GENERAL PLANNING CONSULTANT

TECHNICAL MEMORANDUM 89.3.5

INET - RELATED MODE-CHOICE MODEL RECALIBRATION

Prepared for:

Southern California Rapid Transit District

Prepared by:

Schimpeler Corradino Associates

June, 1989

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1.0 INTRODUCTION

During the 1988-89 Annual Work Program for the General Planning Consultant (GPC) to the Southern California Rapid Transit District, two significant refinements were made to the travel demand forecasting procedures in use at the District. First, fare parameters were incorporated into the path building step (see GPC Technical Memorandum 89.3.1, Incorporation of Fares in the Transit Path Building). Second, the forecasting procedures were converted from UNET to INET (see GPC Technical Memorandum 89.3.4, 1980 INET Network Documentation).

Implementing either of these procedures alone and certainly both of them together, requires recalibration of the bias coefficients in the mode choice model. The reasons for this deserve some explanation.

As described in GPC Technical Memorandum 88.3.7b, A New Method for Calibrating Bias Coefficients in Mode Choice Models, mode choice models commonly contain two kinds of variables: generic variables, including level-of-service and socioeconomic attributes, and bias constants, or alternative-specific dummy variables. The bias constants represent characteristics of each mode that are important to the choice process but that are intangible or unmeasured. Even if generic variables such as time and cost are equal between two modes, there will still be an average propensity or bias toward choosing one mode over the other.

All three mode choice models used by the District (home-based work, home-based non-work, and non-home-based) contain mode-specific bias constants. The home-based work model also contains county-specific bias constants, to capture variations in unmeasured attributes among the counties in the region. Each alternative-specific coefficient was calibrated to reflect the average value of the unmeasured qualities it represented. This was done by finding the value of each dummy coefficient that accurately reproduced the observed mode shares in the region.

Before introducing the fare and INET refinements, then, the aggregate mode shares predicted by the model under 1980 conditions were equal to the observed mode shares in the region in 1980. Any modification to the modeling procedures which changes the predicted mode shares requires recalibration of the dummy coefficients such that predicted and observed shares are again equal for the base year.

Incorporating fare parameters into path-building is certainly a modification that will affect mode choice. The new method results in different paths and path characteristics being included in the choice set for a given O-D pair. It is not, a priori, obvious whether those differences have a systematic bias toward one mode or another, but it is clear that mode choice will be affected.

In the case of converting from UNET to INET, the potential impacts on mode choice are even more subtle but none the less real. If the INET network were identical in every route and link to the UNET network on which the mode choice model was calibrated -- that is,

if it differed only in format, not in content -- it could be expected that the original mode choice model would still be valid. But the INET network was developed by a different agency, at a different point in time, than the UNET network. There will be subjective variations in the way the two networks are coded to approximate reality. The access links generated by BLDCON2I will differ somewhat from the UNET access links. Further, the UNET calibration network (FAR82VAL) is based on a 1982 route structure, which introduces other differences between the two networks. And even if all routes and links were identical, the incorporation of fare links into INET would alone justify recalibration, as discussed above.

This memo presents the results of the mode choice recalibration due to the introduction of INET and of fares into path-building. Section 2 treats home-based work trips, with the calibration iterations reproduced in Appendices A (for Los Angeles County) and B (for the other four counties in the region). Section 3 deals with home-based other and non-home-based trips, with the calibration steps reproduced in Appendices C and D, respectively. Section 4 is a summary.

2.0 HOME-BASED WORK TRIPS

The mode choice model distinguishes seven alternatives for home-based work (HW) trips: three for auto (drive alone, shared-ride with two people, shared-ride with three or more people in the vehicle) and four for transit (walk access, park-and-ride driver access, park-and-ride passenger access, kiss-and-ride access). As described in GPC Technical Memorandum 88.3.7b, the recalibration for HW trips takes place in two stages. In the first stage, six mode bias coefficients (using shared-ride with two people as the base) are calibrated for trips originating in Los Angeles County only. In the second stage, the mode bias dummies are held constant, and county-specific dummies are calibrated for trips originating in Orange, Riverside, San Bernardino, and Ventura Counties. The County-specific dummies are calibrated to ensure that the predicted combined transit share (walk, PNRD, PNRP, and KNR) is equal to the observed combined transit share for each county.

In this application, because of incorporating fares into the transit paths, it was necessary to perform the L.A. County calibration stage on the 1245-zone system developed for region-wide INET modeling with fare links (see GPC Technical Memorandum 89.3.4). Zone boundaries within L.A. County were not changed in the new system, and a high proportion of all transit trips originating in L.A. County terminate in L.A. County, so it is believed that using 1245 zones did not significantly affect the outcome. For the second stage, however, the 1628-zone system was used.

It is important to document the fare assumptions used in this recalibration. Table 1 shows the fare parameters specified in the path-building step, for the two stages of the calibration. For the L.A. County stage (1245-zone system), the average fare-zone increase was $0.19 in 1980 dollars. The number of fare zones crossed by each mode 5 link was coded directly onto the links.[1] In calibrating the other counties (1628-zone system), fare links were not used. Instead, an average boarding fare for mode 5 was calculated as the average mode 5 fare for each transit operator, weighted by the ridership for each operator. This weighted average mode 5 fare came to $1.12 in 1980 dollars.

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[1] In coding the number of fare zones, it was necessary to represent the express bus route in terms of "long" links – i.e., links ignoring intermediate non-stop nodes -- rather than "short" links (for more information on long and short links, refer to the UTPS INET documentation). This approach was taken because of a shortcoming in INET. To explain, a hypothetical example is helpful. In the diagram below, node 2345 is a non-stop node between the two stop nodes 4567 and 4568 (stop nodes are entered in the route sequence with a minus sign, to distinguish them from non-stop nodes). In building the network, INET economizes on the number of links it needs to handle by collapsing short links into long links. This is done by transferring speed and distance information from the underlying short links -- but fare information is not transferred. In the example shown, the two links would be collapsed and would simply be stored as link 4567-4568. If link 4567-2345 were designated as a fare link, INET will ignore it because it doesn't have that link stored. Thus, it is necessary to designate 4567-4568 as the fare link in the INET SYSIN, and to change the route file to replace the two short links with the single long link.

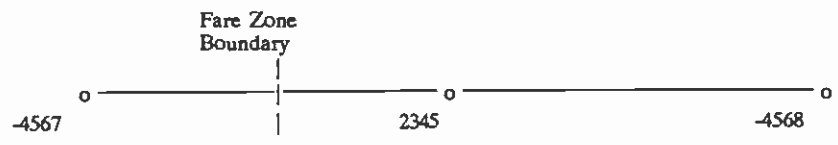

TABLE 1

FARE VALUES* USED IN RECALIBRATION RUNS

Fare Type	With Fare Links (1245-Zone System)	Without Fare Links (1628-Zone System)
Mode 4 Boarding	$0.43	$0.43
Mode 5 Boarding	0.43	1.12
Mode 5 Fare-Zone Increment	0.19	N/A
Mode 8 Boarding	0.33	0.33
Transfer 4-4	0.21	0.21
Transfer 4-5	0.21	0.21
Transfer 4-8	0.21	0.21
Transfer 5-4	0.21	0.21
Transfer 5-5	0.21	0.21
Transfer 5-8	0.21	0.21
Transfer 8-4	0.05	0.05
Transfer 8-5	0.05	0.05
Transfer 8-8	0.05	0.05

* Values shown are an average of cash fares and monthly pass fares, in 1980 dollars.

Table 2 compares three sets of mode bias constants: the original set of coefficients, the coefficients calibrated on the FAR82VAL UNET network after incorporating transit fare links into path building, and the coefficients obtained after converting to INET and incorporating fare links. The first set of coefficients was used as the starting point for calibrating the second set, and the second set provided the starting point for obtaining the third set. **This memo focuses on the second and third set of coefficients; the first set is provided as a matter of interest.** The four iterations required to converge to the new coefficients are produced in Appendix A. The stopping criterion was roughly that

$$0.999 < (\text{estimated share/observed share}) < 1.0001 \text{ for each mode.}$$

From Appendix A it can be seen that the coefficients used as the starting point significantly underestimated park-and-ride driver, park-and-ride passenger, and kiss-and-ride shares. Subsequent iterations successively boosted the dummies for these three modes. Thus, Table 2 shows that the final coefficients for these modes (the last three entries in the rightmost column) are substantially higher than their starting coefficients (the last three entries in the middle column of figures).

The reason for this shift is that the middle set of coefficients in Table 2 was calibrated on a network with 24 park-and-ride locations. A number of these locations represented only informal or unofficial park-and-ride sites. For the INET recalibration, the District specified that only the 14 officially designated park-and-ride lots (in 1980) should be included in the network. This meant that the previously calibrated coefficients, when applied to the new network, would underpredict auto access to transit.

The other coefficients, however, are relatively unchanged between their UNET-with-fare-link values and their INET-related recalibration values. This suggests that, except for the auto access assumptions, the two networks are similar.

TABLE 2

LOS ANGELES COUNTY MODE BIAS COEFFICIENTS

HOME-BASED WORK TRIPS
(1245-ZONE SYSTEM)

Mode	Original Coefficient	Fare-Related Coefficient	INET-and Fare-Related Coefficient
Auto			
Drive Alone (UPRM(41))	-0.2484	-0.2588	-0.1551
Shared Ride 2 (Base)	--	--	--
Shared Ride 3+ (UPRM(42))	-1.4377	-1.4941	-1.5644
Transit			
Walk (UPRM(32))	3.3248	2.8718	3.1175
PNR Driver (UPRM(21))	-0.8101	-0.8703	0.2975
PNR Passenger (UPRM(22))	-1.0350	-1.1084	-0.0158
KNR (UPRM (23))	0.3837	0.2575	2.4321

Table 3 compares the three sets of coefficients for the second stage recalibration, and the four iterations required to converge are presented in Appendix B. Again, transit shares for each of the four counties are underpredicted by the starting coefficients. All four final coefficients in the rightmost column are substantially higher than their initial values in the middle column. The difference in the number of park-and-ride lots is one element that explains the initial underprediction of transit using FAR82VAL coefficients with the INET80 network. Another hypothesis for that underprediction is that the INET80 network might be more sparsely coded in the outlying counties than in Los Angeles County. This does not seem to be the case, however: a higher proportion of routes were non-RTD routes for the INET80 network (51%) than for the FAR82VAL network (45%). Thus, the changes in the county bias coefficients are again attributed to the differences in park-and-ride lots between the old and the new calibration networks.

TABLE 3

COUNTY-BIAS COEFFICIENTS (AUTO VS. TRANSIT ONLY)* HOME-BASED WORK TRIPS (1628-ZONE SYSTEM)

County	Original Coefficient	Fare-Related Coefficient	INET-and Fare-Related Coefficient
Los Angeles (Base)	--	--	--
Orange (UPRM(62))	-0.1940	-0.2264	0.3683
Riverside (UPRM(63))	0.4100	0.7714	1.9882
San Bernardino (UPRM(64))	0.3660	0.1171	1.2713
Ventura (UPRM(65))	0.1074	0.4587	1.2153

* The coefficients shown in this table are associated with the transit mode; the auto mode is the base.

3.0 HOME-BASED OTHER AND NON-HOME-BASED TRIPS

For home-based other (HO) trips, only two mode alternatives are modeled: auto and transit (with walk access). The bias constants consist of a set of 5 county-specific constants associated with the transit mode. The L.A. County constant is obtained by running the mode choice model for trips originating in L.A., on the 1245-zone system. The other four constants are obtained by running the model for all other trips, on the 1628-zone system.

Table 4 presents the old and new coefficients, and the detailed iteration spreadsheets are found in Appendix C. Analysis of the spreadsheets indicates that Los Angeles County-based transit was initially overpredicted, while transit originating elsewhere was initially underpredicted. Accordingly, comparing the last two columns of Table 4 shows that the final coefficient for Los Angeles is smaller (more negative) than before, while the coefficients for the other counties end up larger than their starting values.

TABLE 4

COUNTY BIAS COEFFICIENTS (AUTO VS. TRANSIT)* HOME-BASED OTHER TRIPS

County	Original Coefficient	Fare-Related Coefficient	INET-and Fare-Related Coefficient
Los Angeles (UPRM(41))	-0.3475	-0.5665	-1.9304
Orange (UPRM(42))	-0.1407	-0.2831	0.9552
Riverside (UPRM(43))	0.3819	0.1043	1.1705
San Bernardino (UPRM(44))	0.2495	-0.3674	1.0504
Ventura (UPRM(45))	0.3623	-0.2626	0.7047

* The coefficients shown in this table are associated with the transit mode; the auto mode is the base.

An explanation for this pattern is not readily available. Since HO trips are assigned to a midday path with only walk access to transit, differences in park-and-ride lots cannot account for the changes in coefficients. Again, a hypothesis might be that the INET80 network has significantly more midday transit routes in L.A. County, and fewer midday routes in outlying counties, than the FAR82VAL network. However, this does not seem to be the case: there is about an equal number of midday RTD lines between the two networks, and more midday routes for other transit operators in INET80 than in FAR82VAL.

For non-home-based (NH) trips, three modes are distinguished: drive alone, shared ride, and transit (walk access). Because these trips are non-home-based, the county of origin is not determined. Thus, only two mode-specific constants (using transit as the base) are calibrated; no county-specific constants are involved. The old and new coefficients are presented in Table 5, with the detailed iterations contained in Appendix D. Note that for the NH mode choice model, negative values are favorable, so the negative dummies for drive alone and shared ride indicate a higher propensity to use these modes than transit.

Appendix D shows that transit was overpredicted with the initial set of coefficients, so, as seen in Table 5, the final set of auto dummies became larger in magnitude (more negative) to compensate.

TABLE 5

MODE BIAS COEFFICIENTS

NON-HOME-BASED TRIPS*

Mode	Original Coefficient	Fare-Related Coefficient	INET-and Fare-Related Coefficient
Drive Alone (UPRM(87))	-2.8850	-3.1014	-3.4810
Shared Ride (UPRM(88))	-2.8130	-3.0294	-3.4090
Transit (Base)	--	--	--

* In this model, negative values for a particular mode are more favorable.

4.0 SUMMARY

This memorandum presents the results of the recalibration of the alternative-specific constants for the three mode choice models in use at the District. It was found that, for home-based work trips, the old coefficients generally underestimated transit patronage when applied to a 1980 INET network with fare incorporated into path-building. It is suggested that this is due to different assumptions regarding park-and-ride and kiss-and-ride availability between the old calibration network and the new one. For home-based other and non-home-based trips, the results are mixed and not as easily explained. However, as indicated in Section 1, it was not necessarily clear in advance how the differences between the two situations would affect mode choice. These new coefficients may be used to provide statistically consistent forecasts of future mode choice on INET networks with fare links incorporated into path building.

APPENDIX A

HOME-BASED WORK TRIPS (L.A. COUNTY) CALIBRATION ITERATIONS

APPENDIX A:

YEAR 1980 INET - WORK MODE CHOICE RECALIBRATION

HOME-BASED WORK TRIPS OBSERVATION SUMMARY

	TOTAL TRIPS	TOT PCT BY CTY	TRANSIT TRIPS	TRN SHR W/I CTY	TRN PCT BY CNTY	MODE CHOICES DRV ALONE	SR 2	SR 3+	WLK	PND	PNP	KNR	TOTAL
L.A.	4,601,414	0.653477	441,276	0.0959	0.904672								
ORANGE	1,563,268	0.222010	33,610	0.0215	0.068905								
RIVERSIOE	236,292	0.033557	3,473	0.0147	0.007121								
S.B.	330,825	0.046982	4,863	0.0147	0.009970								
VENTURA	309,628	0.043972	4,552	0.0147	0.009331								
SUM	7,041,427	1.000000	487,774	0.069272	1.000000	5,102,019	1,034,166	417,468	414,559	47,558	8,438	17,218	7,041,427
SUBMODE PCT						0.7785	0.1578	0.0637	0.8499	0.0975	0.0173	0.0353	2.000000
REGION PCT						0.7245717	0.1468688	0.059287	0.058874	0.006754	0.001198	0.002445	1.000000

LA COUNTY ADJUSTMENT -- ITERATION 0

****** L.A.*	TOTAL TRIPS	TOT PCT BY CTY	TRANSIT TRIPS	TRN SHR W/I CTY	TRN PCT BY CNTY	MODE CHOICES DRV ALONE	SR 2	SR 3+	WLK	PND	PNP	KNR	TOTAL
OBS TRP	4,601,414	0.653477	441,276	0.0959	0.904672	3,238,668	656,470	265,001	375,040	43,024	7,634	15,577	4,601,414
EST TRP	4,601,104	0.653433	359,776	0.078193	0.737587	3,207,131	721,445	312,752	337,386	16,741	3,231	2,418	4,601,104
OBS SHR						0.7038418	0.1426669	0.057591	0.081505	0.009350	0.001659	0.003385	1.000000
EST SHR						0.6969881	0.1567876	0.067968	0.073322	0.003638	0.000702	0.000525	0.999933
EST/OBS						0.9902624	1.0989766	1.180192	0.899599	0.389105	0.423234	0.155228	
LN(EST/OBS)						-0.009785	0.0943793	0.165677	-0.10580	-0.94390	-0.85982	-1.86285	
DUMMIES						-0.2589	0	-1.4942	2.8738	-0.8703	-1.1084	0.2578	
DUM - LN						-0.249114	-0.094379	-1.65987	2.979605	0.073605	-0.24857	2.120656	
ADJ DUMMIES						-0.154735	0	-1.56549	3.073984	0.167985	-0.15419	2.215035	
						UPRM(41)		UPRM(42)	UPRM(32)	UPRM(21)	UPRM(22)	UPRM(23)	

APPENDIX A (Contd.)

LA COUNTY ADJUSTMENT -- ITERATION 1

****** L.A.*	TOTAL TRIPS	TOT PCT BY CTY	TRANSIT TRIPS	TRN SHR W/I CTY	TRN PCT BY CNTY	DRV ALONE	SR 2	SR 3+	WLK	PND	PNP	KNR	TOTAL
OBS TRP	4,601,414	0.653477	441,276	0.0959	0.904672	3,238,668	656,470	265,001	375,040	43,024	7,634	15,577	4,601,414
EST TRP	4,601,102	0.653433	423,844	0.092117	0.868935	3,251,507	659,707	266,044	365,244	38,760	6,832	13,008	4,601,102
OBS SHR						0.7038418	0.1426669	0.057591	0.081505	0.009350	0.001659	0.003385	1.000000
EST SHR						0.7066321	0.1433704	0.057817	0.079376	0.008423	0.001484	0.002826	0.999932
EST/OBS						1.0039643	1.0049311	1.003936	0.973879	0.900884	0.894935	0.835075	
LN(EST/OBS)						0.0039565	0.0049190	0.003928	-0.02646	-0.10437	-0.11100	-0.18023	
DUMMIES						-0.154735	0	-1.56549	3.073984	0.167985	-0.15419	2.215035	
DUM - LN						-0.158691	-0.004919	-1.56942	3.100452	0.272363	-0.04318	2.395268	
ADJ DUMMIES						-0.153772	0	-1.56450	3.105371	0.277282	-0.03826	2.400187	
						|		|	|	|	|	|	
						UPRM(41)		UPRM(42)	UPRM(32)	UPRM(21)	UPRM(22)	UPRM(23)	

LA COUNTY ADJUSTMENT -- ITERATION 2

****** L.A.*	TOTAL TRIPS	TOT PCT BY CTY	TRANSIT TRIPS	TRN SHR W/I CTY	TRN PCT BY CNTY	DRV ALONE	SR 2	SR 3+	WLK	PND	PNP	KNR	TOTAL
OBS TRP	4,601,414	0.653477	441,276	0.0959	0.904672	3,238,668	656,470	265,001	375,040	43,024	7,634	15,577	4,601,414
EST TRP	4,601,101	0.653433	436,697	0.094911	0.895285	3,242,701	656,650	265,053	371,755	42,291	7,492	15,159	4,601,101
OBS SHR						0.7038418	0.1426669	0.057591	0.081505	0.009350	0.001659	0.003385	1.000000
EST SHR						0.7047183	0.1427061	0.057602	0.080791	0.009190	0.001628	0.003294	0.999932
EST/OBS						1.0012453	1.0002744	1.000196	0.991240	0.982954	0.981390	0.973163	
LN(EST/OBS)						0.0012445	0.0002744	0.000196	-0.00879	-0.01719	-0.01878	-0.02720	
DUMMIES						-0.153772	0	-1.56450	3.105371	0.277282	-0.03826	2.400187	
DUM - LN						-0.155017	-0.000274	-1.56470	3.114169	0.294474	-0.01948	2.427390	
ADJ DUMMIES						-0.154742	0	-1.56443	3.114443	0.294749	-0.01920	2.427665	
						|		|	|	|	|	|	
						UPRM(41)		UPRM(42)	UPRM(32)	UPRM(21)	UPRM(22)	UPRM(23)	

APPENDIX A (Contd.)

LA COUNTY ADJUSTMENT -- ITERATION 3

****** L.A.*	TOTAL TRIPS	TOT PCT BY CTY	TRANSIT TRIPS	TRN SHR W/I CTY	TRN PCT BY CNTY	MODE ======= CHOICES ======= DRV ALONE	SR 2	SR 3+	WLK	PND	PNP	KNR	TOTAL
OBS TRP	4,601,414	0.653477	441,276	0.0959	0.904672	3,238,668	656,470	265,001	375,040	43,024	7,634	15,577	4,601,414
EST TRP	4,601,100	0.653432	439,914	0.095610	0.901880	3,239,746	656,449	264,991	373,893	42,905	7,608	15,508	4,601,100
OBS SHR						0.7038418	0.1426669	0.057591	0.081505	0.009350	0.001659	0.003385	1.000000
EST SHR						0.7040761	0.1426624	0.057589	0.081256	0.009324	0.001653	0.003370	0.999932
EST/OBS						1.0003329	0.9999682	0.999962	0.996941	0.997225	0.996585	0.995568	
LN(EST/OBS)						0.0003328	-0.000031	-0.00003	-0.00306	-0.00277	-0.00342	-0.00444	
DUMMIES						-0.154742	0	-1.56443	3.114443	0.294749	-0.01920	2.427665	
DUM - LN						-0.155075	0.0000317	-1.56439	3.117507	0.297527	-0.01578	2.432106	
ADJ DUMMIES						-0.155107	0	-1.56442	3.117475	0.297495	-0.01582	2.432074	
						UPRM(41)		UPRM(42)	UPRM(32)	UPRM(21)	UPRM(22)	UPRM(23)	

LA COUNTY ADJUSTMENT -- ITERATION 4

****** L.A.*	TOTAL TRIPS	TOT PCT BY CTY	TRANSIT TRIPS	TRN SHR W/I CTY	TRN PCT BY CNTY	MODE ======= CHOICES ======= DRV ALONE	SR 2	SR 3+	WLK	PNO	PNP	KNR	TOTAL
OBS TRP	4,601,414	0.653477	441,276	0.0959	0.904672	3,238,668	656,470	265,001	375,040	43,024	7,634	15,577	4,601,414
EST TRP	4,601,105	0.653433	440,828	0.095809	0.903754	3,238,860	656,429	264,988	374,626	43,006	7,631	15,565	4,601,105
OBS SHR						0.7038418	0.1426669	0.057591	0.081505	0.009350	0.001659	0.003385	1.000000
EST SHR						0.7038836	0.1426581	0.057588	0.081415	0.009346	0.001658	0.003382	0.999933
EST/OBS						1.0000593	0.9999377	0.999951	0.998895	0.999573	0.999598	0.999227	
LN(EST/OBS)						0.0000593	-0.000062	-0.00004	-0.00110	-0.00042	-0.00040	-0.00077	
DUMMIES						-0.155107	0	-1.56442	3.117475	0.297495	-0.01582	2.432074	
DUM - LN						-0.155166	0.0000622	-1.56437	3.118580	0.297922	-0.01541	2.432847	
ADJ DUMMIES						-0.155229	0	-1.56443	3.118517	0.297860	-0.01548	2.432784	
						UPRM(41)		UPRM(42)	UPRM(32)	UPRM(21)	UPRM(22)	UPRM(23)	

APPENDIX B

HOME-BASED WORK TRIPS (ALL OTHER COUNTIES) CALIBRATION ITERATIONS

APPENDIX B:

YEAR 1980 INET - WORK MODE CHOICE MODEL RECALIBRATION

HOME BASED WORK MODEL RECALIBRATION --- BIAS COEFFICIENTS ADJUSTMENT (UFMTR REPORT 4)
ORANGE, RIVERSIDE, SAN BERNADINO, AND VENTURA COUNTIES

MODE	CNTY	(1) OBSERVED TRIPS	(2) PREDICTED TRIPS	(3) PREDICTED SHARE	(4) OBSERVED SHARE	(5) (3)/(4)	(6) LN(5)	(7) COUNTY DUMMY	(8) (7)-(6)	(9) NEW COEFFICIENT
AUTO	OR	1529663	1543478	0.98733746	0.97850000	1.00903164	0.00899110	0.00000000	-0.00899110	0.00000000
ITER 1		1529663	1531289	0.97954036	0.97850000	1.00106322	0.00106266	0.00000000	-0.00106266	0.00000000
ITER 2		1529663	1529833	0.97860898	0.97850000	1.00011138	0.00011137	0.00000000	-0.00011137	0.00000000
ITER 3		1529663	1529680	0.97851111	0.97850000	1.00001136	0.00001136	0.00000000	-0.00001136	0.00000000
ITER 4		1529663	1529666	0.97850216	0.97850000	1.00000220	0.00000220	0.00000000	-0.00000220	0.00000000
TRANSIT	OR	33610	19795	0.01266254	0.02150000	0.58895514	-0.52940525	-0.22650000	0.30290525	0.31189636
ITER 1		33610	31984	0.02045964	0.02150000	0.95161108	-0.04959886	0.31189636	0.36149522	0.36255787
ITER 2		33610	33440	0.02139102	0.02150000	0.99493104	-0.00508185	0.36255787	0.36763972	0.36775109
ITER 3		33610	33593	0.02148889	0.02150000	0.99948321	-0.00051692	0.36775109	0.36826801	0.36827937
ITER 4		33610	33607	0.02149784	0.02150000	0.99989975	-0.00010026	0.36827937	0.36837963	0.36838183
AUTO	RV	232819	234932	0.99424441	0.98530000	1.00907785	0.00903690	0.00000000	-0.00903690	0.00000000
ITER 1		232819	233462	0.98802329	0.98530000	1.00276392	0.00276011	0.00000000	-0.00276011	0.00000000
ITER 2		232819	232980	0.98598344	0.98530000	1.00069364	0.00069340	0.00000000	-0.00069340	0.00000000
ITER 3		232819	232857	0.98546290	0.98530000	1.00016533	0.00016532	0.00000000	-0.00016532	0.00000000
ITER 4		232819	232828	0.98534017	0.98530000	1.00004077	0.00004077	0.00000000	-0.00004077	0.00000000
ITER 5		232819	232821	0.98531055	0.98530000	1.00001071	0.00001071	0.00000000	-0.00001071	0.00000000
TRANSIT	RV	3473	1360	0.00575559	0.01470000	0.39153677	-0.93767584	0.77150000	1.70917584	1.71821274
ITER 1		3473	2830	0.01197671	0.01470000	0.81474196	-0.20488383	1.71821274	1.92309657	1.92585668
ITER 2		3473	3312	0.01401656	0.01470000	0.95350720	-0.04760831	1.92585668	1.97346499	1.97415839
ITER 3		3473	3435	0.01453710	0.01470000	0.98891824	-0.01114362	1.97415839	1.98530201	1.98546733
ITER 4		3473	3464	0.01465983	0.01470000	0.99726719	-0.00273655	1.98546733	1.98820388	1.98824465
ITER 4		3473	3471	0.01468945	0.01470000	0.99928245	-0.00071781	1.98824465	1.98896246	1.98897316
AUTO	SB	325962	328855	0.99404519	0.98530000	1.00887566	0.00883651	0.00000000	-0.00883651	0.00000000
ITER 1		325962	326787	0.98779415	0.98530000	1.00253136	0.00252816	0.00000000	-0.00252816	0.00000000
ITER 2		325962	326158	0.98589284	0.98530000	1.00060169	0.00060151	0.00000000	-0.00060151	0.00000000
ITER 3		325962	326008	0.98543943	0.98530000	1.00014151	0.00014150	0.00000000	-0.00014150	0.00000000
ITER 4		325962	325971	0.98532759	0.98530000	1.00002800	0.00002800	0.00000000	-0.00002800	0.00000000
ITER 5		325962	325964	0.98530643	0.98530000	1.00000653	0.00000653	0.00000000	-0.00000653	0.00000000

APPENDIX B (Contd.)

YEAR 1980 INET - WORK MODE CHOICE MODEL RECALIBRATION

HOME BASED WORK MODEL RECALIBRATION --- BIAS COEFFICIENTS ADJUSTMENT (UFMTR REPORT 4)
ORANGE, RIVERSIDE, SAN BERNADINO, AND VENTURA COUNTIES

MODE	CNTY	(1) OBSERVED TRIPS	(2) PREDICTED TRIPS	(3) PREDICTED SHARE	(4) OBSERVED SHARE	(5) (3)/(4)	(6) LN(5)	(7) COUNTY DUMMY	(8) (7)-(6)	(9) NEW COEFFICIENT
TRANSIT	SB	4863	1970	0.00595481	0.01470000	0.40508911	-0.90364821	0.11700000	1.02064821	1.02948471
ITER 1		4863	4038	0.01220585	0.01470000	0.83032986	-0.18593223	1.02948471	1.21541694	1.21794510
ITER 2		4863	4667	0.01410716	0.01470000	0.95967050	-0.04116528	1.21794510	1.25911039	1.25971189
ITER 3		4863	4817	0.01456057	0.01470000	0.99051485	-0.00953042	1.25971189	1.26924232	1.26938382
ITER 4		4863	4854	0.01467241	0.01470000	0.99812312	-0.00187864	1.26938382	1.27126246	1.27129046
ITER 5		4863	4861	0.01469357	0.01470000	0.99956252	-0.00043757	1.27129046	1.27172803	1.27173456
AUTO	VE	305076	307108	0.99186120	0.98530000	1.00665909	0.00663702	0.00000000	-0.00663702	0.00000000
ITER 1		305076	305604	0.98700376	0.98530000	1.00172918	0.00172768	0.00000000	-0.00172768	0.00000000
ITER 2		305076	305196	0.98568605	0.98530000	1.00039181	0.00039173	0.00000000	-0.00039173	0.00000000
ITER 3		305076	305103	0.98538569	0.98530000	1.00008697	0.00008696	0.00000000	-0.00008696	0.00000000
ITER 4		305076	305082	0.98531787	0.98530000	1.00001813	0.00001813	0.00000000	-0.00001813	0.00000000
ITER 5		305076	305078	0.98530495	0.98530000	1.00000502	0.00000502	0.00000000	-0.00000502	0.00000000
TRANSIT	VE	4552	2520	0.00813880	0.01470000	0.55365978	-0.59120489	0.45840000	1.04960489	1.05624191
ITER 1		4552	4024	0.01299624	0.01470000	0.88409800	-0.12318736	1.05624191	1.17942927	1.18115695
ITER 2		4552	4432	0.01431395	0.01470000	0.97373816	-0.02661284	1.18115695	1.20776979	1.20816152
ITER 3		4552	4525	0.01461431	0.01470000	0.99417084	-0.00584621	1.20816152	1.21400774	1.21409470
ITER 4		4552	4546	0.01468213	0.01470000	0.99878467	-0.00121607	1.21409470	1.21531077	1.21532890
ITER 5		4552	4550	0.01469505	0.01470000	0.99966350	-0.00033656	1.21532890	1.21566546	1.21567048

APPENDIX C

HOME-BASED OTHER TRIPS
CALIBRATION ITERATIONS

APPENDIX C:

HOME-OTHER MODEL RECALIBRATION --- BIAS COEFFICIENTS ADJUSTMENT (UFMTR REPORT 4)

MODE	CNTY	(1) OBSERVED TRIPS	(2) PREDICTED TRIPS	(3) PREDICTED SHARE	(4) OBSERVED SHARE	(5) (3)/(4)	(6) LN(5)	(7) COUNTY DUMMY	(8) (7)-(6)	(9) NEW COEFFICIENT
AUTO	LA	12799096	12542398	0.94505802	0.96440000	0.97994403	-0.02025982	0.00000000	0.02025982	0.00000000
	ITER 1	12799096	12639144	0.95234774	0.96440000	0.98750284	-0.01257590	0.00000000	0.01257590	0.00000000
	ITER 2	12799096	12696899	0.95669953	0.96440000	0.99201527	-0.00801678	0.00000000	0.00801678	0.00000000
	ITER 3	12799096	12732745	0.95940049	0.96440000	0.99481594	-0.00519755	0.00000000	0.00519755	0.00000000
	ITER 4	12799096	12755595	0.96112222	0.96440000	0.99660122	-0.00340457	0.00000000	0.00340457	0.00000000
	ITER 5	12799096	12770375	0.96223588	0.96440000	0.99775599	-0.00224653	0.00000000	0.00224653	0.00000000
	ITER 6	12799096	12780048	0.96296473	0.96440000	0.99851174	-0.00148936	0.00000000	0.00148936	0.00000000
	ITER 7	12799096	12786424	0.96344515	0.96440000	0.99900990	-0.00099059	0.00000000	0.00099059	0.00000000
	ITER 8	12799096	12790650	0.96376358	0.96440000	0.99934008	-0.00066013	0.00000000	0.00066013	0.00000000
	ITER 9	12799096	12793464	0.96397561	0.96440000	0.99955994	-0.00044015	0.00000000	0.00044015	0.00000000
	ITER 10	12799096	12795335	0.96411659	0.96440000	0.99970613	-0.00029392	0.00000000	0.00029392	0.00000000
	ITER 11	12799096	12796519	0.96420580	0.96440000	0.99979863	-0.00020139	0.00000000	0.00020139	0.00000000
	ITER 12	12799096	12797348	0.96426827	0.96440000	0.99986340	-0.00013661	0.00000000	0.00013661	0.00000000
TRANSIT	LA	472468	729166	0.05494198	0.03560000	1.54331404	0.43393208	-0.56590000	-0.99983208	-1.02009190
	ITER 1	472468	632420	0.04765226	0.03560000	1.33854659	0.29158439	-1.02009190	-1.31167629	-1.32425219
	ITER 2	472468	574665	0.04330047	0.03560000	1.21630542	0.19581792	-1.32425219	-1.52007012	-1.52808690
	ITER 3	472468	538819	0.04059951	0.03560000	1.14043568	0.13141037	-1.52808690	-1.65949726	-1.66469481
	ITER 4	472468	515969	0.03887778	0.03560000	1.09207259	0.08807735	-1.66469481	-1.75277216	-1.75617673
	ITER 5	472468	501189	0.03776412	0.03560000	1.06079002	0.05901394	-1.75617673	-1.81519066	-1.81743720
	ITER 6	472468	491516	0.03703527	0.03560000	1.04031667	0.03952515	-1.81743720	-1.85696235	-1.85845171
	ITER 7	472468	485140	0.03655485	0.03560000	1.02682156	0.02646817	-1.85845171	-1.88491988	-1.88591047
	ITER 8	472468	480914	0.03623642	0.03560000	1.01787704	0.01771912	-1.88591047	-1.90362959	-1.90428972
	ITER 9	472468	478100	0.03602439	0.03560000	1.01192107	0.01185058	-1.90428972	-1.91614030	-1.91658045
	ITER 10	472468	476229	0.03588341	0.03560000	1.00796101	0.00792949	-1.91658045	-1.92450995	-1.92480386
	ITER 11	472468	475045	0.03579420	0.03560000	1.00545502	0.00544020	-1.92480386	-1.93024406	-1.93044545
	ITER 12	472468	474216	0.03573173	0.03560000	1.00370040	0.00369358	-1.93044545	-1.93413902	-1.93427563
AUTO	OR	3820518	3842279	0.99614172	0.99050000	1.00569583	0.00567967	0.00000000	-0.00567967	0.00000000
	ITER 1	3820518	3828154	0.99247970	0.99050000	1.00199869	0.00199669	0.00000000	-0.00199669	0.00000000
	ITER 2	3820518	3822901	0.99111782	0.99050000	1.00062375	0.00062355	0.00000000	-0.00062355	0.00000000
	ITER 3	3820518	3821229	0.99068434	0.99050000	1.00018611	0.00018609	0.00000000	-0.00018609	0.00000000
	ITER 4	3820518	3820730	0.99055497	0.99050000	1.00005550	0.00005550	0.00000000	-0.00005550	0.00000000
	ITER 5	3820518	3820579	0.99051582	0.99050000	1.00001597	0.00001597	0.00000000	-0.00001597	0.00000000
	ITER 6	3820518	3820536	0.99050467	0.99050000	1.00000472	0.00000472	0.00000000	-0.00000472	0.00000000
	ITER 7	3820518	3820523	0.99050130	0.99050000	1.00000132	0.00000132	0.00000000	-0.00000132	0.00000000

APPENDIX C (Contd.)

HOME-OTHER MODEL RECALIBRATION --- BIAS COEFFICIENTS ADJUSTMENT (UFMTR REPORT 4)

MODE	CNTY	(1) OBSERVED TRIPS	(2) PREDICTED TRIPS	(3) PREDICTED SHARE	(4) OBSERVED SHARE	(5) (3)/(4)	(6) LN(5)	(7) COUNTY DUMMY	(8) (7)-(6)	(9) NEW COEFFICIENT
TRANSIT	OR	36643	14882	0.00385828	0.00950000	0.40613454	-0.90107079	-0.28290000	0.61817079	0.62385046
ITER 1		36643	29007	0.00752030	0.00950000	0.79161031	-0.23368604	0.62385046	0.85753650	0.85953320
ITER 2		36643	34260	0.00888218	0.00950000	0.93496636	-0.06724473	0.85953320	0.92677792	0.92740147
ITER 3		36643	35932	0.00931566	0.00950000	0.98059578	-0.01959496	0.92740147	0.94699643	0.94718252
ITER 4		36643	36431	0.00944503	0.00950000	0.99421365	-0.00580316	0.94718252	0.95298568	0.95304118
ITER 5		36643	36582	0.00948418	0.00950000	0.99833449	-0.00166690	0.95304118	0.95470808	0.95472405
ITER 6		36643	36625	0.00949533	0.00950000	0.99950797	-0.00049215	0.95472405	0.95521620	0.95522092
ITER 7		36643	36638	0.00949870	0.00950000	0.99986274	-0.00013727	0.95522092	0.95535819	0.95535951
AUTO	RV	772812	774721	0.99755864	0.99510000	1.00247075	0.00246770	0.00000000	-0.00246770	0.00000000
ITER 1		772812	773604	0.99612035	0.99510000	1.00102538	0.00102485	0.00000000	-0.00102485	0.00000000
ITER 2		772812	773119	0.99549585	0.99510000	1.00039780	0.00039772	0.00000000	-0.00039772	0.00000000
ITER 3		772812	772926	0.99524734	0.99510000	1.00014806	0.00014805	0.00000000	-0.00014805	0.00000000
ITER 4		772812	772854	0.99515463	0.99510000	1.00005489	0.00005489	0.00000000	-0.00005489	0.00000000
ITER 5		772812	772827	0.99511986	0.99510000	1.00001996	0.00001996	0.00000000	-0.00001996	0.00000000
ITER 6		772812	772818	0.99510827	0.99510000	1.00000831	0.00000831	0.00000000	-0.00000831	0.00000000
ITER 7		772812	772813	0.99510183	0.99510000	1.00000184	0.00000184	0.00000000	-0.00000184	0.00000000
TRANSIT	RV	3805	1896	0.00244136	0.00490000	0.49823629	-0.69668083	0.10450000	0.80118083	0.80364853
ITER 1		3805	3013	0.00387965	0.00490000	0.79176474	-0.23349097	0.80364853	1.03713950	1.03816436
ITER 2		3805	3498	0.00450415	0.00490000	0.91921443	-0.08423586	1.03816436	1.12240021	1.12279793
ITER 3		3805	3691	0.00475266	0.00490000	0.96993152	-0.03052981	1.12279793	1.15332774	1.15347579
ITER 4		3805	3763	0.00484537	0.00490000	0.98885188	-0.01121072	1.15347579	1.16468651	1.16474141
ITER 5		3805	3790	0.00488014	0.00490000	0.99594702	-0.00406121	1.16474141	1.16880262	1.16882258
ITER 6		3805	3799	0.00489173	0.00490000	0.99831207	-0.00168936	1.16882258	1.17051194	1.17052025
ITER 7		3805	3804	0.00489817	0.00490000	0.99962598	-0.00037409	1.17052025	1.17089434	1.17089618
AUTO	SB	1082418	1085907	0.99830751	0.99510000	1.00322331	0.00321812	0.00000000	-0.00321812	0.00000000
ITER 1		1082418	1083600	0.99618662	0.99510000	1.00109197	0.00109137	0.00000000	-0.00109137	0.00000000
ITER 2		1082418	1082780	0.99543277	0.99510000	1.00033440	0.00033435	0.00000000	-0.00033435	0.00000000
ITER 3		1082418	1082526	0.99519926	0.99510000	1.00009974	0.00009974	0.00000000	-0.00009974	0.00000000
ITER 4		1082418	1082449	0.99512847	0.99510000	1.00002861	0.00002861	0.00000000	-0.00002861	0.00000000
ITER 5		1082418	1082427	0.99510824	0.99510000	1.00000828	0.00000828	0.00000000	-0.00000828	0.00000000
ITER 6		1082418	1082420	0.99510181	0.99510000	1.00000182	0.00000182	0.00000000	-0.00000182	0.00000000
ITER 7		1082418	1082419	0.99510089	0.99510000	1.00000089	0.00000089	0.00000000	-0.00000089	0.00000000

APPENDIX C (Contd.)

HOME-OTHER MODEL RECALIBRATION --- BIAS COEFFICIENTS ADJUSTMENT (UFMTR REPORT 4)

MODE	CNTY	(1) OBSERVED TRIPS	(2) PREDICTED TRIPS	(3) PREDICTED SHARE	(4) OBSERVED SHARE	(5) (3)/(4)	(6) LN(5)	(7) COUNTY DUMMY	(8) (7)-(6)	(9) NEW COEFFICIENT
TRANSIT	SB	5330	1841	0.00169249	0.00490000	0.34540563	-1.06303581	-0.36680000	0.69623581	0.69945393
ITER 1		5330	4148	0.00381338	0.00490000	0.77824148	-0.25071842	0.69945393	0.95017235	0.95126372
ITER 2		5330	4968	0.00456723	0.00490000	0.93208864	-0.07032736	0.95126372	1.02159108	1.02192543
ITER 3		5330	5222	0.00480074	0.00490000	0.97974373	-0.02046424	1.02192543	1.04238967	1.04248941
ITER 4		5330	5299	0.00487153	0.00490000	0.99419036	-0.00582659	1.04248941	1.04831600	1.04834460
ITER 5		5330	5321	0.00489176	0.004900D0	0.99831796	-0.00168345	1.04834460	1.05002806	1.05003634
ITER 6		5330	5328	0.00489819	0.00490000	0.99963129	-0.00036878	1.05003634	1.05040512	1.05040693
ITER 7		5330	5329	0.00489911	0.00490000	0.99981891	-0.00018111	1.05040693	1.05058804	1.05058893
AUTO	VE	1007254	1009820	0.99763489	0.99510000	1.00254737	0.00254413	0.00000000	-0.00254413	0.00000000
ITER 1		1007254	1008052	0.99588822	0.99510000	1.00079210	0.00079179	0.00000000	-0.00079179	0.00000000
ITER 2		1007254	1007470	0.99531324	0.99510000	1.00021429	0.00021427	0.00000000	-0.00021427	0.00000000
ITER 3		1007254	1007311	0.99515616	0.99510000	1.00005644	0.00005644	0.00000000	-0.00005644	0.00000000
ITER 4		1007254	1007268	0.99511368	0.99510000	1.00001375	0.00001375	0.00000000	-0.00001375	0.00000000
ITER 5		1007254	1007258	0.99510380	0.99510000	1.00000382	0.00000382	0.00000000	-0.00000382	0.00000000
ITER 6		1007254	1007255	0.99510084	0.99510000	1.00000084	0.00000084	0.00000000	-0.00000084	0.00000000
ITER 7		1007254	1007255	0.99510084	0.99510000	1.00000084	0.00000084	0.00000000	-0.00000084	0.00000000
TRANSIT	VE	4960	2394	0.00236511	0.00490000	0.48267602	-0.72840961	-0.26250000	0.46590961	0.46845374
ITER 1		4960	4162	0.00411178	0.00490000	0.83913852	-0.17537949	0.46845374	0.64383323	0.64462502
ITER 2		4960	4744	0.00468676	0.00490000	0.95648081	-0.04449455	0.64462502	0.68911957	0.68933384
ITER 3		4960	4903	0.00484384	0.00490000	0.98853824	-0.01152795	0.68933384	0.70086180	0.70091823
ITER 4		4960	4946	0.00488632	0.00490000	0.99720786	-0.00279605	0.70091823	0.70371428	0.70372803
ITER 5		4960	4956	0.00489620	0.00490000	0.99922405	-0.00077625	0.70372803	0.70450428	0.70450810
ITER 6		4960	4959	0.00489916	D.00490000	0.99982891	-0.00017111	0.70450810	0.70467921	0.70468005
ITER 7		4960	4959	0.00489916	0.00490000	0.99982891	-0.00017111	0.70468005	0.70485116	0.70485200

APPENDIX D

NON-HOME-BASED TRIPS
CALIBRATION ITERATIONS

APPENDIX D:

YEAR 1980 INET - NON-HOME-BASED MODEL RECALIBRATION --- ASSUMING MODE SPLIT (.6905/.2960/.0135) (UFMTR REPORT 4)

ITERATION 0

	1	2	3	4	5	6	7	8	9
MODE	TRIPS PRED	TRIPS OBS	SHR PRED	SHR OBS	(3)/(4)	LN(5)	BETA	BETA+(6)	ADJ BETA
DA OOOW	7,360,405	7,397,057	0.687128348	0.69055	0.995045033	-0.00496728	-3.1015	-3.10646728	-3.41547991
SR OOOW	3,154,459	3,170,167	0.294483577	0.29595	0.995045033	-0.00496728	-3.0295	-3.03446728	-3.34347991
TR OOOW	196,970	144,610	0.018388074	0.0135	1.362079581	0.309012635	0	0.309012635	0
TT OOOW	10,711,834	10,711,834	1	1	1	0			
DA OO	5,165,882	5,186,541	0.687799482	0.69055	0.996016918	-0.00399103	-3.1015	-3.10549103	-3.36095463
SR OO	2,213,950	2,222,803	0.294771206	0.29595	0.996016918	-0.00399103	-3.0295	-3.03349103	-3.28895463
TR OO	130,907	101,395	0.017429310	0.0135	1.291060016	0.255463598	0	0.255463598	0
TT OO	7,510,739	7,510,739	1	1	1	0			
DA OW	2,194,522	2,210,516	0.685553662	0.69055	0.992764697	-0.00726160	-3.1015	-3.10876160	-3.53318781
SR OW	940,510	947,364	0.293808712	0.29595	0.992764697	-0.00726160	-3.0295	-3.03676160	-3.46118781
TR OW	66,063	43,215	0.020637625	0.0135	1.528713004	0.424426208	0	0.424426208	0
TT OW	3,201,095	3,201,095	1	1	1	0			

ITERATION 1

	1	2	3	4	5	6	7	8	9
MODE	TRIPS PRED	TRIPS OBS	SHR PRED	SHR OBS	(3)/(4)	LN(5)	BETA	BETA+(6)	ADJ BETA
DA OOOW	7,391,280	7,397,057	0.690010664	0.69055	0.999218977	-0.00078132	-3.41547991	-3.41626124	-3.47176454
SR OOOW	3,167,691	3,170,167	0.295718856	0.29595	0.999218977	-0.00078132	-3.34347991	-3.34426124	-3.39976454
TR OOOW	152,863	144,610	0.014270478	0.0135	1.057072503	0.055503298	0	0.055503298	0
TT OOOW	10,711,834	10,711,834	1	1	1	0			
DA OO	5,186,497	5,186,541	0.690544219	0.69055	0.999991629	-0.00000837	-3.36095463	-3.36096300	-3.36157452
SR OO	2,222,785	2,222,803	0.295947522	0.29595	0.999991629	-0.00000837	-3.28895463	-3.28896300	-3.28957452
TR OO	101,457	101,395	0.013508258	0.0135	1.000611701	0.000611514	0	0.000611514	0
TT OO	7,510,739	7,510,739	1	1	1	0			
DA OW	2,204,782	2,210,516	0.688758784	0.69055	0.997406102	-0.00259726	-3.53318781	-3.53578507	-3.70935735
SR OW	944,907	947,364	0.295182336	0.29595	0.997406102	-0.00259726	-3.46118781	-3.46378507	-3.63735735
TR OW	51,406	43,215	0.016058879	0.0135	1.189546655	0.173572272	0	0.173572272	0
TT OW	3,201,095	3,201,095	1	1	1	0			

APPENDIX D (Contd.)

YEAR 1980 INET - NON-HOME-BASED MODEL RECALIBRATION --- ASSUMING MODE SPLIT (.6905/.2960/.0135) (UFMTR REPORT 4)
ITERATION 2

	1	2	3	4	5	6	7	8	9
MODE	TRIPS PRED	TRIPS OBS	SHR PRED	SHR OBS	(3)/(4)	LN(5)	BETA	BETA+(6)	ADJ BETA
DA OOOW	7,396,132	7,397,057	0.690463659	0.69055	0.999874968	-0.00012503	-3.47176454	-3.47188958	-3.48098469
SR OOOW	3,169,771	3,170,167	0.295912996	0.29595	0.999874968	-0.00012503	-3.39976454	-3.39988958	-3.40898469
TR OOOW	145,931	144,610	0.013623344	0.0135	1.009136596	0.009095110	0	0.009095110	0
TT OOOW	10,711,834	10,711,834	1	1	1	0			
DA OO	5,189,731	5,186,541	0.690974802	0.69055	1.000615166	0.000614976	-3.36157452	-3.36095954	-3.31496514
SR OO	2,224,171	2,222,803	0.296132058	0.29595	1.000615166	0.000614976	-3.28957452	-3.28895954	-3.24296514
TR OO	96,837	101,395	0.012893138	0.0135	0.955047314	-0.04599439	0	-0.04599439	0
TT OO	7,510,739	7,510,739	1	1	1	0			
DA OW	2,206,401	2,210,516	0.689264361	0.69055	0.998138239	-0.00186349	-3.70935735	-3.71122084	-3.83877505
SR OW	945,600	947,364	0.295399011	0.29595	0.998138239	-0.00186349	-3.63735735	-3.63922084	-3.76677505
TR OW	49,094	43,215	0.015336627	0.0135	1.136046444	0.127554203	0	0.127554203	0
TT OW	3,201,095	3,201,095	1	1	1	0			