRAY ROWADJ   = 2191
  ARRAY COLADJ   = 2191

  MW[14] = MW[4]  ; Extr/Int. trips to be adj. --Start w/ initial trips

 IF (I=1-2144)
    JLOOP
     IF (ICOLTOT[J] = 0)
        COLADJ[J] = 1.0
     ELSE
        COLADJ[J] = CCNTL[J] / ICOLTOT[J]
     ENDIF

     MW[24] = ROUND (MW[14] * COLADJ[J])
     FCOLTOT[J] = FCOLTOT[J] + MW[24]
    ENDJLOOP
ELSE
   IROWTOTA[I] = ROWSUM(14)

    JLOOP
     IF (IROWTOTA[I] = 0)
        ROWADJ[I] = 1.0
     ELSE
        ROWADJ[I] = RCNTL[I] / IROWTOTA[I]
     ENDIF
     MW[24] = ROUND (MW[14][J] * ROWADJ[I])
     FROWTOT[I] = FROWTOT[I] + MW[24][J]
    ENDJLOOP
ENDIF



  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] = @HTKPROALL@, Z=#1,RCNTL=#2    ; HTK Trip Production Controls
  ZDATI[2] = @HTKATTALL@, Z=#1,CCNTL=#2    ; HTK Trip Attraction Controls
  ZDATI[3] = IXCOLTOT.DAT, Z=#1,ICOLTOT=4

  FILLMW MW[1]  = MI.2.3       ;  i-i htk
  FILLMW MW[4]  = MI.1.4       ;  ext htk

  ARRAY IROWTOTA = 2191
  ARRAY FROWTOT  = 2191
  ARRAY FCOLTOT  = 2191
  ARRAY ROWADJ   = 2191
  ARRAY COLADJ   = 2191

  MW[14] = MW[4]  ; Extr/Int. trips to be adj. --Start w/ initial trips

 IF (I=1-2144)
    JLOOP
     IF (ICOLTOT[J] = 0)
        COLADJ[J] = 1.0
     ELSE
        COLADJ[J] = CCNTL[J] / ICOLTOT[J]
     ENDIF

     MW[24] = ROUND (MW[14] * COLADJ[J])
     FCOLTOT[J] = FCOLTOT[J] + MW[24]
    ENDJLOOP
 ELSE
   IROWTOTA[I] = ROWSUM(14)
```

```
    JLOOP
     IF (IROWTOTA[I] = 0)
        ROWADJ[I] = 1.0
     ELSE
        ROWADJ[I] = RCNTL[I] / IROWTOTA[I]
     ENDIF

     MW[24] = ROUND (MW[14][J] * ROWADJ[I])
     FROWTOT[I] = FROWTOT[I] + MW[24][J]
    ENDJLOOP
 ENDIF


 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 --
; Updated RM/MS 8/10/2006 (Mtg and PG Zones)
D 1=1-88                          ; DC cr
D 2=89-319                        ; DC ncr
D 3=320-639,648,650               ; MTG MD
D 4=640-647,649,651-1029          ; 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
```

26 Trip_Generation.s

```
*del tppl*.prn
;==================================================================
;  Trip_Generation.s
;
;   Version 2.2  Trip Generation Script
;
;     Note: NHB trips do not include Commercial Vehicle - they are modeled
;           separately.
;
;   Programmer: Milone
;   Date:       1/11/07
;   6/15/07 The NHB P/A mod file has been updated (..\support\adjzpaf7.upn)
```

```
;           The factor columns normally used as pmods by income level
;           are set to '1.00' (they are now unused) and amods updated.
;           The fifth column will be used to modify the final zonal
;           NHB P's and A's.   NHB trip production equation is updated
;          (P-Mod term is removed)
;=================================================================
;
;=================================================================
; Set Parameters:
;=================================================================

ZONESIZE    =       2191                 ;  No. of TAZs
LastIZN     =       2144                 ;  Last Internal TAZ no.

HBW_GlobalAdj  = 1.00                    ;  Global Trips Production Adjustments
HBS_GlobalAdj  = 1.50                    ;  by Purpose
HBO_GlobalAdj  = 1.50                    ;
NHB_GlobalAdj  = 1.16806  ;was 1.17      ;  Reduction from 1.5    **CV mod**
MTK_GlobalAdj  = 1.00                    ;  counting of CV trips
HTK_GlobalAdj  = 1.00                    ;

DCCoreRng   = '     1-88'                ;  TAZ Range/DC Core
DCNCorRng   = '   89-319'                ;  TAZ Range/DC NonCore
VACoreRng   = '1230-1238'                ;  TAZ Range/VA NonCore
VA10MSRng   = '1239-1360'                ;  TAZ Range/VA 10miSq

JURSIZE     =  24                  ;  No. of Juris. Codes
SzCl        =   4                  ;  No. of HH Size   Classes
InCl        =   4                  ;  No. of Income    Classes
VaCl        =   4                  ;  No. of Veh Avail Classes

ISCells     =   InCl*10    + SzCl  ;  No. of Size by Inc matrix cells
ISVCells    =   ISCells*10 + VaCl  ;  No. of Size by Inc. by Veh Avail. matrix
cells
JSCells     =   JURSIZE*10 + SzCl  ;  No. of Juris by Inc. matrix cells
JICells     =   JURSIZE*10 + InCl  ;  No. of Juris by Inc. matrix cells
JVCells     =   JURSIZE*10 + VaCl  ;  No. of Juris by Va. matrix cells

Ofmt        = '(12.2)'             ;  Format of Output P/A files data

Rept         = 'Trip_Generation.txt' ;  Summary Reports

;=================================================================
; Set Input Files:
;=================================================================

ZNFILE_LU    = 'inputs\zone.asc'     ;  Input  Zonal Land Use File
ZNFILE_AT    = 'BASEZON.DAT'         ;  Input  Zonal Area Type File from network
building
ZNFILE_PEX   = 'inputs\pext.asc'     ;  Input ExtStation Trip-Productions, by
Purpose
ZNFILE_AEX   = 'inputs\aext.asc'     ;  Input ExtStation Trip-Attractions, by
Purpose

ZNFILE_I1SV  = 'HHI1_SV.ASC'         ;  Input  Zonal Income 1 HH by Size& VehAv
Classes: i1s1v1,i1s1v2,...,i1s4v4
ZNFILE_I2SV  = 'HHI2_SV.ASC'         ;  Input  Zonal Income 2 HH by Size& VehAv
Classes: i2s1v1,i2s1v2,...,i2s4v4
ZNFILE_I3SV  = 'HHI3_SV.ASC'         ;  Input  Zonal Income 3 HH by Size& VehAv
Classes: i3s1v1,i3s1v2,...,i3s4v4
ZNFILE_I4SV  = 'HHI4_SV.ASC'         ;  Input  Zonal Income 4 HH by Size& VehAv
Classes: i4s1v1,i4s1v2,...,i4s4v4

ZNFILE_ZModW = '..\support\adjzpaf7.upw'
ZNFILE_ZModS = '..\support\adjzpaf7.ups'
ZNFILE_ZModO = '..\support\adjzpaf7.upo'
ZNFILE_ZModN = '..\support\adjzpaf7.upn'
ZNFILE_ZModM = '..\support\adjznpaf.mtk'
```

```
ZNFILE_ZModH = '..\support\adjznpaf.htk'

;=================================================================
; Set Output Files:
;=================================================================

 hbwnmpa    = 'hbw_NM_PsAs.ASC'

 hbwps_all  ='hbwpros_all.txt'    hbwas_all  ='hbwattrs_all.txt'
 hbwps_inc  ='hbwpros_inc.txt'    hbwas_inc  ='hbwattrs_inc.txt'

 hbsps_all  ='hbspros_all.txt'    hbsas_all  ='hbsattrs_all.txt'
 hbsps_inc  ='hbspros_inc.txt'    hbsas_inc  ='hbsattrs_inc.txt'

 hbops_all  ='hbopros_all.txt'    hboas_all  ='hboattrs_all.txt'
 hbops_inc  ='hbopros_inc.txt'    hboas_inc  ='hboattrs_inc.txt'

 nhbps_int  ='nhbpros_int.txt'    nhbas_int  ='nhbattrs_int.txt'
 nhbps_all  ='nhbpros_all.txt'    nhbas_all  ='nhbattrs_all.txt'

 mtkps_int  ='mtkpros_int.txt'    mtkas_int  ='mtkattrs_int.txt'
 mtkps_all  ='mtkpros_all.txt'    mtkas_all  ='mtkattrs_all.txt'

 htkps_int  ='htkpros_int.txt'    htkas_int  ='htkattrs_int.txt'
 htkps_all  ='htkpros_all.txt'    htkas_all  ='htkattrs_all.txt'


;==================================================================
;/////////////////////////////////////////////////////////////////=
;==================================================================
;          Begin TP+ Matrix Routine :                             =
;==================================================================
;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\=
;==================================================================

RUN PGM=MATRIX
ZONES=@ZONESIZE@

;
; Set up zone arrays for accumulating I/O variables
;
;

ARRAY CHHA   = @ISVCells@,         ;  HH ARRAY at Inc/Size/VehAv Crossclass

 ; Current Trip P's/A's by isv Cells

      Prodw= @ISVCells@, Prods= @ISVCells@, Prodo= @ISVCells@, Prodn=
@ISVCells@,ProdwNM=@ISVCells@,
      Attrw= @ISVCells@, Attrs= @ISVCells@, Attro= @ISVCells@, Attrn=
@ISVCells@,AttrwNM=@ISVCells@,


 ;  ZONAL Trip Arrays

      ZoneJurA  =@LastIZN@,; Zonal Jurisdiction Array

      PHBW_NMTZA=@ZoneSize@,
      PHBWTZA = @ZoneSize@, PHBW1ZA = @ZoneSize@, PHBW2ZA = @ZoneSize@, PHBW3ZA =
@ZoneSize@, PHBW4ZA = @ZoneSize@,
      PHBSTZA = @ZoneSize@, PHBS1ZA = @ZoneSize@, PHBS2ZA = @ZoneSize@, PHBS3ZA =
@ZoneSize@, PHBS4ZA = @ZoneSize@,
      PHBOTZA = @ZoneSize@, PHBO1ZA = @ZoneSize@, PHBO2ZA = @ZoneSize@, PHBO3ZA =
@ZoneSize@, PHBO4ZA = @ZoneSize@,
      PNHBTZA = @ZoneSize@, PNHB1ZA = @ZoneSize@, PNHB2ZA = @ZoneSize@, PNHB3ZA =
@ZoneSize@, PNHB4ZA = @ZoneSize@,
      PMTKTZA = @ZoneSize@,
      PHTKTZA = @ZoneSize@,
```

```
      AHBW_NMTZA=@ZoneSize@,
      AHBWTZA = @ZoneSize@, AHBW1ZA = @ZoneSize@, AHBW2ZA = @ZoneSize@, AHBW3ZA =
@ZoneSize@, AHBW4ZA = @ZoneSize@,
   adjAHBWTZA = @ZoneSize@,
   adjAHBW1ZA = @ZoneSize@,
   adjAHBW2ZA = @ZoneSize@,
   adjAHBW3ZA = @ZoneSize@,
   adjAHBW4ZA = @ZoneSize@,
      AHBSTZA = @ZoneSize@, AHBS1ZA = @ZoneSize@, AHBS2ZA = @ZoneSize@, AHBS3ZA =
@ZoneSize@, AHBS4ZA = @ZoneSize@,
      AHBOTZA = @ZoneSize@, AHBO1ZA = @ZoneSize@, AHBO2ZA = @ZoneSize@, AHBO3ZA =
@ZoneSize@, AHBO4ZA = @ZoneSize@,
      ANHBTZA = @ZoneSize@,
      AMTKTZA = @ZoneSize@,
      AHTKTZA = @ZoneSize@,

     FAHBWTZA = @ZoneSize@,FAHBW1ZA = @ZoneSize@,FAHBW2ZA = @ZoneSize@,FAHBW3ZA =
@ZoneSize@,FAHBW4ZA = @ZoneSize@,
     FAHBSTZA = @ZoneSize@,FAHBS1ZA = @ZoneSize@,FAHBS2ZA = @ZoneSize@,FAHBS3ZA =
@ZoneSize@,FAHBS4ZA = @ZoneSize@,
     FAHBOTZA = @ZoneSize@,FAHBO1ZA = @ZoneSize@,FAHBO2ZA = @ZoneSize@,FAHBO3ZA =
@ZoneSize@,FAHBO4ZA = @ZoneSize@,
     FANHBTZA = @ZoneSize@,
     FAMTKTZA = @ZoneSize@,
     FAHTKTZA = @ZoneSize@,


      JurHHA     = @Jursize@,      ; Juris. HH  Trips array
      JurHBWA    = @Jursize@, JurHBWrA    = @Jursize@,     ;  Juris. HBW Trips &
Rates array
      JurHBSA    = @Jursize@, JurHBSrA    = @Jursize@,     ;  Juris. HBS Trips &
Rates array
      JurHBOA    = @Jursize@, JurHBOrA    = @Jursize@,     ;  Juris. HBO Trips &
Rates array
      JurNHBA    = @Jursize@, JurNHBrA    = @Jursize@,     ;  Juris. NHB Trips &
Rates array
      JurMTKA    = @Jursize@, JurMTKrA    = @Jursize@,     ;  Juris. MTK Trips &
Rates array
      JurHTKA    = @Jursize@, JurHTKrA    = @Jursize@,     ;  Juris. HTK Trips &
Rates array

      RegHHSzA   = @SzCl@,          ;  Regional HH by Size array
      RegHBWSzA  = @SzCl@, RegHBWrSzA   = @SzCl@,     ;  Regional HBW Trips & Rates
by Size array
      RegHBSSzA  = @SzCl@, RegHBSrSzA   = @SzCl@,     ;  Regional HBS Trips & Rates
by Size array
      RegHBOSzA  = @SzCl@, RegHBOrSzA   = @SzCl@,     ;  Regional HBO Trips & Rates
by Size array
      RegNHBSzA  = @SzCl@, RegNHBrSzA   = @SzCl@,     ;  Regional NHB Trips & Rates
by Size array

      RegHHInA   = @InCl@,          ;  Regional HH by Inc array
      RegHBWInA  = @InCl@, RegHBWrInA   = @InCl@,     ;  Regional HBW Trips & Rates
by Inc. array
      RegHBSInA  = @InCl@, RegHBSrInA   = @InCl@,     ;  Regional HBS Trips & Rates
by Inc. array
      RegHBOInA  = @InCl@, RegHBOrInA   = @InCl@,     ;  Regional HBO Trips & Rates
by Inc. array
      RegNHBInA  = @InCl@, RegNHBrInA   = @InCl@,     ;  Regional NHB Trips & Rates
by Inc. array


      RegHHVaA   = @VaCl@,          ;  Regional HH by VeAv array
      RegHBWVaA  = @VaCl@, RegHBWrVaA   = @VaCl@,     ;  Regional HBW Trips & Rates
by Vehs Av. array
      RegHBSVaA  = @VaCl@, RegHBSrVaA   = @VaCl@,     ;  Regional HBS Trips & Rates
by Vehs Av. array
      RegHBOVaA  = @VaCl@, RegHBOrVaA   = @VaCl@,     ;  Regional HBO Trips & Rates
by Vehs Av. array
      RegNHBVaA  = @VaCl@, RegNHBrVaA   = @VaCl@,     ;  Regional NHB Trips & Rates
by Vehs Av. array

      JurInHHA     = @JICells@,      ; Juris. HH  Trips array
      JurInHBWA    = @JICells@, JurInHBWrA    = @JICells@,     ;  Juris. HBW Trips &
Rates array
      JurInHBSA    = @JICells@, JurInHBSrA    = @JICells@,     ;  Juris. HBS Trips &
Rates array
      JurInHBOA    = @JICells@, JurInHBOrA    = @JICells@,     ;  Juris. HBO Trips &
Rates array
      JurInNHBA    = @JICells@, JurInNHBrA    = @JICells@      ;  Juris. NHB Trips &
Rates array

;==========================
; Define Loop-up Tables  =
;==========================
;
;=================================================================
; Trip Production Rates, based on Inc/Size/VeAv Index 111 to 444 =
;=================================================================
;
      LOOKUP Name=PRATE,
             LOOKUP[1]   = 1,Result = 2,  ; HBW rate
             LOOKUP[2]   = 1,Result = 3,  ; HBS rate
             LOOKUP[3]   = 1,Result = 4,  ; HBO rate
             LOOKUP[4]   = 1,Result = 5,  ; NHB rate
             Interpolate = N, FAIL=0,0,0,
; Trip production rates: isv
;      isv     HBW    HBS    HBO    NHB
;     -----   -----  -----  -----  -----
  R="  111,   0.686, 0.215, 0.415, 0.200",
    "  112,   0.851, 0.599, 1.121, 1.258",
    "  113,   0.750, 0.599, 1.435, 1.258",
    "  114,   0.957, 0.631, 1.435, 1.258",
    "  121,   1.082, 0.215, 0.540, 0.300",
    "  122,   1.082, 0.680, 1.700, 1.258",
    "  123,   1.412, 0.680, 1.770, 1.430",
    "  124,   1.412, 0.680, 1.800, 1.430",
    "  131,   1.096, 0.215, 1.284, 0.400",
    "  132,   1.517, 0.680, 2.400, 1.430",
    "  133,   1.936, 0.838, 2.614, 1.430",
    "  134,   1.936, 0.838, 2.391, 1.430",
    "  141,   1.664, 0.215, 1.364, 0.500",
    "  142,   1.664, 0.680, 2.900, 1.500",
    "  143,   1.936, 0.960, 4.266, 1.600",
    "  144,   1.936, 1.000, 3.819, 1.700",
    "  211,   1.017, 0.215, 0.685, 0.300",
    "  212,   1.182, 0.599, 1.158, 1.258",
    "  213,   1.301, 0.599, 1.474, 1.400",
    "  214,   1.527, 0.631, 1.474, 1.490",
    "  221,   1.352, 0.294, 0.889, 0.400",
    "  222,   1.352, 0.680, 1.892, 1.258",
    "  223,   1.531, 0.680, 1.968, 2.197",
    "  224,   2.122, 0.840, 2.041, 2.197",
    "  231,   1.662, 0.400, 1.349, 0.500",
    "  232,   1.662, 0.965, 2.500, 1.762",
    "  233,   1.790, 0.965, 3.190, 2.600",
    "  234,   2.122, 1.043, 3.472, 2.800",
    "  241,   1.849, 0.450, 0.750, 0.600",
    "  242,   1.849, 0.965, 3.486, 1.983",
    "  243,   2.049, 1.000, 4.266, 2.800",
    "  244,   2.426, 1.100, 5.674, 2.967",
    "  311,   1.017, 0.294, 0.708, 0.400",
    "  312,   1.223, 0.666, 1.035, 1.524",
    "  313,   1.223, 0.666, 1.474, 1.565",
    "  314,   1.223, 0.666, 1.474, 1.565",
```

```
    "  321,   1.464, 0.429, 0.889, 0.500",
    "  322,   1.464, 0.680, 2.161, 1.625",
    "  323,   1.841, 0.900, 2.460, 2.330",
    "  324,   2.152, 0.965, 2.659, 2.536",
    "  331,   1.662, 0.500, 1.548, 0.600",
    "  332,   1.662, 0.965, 2.843, 2.479",
    "  333,   2.016, 1.000, 3.190, 2.892",
    "  334,   3.024, 1.141, 3.559, 2.891",
    "  341,   2.295, 0.600, 3.446, 0.609",
    "  342,   2.295, 0.956, 4.653, 2.188",
    "  343,   2.295, 1.141, 5.395, 2.925",
    "  344,   3.076, 1.400, 6.501, 4.202",
    "  411,   1.335, 0.429, 0.708, 0.600",
    "  412,   1.335, 0.860, 1.087  1.760",
    "  413,   1.335, 0.860, 1.083, 1.760",
    "  414,   2.000, 0.860, 2.000, 2.405",
    "  421,   1.451, 0.886, 1.567, 0.700",
    "  422,   1.451, 0.886, 1.810, 1.760",
    "  423,   1.841, 0.965, 2.460, 2.405",
    "  424,   2.152, 0.980, 2.460, 2.691",
    "  431,   1.672, 0.900, 3.446, 0.800",
    "  432,   1.672, 1.039, 3.446, 2.720",
    "  433,   2.017, 1.150, 3.937, 2.812",
    "  434,   3.024, 1.200, 3.940, 3.100",
    "  441,   3.333, 1.092, 4.146, 0.900",
    "  442,   3.333, 1.278, 4.839, 1.536",
    "  443,   3.333, 1.333, 5.921, 3.348",
    "  444,   3.365  1.659  6.738  4.376"


;==============================================================
;    Attraction Rate Lookups  :                                =
;==============================================================
;==================================================
;  HBW Trip Attraction Rates by Area Type        .
;==================================================
      LOOKUP Name=HBWARate,
             LOOKUP[1]   = 1,Result = 2, ;  hh
             LOOKUP[2]   = 1,Result = 3, ;  hhpop
             LOOKUP[3]   = 1,Result = 4, ;  totemp
             LOOKUP[4]   = 1,Result = 5, ;  indemp
             LOOKUP[5]   = 1,Result = 6, ;  retemp
             LOOKUP[6]   = 1,Result = 7, ;  offemp
             LOOKUP[7]   = 1,Result = 8, ;  othemp
             LOOKUP[8]   = 1,Result = 9, ;  nonretailemp
             Interpolate = N, FAIL=0,0,0,
;                 HH    Tot Ind  Ret  Off  Oth NonRet
; AType     HHs  Pop   Emp Emp  Emp  Emp  Emp  Emp
R="1        0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00",
  "2        0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00",
  "3        0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00",
  "4        0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00",
  "5        0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00",
  "6        0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00",
  "7        0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00"

;==================================================
;  HBS Trip Attraction Rates by Area Type        .
;==================================================
      LOOKUP Name=HBSARate,
             LOOKUP[1]   = 1,Result = 2, ;  hh
             LOOKUP[2]   = 1,Result = 3, ;  hhpop
             LOOKUP[3]   = 1,Result = 4, ;  totemp
             LOOKUP[4]   = 1,Result = 5, ;  indemp
             LOOKUP[5]   = 1,Result = 6, ;  retemp
             LOOKUP[6]   = 1,Result = 7, ;  offemp
             LOOKUP[7]   = 1,Result = 8, ;  othemp
             LOOKUP[8]   = 1,Result = 9, ;  nonretailemp
             Interpolate = N, FAIL=0,0,0,
;                 HH    Tot Ind  Ret  Off  Oth NonRet
; AType     HHs  Pop   Emp Emp  Emp  Emp  Emp  Emp
R="1        0.00,0.00,0.00,0.00,0.29,0.00,0.00,0.00",
  "2        0.00,0.00,0.00,0.00,2.44,0.00,0.00,0.00",
  "3        0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00",
  "4        0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00",
  "5        0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00",
  "6        0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00",
  "7        0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00"

;==================================================
;  HBO Trip Attraction Rates by Area Type        .
;==================================================
      LOOKUP Name=HBOARate,
             LOOKUP[1]   = 1,Result = 2, ;  hh
             LOOKUP[2]   = 1,Result = 3, ;  hhpop
             LOOKUP[3]   = 1,Result = 4, ;  totemp
             LOOKUP[4]   = 1,Result = 5, ;  indemp
             LOOKUP[5]   = 1,Result = 6, ;  retemp
             LOOKUP[6]   = 1,Result = 7, ;  offemp
             LOOKUP[7]   = 1,Result = 8, ;  othemp
             LOOKUP[8]   = 1,Result = 9, ;  nonretailemp
             Interpolate = N, FAIL=0,0,0,
;                 HH    Tot Ind  Ret  Off  Oth NonRet
; AType     HHs  Pop   Emp Emp  Emp  Emp  Emp  Emp
R="1        0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30",
  "2        0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30",
  "3        0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30",
  "4        0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30",
  "5        0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30",
  "6        0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30",
  "7        0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30"


;==================================================
;  NHB Trip Attraction Rates by Area Type        .
;==================================================
      LOOKUP Name=NHBARate,
             LOOKUP[1]   = 1,Result = 2, ;  hh
             LOOKUP[2]   = 1,Result = 3, ;  hhpop
             LOOKUP[3]   = 1,Result = 4, ;  totemp
             LOOKUP[4]   = 1,Result = 5, ;  indemp
             LOOKUP[5]   = 1,Result = 6, ;  retemp
             LOOKUP[6]   = 1,Result = 7, ;  offemp
             LOOKUP[7]   = 1,Result = 8, ;  othemp
             LOOKUP[8]   = 1,Result = 9, ;  nonretailemp
             Interpolate = N, FAIL=0,0,0,
;                 HH    Tot Ind  Ret  Off  Oth NonRet
; AType     HHs  Pop   Emp Emp  Emp  Emp  Emp  Emp
R="1        0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.42",
  "2        0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49",
  "3        0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49",
  "4        0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49",
  "5        0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49",
  "6        0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49",
  "7        0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49"

;====================================================================
;  Medium Truck Trip Rates by Location 1-4
;  Locations are: 1)Reg Core, 2)DC NonCore, 3)VA 10 Mi Sq, 4)Other
;====================================================================
      LOOKUP Name=MTKARate,
             LOOKUP[1]   = 1,Result = 2, ;  IndEmp
             LOOKUP[2]   = 1,Result = 3, ;  RetEmp
             LOOKUP[3]   = 1,Result = 4, ;  OffEmp
             LOOKUP[4]   = 1,Result = 5, ;  OthEmp
             LOOKUP[5]   = 1,Result = 6, ;  HH
```

```
           Interpolate = N, FAIL=0,0,0,
;          Ind   Ret  Off  Oth
;LocaCode  Emp   Emp  EMP  EMP  HH
R="1        0.09,0.17,0.01,0.04,0.04",
  "2        0.19,0.17,0.01,0.04,0.04",
  "3        0.14,0.17,0.01,0.04,0.04",
  "4        0.11,0.17,0.01,0.04,0.04"

;====================================================================
;  Heavy Truck Trip Rates by Location 1-4
;  Locations are: 1)Reg Core, 2)DC NonCore, 3)VA 10 Mi Sq, 4)Other
;====================================================================
      LOOKUP Name=HTKARate,
           LOOKUP[1]   = 1,Result = 2, ;  IndEmp
           LOOKUP[2]   = 1,Result = 3, ;  RetEmp
           LOOKUP[3]   = 1,Result = 4, ;  OffEmp
           LOOKUP[4]   = 1,Result = 5, ;  OthEmp
           LOOKUP[5]   = 1,Result = 6, ;  HH
           Interpolate = N, FAIL=0,0,0,
;          Ind   Ret  Off  Oth
;LocaCode  Emp   Emp  EMP  EMP  HH
R="1        0.03,0.04,0.00,0.03,0.00",
  "2        0.13,0.04,0.00,0.03,0.00",
  "3        0.04,0.04,0.00,0.03,0.00",
  "4        0.11,0.04,0.00,0.03,0.00"

;==========================================
;  Production Adjustment Rates by Purpose
;==========================================
      LOOKUP Name=JurPmod,
           LOOKUP[1]   = 1,Result = 2, ;  HBW
           LOOKUP[2]   = 1,Result = 3, ;  HBS
           LOOKUP[3]   = 1,Result = 4, ;  HBO
           LOOKUP[4]   = 1,Result = 5, ;  NHB
           LOOKUP[5]   = 1,Result = 6, ;  Mtk
           LOOKUP[6]   = 1,Result = 7, ;  Htk
           Interpolate = N, FAIL=0,0,0,List=Y,
; Jur   HBW   HBS   HBO   NHB   Mtk   Htk
R=" 0  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; dc  1
  " 1  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; mtg 2
  " 2  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; pg  3
  " 3  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; arl 4
  " 4  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; alx 5
  " 5  0.90, 1.00, 1.00, 1.00, 1.00, 1.00", ; ffx 6  HBW changed from 1.0>0.90
  " 6  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; ldn 7              v2.2D
  " 7  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; pw  8
  " 8  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; -   9
  " 9  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; frd 10
  "10  0.75, 0.75, 0.70, 1.00, 1.00, 1.00", ; how 11
  "11  0.85, 1.00, 1.00, 1.00, 1.00, 1.00", ; aa  12
  "12  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; chs 13
  "13  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; -   14
  "14  0.85, 0.68, 0.75, 1.00, 1.00, 1.00", ; car 15
  "15  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; cal 16
  "16  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; stm 17
  "17  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; kge 18
  "18  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; fbg 19
  "19  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; stf 20
  "20  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; spt 21
  "21  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; fau 22
  "22  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; clk 23
  "23  1.00, 1.00, 1.00, 1.00, 1.00, 1.00"  ; jef 24


;==========================================
;  Attraction Adjustment Rates by Purpose
;==========================================
      LOOKUP Name=JurAmod,
           LOOKUP[1]   = 1,Result = 2, ;  HBW
           LOOKUP[2]   = 1,Result = 3, ;  HBS
           LOOKUP[3]   = 1,Result = 4, ;  HBO
           LOOKUP[4]   = 1,Result = 5, ;  NHB
           LOOKUP[5]   = 1,Result = 6, ;  Mtk
           LOOKUP[6]   = 1,Result = 7, ;  Htk
           Interpolate = N, FAIL=0,0,0,List=Y,
; Jur   HBW   HBS   HBO   NHB   Mtk   Htk
R=" 0  1.07, 1.00, 1.00, 1.00, 1.00, 1.00", ; dc  1
  " 1  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; mtg 2
  " 2  1.10, 1.00, 1.00, 1.00, 1.00, 1.00", ; pg  3
  " 3  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; arl 4
  " 4  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; alx 5
  " 5  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; ffx 6
  " 6  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; ldn 7
  " 7  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; pw  8
  " 8  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; -   9
  " 9  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; frd 10
  "10  0.75  0.80, 0.80, 1.00, 1.00, 1.00", ; how 11
  "11  0.85, 1.03, 1.00, 1.00, 1.00, 1.00", ; aa  12
  "12  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; chs 13
  "13  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; -   14
  "14  0.85, 0.70, 0.75, 1.00, 1.00, 1.00", ; car 15
  "15  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; cal 16
  "16  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; stm 17
  "17  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; kge 18
  "18  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; fbg 19
  "19  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; stf 20
  "20  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; spt 21
  "21  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; fau 22
  "22  1.00, 1.00, 1.00, 1.00, 1.00, 1.00", ; clk 23
  "23  1.00, 1.00, 1.00, 1.00, 1.00, 1.00"  ; jef 24

;===========================================================
;  HBW Zonal Production / Attraction Modifcation Factors  =
;===========================================================
      LOOKUP Name=HBWZmod,
           LOOKUP[1]   = 1,Result = 2, ;  Prod Factor/Inc. 1
           LOOKUP[2]   = 1,Result = 3, ;             /Inc. 2
           LOOKUP[3]   = 1,Result = 4, ;             /Inc. 3
           LOOKUP[4]   = 1,Result = 5, ;             /Inc. 4
           LOOKUP[5]   = 1,Result = 6, ;  Attr Factor/Inc. 1
           LOOKUP[6]   = 1,Result = 7, ;             /Inc. 2
           LOOKUP[7]   = 1,Result = 8, ;             /Inc. 3
           LOOKUP[8]   = 1,Result = 9, ;             /Inc. 4
           Interpolate = N, FAIL=0,0,0,File=@ZNFILE_ZModW@


;===========================================================
;  HBS Zonal Production / Attraction Modifcation Factors  =
;===========================================================
      LOOKUP Name=HBSZmod,
           LOOKUP[1]   = 1,Result = 2, ;  Prod Factor/Inc. 1
           LOOKUP[2]   = 1,Result = 3, ;             /Inc. 2
           LOOKUP[3]   = 1,Result = 4, ;             /Inc. 3
           LOOKUP[4]   = 1,Result = 5, ;             /Inc. 4
           LOOKUP[5]   = 1,Result = 6, ;  Attr Factor/Inc. 1
           LOOKUP[6]   = 1,Result = 7, ;             /Inc. 2
           LOOKUP[7]   = 1,Result = 8, ;             /Inc. 3
           LOOKUP[8]   = 1,Result = 9, ;             /Inc. 4
           Interpolate = N, FAIL=0,0,0,File=@ZNFILE_ZModS@
;===========================================================
;  HBO Zonal Production / Attraction Modifcation Factors  =
;===========================================================
      LOOKUP Name=HBOZmod,
           LOOKUP[1]   = 1,Result = 2, ;  Prod Factor/Inc. 1
           LOOKUP[2]   = 1,Result = 3, ;             /Inc. 2
           LOOKUP[3]   = 1,Result = 4, ;             /Inc. 3
```

```
            LOOKUP[4]   = 1,Result = 5, ;            /Inc. 4
            LOOKUP[5]   = 1,Result = 6, ;  Attr Factor/Inc. 1
            LOOKUP[6]   = 1,Result = 7, ;            /Inc. 2
            LOOKUP[7]   = 1,Result = 8, ;            /Inc. 3
            LOOKUP[8]   = 1,Result = 9, ;            /Inc. 4
            Interpolate = N, FAIL=0,0,0,File=@ZNFILE_ZModO@
;

;=========================================================
;  NHB Zonal Production / Attraction Modifcation Factors  =
;=========================================================
      LOOKUP Name=NHBZmod,
            LOOKUP[1]   = 1,Result = 2, ;  Prod Factor/Inc. 1
            LOOKUP[2]   = 1,Result = 3, ;            /Inc. 2
            LOOKUP[3]   = 1,Result = 4, ;            /Inc. 3
            LOOKUP[4]   = 1,Result = 5, ;            /Inc. 4
            LOOKUP[5]   = 1,Result = 6, ;  Attr Factor/Inc. 1
            LOOKUP[6]   = 1,Result = 7, ;            /Inc. 2
            LOOKUP[7]   = 1,Result = 8, ;            /Inc. 3
            LOOKUP[8]   = 1,Result = 9, ;            /Inc. 4
            Interpolate = N, FAIL=0,0,0,File=@ZNFILE_ZModN@
;===============================================================
;  Med.Truck Zonal Production / Attraction Modifcation Factors  =
;===============================================================
      LOOKUP Name=MTKZmod,
            LOOKUP[1]   = 1,Result = 2, ;  Prod Factor/Inc. 1
            LOOKUP[2]   = 1,Result = 3, ;            /Inc. 2
            LOOKUP[3]   = 1,Result = 4, ;            /Inc. 3
            LOOKUP[4]   = 1,Result = 5, ;            /Inc. 4
            LOOKUP[5]   = 1,Result = 6, ;  Attr Factor/Inc. 1
            LOOKUP[6]   = 1,Result = 7, ;            /Inc. 2
            LOOKUP[7]   = 1,Result = 8, ;            /Inc. 3
            LOOKUP[8]   = 1,Result = 9, ;            /Inc. 4
            Interpolate = N, FAIL=0,0,0,File=@ZNFILE_ZModM@


;=================================================================
;  Heavy Truck Zonal Production / Attraction Modifcation Factors  =
;=================================================================
      LOOKUP Name=HTKZmod,
            LOOKUP[1]   = 1,Result = 2, ;  Prod Factor/Inc. 1
            LOOKUP[2]   = 1,Result = 3, ;            /Inc. 2
            LOOKUP[3]   = 1,Result = 4, ;            /Inc. 3
            LOOKUP[4]   = 1,Result = 5, ;            /Inc. 4
            LOOKUP[5]   = 1,Result = 6, ;  Attr Factor/Inc. 1
            LOOKUP[6]   = 1,Result = 7, ;            /Inc. 2
            LOOKUP[7]   = 1,Result = 8, ;            /Inc. 3
            LOOKUP[8]   = 1,Result = 9, ;            /Inc. 4
            Interpolate = N, FAIL=0,0,0,File=@ZNFILE_ZModH@

;=================================================================================
=================
;
=
; End of LookUps  Now read the input files
=
;=================================================================================
=================

;
; read Zonal land use files  into Z-File
ZDATI[1] = @ZNFILE_LU@,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,
                       DistnEX = 96-98

    ; Current Zonal Totals:
                 HH      = zi.1.HH[I]
                 HHPOP   = zi.1.HHPOP[I]
                 TOTPOP  = zi.1.TOTPOP[I]
                 TOTEMP  = zi.1.TOTEMP[I]
                 INDEMP  = zi.1.INDEMP[I]
                 RETEMP  = zi.1.RETEMP[I]
                 OFFEMP  = zi.1.OFFEMP[I]
                 OTHEMP  = zi.1.OTHEMP[I]
                 NRETEMP = zi.1.OTHEMP[I] + zi.1.OFFEMP[I] + zi.1.INDEMP[I]
                 JURCODE = zi.1.JURCODE[I]
                 DistnEX = zi.1.DistnEX[I]

      ; Accumulate Regional Totals:
                 HH_Tot      = HH_Tot      +  zi.1.HH[I]
                 HHPOP_Tot   = HHPOP_Tot   +  zi.1.HHPOP[I]
                 TOTPOP_Tot  = TOTPOP_Tot  +  zi.1.TOTPOP[I]
                 TOTEMP_Tot  = TOTEMP_Tot  +  zi.1.TOTEMP[I]
                 INDEMP_Tot  = INDEMP_Tot  +  zi.1.INDEMP[I]
                 RETEMP_Tot  = RETEMP_Tot  +  zi.1.RETEMP[I]
                 OFFEMP_Tot  = OFFEMP_Tot  +  zi.1.OFFEMP[I]
                 OTHEMP_Tot  = OTHEMP_Tot  +  zi.1.OTHEMP[I]
                 NRETEMP_Tot  = NRETEMP_Tot +  zi.1.OTHEMP[I] + zi.1.OFFEMP[I] +
zi.1.INDEMP[I]

                  IF  (I <= @LASTIZN@)
                       ZoneJURA[I]  = JurCode + 1
                  ENDIF
;
;  Define location variables for truck models
                   Loc  = 4                                      ; default
                   IF (I=@DCCoreRng@ || I=@VACoreRNG@)  Loc = 1  ; regional core
                   IF (I=@DCNCorRng@                 )  Loc = 2  ; DC non-Core
                   IF (I=@VA10MSRng@                 )  Loc = 3  ; VA 10miSquare

; Zonal Area Type File
ZDATI[2] = @ZNFILE_AT@, Z       =  1- 5,
                        ATYPE   = 58-59
                        ATYPE   = zi.2.Atype[I]

ZDATI[3] = @ZNFILE_PEX@ , Z= 1 - 4, hbwxp=5-12,hbsxp=13-20,hboxp=21-28,nhbxp=29-
36,mtkxp=37-44,htkxp=45-52
ZDATI[4] = @ZNFILE_AEX@ , Z= 1 - 4, hbwxa=5-12,hbsxa=13-20,hboxa=21-28,nhbxa=29-
36,mtkxa=37-44,htkxa=45-52

; read HH files by ISV
ZDATI[5]  = @ZNFILE_I1SV@, Z= #1, hh111=#2 , hh112=#3 , hh113=#4 , hh114=#5 ,
                                  hh121=#6 , hh122=#7 , hh123=#8 , hh124=#9 ,
                                  hh131=#10, hh132=#11, hh133=#12, hh134=#13,
                                  hh141=#14, hh142=#15, hh143=#16, hh144=#17

ZDATI[6]  = @ZNFILE_I2SV@, Z= #1, hh211=#2 , hh212=#3 , hh213=#4 , hh214=#5 ,
                                  hh221=#6 , hh222=#7 , hh223=#8 , hh224=#9 ,
                                  hh231=#10, hh232=#11, hh233=#12, hh234=#13,
                                  hh241=#14, hh242=#15, hh243=#16, hh244=#17

ZDATI[7]  = @ZNFILE_I3SV@, Z= #1, hh311=#2 , hh312=#3 , hh313=#4 , hh314=#5 ,
                                  hh321=#6 , hh322=#7 , hh323=#8 , hh324=#9 ,
                                  hh331=#10, hh332=#11, hh333=#12, hh334=#13,
                                  hh341=#14, hh342=#15, hh343=#16, hh344=#17

ZDATI[8]  = @ZNFILE_I4SV@, Z= #1, hh411=#2 , hh412=#3 , hh413=#4 , hh414=#5 ,
```

```
                                  hh421=#6 , hh422=#7 , hh423=#8 , hh424=#9 ,
                                  hh431=#10, hh432=#11, hh433=#12, hh434=#13,
                                  hh441=#14, hh442=#15, hh443=#16, hh444=#17

;-----------------------------------------------------------------------
;Begin Matrix Work Now ...
;-----------------------------------------------------------------------



; Put HH variables into arrays
  CHHA[111]=zi.5.hh111[I]  CHHA[112]=zi.5.hh112[I]  CHHA[113]=zi.5.hh113[I]
CHHA[114]=zi.5.hh114[I]
  CHHA[121]=zi.5.hh121[I]  CHHA[122]=zi.5.hh122[I]  CHHA[123]=zi.5.hh123[I]
CHHA[124]=zi.5.hh124[I]
  CHHA[131]=zi.5.hh131[I]  CHHA[132]=zi.5.hh132[I]  CHHA[133]=zi.5.hh133[I]
CHHA[134]=zi.5.hh134[I]
  CHHA[141]=zi.5.hh141[I]  CHHA[142]=zi.5.hh142[I]  CHHA[143]=zi.5.hh143[I]
CHHA[144]=zi.5.hh144[I]

  CHHA[211]=zi.6.hh211[I]  CHHA[212]=zi.6.hh212[I]  CHHA[213]=zi.6.hh213[I]
CHHA[214]=zi.6.hh214[I]
  CHHA[221]=zi.6.hh221[I]  CHHA[222]=zi.6.hh222[I]  CHHA[223]=zi.6.hh223[I]
CHHA[224]=zi.6.hh224[I]
  CHHA[231]=zi.6.hh231[I]  CHHA[232]=zi.6.hh232[I]  CHHA[233]=zi.6.hh233[I]
CHHA[234]=zi.6.hh234[I]
  CHHA[241]=zi.6.hh241[I]  CHHA[242]=zi.6.hh242[I]  CHHA[243]=zi.6.hh243[I]
CHHA[244]=zi.6.hh244[I]

  CHHA[311]=zi.7.hh311[I]  CHHA[312]=zi.7.hh312[I]  CHHA[313]=zi.7.hh313[I]
CHHA[314]=zi.7.hh314[I]
  CHHA[321]=zi.7.hh321[I]  CHHA[322]=zi.7.hh322[I]  CHHA[323]=zi.7.hh323[I]
CHHA[324]=zi.7.hh324[I]
  CHHA[331]=zi.7.hh331[I]  CHHA[332]=zi.7.hh332[I]  CHHA[333]=zi.7.hh333[I]
CHHA[334]=zi.7.hh334[I]
  CHHA[341]=zi.7.hh341[I]  CHHA[342]=zi.7.hh342[I]  CHHA[343]=zi.7.hh343[I]
CHHA[344]=zi.7.hh344[I]

  CHHA[411]=zi.8.hh411[I]  CHHA[412]=zi.8.hh412[I]  CHHA[413]=zi.8.hh413[I]
CHHA[414]=zi.8.hh414[I]
  CHHA[421]=zi.8.hh421[I]  CHHA[422]=zi.8.hh422[I]  CHHA[423]=zi.8.hh423[I]
CHHA[424]=zi.8.hh424[I]
  CHHA[431]=zi.8.hh431[I]  CHHA[432]=zi.8.hh432[I]  CHHA[433]=zi.8.hh433[I]
CHHA[434]=zi.8.hh434[I]
  CHHA[441]=zi.8.hh441[I]  CHHA[442]=zi.8.hh442[I]  CHHA[443]=zi.8.hh443[I]
CHHA[444]=zi.8.hh444[I]

;
;==================================================================================
==============
; Compute Current Internal trip productions of current TAZ (I) for HBW, HBS, HBO,&
NHB purposes  =
;==================================================================================
==============

    EXTsh     = 0.0791 * EXP(-0.0882 * DISTnEX)     ; share of hb/nhb trips that are
External
    nonEXTsh  = 1.00 - EXTsh                        ; share of hb/nhb trips that are
Internal

    IF (Atype = 1)  HBWNMPsh = 0.40334
    IF (Atype = 2)  HBWNMPsh = 0.11155
    IF (Atype = 3)  HBWNMPsh = 0.03201
    IF (Atype >=4)  HBWNMPsh = 0.02346              ; with fix

Loop in = 1, @InCl@
   Loop sz = 1, @SzCl@
      Loop va = 1,@VaCl@
            isv =  in*100.0 + sz*10.0 + va    ; 3-digit index, Income/Size/Va
            extsh    = 0.0791 * EXP(-0.0882 * DISTnEX)     ; share of hb/nhb trips
to externals
            nonextsh = 1.00 - extsh                        ; share of hb/nhb trips
to externals
      ; Compute rates by purpose:
      ; HBW Motorized& NonMotorized INTERNAL Trips:
         tem_M_N_II   = CHHA[isv] * Prate(1,isv) * HBWZmod(in,I) *
JurPmod(1,JurCode) * @HBW_GlobalAdj@ * nonExtSH
      ; HBW Motorized/NonMotorized INTERNAL to EXTERNAL Trips:
         tem_M_N_IX   = CHHA[isv] * Prate(1,isv) * HBWZmod(in,I) *
JurPmod(1,JurCode) * @HBW_GlobalAdj@ * ExtSH
      ; HBW Non-Motorized Trips:
         tem_NMtr_II  = tem_M_N_II * HBWNMPsh    ; nonmotorised trips
      ; HBW Motorized INTERNAL to INTERNAL Trips:
         tem_Mtr_II   = tem_M_N_II * (1.00 - HBWNMPsh)

         ; compute non-motorized HBW Trips, store in isv array
         prodwNM[isv] = tem_NMtr_II

         ; compute internal motorized trips here, store in zonal arrays:
         prodw[isv]   = tem_Mtr_II
         prods[isv]   = CHHA[isv] * Prate(2,isv) * HBSZmod(in,I) *
JurPmod(2,JurCode) * @HBS_GlobalAdj@ * nonExtSH
         prodo[isv]   = CHHA[isv] * Prate(3,isv) * HBOZmod(in,I) *
JurPmod(3,JurCode) * @HBO_GlobalAdj@ * nonExtSH
         prodn[isv]   = CHHA[isv] * Prate(4,isv) *
JurPmod(4,JurCode) * @NHB_GlobalAdj@ * nonExtSH

;        #Note:#       Zonal production factor for NHB productions is removed
;                      A-mod factors is NHBZmod(5,I) used as a NHB special
generator adjustment

      ; Accumulate Trips by purpose at the TAZ level
         PHBW_NMTZA[I]= PHBW_NMTZA[I] + prodwNM[isv]
         PHBWTZA[I]   = PHBWTZA[I]    + prodw[isv]
         PHBSTZA[I]   = PHBSTZA[I]    + prods[isv]
         PHBOTZA[I]   = PHBOTZA[I]    + prodo[isv]
         PNHBTZA[I]   = PNHBTZA[I]    + prodn[isv]

      ; Accumulate Trips by purpose and Income at the TAZ level
             if (in=1)
                         PHBW1ZA[I]   = PHBW1ZA[I] + prodw[isv]
                         PHBS1ZA[I]   = PHBS1ZA[I] + prods[isv]
                         PHBO1ZA[I]   = PHBO1ZA[I] + prodo[isv]
                         PNHB1ZA[I]   = PNHB1ZA[I] + prodn[isv]
              endif
              if (in=2)
                         PHBW2ZA[I]   = PHBW2ZA[I] + prodw[isv]
                         PHBS2ZA[I]   = PHBS2ZA[I] + prods[isv]
                         PHBO2ZA[I]   = PHBO2ZA[I] + prodo[isv]
                         PNHB2ZA[I]   = PNHB2ZA[I] + prodn[isv]
              endif
              if (in=3)
                         PHBW3ZA[I]   = PHBW3ZA[I] + prodw[isv]
                         PHBS3ZA[I]   = PHBS3ZA[I] + prods[isv]
                         PHBO3ZA[I]   = PHBO3ZA[I] + prodo[isv]
                         PNHB3ZA[I]   = PNHB3ZA[I] + prodn[isv]
              endif
              if (in=4)
                         PHBW4ZA[I]   = PHBW4ZA[I] + prodw[isv]
                         PHBS4ZA[I]   = PHBS4ZA[I] + prods[isv]
                         PHBO4ZA[I]   = PHBO4ZA[I] + prodo[isv]
                         PNHB4ZA[I]   = PNHB4ZA[I] + prodn[isv]
              endif
```

```
      ; Accumulate Internal HHs, Trip Productions by purpose by Size  Levels

               RegHHSzA[sz]   =  RegHHSzA[sz]  + CHHA[isv]
              RegHBWSzA[sz]   = RegHBWSzA[sz]  + prodw[isv]
              RegHBSSzA[sz]   = RegHBSSzA[sz]  + prods[isv]
              RegHBOSzA[sz]   = RegHBOSzA[sz]  + prodo[isv]
              RegNHBSzA[sz]   = RegNHBSzA[sz]  + prodn[isv]

      ; Accumulate Internal HHs, Trip Productions by purpose by Income Levels
               RegHHInA[in]   =  RegHHInA[in]  + CHHA[isv]
              RegHBWInA[in]   = RegHBWInA[in]  + prodw[isv]
              RegHBSInA[in]   = RegHBSInA[in]  + prods[isv]
              RegHBOInA[in]   = RegHBOInA[in]  + prodo[isv]
              RegNHBInA[in]   = RegNHBInA[in]  + prodn[isv]


      ; Accumulate Internal HHs, Trip Productions by purpose by Veh. Av. Levels
               RegHHVaA[va]   =  RegHHVaA[va]  + CHHA[isv]
              RegHBWVaA[va]   = RegHBWVaA[va]  + prodw[isv]
              RegHBSVaA[va]   = RegHBSVaA[va]  + prods[isv]
              RegHBOVaA[va]   = RegHBOVaA[va]  + prodo[isv]
              RegNHBVaA[va]   = RegNHBVaA[va]  + prodn[isv]

      ; Accumulate Internal HHs, Trip Productions by purpose at Juris Level
              If (I<= @LastIZN@)
                 Jr = ZoneJURA[I]
                 JurHHA[Jr]  = JurHHA[Jr]  + CHHA[isv]
                 JurHBWA[Jr] = JurHBWA[Jr] + prodw[isv]
                 JurHBSA[Jr] = JurHBSA[Jr] + prods[isv]
                 JurHBOA[Jr] = JurHBOA[Jr] + prodo[isv]


                 JI = Jr*10 + in
                       JurInHHA[JI]   =   JurInHHA[JI] + CHHA[isv]    ; Juris. HHs/
Inc1
                       JurInHBWA[JI]  =  JurInHBWA[JI] + prodw[isv]
                       JurInHBSA[JI]  =  JurInHBSA[JI] + prods[isv]
                       JurInHBOA[JI]  =  JurInHBOA[JI] + prodo[isv]
                       JurInNHBA[JI]  =  JurInNHBA[JI] + prodn[isv]

              ENDIF

      ; Accumulate Internal Trip Productions by purpose for the system
            HH_TotSIV    = HH_TotSIV    + CHHA[isv]
            IntlNMHBWPs  = IntlNMHBWPs  + prodwNM[isv]

            IntlHBWPs    = IntlHBWPs    + prodw[isv]
            IntlHBSPs    = IntlHBSPs    + prods[isv]
            IntlHBOPs    = IntlHBOPs    + prodo[isv]
            IntlNHBPs    = IntlNHBPs    + prodn[isv]
      EndLoop
   EndLoop
EndLoop
;
;==================================================================================
===========
; Read in External trip prods of current TAZ (I) for HBW, HBS, HBO, NHB, Mtk, Htk
purposes    =
;==================================================================================
===========
;
IF (I > @LastIZN@)
            PHBWTZA[I]   = zi.3.hbwxp[I]
            PHBSTZA[I]   = zi.3.hbsxp[I]
            PHBOTZA[I]   = zi.3.hboxp[I]
            PNHBTZA[I]   = zi.3.nhbxp[I]

      ; Accumulate External Trip Productions by purpose for the system
            ExtlHBWPs    = ExtlHBWPs  +  zi.3.hbwxp[I]
            ExtlHBSPs    = ExtlHBSPs  +  zi.3.hbsxp[I]
            ExtlHBOPs    = ExtlHBOPs  +  zi.3.hboxp[I]
            ExtlNHBPs    = ExtlNHBPs  +  zi.3.nhbxp[I]
            ExtlMTKPs    = ExtlMTKPs  +  zi.3.mtkxp[I]
            ExtlHTKPs    = ExtlHTKPs  +  zi.3.htkxp[I]
ENDIF

;
;==================================================================================
===========
; Compute Internal trip Attractions  for HBW, HBS, HBO, NHB, Mtk, Htk purposes
=
;==================================================================================
===========
; calculate totals to allocated among income groups

            AHBWtem      = HBWArate(1,Atype) * HH      +
                           HBWArate(2,Atype) * HHpop   +
                           HBWArate(3,Atype) * TOTEMP  +
                           HBWArate(4,Atype) * INDEMP  +
                           HBWArate(5,Atype) * RETEMP  +
                           HBWArate(6,Atype) * OFFEMP  +
                           HBWArate(7,Atype) * OTHEMP  +
                           HBWArate(8,Atype) * NRETEMP

            AHBStem      = HBSArate(1,Atype) * HH      +
                           HBSArate(2,Atype) * HHpop   +
                           HBSArate(3,Atype) * TOTEMP  +
                           HBSArate(4,Atype) * INDEMP  +
                           HBSArate(5,Atype) * RETEMP  +
                           HBSArate(6,Atype) * OFFEMP  +
                           HBSArate(7,Atype) * OTHEMP  +
                           HBSArate(8,Atype) * NRETEMP

            AHBOtem      = HBOArate(1,Atype) * HH      +
                           HBOArate(2,Atype) * HHpop   +
                           HBOArate(3,Atype) * TOTEMP  +
                           HBOArate(4,Atype) * INDEMP  +
                           HBOArate(5,Atype) * RETEMP  +
                           HBOArate(6,Atype) * OFFEMP  +
                           HBOArate(7,Atype) * OTHEMP  +
                           HBOArate(8,Atype) * NRETEMP

            ANHBtem      = NHBArate(1,Atype) * HH      +
                           NHBArate(2,Atype) * HHpop   +
                           NHBArate(3,Atype) * TOTEMP  +
                           NHBArate(4,Atype) * INDEMP  +
                           NHBArate(5,Atype) * RETEMP  +
                           NHBArate(6,Atype) * OFFEMP  +
                           NHBArate(7,Atype) * OTHEMP  +
                           NHBArate(8,Atype) * NRETEMP

            AMTKtem      = MTKARATE(1,LOC) * INDEMP  +
                           MTKARATE(2,LOC) * RETEMP  +
                           MTKARATE(3,LOC) * OFFEMP  +
                           MTKARATE(4,LOC) * OTHEMP  +
                           MTKARATE(5,LOC) * HH

            AHTKtem      = HTKARATE(1,LOC) * INDEMP  +
                           HTKARATE(2,LOC) * RETEMP  +
                           HTKARATE(3,LOC) * OFFEMP  +
                           HTKARATE(4,LOC) * OTHEMP  +
                           HTKARATE(5,LOC) * HH

; Allocate HB-Attractions among income groups:
; HBW
          IF (ATYPE = 1)
```

```
            AHBW1ZA[I] = AHBWtem * 0.1220 * JurAmod(1,JurCode) * HBWZmod(5,I)
            AHBW2ZA[I] = AHBWtem * 0.1782 * JurAmod(1,JurCode) * HBWZmod(6,I)
            AHBW3ZA[I] = AHBWtem * 0.2897 * JurAmod(1,JurCode) * HBWZmod(7,I)
            AHBW4ZA[I] = AHBWtem * 0.4101 * JurAmod(1,JurCode) * HBWZmod(8,I)
         ENDIF
        IF (ATYPE = 2)
            AHBW1ZA[I] = AHBWtem * 0.1559 * JurAmod(1,JurCode) * HBWZmod(5,I)
            AHBW2ZA[I] = AHBWtem * 0.1714 * JurAmod(1,JurCode) * HBWZmod(6,I)
            AHBW3ZA[I] = AHBWtem * 0.3006 * JurAmod(1,JurCode) * HBWZmod(7,I)
            AHBW4ZA[I] = AHBWtem * 0.3721 * JurAmod(1,JurCode) * HBWZmod(8,I)
         ENDIF
        IF (ATYPE = 3)
            AHBW1ZA[I] = AHBWtem * 0.1523 * JurAmod(1,JurCode) * HBWZmod(5,I)
            AHBW2ZA[I] = AHBWtem * 0.2153 * JurAmod(1,JurCode) * HBWZmod(6,I)
            AHBW3ZA[I] = AHBWtem * 0.3330 * JurAmod(1,JurCode) * HBWZmod(7,I)
            AHBW4ZA[I] = AHBWtem * 0.2994 * JurAmod(1,JurCode) * HBWZmod(8,I)
         ENDIF
        IF (ATYPE > 3)
            AHBW1ZA[I] = AHBWtem * 0.2062 * JurAmod(1,JurCode) * HBWZmod(5,I)
            AHBW2ZA[I] = AHBWtem * 0.2501 * JurAmod(1,JurCode) * HBWZmod(6,I)
            AHBW3ZA[I] = AHBWtem * 0.3236 * JurAmod(1,JurCode) * HBWZmod(7,I)
            AHBW4ZA[I] = AHBWtem * 0.2201 * JurAmod(1,JurCode) * HBWZmod(8,I)
         ENDIF

       AHBWTZA[I]  = AHBW1ZA[I] + AHBW2ZA[I] + AHBW3ZA[I] + AHBW4ZA[I]


; HBS
        IF (ATYPE < 3)
            AHBS1ZA[I] = AHBStem * 0.1765 * JurAmod(2,JurCode) * HBSZmod(5,I)
            AHBS2ZA[I] = AHBStem * 0.1790 * JurAmod(2,JurCode) * HBSZmod(6,I)
            AHBS3ZA[I] = AHBStem * 0.3066 * JurAmod(2,JurCode) * HBSZmod(7,I)
            AHBS4ZA[I] = AHBStem * 0.3379 * JurAmod(2,JurCode) * HBSZmod(8,I)
         ENDIF
        IF (ATYPE = 3)
            AHBS1ZA[I] = AHBStem * 0.1501 * JurAmod(2,JurCode) * HBSZmod(5,I)
            AHBS2ZA[I] = AHBStem * 0.2010 * JurAmod(2,JurCode) * HBSZmod(6,I)
            AHBS3ZA[I] = AHBStem * 0.3732 * JurAmod(2,JurCode) * HBSZmod(7,I)
            AHBS4ZA[I] = AHBStem * 0.2757 * JurAmod(2,JurCode) * HBSZmod(8,I)
         ENDIF
        IF (ATYPE > 3)
            AHBS1ZA[I] = AHBStem * 0.1446 * JurAmod(2,JurCode) * HBSZmod(5,I)
            AHBS2ZA[I] = AHBStem * 0.2055 * JurAmod(2,JurCode) * HBSZmod(6,I)
            AHBS3ZA[I] = AHBStem * 0.3051 * JurAmod(2,JurCode) * HBSZmod(7,I)
            AHBS4ZA[I] = AHBStem * 0.3448 * JurAmod(2,JurCode) * HBSZmod(8,I)
         ENDIF

       AHBSTZA[I]  = AHBS1ZA[I] + AHBS2ZA[I] + AHBS3ZA[I] + AHBS4ZA[I]


; HBO
        IF (ATYPE < 3)
            AHBO1ZA[I] = AHBOtem * 0.1588 * JurAmod(3,JurCode) * HBOZmod(5,I)
            AHBO2ZA[I] = AHBOtem * 0.1665 * JurAmod(3,JurCode) * HBOZmod(6,I)
            AHBO3ZA[I] = AHBOtem * 0.3039 * JurAmod(3,JurCode) * HBOZmod(7,I)
            AHBO4ZA[I] = AHBOtem * 0.3708 * JurAmod(3,JurCode) * HBOZmod(8,I)
         ENDIF
        IF (ATYPE = 3)
            AHBO1ZA[I] = AHBOtem * 0.0971 * JurAmod(3,JurCode) * HBOZmod(5,I)
            AHBO2ZA[I] = AHBOtem * 0.1626 * JurAmod(3,JurCode) * HBOZmod(6,I)
            AHBO3ZA[I] = AHBOtem * 0.3842 * JurAmod(3,JurCode) * HBOZmod(7,I)
            AHBO4ZA[I] = AHBOtem * 0.3561 * JurAmod(3,JurCode) * HBOZmod(8,I)
         ENDIF
        IF (ATYPE > 3)
            AHBO1ZA[I] = AHBOtem * 0.1309 * JurAmod(3,JurCode) * HBOZmod(5,I)
            AHBO2ZA[I] = AHBOtem * 0.2119 * JurAmod(3,JurCode) * HBOZmod(6,I)
            AHBO3ZA[I] = AHBOtem * 0.3456 * JurAmod(3,JurCode) * HBOZmod(7,I)
            AHBO4ZA[I] = AHBOtem * 0.3116 * JurAmod(3,JurCode) * HBOZmod(8,I)
```

```
            ENDIF


       AHBOTZA[I]  = AHBO1ZA[I] + AHBO2ZA[I] + AHBO3ZA[I] + AHBO4ZA[I]

; NHB
       ANHBTZA[I]  = ANHBtem          * JurAmod(4,JurCode) * NHBZmod(5,I) ;  see
#Note# above

; MTK
       AMTKTZA[I]  = AMTKtem          * JurAmod(5,JurCode) * MTKZmod(5,I) *
@MTK_GlobalAdj@
       PMTKTZA[I]  = AMTKtem          * JurAmod(5,JurCode) * MTKZmod(1,I) *
@MTK_GlobalAdj@

; HTK
       AHTKTZA[I]  = AHTKtem          * JurAmod(6,JurCode) * HTKZmod(5,I) *
@HTK_GlobalAdj@
       PHTKTZA[I]  = AHTKtem          * JurAmod(6,JurCode) * HTKZmod(1,I) *
@HTK_GlobalAdj@



 ; Accumulate Internal Trip Attractions by purpose for the system
  IF (I <=  @LastIZN@)
            IntlHBWAs    = IntlHBWAs  + AHBWTZA[I]
            IntlHBSAs    = IntlHBSAs  + AHBSTZA[I]
            IntlHBOAs    = IntlHBOAs  + AHBOTZA[I]
            IntlNHBAs    = IntlNHBAs  + ANHBTZA[I]
            IntlMTKAs    = IntlMTKAs  + AMTKTZA[I]  IntlMTKPs    = IntlMTKPs  +
PMTKTZA[I]
            IntlHTKAs    = IntlHTKAs  + AHTKTZA[I]  IntlHTKPs    = IntlHTKPs  +
PHTKTZA[I]
  ENDIF

 IF(I > @LastIZN@)
            AHBWTZA[I]   = zi.4.hbwxa[I]
            AHBSTZA[I]   = zi.4.hbsxa[I]
            AHBOTZA[I]   = zi.4.hboxa[I]
            ANHBTZA[I]   = zi.4.nhbxa[I]
            AMTKTZA[I]   = zi.4.mtkxa[I]
            AHTKTZA[I]   = zi.4.htkxa[I]
            PMTKTZA[I]   = zi.3.mtkxp[I]
            PHTKTZA[I]   = zi.3.htkxp[I]

      ; Accumulate External Trip Attractions by purpose for the system
            ExtlHBWAs    = ExtlHBWAs  +  zi.4.hbwxa[I]
            ExtlHBSAs    = ExtlHBSAs  +  zi.4.hbsxa[I]
            ExtlHBOAs    = ExtlHBOAs  +  zi.4.hboxa[I]
            ExtlNHBAs    = ExtlNHBAs  +  zi.4.nhbxa[I]
            ExtlMTKAs    = ExtlMTKAs  +  zi.4.mtkxa[I]
            ExtlHTKAs    = ExtlHTKAs  +  zi.4.htkxa[I]
ENDIF



;=====================================================================================
======
;  Scale Attractions to Productions
;=====================================================================================
======


IF (I = @ZONESIZE@)
;######################################################################

  ;  Before scaling, compute HBW nonMotorized attractions as per CGTGV2TP.FOR
     LOOP IDX=1,@LastIZN@
```

```
        AHBW_NMTZA[IDX]  =  PHBW_NMTZA[IDX] * 0.8982

             IF (AHBW_NMTZA[IDX]    >   AHBWTZA[IDX] )
                    AHBW_NMTZA[IDX]  =  AHBWTZA[IDX] * 0.1870
             ENDIF

              IntlHBWNMAs  = IntlHBWNMAs  +  AHBW_NMTZA[IDX]

     ENDLOOP

     NMScale     = IntlNMHBWPs /IntlHBWNMAs

 ;
 ;  Now, allocate HBW attractions among motorized/non-motorized groups
 ;



     LOOP IDX=1,@ZONESIZE@
          TEM            =  AHBW_NMTZA[IDX]
          AHBW_NMTZA[IDX]=  TEM   * NMScale              ;<-- Final Scaled HBW
Non_Motorized Attractions

          AdjAHBWTZA[IDX]   =  AHBWTZA[IDX] -  AHBW_NMTZA[IDX]      ; <-- Final HBW
Mototized Attractions
             IF  (AdjAHBWTZA[IDX] <=  0.0)
                  AdjAHBWTZA[IDX]  =  0.0
                  AdjAHBW1ZA[IDX]  =  0.0
                  AdjAHBW2ZA[IDX]  =  0.0
                  AdjAHBW3ZA[IDX]  =  0.0
                  AdjAHBW4ZA[IDX]  =  0.0
               ELSE
               AdjAHBW1ZA[IDX] = AdjAHBWTZA[IDX] *  AHBW1ZA[IDX]/AHBWTZA[IDX]
               AdjAHBW2ZA[IDX] = AdjAHBWTZA[IDX] *  AHBW2ZA[IDX]/AHBWTZA[IDX]
               AdjAHBW3ZA[IDX] = AdjAHBWTZA[IDX] *  AHBW3ZA[IDX]/AHBWTZA[IDX]
               AdjAHBW4ZA[IDX] = AdjAHBWTZA[IDX] *  AHBW4ZA[IDX]/AHBWTZA[IDX]
             ENDIF

      IF(IDX <= @LastIZN@)
              IntlADJHBWAs   = IntlADJHBWAs  +  AdjAHBWTZA[IDX]
              IntlNMHBWAs   = IntlNMHBWAs    +  AHBW_NMTZA[IDX]
      ENDIF

      IF(IDX > @LastIZN@)
          ADJAHBWTZA[I]   = zi.4.hbwxa[I]
          ADJAHBW1ZA[I]   = 0
          ADJAHBW2ZA[I]   = 0
          ADJAHBW3ZA[I]   = 0
          ADJAHBW4ZA[I]   = 0

      ENDIF

     ENDLOOP

  ;----------------------------------------------------------
  ;  Now compute Gloval Scaling Factors by Purpose here:
  ;----------------------------------------------------------

    IF (IntlAdjHBWAs == 0)
        SF_HBW =  0
      ELSE
        SF_HBW =  ((IntlHBWPs  + ExtlHBWPs) - ExtlHBWAs) / IntlAdjHBWAs
    ENDIF

    IF (IntlHBSAs == 0)
        SF_HBS =  0
      ELSE
        SF_HBS =  ((IntlHBSPs  + ExtlHBSPs) - ExtlHBSAs) / IntlHBSAs
    ENDIF

    IF (IntlHBOAs == 0)
        SF_HBO =  0
      ELSE
        SF_HBO =  ((IntlHBOPs  + ExtlHBOPs) - ExtlHBOAs) / IntlHBOAs
    ENDIF

    IF (IntlNHBAs == 0)
        SF_NHB =  0
      ELSE
        SF_NHB =  ((IntlNHBPs  + ExtlNHBPs) - ExtlNHBAs) / IntlNHBAs
    ENDIF

    IF (IntlMTKAs == 0)
        SF_MTK =  0
      ELSE
        SF_MTK =  ((IntlMTKPs  + ExtlMTKPs) - ExtlMTKAs) / IntlMTKAs
    ENDIF

    IF (IntlHTKAs == 0)
        SF_HTK =  0
      ELSE
        SF_HTK =  ((IntlHTKPs  + ExtlHTKPs) - ExtlHTKAs) / IntlHTKAs
    ENDIF

  ;----------------------------------------------------------
  ; Now apply attraction scaling factors to Internal TAZs Only
  ;----------------------------------------------------------

LOOP IDX = 1,@LastIZN@

      FAHBW1ZA[IDX] = AdjAHBW1ZA[IDX] * SF_HBW      FAHBW2ZA[IDX] = AdjAHBW2ZA[IDX]
* SF_HBW
      FAHBW3ZA[IDX] = AdjAHBW3ZA[IDX] * SF_HBW      FAHBW4ZA[IDX] = AdjAHBW4ZA[IDX]
* SF_HBW
      FAHBWTZA[IDX] = AdjAHBWTZA[IDX] * SF_HBW

      FAHBS1ZA[IDX] = AHBS1ZA[IDX]    * SF_HBS      FAHBS2ZA[IDX] = AHBS2ZA[IDX]
* SF_HBS
      FAHBS3ZA[IDX] = AHBS3ZA[IDX]    * SF_HBS      FAHBS4ZA[IDX] = AHBS4ZA[IDX]
* SF_HBS
      FAHBSTZA[IDX] = AHBSTZA[IDX]    * SF_HBS

      FAHBO1ZA[IDX] = AHBO1ZA[IDX]    * SF_HBO      FAHBO2ZA[IDX] = AHBO2ZA[IDX]
* SF_HBO
      FAHBO3ZA[IDX] = AHBO3ZA[IDX]    * SF_HBO      FAHBO4ZA[IDX] = AHBO4ZA[IDX]
* SF_HBO
      FAHBOTZA[IDX] = AHBOTZA[IDX]    * SF_HBO

      FANHBTZA[IDX] = ANHBTZA[IDX]    * SF_NHB   ; Final NHB A's  (Also used as
final P's too)

      FAMTKTZA[IDX] = AMTKTZA[IDX]    * SF_MTK   ; Final MTK A's  (Also used as
final P's too)

      FAHTKTZA[IDX] = AHTKTZA[IDX]    * SF_HTK   ; Final HTK A's  (Also used as
final P's too)

;
; Accumulate the Total Internal Final/Scaled Attractions Here:
;
          IntlFinHBWAs   = IntlFinHBWAs  +  FAHBWTZA[IDX]
          IntlFinHBSAs   = IntlFinHBSAs  +  FAHBSTZA[IDX]
          IntlFinHBOAs   = IntlFinHBOAs  +  FAHBOTZA[IDX]
          IntlFinNHBAs   = IntlFinNHBAs  +  FANHBTZA[IDX]
          IntlFinMTKAs   = IntlFinMTKAs  +  FAMTKTZA[IDX]
```

```
         IntlFinHTKAs   = IntlFinHTKAs  +  FAHTKTZA[IDX]
;
; Accumulate Internal NHB, Mtk, Htk final/scaled trip attractions at Juris Level
;
      IF(IDX <= @LastIZN@)
      Jr  = ZoneJURA[IDX]
              JurNHBA[jr] = JurNHBA[jr]  + FANHBTZA[IDX]
              JurMTKA[jr] = JurMTKA[jr]  + FAMTKTZA[IDX]
              JurHTKA[jr] = JurHTKA[jr]  + FAHTKTZA[IDX]
      EndIF

ENDLOOP


;
; Now just set final/scaled attractions equal to initial attractions which are
; really just the input external attractions.  These are maintained as is
;

FrstExZN = @LastIZN@ + 1
LOOP  IDX= FrstExZN,@ZONESIZE@

          FAHBWTZA[IDX] = AHBWTZA[IDX]              ; Final HBW As
          FAHBSTZA[IDX] = AHBSTZA[IDX]              ; Final HBS As
          FAHBOTZA[IDX] = AHBOTZA[IDX]              ; Final HBO A's
          FANHBTZA[IDX] = ANHBTZA[IDX]              ; Final NHB A's
          FAMTKTZA[IDX] = AMTKTZA[IDX]              ; Final MTK A's
          FAHTKTZA[IDX] = AHTKTZA[IDX]              ; Final HTK A's

 ENDLOOP

;
;=====================================================================================
========
;  Now Write the Zonal P/A Files for Trip Distribution
;=====================================================================================
========
;

 LOOP Idx= 1,@ZoneSize@
   Print Form=@Ofmt@ List =IDX(5),PHBW_NMTZA[IDX],AHBW_NMTZA[IDX],
file=@hbwnmpa@

   Print Form=@Ofmt@ List =IDX(5),PHBWTZA[IDX],
file=@hbwps_all@
   Print Form=@Ofmt@ List =IDX(5),PHBSTZA[IDX],
file=@hbsps_all@
   Print Form=@Ofmt@ List =IDX(5),PHBOTZA[IDX],
file=@hbops_all@
   Print Form=@Ofmt@ List =IDX(5),PNHBTZA[IDX],
file=@nhbps_all@
   Print Form=@Ofmt@ List =IDX(5),PMTKTZA[IDX],
file=@mtkps_all@
   Print Form=@Ofmt@ List =IDX(5),PHTKTZA[IDX],
file=@htkps_all@

   Print Form=@Ofmt@ List
=IDX(5),PHBW1ZA[IDX],PHBW2ZA[IDX],PHBW3ZA[IDX],PHBW4ZA[IDX], file=@hbwps_inc@
   Print Form=@Ofmt@ List
=IDX(5),PHBS1ZA[IDX],PHBS2ZA[IDX],PHBS3ZA[IDX],PHBS4ZA[IDX], file=@hbsps_inc@
   Print Form=@Ofmt@ List
=IDX(5),PHBO1ZA[IDX],PHBO2ZA[IDX],PHBO3ZA[IDX],PHBO4ZA[IDX], file=@hbops_inc@

   Print Form=@Ofmt@ List =IDX(5),FAHBWTZA[IDX],
file=@hbwas_all@
   Print Form=@Ofmt@ List =IDX(5),FAHBSTZA[IDX],
file=@hbsas_all@
   Print Form=@Ofmt@ List =IDX(5),FAHBOTZA[IDX],
file=@hboas_all@
   Print Form=@Ofmt@ List =IDX(5),FANHBTZA[IDX],
file=@nhbas_all@
   Print Form=@Ofmt@ List =IDX(5),FAMTKTZA[IDX],
file=@mtkas_all@
   Print Form=@Ofmt@ List =IDX(5),FAHTKTZA[IDX],
file=@htkas_all@

   Print Form=@Ofmt@ List
=IDX(5),FAHBW1ZA[IDX],FAHBW2ZA[IDX],FAHBW3ZA[IDX],FAHBW4ZA[IDX], file=@hbwas_inc@
   Print Form=@Ofmt@ List
=IDX(5),FAHBS1ZA[IDX],FAHBS2ZA[IDX],FAHBS3ZA[IDX],FAHBS4ZA[IDX], file=@hbsas_inc@
   Print Form=@Ofmt@ List
=IDX(5),FAHBO1ZA[IDX],FAHBO2ZA[IDX],FAHBO3ZA[IDX],FAHBO4ZA[IDX], file=@hboas_inc@

  IF (IDX  <= @LastIZN@) ; Internal Med/Hvy Truck and NHB Trips Only

    Print Form=@Ofmt@ List =IDX(5),PNHBTZA[IDX],
file=@nhbps_int@
    Print Form=@Ofmt@ List =IDX(5),PMTKTZA[IDX],
file=@mtkps_int@
    Print Form=@Ofmt@ List =IDX(5),PHTKTZA[IDX],
file=@htkps_int@

    Print Form=@Ofmt@ List =IDX(5),FANHBTZA[IDX],
file=@nhbas_int@
    Print Form=@Ofmt@ List =IDX(5),FAMTKTZA[IDX],
file=@mtkas_int@
    Print Form=@Ofmt@ List =IDX(5),FAHTKTZA[IDX],
file=@htkas_int@

    ELSE

    Print Form=@Ofmt@ List =IDX(5),'        0.00',
file=@nhbps_int@
    Print Form=@Ofmt@ List =IDX(5),'        0.00',
file=@mtkps_int@
    Print Form=@Ofmt@ List =IDX(5),'        0.00',
file=@htkps_int@

    Print Form=@Ofmt@ List =IDX(5),'        0.00',
file=@nhbas_int@
    Print Form=@Ofmt@ List =IDX(5),'        0.00',
file=@mtkas_int@
    Print Form=@Ofmt@ List =IDX(5),'        0.00',
file=@htkas_int@

  ENDIF


ENDLOOP

;
;=====================================================================================
========
;  Write the Report Files
;=====================================================================================
========
;
; compute total motorized Ps/As for summary:
  TOTHBWPs = IntlHBWPs       + ExtlHBWPs
  TOTHBWAs = IntlAdjHBWAs    + ExtlHBWAs
  DiffHBW  =  TOTHBWAs - TOTHBWPs
  PctDHBW  =  DiffHBW/TOTHBWPs * 100.00

  TOTHBSPs = IntlHBSPs   + ExtlHBSPs
  TOTHBSAs = IntlHBSAs   + ExtlHBSAs
```

```
  DiffHBS  =  TOTHBSAs - TOTHBSPs
  PctDHBS  =  DiffHBS/TOTHBSPs * 100.00

  TOTHBOPs = IntlHBOPs    + ExtlHBOPs
  TOTHBOAs = IntlHBOAs + ExtlHBOAs
  DiffHBO  =  TOTHBOAs - TOTHBOPs
  PctDHBO  =  DiffHBO/TOTHBOPs * 100.00

  TOTNHBPs = IntlNHBPs    + ExtlNHBPs
  TOTNHBAs = IntlNHBAs + ExtlNHBAs
  DiffNHB  =  TOTNHBAs - TOTNHBPs
  PctDNHB  =  DiffNHB/TOTNHBPs * 100.00

  TOTMTKPs = IntlMTKPs + ExtlMTKPs
  TOTMTKAs = IntlMTKAs + ExtlMTKAs
  DiffMTK  =  TOTMTKAs - TOTMTKPs
  PctDMTK  =  DiffMTK/TOTMTKPs * 100.00

  TOTHTKPs = IntlHTKPs + ExtlHTKPs
  TOTHTKAs = IntlHTKAs + ExtlHTKAs
  DiffHTK  = TOTHTKAs - TOTHTKPs
  PctDHTK  = DiffHTK/TOTHTKPs * 100.00

;
; Calculate 'person' subtotals for summary:
  IntlPSNPs = IntlHBWPs    + IntlHBSPs + IntlHBOPs + IntlNHBPs
  IntlPSNAs = IntlAdjHBWAs + IntlHBSAs + IntlHBOAs + IntlNHBAs
  ExtlPSNPs = ExtlHBWPs    + ExtlHBSPs + ExtlHBOPs + ExtlNHBPs
  ExtlPSNAs = ExtlHBWAs    + ExtlHBSAs + ExtlHBOAs + ExtlNHBAs
  TOTPSNPs  = IntlPSNPs    + ExtlPSNPs
  TOTPSNAs  = IntlPSNAs    + ExtlPSNAs
  DiffPSN   =  TOTPSNAs - TOTPSNPs
  PctDPSN   =  DiffPSN/TOTPSNPs * 100.00
  IntlFinPSNAs = IntlFinHBWAs + IntlFinHBSAs + IntlFinHBOAs + IntlFinNHBAs

;
; Calculate 'truck ' subtotals for summary:
  IntlTrkPs = IntlMTKPs  + IntlHTKPs
  IntlTrkAs = IntlMTKAs  + IntlHTKAs
  ExtlTrkPs = ExtlMtkPs  + ExtlHtkPs
  ExtlTrkAs = ExtlMtkAs  + ExtlHtkAs
  TOTTrkPs  = IntlTrkPs  + ExtlTrkPs
  TOTTrkAs  = IntlTrkAs  + ExtlTrkAs
  DiffTrk   =  TOTTrkAs - TOTTrkPs
  PctDTrk   =  DiffTrk/TOTTrkPs * 100.00
  IntlFinTrkAs = IntlFinMTKAs + IntlFinHTKAs



 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '     TRIP_GENERATION.S  -  P r o g r a m   O u t p u t   S u m m a r y
- ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '                                  Initial
Final/Scaled  Scaling    '
 Print LIST= ' Trip        Internal   External   Internal   External   Total
Total      Diff.      % Diff.    Internal    Factor     ' ,file=@Rept@
 Print LIST= ' Purpose      Prods.     Prods.     Attrs.     Attrs.    Prods.
Attrs.    (As - Ps)             Attrs.               ' ,file=@Rept@
 Print LIST= '----------- ---------- ---------- ---------- ---------- ---------- ---
------- ---------- ---------- ----------  ---------- ' ,file=@Rept@
 Print form=11csv list='HB Work    ',IntlHBWPs,ExtlHBWPs,IntlHBWAs,
ExtlHBWAs,TOTHBWPs,TOTHBWAs,DiffHBW,PctDHBW(11.2),IntlFinHBWAs, SF_HBW(11.3)
,file=@Rept@
 Print form=11csv list='HB Shop    ',IntlHBSPs,ExtlHBSPs,IntlHBSAs,
ExtlHBSAs,TOTHBSPs,TOTHBSAs,DiffHBS,PctDHBS(11.2),IntlFinHBSAs, SF_HBS(11.3)
,file=@Rept@
 Print form=11csv list='HB Other   ',IntlHBOPs,ExtlHBOPs,IntlHBOAs,
ExtlHBOAs,TOTHBOPs,TOTHBOAs,DiffHBO,PctDHBO(11.2),IntlFinHBOAs, SF_HBO(11.3)
,file=@Rept@
 Print form=11csv list='NonHB      ',IntlNHBPs,ExtlNHBPs,IntlNHBAs,
ExtlNHBAs,TOTNHBPs,TOTNHBAs,DiffNHB,PctDNHB(11.2),IntlFinNHBAs, SF_NHB(11.3)
,file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print form=11csv list='Persn Total',IntlPsnPs,ExtlPsnPs,IntlPsnAs,
ExtlPsnAs,TOTPsnPs,TOTPsnAs,DiffPsn,PctDPsn(11.2),IntlFinPsnAs,'          -'
,file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print form=11csv list='Med. Truck ',IntlMTKPs,ExtlMTKPs,IntlMTKAs,
ExtlMTKAs,TOTMTKPs,TOTMTKAs,DiffMTK,PctDMTK(11.2),IntlFinMTKAs, SF_MTK(11.3)
,file=@Rept@
 Print form=11csv list='Hvy. Truck ',IntlHTKPs,ExtlHTKPs,IntlHTKAs,
ExtlHTKAs,TOTHTKPs,TOTHTKAs,DiffHTK,PctDHTK(11.2),IntlFinHTKAs, SF_HTK(11.3)
,file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print form=11csv list='TruckTotal ',IntlTrkPs,ExtlTrkPs,IntlTrkAs,
ExtlTrkAs,TOTTrkPs,TOTTrkAs,DiffTrk,PctDTrk(11.2),IntlFinTrkAs,'          -'
,file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@


 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
   Print Form=12.csv  List='Non-Motorized HBW Production  Total: ', IntlNMHBWPs,
file=@rept@
   Print Form=12.csv  List='Non-Motorized HBW Attractions Total: ', IntlNMHBWAs,
file=@rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
;
; Compute Trip Rate Totals, marginals for reporting
;
  IntlHBWPr  = IntlHBWPs/HH_TotSIV, IntlHBSPr  = IntlHBSPs/HH_TotSIV, IntlHBOPr  =
IntlHBOPs/HH_TotSIV
  IntlNHBPr  = IntlNHBPs/HH_TotSIV, IntlMTKPr  = IntlMTKPs/HH_TotSIV, IntlHTKPr  =
IntlHTKPs/HH_TotSIV
  DFIOHH     = HH_TotSIV - HH_Tot

 Loop IDX=1,@SzCL@
  RegHBWrSzA[IDX] = RegHBWSzA[IDX]/RegHHSzA[IDX]
  RegHBSrSzA[IDX] = RegHBSSzA[IDX]/RegHHSzA[IDX]
  RegHBOrSzA[IDX] = RegHBOSzA[IDX]/RegHHSzA[IDX]
  RegNHBrSzA[IDX] = RegNHBSzA[IDX]/RegHHSzA[IDX]
 ENDLOOP

 Loop IDX=1,@InCL@
  RegHBWrInA[IDX] = RegHBWInA[IDX]/RegHHInA[IDX]
  RegHBSrInA[IDX] = RegHBSInA[IDX]/RegHHInA[IDX]
  RegHBOrInA[IDX] = RegHBOInA[IDX]/RegHHInA[IDX]
  RegNHBrInA[IDX] = RegNHBInA[IDX]/RegHHInA[IDX]
 ENDLOOP

 Loop IDX=1,@VaCL@
  RegHBWrVaA[IDX] = RegHBWVaA[IDX]/RegHHVaA[IDX]
  RegHBSrVaA[IDX] = RegHBSVaA[IDX]/RegHHVaA[IDX]
  RegHBOrVaA[IDX] = RegHBOVaA[IDX]/RegHHVaA[IDX]
  RegNHBrVaA[IDX] = RegNHBVaA[IDX]/RegHHVaA[IDX]
 ENDLOOP
;
```

```
 Loop IDX=1,@JurSize@
  IF (  JurHHa[IDX]  = 0)
      JurHBWrA[IDX] = 0
      JurHBSrA[IDX] = 0
      JurHBOrA[IDX] = 0
      JurNHBrA[IDX] = 0
      JurMTKrA[IDX] = 0
      JurHTKrA[IDX] = 0
   ELSE
      JurHBWrA[IDX] = JurHBWA[IDX]/JurHHa[IDX]
      JurHBSrA[IDX] = JurHBSA[IDX]/JurHHa[IDX]
      JurHBOrA[IDX] = JurHBOA[IDX]/JurHHa[IDX]
      JurNHBrA[IDX] = JurNHBA[IDX]/JurHHa[IDX]
      JurMTKrA[IDX] = JurMTKA[IDX]/JurHHa[IDX]
      JurHTKrA[IDX] = JurHTKA[IDX]/JurHHa[IDX]
  ENDIF


 ENDLOOP
;
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 PRINT LIST =' Regional Households and Motorized Person Trips By Size Level
',file=@Rept@
 PRINT LIST =           '                            HBW         HBW         HBS
HBS         HBO         HBO          NHB        NHB          ',file=@Rept@
 PRINT LIST =           '   Size         HHs         Trips        Rate        Trips
Rate       Trips        Rate        Trips       Rate         ',file=@Rept@
 PRINT LIST =           '           ----------- ------------ ----------- ----------
- ----------- ----------- ----------- ------------ -----------    ',file=@Rept@
 Print form=12.csv LIST= '      1
',RegHHSzA[1],RegHBWSzA[1],RegHBWrSzA[1](12.3),RegHBSSzA[1],RegHBSrSzA[1](12.3),RegH
BOSzA[1],RegHBOrSzA[1](12.3),RegNHBSzA[1],RegNHBrSzA[1](12.3),file=@Rept@ ;
 Print form=12.csv LIST= '      2
',RegHHSzA[2],RegHBWSzA[2],RegHBWrSzA[2](12.3),RegHBSSzA[2],RegHBSrSzA[2](12.3),RegH
BOSzA[2],RegHBOrSzA[2](12.3),RegNHBSzA[2],RegNHBrSzA[2](12.3),file=@Rept@ ;
 Print form=12.csv LIST= '      3
',RegHHSzA[3],RegHBWSzA[3],RegHBWrSzA[3](12.3),RegHBSSzA[3],RegHBSrSzA[3](12.3),RegH
BOSzA[3],RegHBOrSzA[3](12.3),RegNHBSzA[3],RegNHBrSzA[3](12.3),file=@Rept@ ;
 Print form=12.csv LIST= '      4+
',RegHHSzA[4],RegHBWSzA[4],RegHBWrSzA[4](12.3),RegHBSSzA[4],RegHBSrSzA[4](12.3),RegH
BOSzA[4],RegHBOrSzA[4](12.3),RegNHBSzA[4],RegNHBrSzA[4](12.3),file=@Rept@ ;
 Print LIST= '    ',file=@Rept@
 Print form=12.csv LIST= ' Total    ',HH_TotSIV,
IntlHBWPs,IntlHBWPr(12.3),IntlHBSPs, IntlHBSPr(12.3), IntlHBOPs,IntlHBOPr(12.3),
IntlNHBPs,IntlNHBPr(12.3),  ,file=@Rept@ ;
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print form=12.csv LIST= 'I/P HHs:  ',HH_Tot, ' (Regional HH Total from ZONE.ASC
file) '     ,file=@Rept@ ;
 Print form=12.csv LIST= 'HH Diff.  ',DFIOHH,
,file=@Rept@ ;

 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 PRINT LIST =' Regional Households and Motorized Person Trips By Income Level
',file=@Rept@
 PRINT LIST =           '                            HBW         HBW         HBS
HBS         HBO         HBO          NHB        NHB          ',file=@Rept@
 PRINT LIST =           'Inc.Level      HHs         Trips        Rate        Trips
Rate       Trips        Rate        Trips       Rate         ',file=@Rept@
 PRINT LIST =           '           ----------- ------------ ----------- ----------
- ----------- ----------- ----------- ------------ -----------    ',file=@Rept@
 Print form=12.csv LIST= '      1
',RegHHInA[1],RegHBWInA[1],RegHBWrInA[1](12.3),RegHBSInA[1],RegHBSrInA[1](12.3),RegH
BOInA[1],RegHBOrInA[1](12.3),RegNHBInA[1],RegNHBrInA[1](12.3),file=@Rept@ ;
 Print form=12.csv LIST= '      2
',RegHHInA[2],RegHBWInA[2],RegHBWrInA[2](12.3),RegHBSInA[2],RegHBSrInA[2](12.3),RegH
BOInA[2],RegHBOrInA[2](12.3),RegNHBInA[2],RegNHBrInA[2](12.3),file=@Rept@ ;
 Print form=12.csv LIST= '      3
',RegHHInA[3],RegHBWInA[3],RegHBWrInA[3](12.3),RegHBSInA[3],RegHBSrInA[3](12.3),RegH
BOInA[3],RegHBOrInA[3](12.3),RegNHBInA[3],RegNHBrInA[3](12.3),file=@Rept@ ;
 Print form=12.csv LIST= '      4
',RegHHInA[4],RegHBWInA[4],RegHBWrInA[4](12.3),RegHBSInA[4],RegHBSrInA[4](12.3),RegH
BOInA[4],RegHBOrInA[4](12.3),RegNHBInA[4],RegNHBrInA[4](12.3),file=@Rept@ ;
 Print LIST= '    ',file=@Rept@
 Print form=12.csv LIST= ' Total    ',HH_TotSIV,
IntlHBWPs,IntlHBWPr(12.3),IntlHBSPs, IntlHBSPr(12.3), IntlHBOPs,IntlHBOPr(12.3),
IntlNHBPs,IntlNHBPr(12.3),  ,file=@Rept@ ;
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
;
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 PRINT LIST =' Regional Households and Motorized Person Trips By Vehicle Availablity
Level     ',file=@Rept@
 PRINT LIST =           '                            HBW         HBW         HBS
HBS         HBO         HBO          NHB        NHB          ',file=@Rept@
 PRINT LIST =           'Vehs.Avail.    HHs         Trips        Rate        Trips
Rate       Trips        Rate        Trips       Rate         ',file=@Rept@
 PRINT LIST =           '           ----------- ------------ ----------- ----------
- ----------- ----------- ----------- ------------ -----------    ',file=@Rept@
 Print form=12.csv LIST= '      0
',RegHHVaA[1],RegHBWVaA[1],RegHBWrVaA[1](12.3),RegHBSVaA[1],RegHBSrVaA[1](12.3),RegH
BOVaA[1],RegHBOrVaA[1](12.3),RegNHBVaA[1],RegNHBrVaA[1](12.3),file=@Rept@ ;
 Print form=12.csv LIST= '      1
',RegHHVaA[2],RegHBWVaA[2],RegHBWrVaA[2](12.3),RegHBSVaA[2],RegHBSrVaA[2](12.3),RegH
BOVaA[2],RegHBOrVaA[2](12.3),RegNHBVaA[2],RegNHBrVaA[2](12.3),file=@Rept@ ;
 Print form=12.csv LIST= '      2
',RegHHVaA[3],RegHBWVaA[3],RegHBWrVaA[3](12.3),RegHBSVaA[3],RegHBSrVaA[3](12.3),RegH
BOVaA[3],RegHBOrVaA[3](12.3),RegNHBVaA[3],RegNHBrVaA[3](12.3),file=@Rept@ ;
 Print form=12.csv LIST= '      3+
',RegHHVaA[4],RegHBWVaA[4],RegHBWrVaA[4](12.3),RegHBSVaA[4],RegHBSrVaA[4](12.3),RegH
BOVaA[4],RegHBOrVaA[4](12.3),RegNHBVaA[4],RegNHBrVaA[4](12.3),file=@Rept@ ;
 Print LIST= '    ',file=@Rept@
 Print form=12.csv LIST= ' Total    ',HH_TotSIV,
IntlHBWPs,IntlHBWPr(12.3),IntlHBSPs, IntlHBSPr(12.3), IntlHBOPs,IntlHBOPr(12.3),
IntlNHBPs,IntlNHBPr(12.3),  ,file=@Rept@ ;
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@

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

  PRINT LIST =           ' Jurisdictional Households and Motorized Person Trips by
Purpose ',file=@Rept@
 PRINT LIST =           '                            HBW         HBW         HBS
HBS         HBO         HBO          NHB        NHB          ',file=@Rept@
 PRINT LIST =           '  Juris.       HHs         Trips        Rate        Trips
Rate       Trips        Rate        Trips       Rate         ',file=@Rept@
 PRINT LIST =           '           ----------- ------------ ----------- ----------
- ----------- ----------- ----------- ------------ -----------    ',file=@Rept@

  Print form=12.csv LIST= '    0_DC
',JurHHA[01],JurHBWA[01],JurHBWrA[01](12.3),JurHBSA[01],JurHBSrA[01](12.3),JurHBOA[0
1],JurHBOrA[01](12.3),JurNHBA[01],JurNHBrA[01](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '    1_Mtg
',JurHHA[02],JurHBWA[02],JurHBWrA[02](12.3),JurHBSA[02],JurHBSrA[02](12.3),JurHBOA[0
2],JurHBOrA[02](12.3),JurNHBA[02],JurNHBrA[02](12.3),file=@Rept@ ;
```

```
  Print form=12.csv LIST= '    2_PG
',JurHHA[03],JurHBWA[03],JurHBWrA[03](12.3),JurHBSA[03],JurHBSrA[03](12.3),JurHBOA[0
3],JurHBOrA[03](12.3),JurNHBA[03],JurNHBrA[03](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '    3_Arl
',JurHHA[04],JurHBWA[04],JurHBWrA[04](12.3),JurHBSA[04],JurHBSrA[04](12.3),JurHBOA[0
4],JurHBOrA[04](12.3),JurNHBA[04],JurNHBrA[04](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '    4_Alx
',JurHHA[05],JurHBWA[05],JurHBWrA[05](12.3),JurHBSA[05],JurHBSrA[05](12.3),JurHBOA[0
5],JurHBOrA[05](12.3),JurNHBA[05],JurNHBrA[05](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '    5_Ffx
',JurHHA[06],JurHBWA[06],JurHBWrA[06](12.3),JurHBSA[06],JurHBSrA[06](12.3),JurHBOA[0
6],JurHBOrA[06](12.3),JurNHBA[06],JurNHBrA[06](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '    6_Ldn
',JurHHA[07],JurHBWA[07],JurHBWrA[07](12.3),JurHBSA[07],JurHBSrA[07](12.3),JurHBOA[0
7],JurHBOrA[07](12.3),JurNHBA[07],JurNHBrA[07](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '    7_PW
',JurHHA[08],JurHBWA[08],JurHBWrA[08](12.3),JurHBSA[08],JurHBSrA[08](12.3),JurHBOA[0
8],JurHBOrA[08](12.3),JurNHBA[08],JurNHBrA[08](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '    8_ -
',JurHHA[09],JurHBWA[09],JurHBWrA[09](12.3),JurHBSA[09],JurHBSrA[09](12.3),JurHBOA[0
9],JurHBOrA[09](12.3),JurNHBA[09],JurNHBrA[09](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '    9_Frd
',JurHHA[10],JurHBWA[10],JurHBWrA[10](12.3),JurHBSA[10],JurHBSrA[10](12.3),JurHBOA[1
0],JurHBOrA[10](12.3),JurNHBA[10],JurNHBrA[10](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   10_How
',JurHHA[11],JurHBWA[11],JurHBWrA[11](12.3),JurHBSA[11],JurHBSrA[11](12.3),JurHBOA[1
1],JurHBOrA[11](12.3),JurNHBA[11],JurNHBrA[11](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   11_AA
',JurHHA[12],JurHBWA[12],JurHBWrA[12](12.3),JurHBSA[12],JurHBSrA[12](12.3),JurHBOA[1
2],JurHBOrA[12](12.3),JurNHBA[12],JurNHBrA[12](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   12_Chs
',JurHHA[13],JurHBWA[13],JurHBWrA[13](12.3),JurHBSA[13],JurHBSrA[13](12.3),JurHBOA[1
3],JurHBOrA[13](12.3),JurNHBA[13],JurNHBrA[13](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   13_ -
',JurHHA[14],JurHBWA[14],JurHBWrA[14](12.3),JurHBSA[14],JurHBSrA[14](12.3),JurHBOA[1
4],JurHBOrA[14](12.3),JurNHBA[14],JurNHBrA[14](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   14_Car
',JurHHA[15],JurHBWA[15],JurHBWrA[15](12.3),JurHBSA[15],JurHBSrA[15](12.3),JurHBOA[1
5],JurHBOrA[15](12.3),JurNHBA[15],JurNHBrA[15](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   15_Cal
',JurHHA[16],JurHBWA[16],JurHBWrA[16](12.3),JurHBSA[16],JurHBSrA[16](12.3),JurHBOA[1
6],JurHBOrA[16](12.3),JurNHBA[16],JurNHBrA[16](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   16_SM
',JurHHA[17],JurHBWA[17],JurHBWrA[17](12.3),JurHBSA[17],JurHBSrA[17](12.3),JurHBOA[1
7],JurHBOrA[17](12.3),JurNHBA[17],JurNHBrA[17](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '
17_KGeo',JurHHA[18],JurHBWA[18],JurHBWrA[18](12.3),JurHBSA[18],JurHBSrA[18](12.3),Ju
rHBOA[18],JurHBOrA[18](12.3),JurNHBA[18],JurNHBrA[18](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   18_Fbg
',JurHHA[19],JurHBWA[19],JurHBWrA[19](12.3),JurHBSA[19],JurHBSrA[19](12.3),JurHBOA[1
9],JurHBOrA[19](12.3),JurNHBA[19],JurNHBrA[19](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   19_Sta
',JurHHA[20],JurHBWA[20],JurHBWrA[20](12.3),JurHBSA[20],JurHBSrA[20](12.3),JurHBOA[2
0],JurHBOrA[20](12.3),JurNHBA[20],JurNHBrA[20](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   20_Spt
',JurHHA[21],JurHBWA[21],JurHBWrA[21](12.3),JurHBSA[21],JurHBSrA[21](12.3),JurHBOA[2
1],JurHBOrA[21](12.3),JurNHBA[21],JurNHBrA[21](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   21_Fau
',JurHHA[22],JurHBWA[22],JurHBWrA[22](12.3),JurHBSA[22],JurHBSrA[22](12.3),JurHBOA[2
2],JurHBOrA[22](12.3),JurNHBA[22],JurNHBrA[22](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   22_Clk
',JurHHA[23],JurHBWA[23],JurHBWrA[23](12.3),JurHBSA[23],JurHBSrA[23](12.3),JurHBOA[2
3],JurHBOrA[23](12.3),JurNHBA[23],JurNHBrA[23](12.3),file=@Rept@ ;
  Print form=12.csv LIST= '   23_Jef
',JurHHA[24],JurHBWA[24],JurHBWrA[24](12.3),JurHBSA[24],JurHBSrA[24](12.3),JurHBOA[2
4],JurHBOrA[24](12.3),JurNHBA[24],JurNHBrA[24](12.3),file=@Rept@ ;

  Print LIST= '           ',file=@Rept@
```

```
 Print form=12.csv LIST=  ' Total    ',HH_TotSIV,
IntlHBWPs,IntlHBWPr(12.3),IntlHBSPs, IntlHBSPr(12.3), IntlHBOPs,IntlHBOPr(12.3),
IntlNHBPs,IntlNHBPr(12.3),  ,file=@Rept@ ;
 Print LIST= '   ',file=@Rept@
 Print LIST= '   ',file=@Rept@

  PRINT LIST =            ' Jurisdictional Households and Truck Trips by Vehicle
Type  ',file=@Rept@
 PRINT LIST =            '                       Medium_Truck Medium_Truck
Heavy_Truck Heavy_Truck ',file=@Rept@
 PRINT LIST =            '  Juris.       HHs        Trips        Rate        Trips
Rate     ',file=@Rept@
 PRINT LIST =            '           ----------- ------------ ----------- ----------
- -----------  ',file=@Rept@

  Print form=12.csv LIST= '    0_DC
',JurHHA[01],JurMTKA[01],JurMTKrA[01](12.3),JurHTKA[01],JurHTKrA[01](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '    1_Mtg
',JurHHA[02],JurMTKA[02],JurMTKrA[02](12.3),JurHTKA[02],JurHTKrA[02](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '    2_PG
',JurHHA[03],JurMTKA[03],JurMTKrA[03](12.3),JurHTKA[03],JurHTKrA[03](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '    3_Arl
',JurHHA[04],JurMTKA[04],JurMTKrA[04](12.3),JurHTKA[04],JurHTKrA[04](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '    4_Alx
',JurHHA[05],JurMTKA[05],JurMTKrA[05](12.3),JurHTKA[05],JurHTKrA[05](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '    5_Ffx
',JurHHA[06],JurMTKA[06],JurMTKrA[06](12.3),JurHTKA[06],JurHTKrA[06](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '    6_Ldn
',JurHHA[07],JurMTKA[07],JurMTKrA[07](12.3),JurHTKA[07],JurHTKrA[07](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '    7_PW
',JurHHA[08],JurMTKA[08],JurMTKrA[08](12.3),JurHTKA[08],JurHTKrA[08](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '    8_ -
',JurHHA[09],JurMTKA[09],JurMTKrA[09](12.3),JurHTKA[09],JurHTKrA[09](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '    9_Frd
',JurHHA[10],JurMTKA[10],JurMTKrA[10](12.3),JurHTKA[10],JurHTKrA[10](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   10_How
',JurHHA[11],JurMTKA[11],JurMTKrA[11](12.3),JurHTKA[11],JurHTKrA[11](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   11_AA
',JurHHA[12],JurMTKA[12],JurMTKrA[12](12.3),JurHTKA[12],JurHTKrA[12](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   12_Chs
',JurHHA[13],JurMTKA[13],JurMTKrA[13](12.3),JurHTKA[13],JurHTKrA[13](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   13_ -
',JurHHA[14],JurMTKA[14],JurMTKrA[14](12.3),JurHTKA[14],JurHTKrA[14](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   14_Car
',JurHHA[15],JurMTKA[15],JurMTKrA[15](12.3),JurHTKA[15],JurHTKrA[15](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   15_Cal
',JurHHA[16],JurMTKA[16],JurMTKrA[16](12.3),JurHTKA[16],JurHTKrA[16](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   16_SM
',JurHHA[17],JurMTKA[17],JurMTKrA[17](12.3),JurHTKA[17],JurHTKrA[17](12.3),file=@Rep
t@ ;
```

```
  Print form=12.csv LIST= '
17_KGeo',JurHHA[18],JurMTKA[18],JurMTKrA[18](12.3),JurHTKA[18],JurHTKrA[18](12.3),fi
le=@Rept@ ;
  Print form=12.csv LIST= '   18_Fbg
',JurHHA[19],JurMTKA[19],JurMTKrA[19](12.3),JurHTKA[19],JurHTKrA[19](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   19_Sta
',JurHHA[20],JurMTKA[20],JurMTKrA[20](12.3),JurHTKA[20],JurHTKrA[20](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   20_Spt
',JurHHA[21],JurMTKA[21],JurMTKrA[21](12.3),JurHTKA[21],JurHTKrA[21](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   21_Fau
',JurHHA[22],JurMTKA[22],JurMTKrA[22](12.3),JurHTKA[22],JurHTKrA[22](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   22_Clk
',JurHHA[23],JurMTKA[23],JurMTKrA[23](12.3),JurHTKA[23],JurHTKrA[23](12.3),file=@Rep
t@ ;
  Print form=12.csv LIST= '   23_Jef
',JurHHA[24],JurMTKA[24],JurMTKrA[24](12.3),JurHTKA[24],JurHTKrA[24](12.3),file=@Rep
t@ ;

  Print LIST= '           ',file=@Rept@
 Print form=12.csv LIST=  ' Total    ',HH_TotSIV,
IntlMTKPs,IntlMTKPr(12.3),IntlHTKPs, IntlHTKPr(12.3),file=@Rept@ ;
;==================================================================================
========================

  ENDIF   ;
##################################################################################
##################


ENDRUN

*copy TPPL*.prn Trip_Generation.RPT
```

27 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.      ;
;---------------------------------------------------------------------------;
; 2005-02-25 Remove exclusion of Metrorail/commRail walk-acc links in the
;               old file, but not the new
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
```

28 unbuild_net.s

```
*del tppl*.prn
;-------------------------------------------------------------------------------
; unbuild_net.s
;   Unbuilds a highway network (converts from TP+ binary to text format)
;   Output files are in the format needed for the Version 2.2 travel model
;-------------------------------------------------------------------------------
pageheight=32767  ; Set the page height to a large value to minimize page breaks


basepath  = 'c:\user\Summary'
inhwy     = 'zonehwy.NET'
out_link  = 'link.asc'
out_node  = 'node.asc'


run pgm = hwynet

neti = @basepath@\@inhwy@

/* Write out link file */

print file=@basepath@\@out_link@,
      list=a(5),b(5),distance(7.2),spdclass(7),capclass(3),count(6),cnt_type(3),
           jur(4),screen(12),ftype(3),toll(9),tollgrp(5),
           amlane(13),amlimit(3),pmlane(3),pmlimit(3),oplane(3),oplimit(3),
           '         ',proj_id(10)

/* Write out node file */

nodeo= @basepath@\@out_node@,
  format=txt,
  include=n(6),x(8),y(8)

endrun

*copy tppl*.prn unbuild_net.rpt
```

Appendix F. Batch files

Ref:

1 Runall

1.1 runall_2000.bat

```
:: runall_2000.bat

:: TPB Travel Model, Version 2.2

set _year_=2000
set _alt_=Version2.2

:: Make sure appropriate MC control files exist in \controls SD
:: and copy to generic names in the output SD.
if not exist          controls\mc_hbw00.ctl    goto error
if not exist          controls\mc_hbs00.ctl    goto error
if not exist          controls\mc_hbo00.ctl    goto error
if not exist          controls\mc_nhb00.ctl    goto error
copy controls\mc_hbw00.ctl  %1\mchbw.ctl  /y
copy controls\mc_hbs00.ctl  %1\mchbs.ctl  /y
copy controls\mc_hbo00.ctl  %1\mchbo.ctl  /y
copy controls\mc_nhb00.ctl  %1\mcnhb.ctl  /y


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

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call Set_CPI.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call Transit_Skim.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1


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

set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

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

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

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

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

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

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 =============================================

goto end
:error
REM  Processing Error or File Missing ....
PAUSE
:end

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

2.2 runall2000_ModDev.bat

```
:: runall2000.bat, 2008-01-04
:: Source:  M:\model_dev\Version2.2


set root=F:\model_dev\Version2.2
set scenar=2000_ModDev
set runbat=runall_2000.bat
set fullpth=%root%\%scenar%
:: Std error redirected to a file; Std output split between file and screen
timethis "cmd /c %runbat%  %scenar%  2> %fullpth%\%scenar%_errs.txt" | tee
%fullpth%\%scenar%_output.txt
start %fullpth%\%scenar%_errs.txt
start %fullpth%\%scenar%_output.txt

:: Cleanup
set root=
set scenar=
set fullpth=
set runbat=
```

2.3 runall_2002.bat

```
:: runall_2002.bat

:: TPB Travel Model, Version2.2

set _year_=2002
set _alt_=Version2.2

:: Make sure appropriate MC control files exist in \controls SD
:: and copy to generic names in the output SD.
if not exist          controls\mc_hbw02.ctl    goto error
if not exist          controls\mc_hbs02.ctl    goto error
if not exist          controls\mc_hbo02.ctl    goto error
if not exist          controls\mc_nhb02.ctl    goto error
copy controls\mc_hbw02.ctl  %1\mchbw.ctl  /y
```

```
copy controls\mc_hbs02.ctl  %1\mchbs.ctl  /y
copy controls\mc_hbo02.ctl  %1\mchbo.ctl  /y
copy controls\mc_nhb02.ctl  %1\mcnhb.ctl  /y

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

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call Set_CPI.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call Transit_Skim.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

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

set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

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

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

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

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

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

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 ============================================

goto end
:error
REM  Processing Error or File Missing ....
PAUSE
:end

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

2.4 runall2002_Conf.bat

```
:: runall2002_Conf.bat, 2008-01-04
:: Source:  M:\ateam\model_dev\Version2.2


set root=F:\model_dev\Version2.2
set scenar=2002_Conf
set runbat=runall_2002.bat
set fullpth=%root%\%scenar%
:: Std error redirected to a file; Std output split between file and screen
timethis "cmd /c %runbat%  %scenar%  2> %fullpth%\%scenar%_errs.txt" | tee
%fullpth%\%scenar%_output.txt
start %fullpth%\%scenar%_errs.txt
start %fullpth%\%scenar%_output.txt

:: Cleanup
set root=
set scenar=
set fullpth=
set runbat=
```

2.5 runall_2005.bat

```
:: runall_2005.bat

:: TPB Travel Model, Version 2.2
set _year_=2005
set _alt_=Version2.2
:: Make sure appropriate MC control files exist in \controls SD
:: and copy to generic names in the output SD.
if not exist          controls\mc_hbw05.ctl    goto error
if not exist          controls\mc_hbs05.ctl    goto error
if not exist          controls\mc_hbo05.ctl    goto error
if not exist          controls\mc_nhb05.ctl    goto error
copy controls\mc_hbw05.ctl  %1\mchbw.ctl  /y
copy controls\mc_hbs05.ctl  %1\mchbs.ctl  /y
copy controls\mc_hbo05.ctl  %1\mchbo.ctl  /y
copy controls\mc_nhb05.ctl  %1\mcnhb.ctl  /y


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

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call Set_CPI.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call Transit_Skim.bat %1
```

```
call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1


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

set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

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

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

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

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

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

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 =============================================

goto end
:error
REM  Processing Error or File Missing ....
PAUSE
:end

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

2.6 runall2005_ModDev.bat

```
:: runall2005_ModDev.bat, 2008-01-03
:: Source:  M:\model_dev\Version2.2


set root=F:\model_dev\Version2.2
set scenar=2005_ModDev
set runbat=runall_2005.bat
set fullpth=%root%\%scenar%
:: Std error redirected to a file; Std output split between file and screen
timethis "cmd /c %runbat%  %scenar%  2> %fullpth%\%scenar%_errs.txt" | tee
%fullpth%\%scenar%_output.txt
start %fullpth%\%scenar%_errs.txt
start %fullpth%\%scenar%_output.txt

:: Cleanup
set root=
set scenar=
set fullpth=
set runbat=
```

2.7 runall_2008.bat

```
:: runall_2008.bat

:: TPB Travel Model, Version2.2

set _year_=2008
set _alt_=Version2.2

:: Make sure appropriate MC control files exist in \controls SD
:: and copy to generic names in the output SD.
if not exist          controls\mc_hbw10.ctl    goto error
if not exist          controls\mc_hbs10.ctl    goto error
if not exist          controls\mc_hbo10.ctl    goto error
if not exist          controls\mc_nhb10.ctl    goto error
copy controls\mc_hbw10.ctl  %1\mchbw.ctl  /y
copy controls\mc_hbs10.ctl  %1\mchbs.ctl  /y
copy controls\mc_hbo10.ctl  %1\mchbo.ctl  /y
copy controls\mc_nhb10.ctl  %1\mcnhb.ctl  /y


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

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call Set_CPI.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call Transit_Skim.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1


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


set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1
```

```
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

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

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

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

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 =============================================

goto end
:error
REM  Processing Error or File Missing ....
PAUSE
:end

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

2.8 runall2008_Conf.bat

```
:: runall2008_Conf.bat, 2008-01-04
:: Source:  M:\model_dev\Version2.2


set root=F:\model_dev\Version2.2
set scenar=2008_Conf
set runbat=runall_2008.bat
set fullpth=%root%\%scenar%
:: Std error redirected to a file; Std output split between file and screen
timethis "cmd /c %runbat%  %scenar%  2> %fullpth%\%scenar%_errs.txt" | tee
%fullpth%\%scenar%_output.txt
start %fullpth%\%scenar%_errs.txt
start %fullpth%\%scenar%_output.txt

:: Cleanup
set root=
set scenar=
set fullpth=
set runbat=
```

2.9 runall_2009.bat

```
:: runall_2009.bat

:: TPB Travel Model, Version2.2

set _year_=2009
set _alt_=Version2.2

:: Make sure appropriate MC control files exist in \controls SD
:: and copy to generic names in the output SD.
if not exist          controls\mc_hbw10.ctl    goto error
if not exist          controls\mc_hbs10.ctl    goto error
if not exist          controls\mc_hbo10.ctl    goto error
if not exist          controls\mc_nhb10.ctl    goto error
copy controls\mc_hbw10.ctl  %1\mchbw.ctl  /y
copy controls\mc_hbs10.ctl  %1\mchbs.ctl  /y
copy controls\mc_hbo10.ctl  %1\mchbo.ctl  /y
copy controls\mc_nhb10.ctl  %1\mcnhb.ctl  /y


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

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call Set_CPI.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call Transit_Skim.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1


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


set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

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

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

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

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

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 =============================================

goto end
:error
REM  Processing Error or File Missing ....
PAUSE
:end

set _year_=
```

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

2.10 runall2009_Conf.bat

```
:: runall2009_Conf.bat, 2008-01-04
:: Source:  M:\model_dev\Version2.2


set root=F:\model_dev\Version2.2
set scenar=2009_Conf
set runbat=runall_2009.bat
set fullpth=%root%\%scenar%
:: Std error redirected to a file; Std output split between file and screen
timethis "cmd /c %runbat%  %scenar%  2> %fullpth%\%scenar%_errs.txt" | tee
%fullpth%\%scenar%_output.txt
start %fullpth%\%scenar%_errs.txt
start %fullpth%\%scenar%_output.txt

:: Cleanup
set root=
set scenar=
set fullpth=
set runbat=
```

2.11 runall_2010.bat

```
:: runall_2009.bat

:: TPB Travel Model, Version2.2

set _year_=2010
set _alt_=Version2.2

:: Make sure appropriate MC control files exist in \controls SD
:: and copy to generic names in the output SD.
if not exist          controls\mc_hbw10.ctl    goto error
if not exist          controls\mc_hbs10.ctl    goto error
if not exist          controls\mc_hbo10.ctl    goto error
if not exist          controls\mc_nhb10.ctl    goto error
copy controls\mc_hbw10.ctl  %1\mchbw.ctl  /y
copy controls\mc_hbs10.ctl  %1\mchbs.ctl  /y
copy controls\mc_hbo10.ctl  %1\mchbo.ctl  /y
copy controls\mc_nhb10.ctl  %1\mcnhb.ctl  /y


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

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call Set_CPI.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call Transit_Skim.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1


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


set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR10_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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR10_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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR10_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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR10_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 HSR10_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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR10_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 =============================================

goto end
:error
REM  Processing Error or File Missing ....
PAUSE
:end

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

2.12 runall2010_Conf.bat

```
:: runall2010_Conf.bat, 2008-01-04
:: Source:  M:\model_dev\Version2.2


set root=F:\model_dev\Version2.2
set scenar=2010_Conf
set runbat=runall_2010.bat
```

```
set fullpth=%root%\%scenar%
:: Std error redirected to a file; Std output split between file and screen
timethis "cmd /c %runbat%  %scenar%  2> %fullpth%\%scenar%_errs.txt" | tee
%fullpth%\%scenar%_output.txt
start %fullpth%\%scenar%_errs.txt
start %fullpth%\%scenar%_output.txt

:: Cleanup
set root=
set scenar=
set fullpth=
set runbat=
```

2.13 runall_2020.bat

```
:: runall_2020.bat

:: TPB Travel Model, Version2.2

set _year_=2020
set _alt_=Version2.2

:: Make sure appropriate MC control files exist in \controls SD
:: and copy to generic names in the output SubDir.
if not exist         controls\mc_hbw20.ctl    goto error
if not exist         controls\mc_hbs20.ctl    goto error
if not exist         controls\mc_hbo20.ctl    goto error
if not exist         controls\mc_nhb20.ctl    goto error
copy controls\mc_hbw20.ctl  %1\mchbw.ctl  /y
copy controls\mc_hbs20.ctl  %1\mchbs.ctl  /y
copy controls\mc_hbo20.ctl  %1\mchbo.ctl  /y
copy controls\mc_nhb20.ctl  %1\mcnhb.ctl  /y

::  Enter the name of the path and file of pre-existing 2010 MC run

cd %1
set _path10_=..\2010_Conf
if not exist    %_path10_%\mc_hbwi6.fin goto error
cd..

set _path10hbw_=%_path10_%\mc_hbwi6.fin
set _path10hbs_=%_path10_%\mc_hbsi6.fin
set _path10hbo_=%_path10_%\mc_hboi6.fin
set _path10nhb_=%_path10_%\mc_nhbi6.fin


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

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call Set_CPI.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call Transit_Skim.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1


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

set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR20_Mode_Choice_TC10.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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR20_Mode_Choice_TC10.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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR20_Mode_Choice_TC10.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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR20_Mode_Choice_TC10.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 HSR20_Mode_Choice_TC10.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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR20_Mode_Choice_TC10.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 ============================================

goto end
:error
REM  Processing Error or File Missing ....
PAUSE
:end

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

2.14 runall2020_Conf.bat

```
:: runall2020_Conf.bat, 2008-01-07
:: Source:  M:\model_dev\Version2.2


set root=F:\model_dev\Version2.2
set scenar=2020_Conf
set runbat=runall_2020.bat
set fullpth=%root%\%scenar%
:: Std error redirected to a file; Std output split between file and screen
timethis "cmd /c %runbat%  %scenar%  2> %fullpth%\%scenar%_errs.txt" | tee
%fullpth%\%scenar%_output.txt
start %fullpth%\%scenar%_errs.txt
start %fullpth%\%scenar%_output.txt

:: Cleanup
set root=
set scenar=
set fullpth=
```

```
set runbat=
```

2.15 runall_2030.bat

```
:: runall_2030.bat

:: TPB Travel Model, Version2.2

set _year_=2030
set _alt_=Version2.2

:: Make sure appropriate MC control files exist in \controls SD
:: and copy to generic names in the output SubDir.
if not exist          controls\mc_hbw30.ctl    goto error
if not exist          controls\mc_hbs30.ctl    goto error
if not exist          controls\mc_hbo30.ctl    goto error
if not exist          controls\mc_nhb30.ctl    goto error
copy controls\mc_hbw30.ctl  %1\mchbw.ctl  /y
copy controls\mc_hbs30.ctl  %1\mchbs.ctl  /y
copy controls\mc_hbo30.ctl  %1\mchbo.ctl  /y
copy controls\mc_nhb30.ctl  %1\mcnhb.ctl  /y

::  Enter the name of the path and file of pre-existing 2010 MC run

cd %1
set _path10_=..\2010_Conf
if not exist    %_path10_%\mc_hbwi6.fin goto error
cd..

set _path10hbw_=%_path10_%\mc_hbwi6.fin
set _path10hbs_=%_path10_%\mc_hbsi6.fin
set _path10hbo_=%_path10_%\mc_hboi6.fin
set _path10nhb_=%_path10_%\mc_nhbi6.fin


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

set _iter_=pp
set _prev_=pp

call Set_Factors.bat %1

call Set_CPI.bat %1

call PP_Highway_Build.bat %1

call PP_Highway_PNR.bat %1

call PP_Transit_Prep.bat %1

call Transit_Skim.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call PP_Auto_Drivers.bat %1

call Time-of-Day.bat %1

call Highway_Assignment.bat %1

call Highway_Skims.bat %1

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

set _iter_=i1
set _prev_=pp

call Highway_PNR.bat %1

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR30_Mode_Choice_TC10.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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR30_Mode_Choice_TC10.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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR30_Mode_Choice_TC10.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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR30_Mode_Choice_TC10.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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR30_Mode_Choice_TC10.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

call Transit_Skim.bat %1

call Transit_Fare.bat %1

call Trip_Generation.bat %1

call Trip_Distribution.bat %1

call HSR30_Mode_Choice_TC10.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 =============================================

goto end
:error
REM  Processing Error or File Missing ....
PAUSE
:end

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

2.16 runall2030_Conf.bat

```
:: runall2030_Conf.bat, 2008-01-07
:: Source:  M:\ateam\model_dev\Version2.2


set root=F:\model_dev\Version2.2
set scenar=2030_Conf
set runbat=runall_2030.bat
set fullpth=%root%\%scenar%
:: Std error redirected to a file; Std output split between file and screen
timethis "cmd /c %runbat%  %scenar%  2> %fullpth%\%scenar%_errs.txt" | tee
%fullpth%\%scenar%_output.txt
start %fullpth%\%scenar%_errs.txt
start %fullpth%\%scenar%_output.txt

:: Cleanup
set root=
set scenar=
set fullpth=
set runbat=
```

2 ‘Pump-Prime’ Iterations

2.1 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
        copy TRN_deflator.txt ..\%1
        copy Hwy_Deflator.txt ..\%1
        copy MFARE2_CPI.TXT   ..\%1
        del  TRN_deflator.txt
        del  Hwy_Deflator.txt
        del  MFARE2_CPI.TXT

goto end
:error
REM Processing Error
PAUSE
:end
cd..
.0
```

2.2 set_CPI.bat

```
cd %1

REM  CPI Establishment

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

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

2.3 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..
```

2.4 PP_Highway_PNR.bat

```
CD %1
REM  Highway Skimming and PNR development

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

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

2.5 PP_Transit_Prep.bat

```
CD %1


copy inputs\MODE*.TB


..\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

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



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

2.6 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..
```

3 'Standard' Iterations (1-6)

3.1 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..
```

3.2 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..
```

3.3 Transit_Fare.bat

```
CD %1

REM  Transit Fares

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


del tppl*.*
del %_iter_%_mfare1.rpt
start /w TPPLUS.EXE  ..\scripts\mfare1.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn    %_iter_%_mfare1.rpt

del tppl*.*
del %_iter_%_mfare2.rpt
start /w TPPLUS.EXE  ..\scripts\mfare2.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn    %_iter_%_mfare2.rpt



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

3.4 Trip_Generation.bat

```
CD %1


REM  Trip Generation
del tppl*.*
del                 %_iter_%_Demo_Models.rpt
start /w TPPLUS.EXE  ..\scripts\Demo_Models.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn        %_iter_%_Demo_Models.rpt
copy Demo_Models.txt  %_iter_%_Demo_Models.txt


copy HHI1_SV.ASC    %_iter_%HHI1_SV.ASC
copy HHI2_SV.ASC    %_iter_%HHI2_SV.ASC
copy HHI3_SV.ASC    %_iter_%HHI3_SV.ASC
copy HHI4_SV.ASC    %_iter_%HHI4_SV.ASC

copy HH_Veh.dat     %_iter_%HH_Veh.dat

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

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

..\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..
```

3.5 Trip_Distribution.bat

```
REM Trip Distribution

CD %1


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


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

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

3.6 Mode_Choice.bat

```
::  Standard Mode Choice Model Application / No Constraint

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  mchbw.ctl
if errorlevel 1 goto error

del mc_hbs.*
..\software\COGMC  mchbs.ctl
if errorlevel 1 goto error

del mc_hbo.*
..\software\COGMC  mchbo.ctl
if errorlevel 1 goto error

del mc_nhb.*
..\software\COGMC  mcnhb.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..
```

3.7 Mode_Choice_tc.bat

```
::   Mode Choice Model Application w/ Transit Constraint
::   This Batch file REPLACES Mode_Choice.bat if the transit
::   constraint process is utilized


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

::   GET MODE CHOICE INPUT FILES FROM 2010
::   Check that the 2010 mode ch. model output files are correctly spec'd
if not exist %_path10hbw_% goto error
if not exist %_path10hbs_% goto error
if not exist %_path10hbo_% goto error
if not exist %_path10nhb_% goto error

REM Run Mode Choice Model to get unconstrained transit trips
del mc_hbw.*
..\software\COGMC  mchbw.ctl
if errorlevel 1 goto error

del mc_hbs.*
..\software\COGMC  mchbs.ctl
if errorlevel 1 goto error

del mc_hbo.*
..\software\COGMC  mchbo.ctl
if errorlevel 1 goto error

del mc_nhb.*
..\software\COGMC  mcnhb.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 Save unconstrained Mode Choice Output files to
REM  off-line files used for checking (*.ucn)
REM Then remove constrained files and
REM replace them with constrained versions, and summarize


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

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 2010 transit file path....
PAUSE
:end
CD..
```

3.8 HSR10_Mode_Choice.bat

```
::  Standard Mode Choice Model Application / No Constraint

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

:
: HOT Lane Study for 2030
: reading HOV3+ skims from 2030 2008 AQC
: jcpark 09/28/2007
:

copy sov%_prev_%am.skm  sovam.skm
copy hov2%_prev_%am.skm hov2am.skm
copy ..\2010_Base\hov3%_prev_%am.skm hov3am.skm

copy sov%_prev_%op.skm  sovop.skm
copy hov2%_prev_%op.skm hov2op.skm
copy ..\2010_Base\hov3%_prev_%op.skm hov3op.skm
```

```
del mc_hbw.*
..\software\COGMC  mchbw.ctl
if errorlevel 1 goto error

del mc_hbs.*
..\software\COGMC  mchbs.ctl
if errorlevel 1 goto error

del mc_hbo.*
..\software\COGMC  mchbo.ctl
if errorlevel 1 goto error

del mc_nhb.*
..\software\COGMC  mcnhb.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..
```

3.9 HSR20_Mode_Choice_TC10.bat

```
::   Mode Choice Model Application w/ Transit Constraint
::   This Batch file REPLACES Mode_Choice.bat if the transit
::   constraint process is utilized


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

:
: HOT Lane Study for 2030
: reading HOV3+ skims from 2030 2005 CLRP
: jcpark 09/29/2007
:

copy sov%_prev_%am.skm  sovam.skm
copy hov2%_prev_%am.skm hov2am.skm
copy ..\2020_BASE\hov3%_prev_%am.skm hov3am.skm

copy sov%_prev_%op.skm  sovop.skm
copy hov2%_prev_%op.skm hov2op.skm
copy ..\2020_BASE\hov3%_prev_%op.skm hov3op.skm

REM Run Mode Choice Model to get unconstrained transit trips
del mc_hbw.*
..\software\COGMC  mchbw.ctl
if errorlevel 1 goto error

del mc_hbs.*
..\software\COGMC  mchbs.ctl
if errorlevel 1 goto error

del mc_hbo.*
..\software\COGMC  mchbo.ctl
if errorlevel 1 goto error

del mc_nhb.*
..\software\COGMC  mcnhb.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 Save unconstrained Mode Choice Output files to
REM  off-line files used for checking (*.ucn)
REM Then remove constrained files and
REM replace them with constrained versions, and summarize


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

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 2010 transit file path....
PAUSE
:end
CD..
```

3.10 HSR30_Mode_Choice_TC10.bat

```
::   Mode Choice Model Application w/ Transit Constraint
::   This Batch file REPLACES Mode_Choice.bat if the transit
::   constraint process is utilized


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

:
: HOT Lane Study for 2030
: reading HOV3+ skims from 2030 2005 CLRP
: jcpark 09/29/2007
:

copy sov%_prev_%am.skm  sovam.skm
copy hov2%_prev_%am.skm hov2am.skm
copy ..\2030_BASE\hov3%_prev_%am.skm hov3am.skm

copy sov%_prev_%op.skm  sovop.skm
copy hov2%_prev_%op.skm hov2op.skm
copy ..\2030_BASE\hov3%_prev_%op.skm hov3op.skm

REM Run Mode Choice Model to get unconstrained transit trips
del mc_hbw.*
..\software\COGMC  mchbw.ctl
if errorlevel 1 goto error

del mc_hbs.*
..\software\COGMC  mchbs.ctl
if errorlevel 1 goto error

del mc_hbo.*
..\software\COGMC  mchbo.ctl
if errorlevel 1 goto error

del mc_nhb.*
..\software\COGMC  mcnhb.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 Save unconstrained Mode Choice Output files to
REM  off-line files used for checking (*.ucn)
REM Then remove constrained files and
REM replace them with constrained versions, and summarize


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

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 2010 transit file path....
PAUSE
:end
CD..
```

3.11 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..
```

3.12 Time-of-Day.bat

```
CD %1
REM --  Time of Day Process ---

REM ----------------------------------------
REM  Auto Driver Time-of-Day Trips
REM ----------------------------------------

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

REM ----------------------------------------
REM  Commercial Vehicle Time-of-Day Trips
REM ----------------------------------------

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

REM ----------------------------------------
REM  Truck and Exogenous Time-of-Day Trips
REM ----------------------------------------

del tppl*.*
del                       %_iter_%_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            %_iter_%_Misc_Time-of-Day.rpt
copy                      %_iter_%_Misc_Time-of-Day.rpt temp.dat
..\software\extrtab       temp.dat
copy extrtab.out          %_iter_%_Misc_Time-of-Day.tab
del  extrtab.out
del  temp.dat

goto end

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

3.13 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..
```

3.14 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..
```

Appendix G. Flowcharts

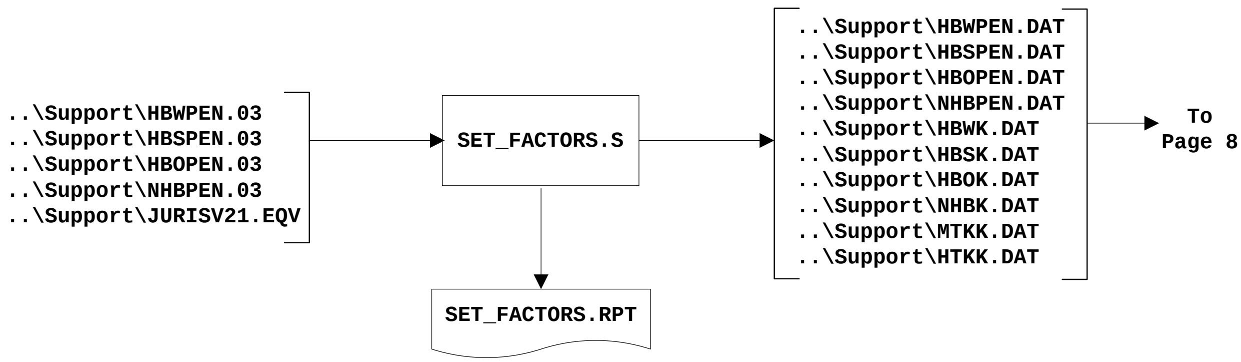
Ref: v2.2_MODAPP_Final.vsd

Flowchart Numbers associated with Flowchart Steps

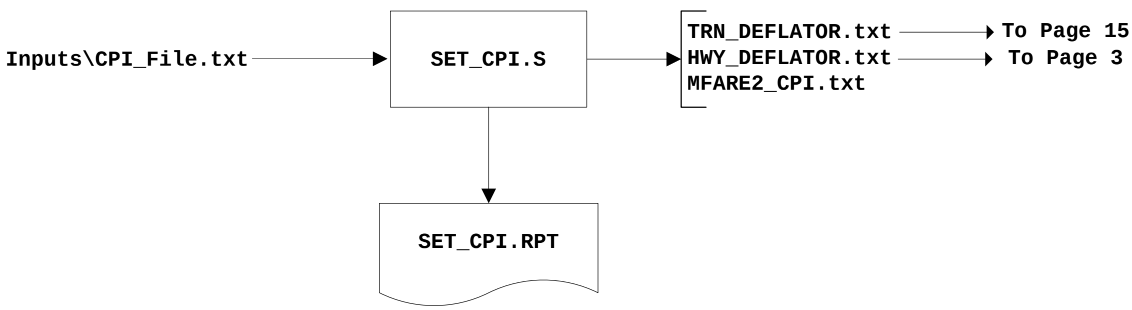
This Appendix contains detailed data processing flow charts showing the relationship of input and output files to the processing steps comprising the Version 2.2 travel model. The flowcharts are arranged on the basis of the 17 batch files used in the model application. Many of the batch files are reused during the application of the model. The table below describes the sequence of each batch file used by iteration. The flowcharts are numbered in accordance with the numbering system (1-17), shown in the table below.

	Initial (Pump Prime) Iteration	Standard Iterations →					
Batch File	PP	1	2	3	4	5	6
Set_Factors.bat	1						
Set_CPI.bat	2						
PP_Highway_Build.bat	3						
PP_Highway_PNR.bat	4						
Highway_PNR.bat				13			
PP_Transit_Prep.bat	5						
Transit_Skim.bat				6			
Transit_Fare.bat				14			
Trip_Generation.bat				7			
Trip_Distribution.bat				8			
Mode_Choice.bat or Mode_Choice_TC.bat				15			
PP_Auto_Drivers.bat	9						
Auto_Driver.bat				16			
Time-of-Day.bat				10			
Highway_Assignment.bat				11			
Highway_Skims.bat				12			

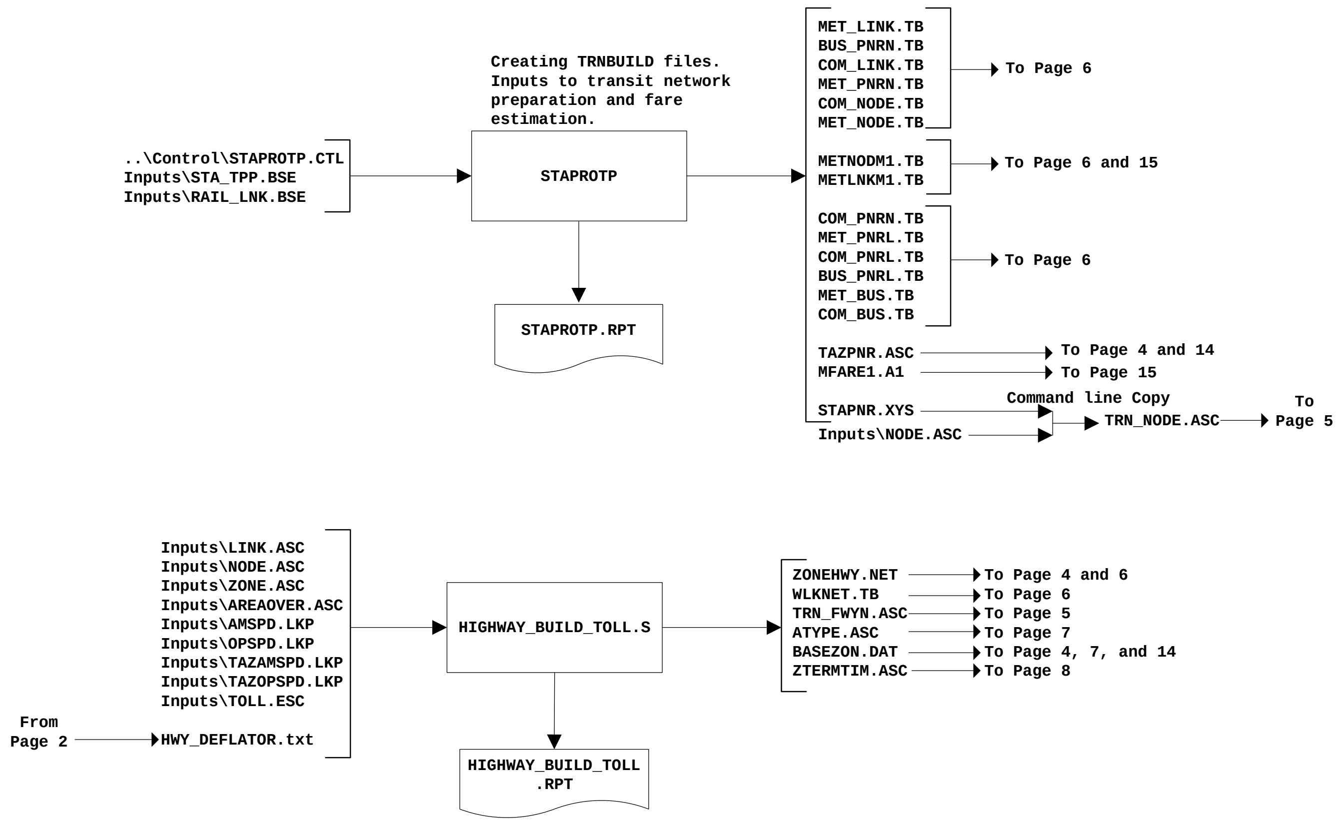
Set_Factors.bat



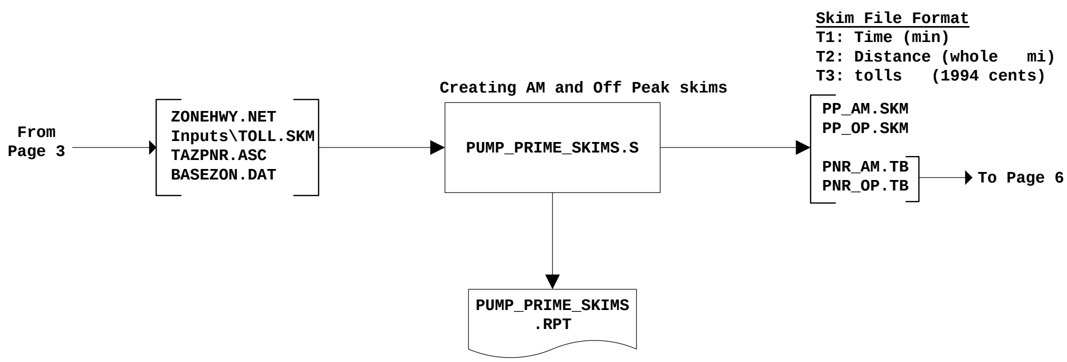
Set_CPI.bat


Inputs\CPI_File.txt
SET_CPI.S
TRN_DEFLATOR.txt
HWY_DEFLATOR.txt
MFARE2_CPI.txt
To Page 15
To Page 3
SET_CPI.RPT

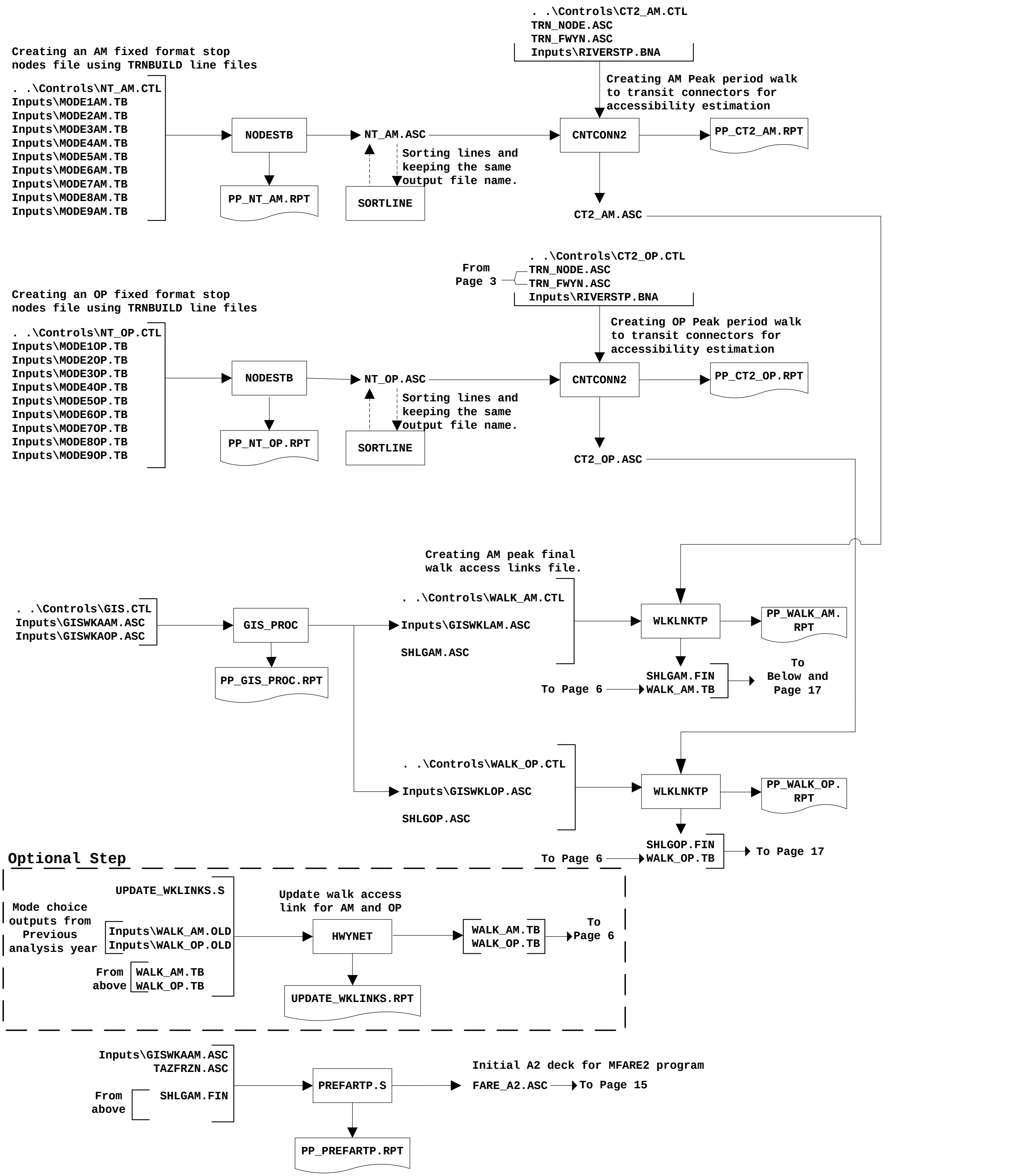
PP_Highway_Build.bat: Highway Network Preparation



PP_Highway_PNR.bat: Highway Path Building



PP_Transit_Prep.bat



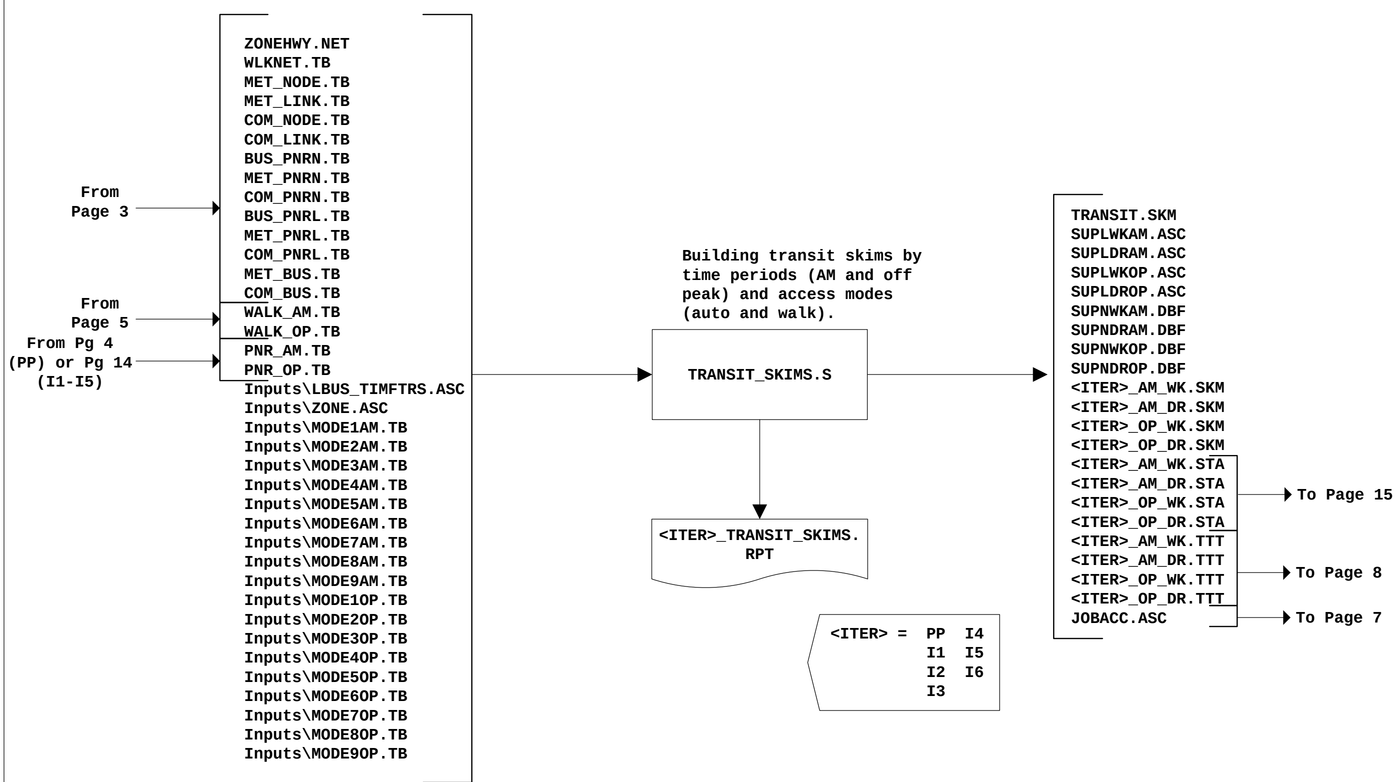
TITLE: Version 2.2 Model Application

COMPANY: COG/TPB **CREATOR: RM/MS**

DATE: January 2007 PG: 6 OF 16

FILENAME: V2.2_MODAPP_Final.VSD

Transit_Skim.bat: Transit Path Building



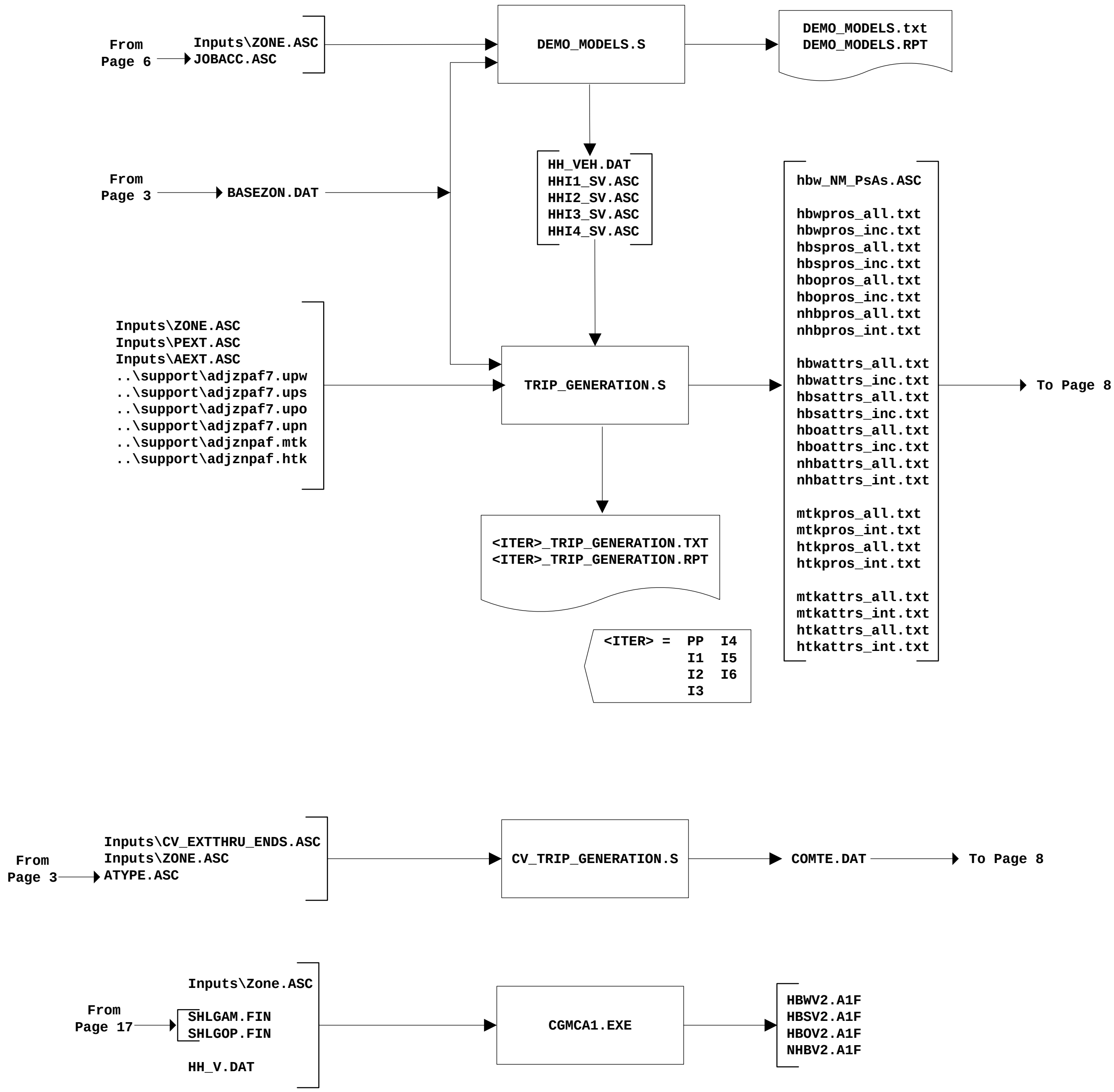
TITLE: Version 2.2 Model Application

COMPANY: COG/TPB **CREATOR: RM/MS**

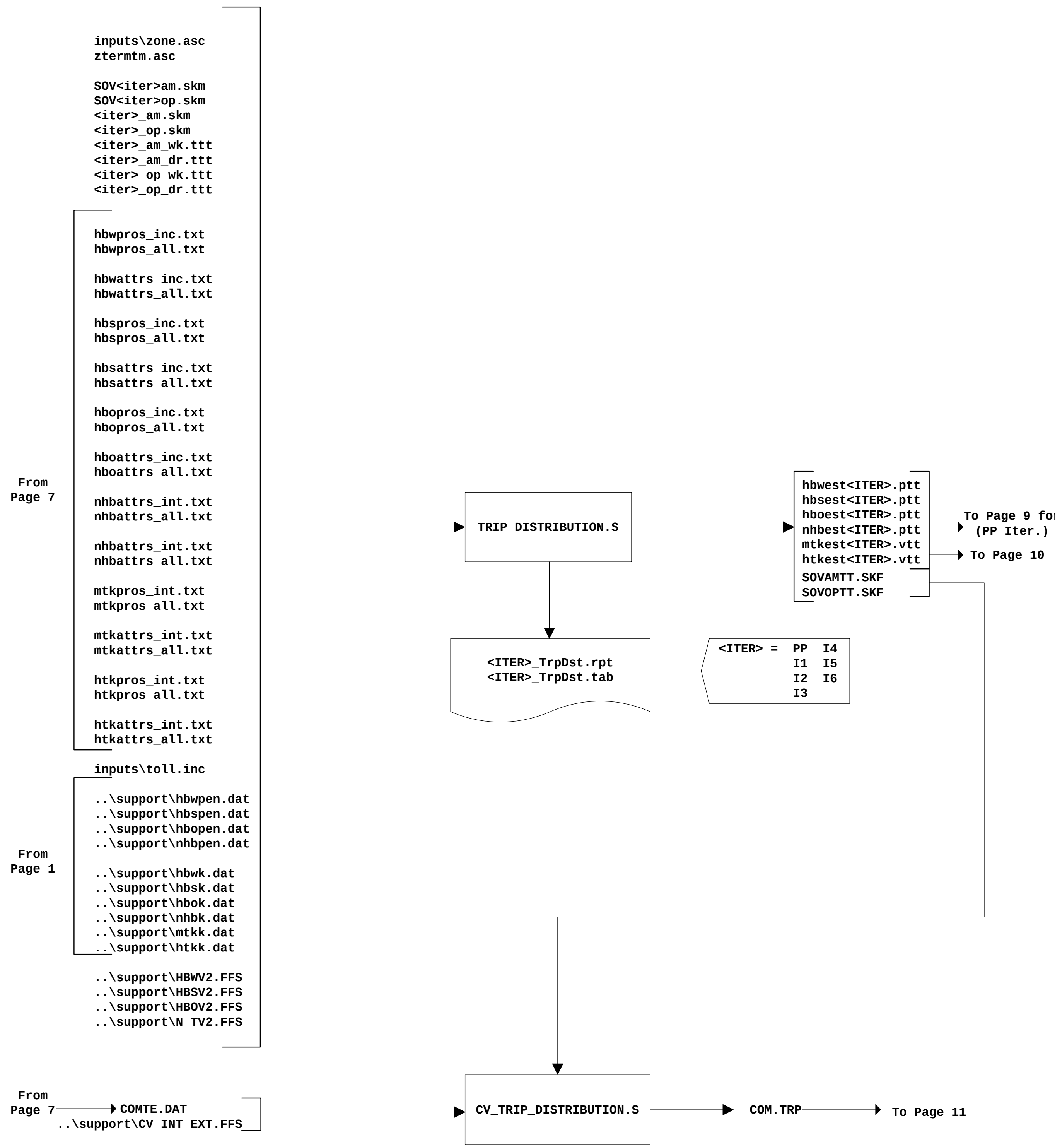
DATE: January 2007

FILENAME: V2.2_MODAPP_Final.VSD

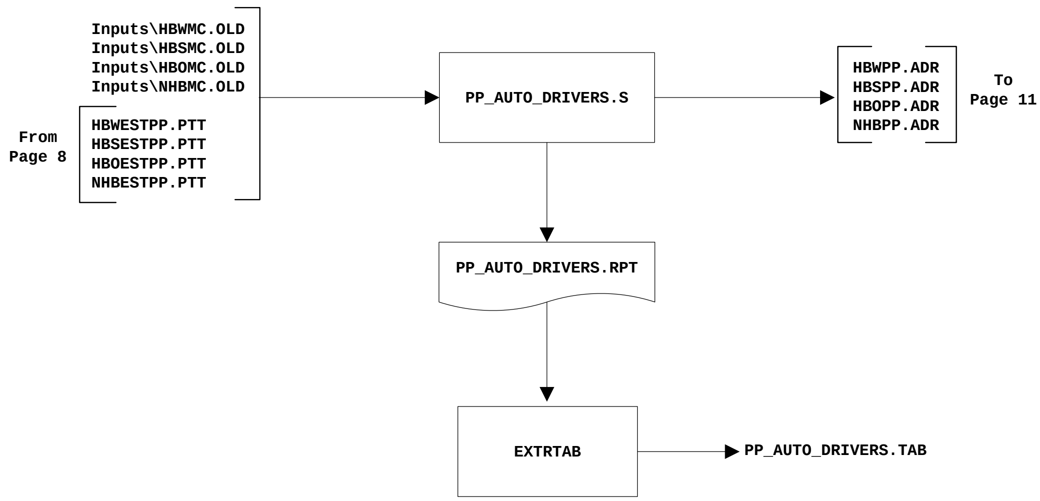
Trip Generation.bat: Trip Generation



Trip_Distribution.bat: Trip Distribution



PP_Auto_Drivers.bat: Pump Prime Auto Driver Trips

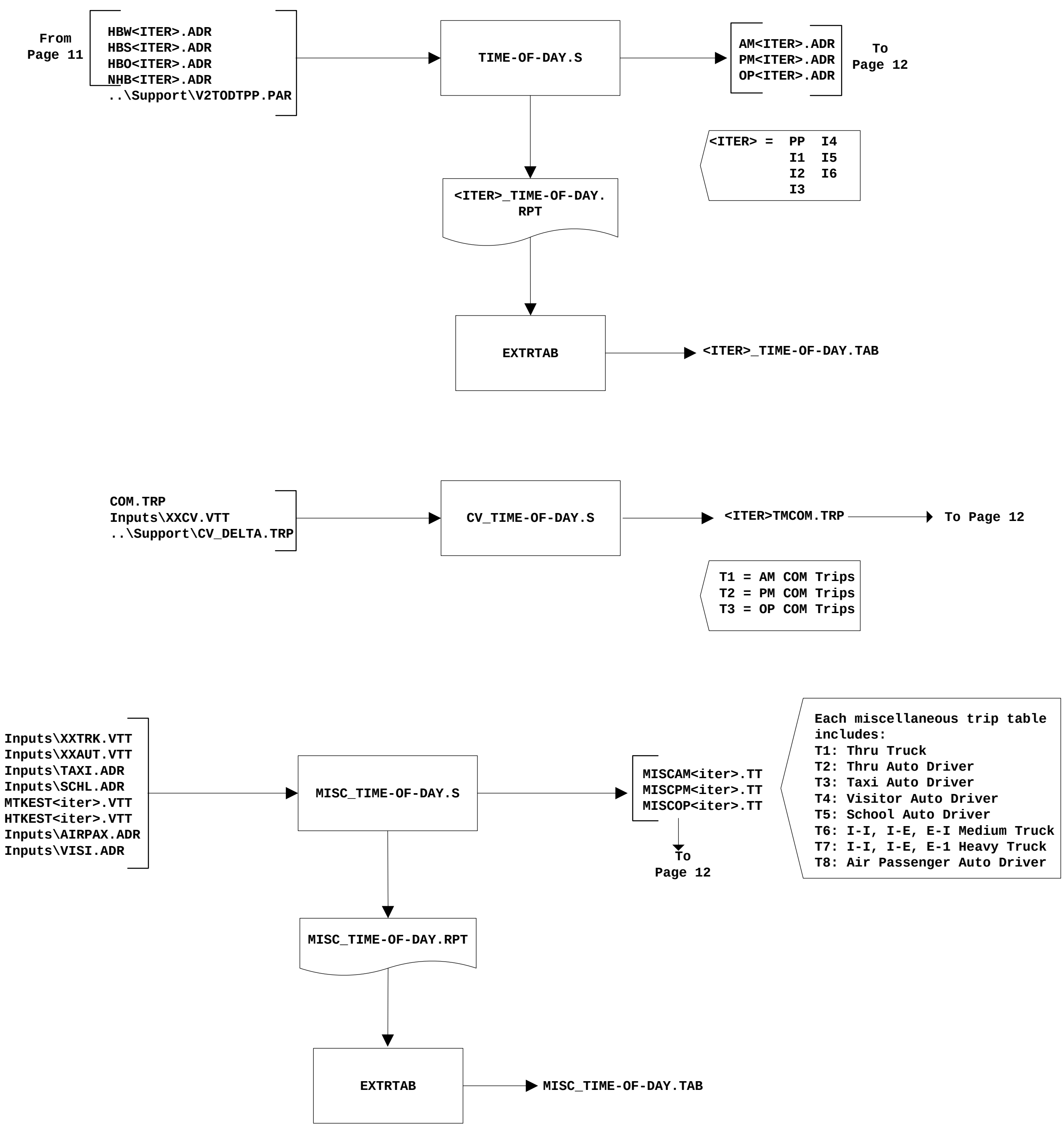


TITLE: Version 2.2 Model Application

COMPANY: COG/TPB **CREATOR: RM/MS**

FILENAME: V2.2_MODAPP_Final.VSD

Time-of-Day.bat



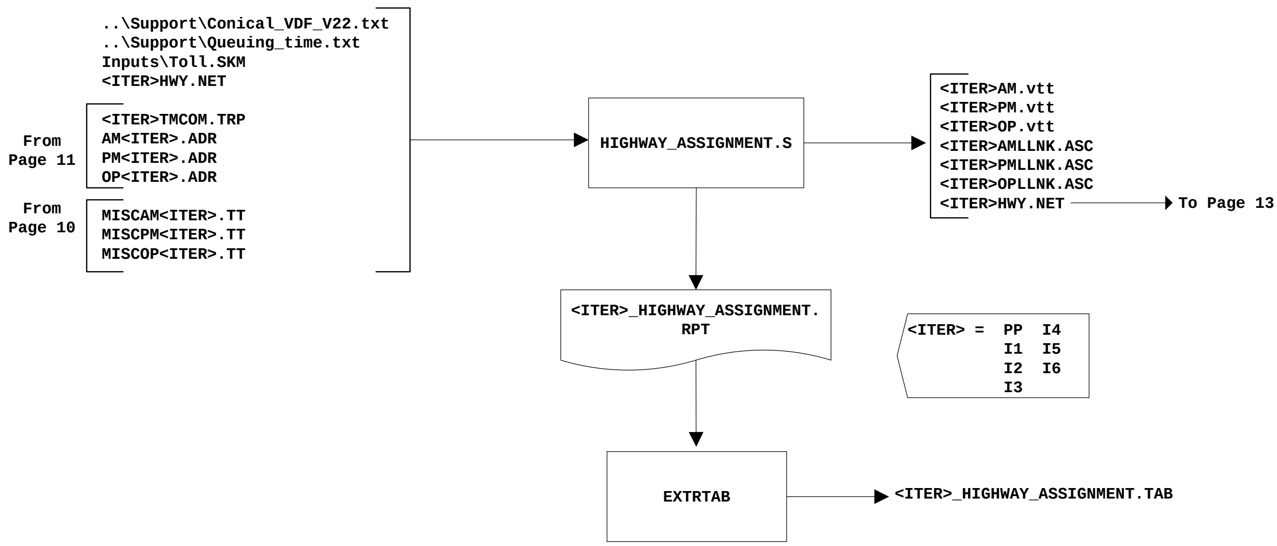
TITLE: Version 2.2 Model Application

COMPANY: COG/TPB **CREATOR:** RM/MS

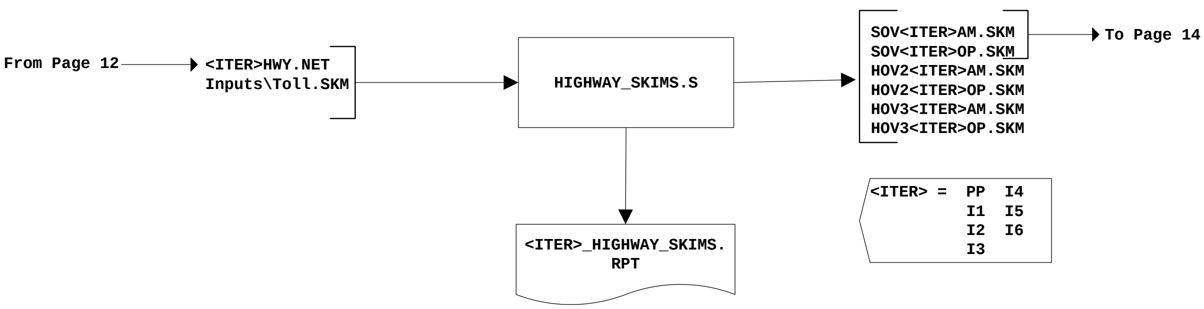
DATE: January 2007 PG: 11 OF 16

FILENAME: V2.2_MODAPP_Final.VSD

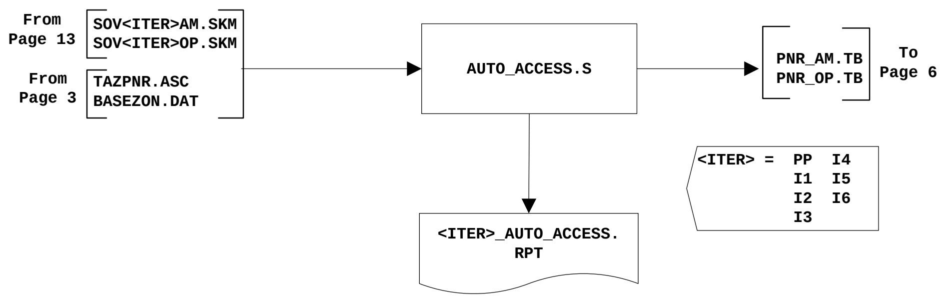
Highway_Assignment.bat



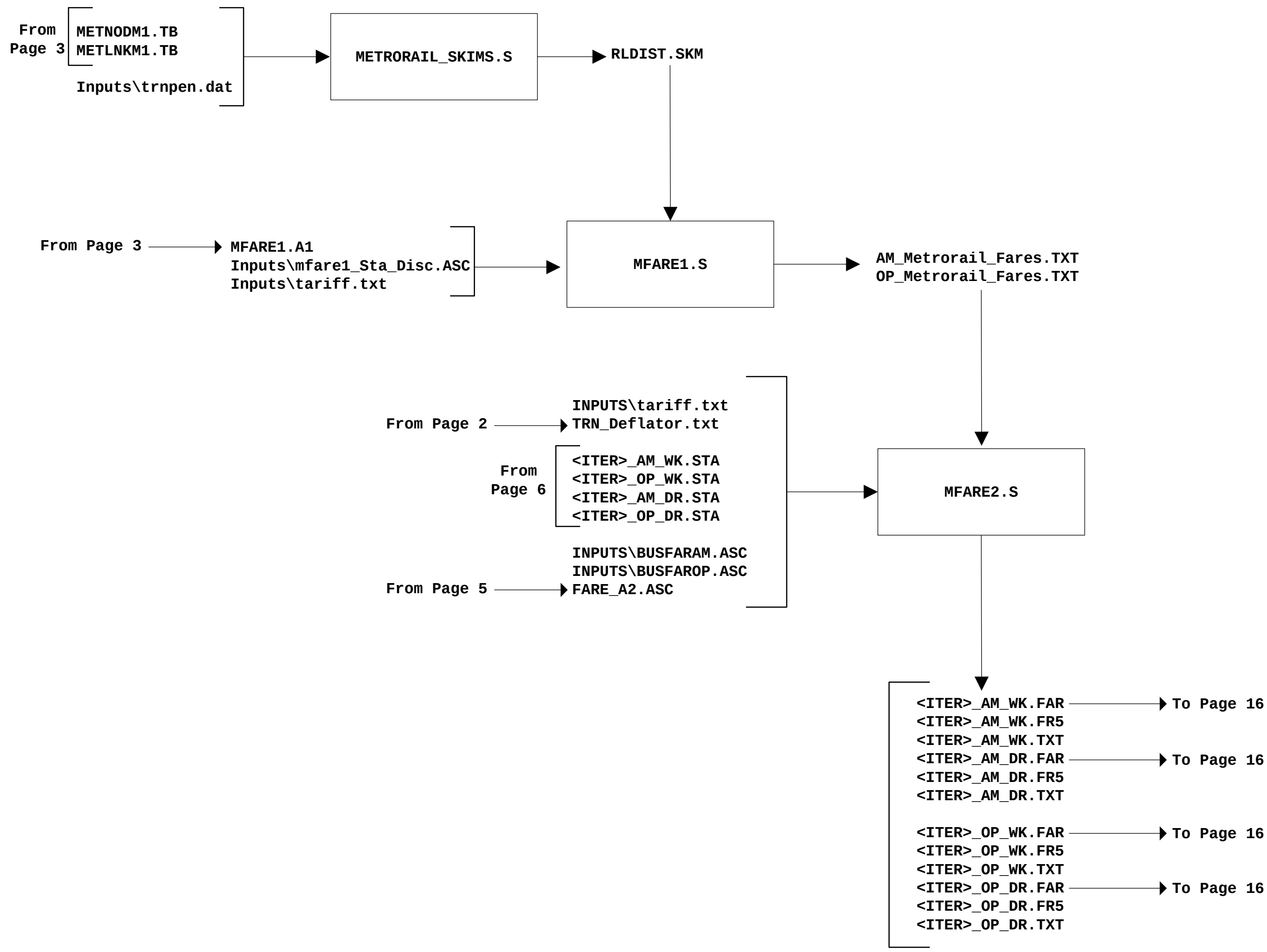
Highway_Skims.bat



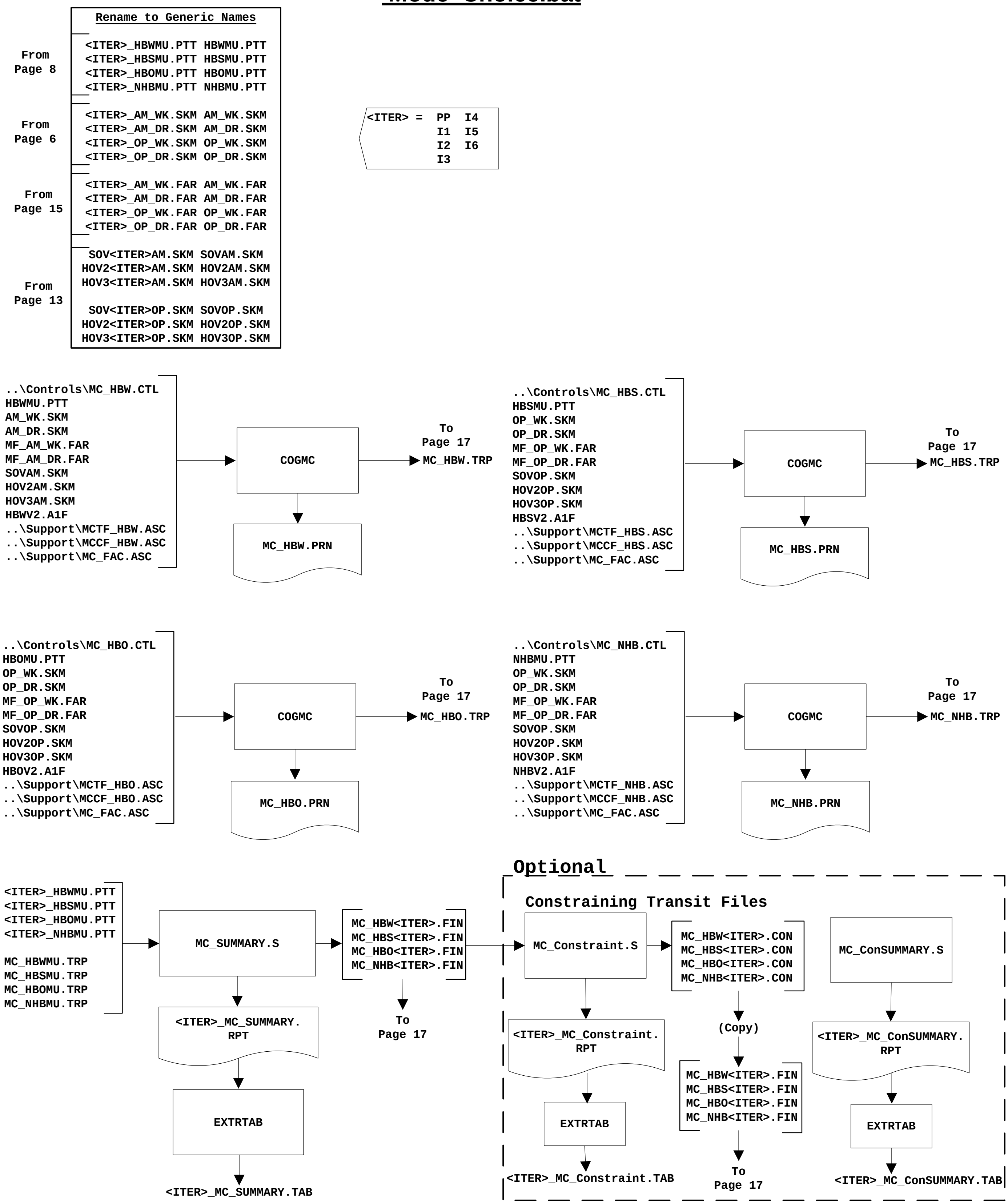
Highway_PNR.bat: Base Highway Path Building



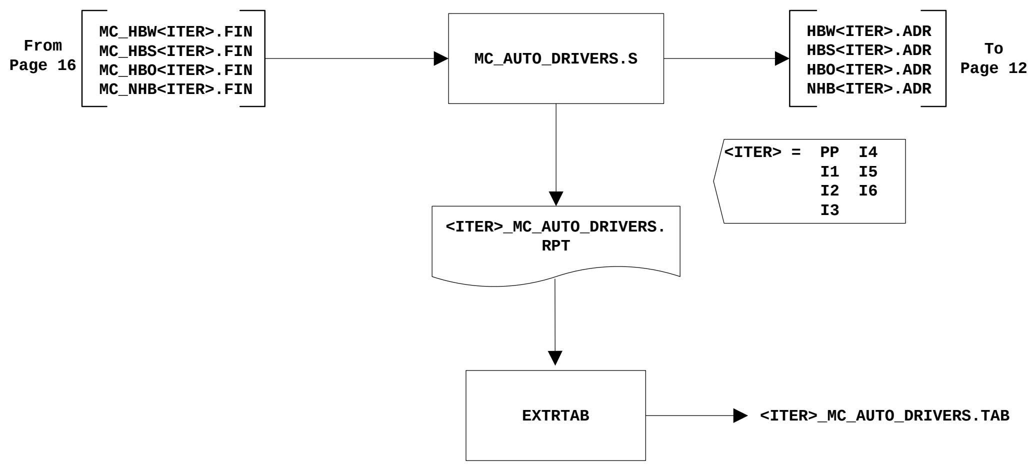
Transit_Fare.bat



Mode Choice.bat



Auto_Driver.bat



Appendix H. Fortran and other control files

Ref:

1 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'
  /
```

2 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
 2005-02-24 Max node number increased from 16600 to 25000
 &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  = 25000
 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
 /
```

3 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
 2005-02-24 Max node number increased from 16600 to 25000
 &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  = 25000
 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
 /
```

4 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
   /
```

5 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,-639,648,650         / mtg
 &ADJDST ADST=4,AZNE=640,-647,649,651,-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,-639,648,650         / mtg
 &NWKDST NDST=4,NZNE=640,-647,649,651,-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,-639,648,650         / mtg
 &CARDST CDST=4,CZNE=640,-647,649,651,-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   /
```

6 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,-639,648,650         / mtg
 &ADJDST ADST=4,AZNE=640,-647,649,651,-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,-639,648,650         / mtg
 &NWKDST NDST=4,NZNE=640,-647,649,651,-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,-639,648,650         / mtg
 &CARDST CDST=4,CZNE=640,-647,649,651,-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   /
```

7 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,-639,648,650          / mtg
 &ADJDST ADST=4,AZNE=640,-647,649,651,-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,-639,648,650        / mtg
&NWKDST NDST=4,NZNE=640,-647,649,651,-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,-639,648,650        / mtg
&CARDST CDST=4,CZNE=640,-647,649,651,-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   /
```

8 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,-639,648,650         / mtg
 &ADJDST ADST=4,AZNE=640,-647,649,651,-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,-639,648,650         / mtg
 &NWKDST NDST=4,NZNE=640,-647,649,651,-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,-639,648,650       / mtg
 &CARDST CDST=4,CZNE=640,-647,649,651,-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   /
```

9 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,-639,648,650          / mtg
 &ADJDST ADST=4,AZNE=640,-647,649,651,-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,-639,648,650          / mtg
 &NWKDST NDST=4,NZNE=640,-647,649,651,-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,-639,648,650          / mtg
 &CARDST CDST=4,CZNE=640,-647,649,651,-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   /
```

10 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,-639,648,650        / mtg
 &ADJDST ADST=4,AZNE=640,-647,649,651,-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,-639,648,650        / mtg
&NWKDST NDST=4,NZNE=640,-647,649,651,-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,-639,648,650        / mtg
&CARDST CDST=4,CZNE=640,-647,649,651,-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   /
```

11 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,-639,648,650        / mtg
 &ADJDST ADST=4,AZNE=640,-647,649,651,-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,-639,648,650        / mtg
 &NWKDST NDST=4,NZNE=640,-647,649,651,-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,-639,648,650        / mtg
 &CARDST CDST=4,CZNE=640,-647,649,651,-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  /
```

12 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,-639,648,650          / mtg
 &ADJDST ADST=4,AZNE=640,-647,649,651,-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,-639,648,650          / mtg
 &NWKDST NDST=4,NZNE=640,-647,649,651,-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,-639,648,650          / mtg
 &CARDST CDST=4,CZNE=640,-647,649,651,-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   /
```

13 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       /
```

14 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      /
```

15 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'
   /
```

16 Walk_AM.CTL

```
walk_am.ctl
  Control File for WLKLNKtp.EXE Program
  2005-02-25 Modified to incorporate LRT

   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
   Node range(s).  Range 1 is from railnr11 to railnr12 for Metrorail/commRail
                   Range 2 is from railnr21 to railnr22 for LRT
&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 =20000
   railnr22 =22000
   /
```

17 Walk_OP.CTL

```
walk_op.ctl
  Control File for WLKLNKtp.EXE Program
  2005-02-25 Modified to incorporate LRT

   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
   Node range(s).  Range 1 is from railnr11 to railnr12 for Metrorail/commRail
                   Range 2 is from railnr21 to railnr22 for LRT
&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 =20000
   railnr22 =22000
   /
```