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GENERAL PLANNING CONSULTANT

TECHNICAL MEMORANDUM 89.3.7

REVISED NON-WORK MODE CHOICE

MODEL USER'S GUIDE

FOR REPLACEMENT OF PAGES 94 TO 108 IN THE

COMPENDIUM OF TECHNICAL MEMORANDA

TRANSPORTATION PLANNING AND MODELING SERVICES

MARCH 1984

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Prepared for:

Southern California Rapid Transit District

Prepared by:
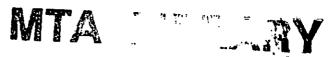
Schimpeler•Corradino Associates

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The Planning Group, Inc.
Cordoba Corporation

SCRTD General Planning Consultant

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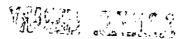Prepared for:

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June, 1989

NON-WORK MODE CHOICE PROGRAM

Summary

The Non-work Mode Choice Program combines mode choice calculations for the Home-Based Non-Work and Non-Home Based trip purposes. Five logit mode split model formulations have been incorporated into the application program:

1. The CSI Home-Based Non-Work Mode Choice Model.
2. The CSI Non-Home Based Transit Trip Factoring Procedure.
3. A transferred Home-Based Non-Work Mode Choice Model.
4. A transferred Non-Home Based Mode Choice Model.
5. A post-processor to split transit trips into four access modes.

The use of one or more of these models in actual execution is controlled directly by user option (see UPARMS definitions). The fundamental construction and calibration of the two CSI models are discussed in Volume 1 of their final project report.[1] Adjustments to the CSI Home-Based Non-Work Model for SCRTD and the derivation and adjustment of a transferred Non-Home Based Model are discussed in a Planning and Modeling Services Project Technical Memorandum.[2] The transferred Home-Based Non-Work model has not been adjusted as part of this project and should, therefore, not be used. Finally, the splitting of transit trips into modes of access is discussed in Technical Memorandum.

The Non-Work Mode Choice Program uses highway and transit travel times and costs to split (purpose-specific) person-trip tables into a set (by purpose) of modal trip tables. The person-trip tables represent 24-hour trips in production-attraction format, except for the two Non-Home Based trip tables (other-other, other-work) which are in origin-destination format. For the CSI Home-Based Non-Work model, the market segmentation delineation is identical to that as used in the Home-Based Non-Work model is selected, a four income level market segmentation is used. The proportioning of person-trips for each interchange into the four income levels is discussed in Technical Memorandum 4.2.[3] In addition to the above, access times are used to split transit trip to access modes.

The CSI Home-Based Non-Work model formulation is considerably less complicated than the work model, and therefore requires significantly fewer level-of-service matrices as input. This is both a result of the more simplistic binary form of the model and the implicit assumption that only households within walking distance of transit can utilize transit for non-work travel. While the transferred Home-Based Non-Work model is not inherently constrained in this manner, its application does also adhere to this convention. Both of the transferred models are multimodal (not binary) in form, and are applied internally as such.

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[1]Op. Cit.

[2]Op. Cit.

[3]Op. Cit.

However, the program's trip table outputs and trip-end summaries are consistent with CSI's original output conventions.

As indicated previously, this application program represents a new and original programming effort. To the extent possible, however, input and output data file conventions were maintained.

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Input Data

There are 50 pieces of data listed in Table 7 which are required by the program. The notes contained in Table 2 also apply. Their location and type are defined to UMODEL through the "Variable Identification Cards." The first 26 data items are zonal or vector variables (i.e., one record per zone); the next 11 items are interchange (zone-to-zone) data; the next nine items are temporary or "generated" variables; and the last item is also a zonal variable. The derivation of these data elements is briefly described below:

<div align="center">TABLE 7</div>

<div align="center">DEFINITION OF INPUT DATA REQUIREMENTS FOR THE MODE
CHOICE APPLICATION PROGRAM FOR NON-WORK TRIPS</div>

Data Item Number	Data Type	Description
1	P	Zone Number
2	P	Highway Time to Access Network (IVT)(Minutes * 100)
3	P	Highway Distance to Access Network (Miles * 100.0)
4	A	Highway Terminal Time (Minutes * 100)
5	A	Parking Cost (Cents)
6	A	CBD Indicator (0,1)
7	P	Proportion of Person-Trips: Market Segment 1
8	P	Autos Owned: Market Segment 1
9	P	Licensed Drivers: Market Segment 1
10	P	Annual Income: Market Segment 1
11	P	Number of Persons: Market Segment 1
12	P	Proportion of Person-Trips: Market Segment 2
13	P	Autos Owned: Market Segment 2
14	P	Licensed Drivers: Market Segment 2
15	P	Annual Income: Market Segment 2
16	P	Number of Persons: Market Segment 2
17	P	Proportion of Person-Trips: Market Segment 3
18	P	Autos Owned: Market Segment 3
19	P	Licensed Drivers: Market Segment 3
20	P	Annual Income: Market Segment 3
21	P	Number of Persons: Market Segment 3
22	P	Proportion of Person-Trips: Market Segment 4
23	P	Autos Owned: Market Segment 4
24	P	Licensed Drivers: Market Segment 4
25	P	Annual Income: Market Segment 4
26	P	Number of Persons: Market Segment 4
27	X	Highway Travel Time
28	X	Highway Distance
29	X	Transit In-Vehicle Time
30	X	Initial Transit Wait Time
31	X	Transfer Time
32	X	Transit Walk Time
33	X	Transit Fare
34	T	Home-Based Non-Work Person-Trips
35	T	Non-Home Based (Other-to-Other) Person-Trips

<div align="center">4</div>

DEFINITION OF INPUT DATA REQUIREMENTS FOR THE MODE CHOICE APPLICATION PROGRAM FOR NON-WORK TRIPS
(Continued)

Data Item Number	Data Type	Description
36	T	Non-Home Based (Other-Work) Person-Trips
37	X	Number of Transit Transfers
38	P*	Percent of Trips-Income Quartile 1
39	P*	Percent of Trips-Income Quartile 2
40	P*	Percent of Trips-Income Quartile 3
41	P*	Percent of Trips-Income Quartile 4
42	P*	Percent of Trips Within Walking Distance
43	P*	Inverse of the Log of Income-CSI Market Segment 1
44	P*	Inverse of the Log of Income-CSI Market Segment 2
45	P*	Inverse of the Log of Income-CSI Market Segment 3
46	P*	Inverse of the Log of Income-CSI Market Segment 4
47	P*	County of Origin Code
48	X	Access Station in APTH
49	X	Walk Time in MPTH
50	X	Auto Time in APTH

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1.   Zone Number. The first data item on each and all of the trip-end ("A") files input to the program.

2. to 4.   Highway Access and Terminal Time. Identical to the values supplied to the work model program. Refer to work section for definition of content.

5.   Parking Cost. Developed by local planners to represent an average off-peak parking cost in each zone. Documentation of the basis or typical duration for these costs are not yet available from CALTRANS.

6.   CBD Indicator. Refer to the work program section for a description of this variable.

7. to 26.   Market Segment Variables. For each of the four market segments defined above, the following data is provided to the program:

         o   Proportion of Person-Trips
         o   Autos Owned Per Household
         o   Licensed Drivers Per Household
         o   Annual Income
         o   Persons Per Household

This data is similar to the work model market segment data, but includes persons per household rather than workers per household. This information is provided directly as output from the CSI Market Segmentation Program (MSEG).

27. and 28.   Highway Time and Distance. These off-peak skim matrices are generated using the CALTRANS FWY program package and are normally expressed in hundredths of minutes and miles respectively.

29. to 32.
and 37   Transit Time Components. Execution of the UNET, UPATH, UPSUM program sequence summarizes the transit travel time components for each minimum path. The components used in the program are:

         o   In-Vehicle Time
         o   Initial Wait Time
         o   Transfer Wait Time
         o   Walk Time
         o   Number of Transfers

These interchange values are build separately for paths which can access transit via the walk or auto mode.

33.   Transit Fare. As in the work model, these values are generated by UPATH. The fare levels input also represent average daily fares.

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34. to 36. Person-Trip Tables. Synthesized via the standard regional trip generation and distribution process.

38. to 46. Generated Variables. These variables are generated internally within the program and are temporarily "stored" in these locations.

47. County of Origin Code. Refer to the work program section for a description of this variable.

48. Access Station in APTH. Rail station accessed by auto modes in the midday auto path, identified through a USTOS run (STOSA).

49. Walk Access Time. This is the walk access time identified in MPTH, assumed to be one half of the total walk time.

50. Auto Time in APTH. This is the auto access time identified in APTH.

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TABLE 8

USER CODED PARAMETERS NON-WORK PROGRAM

UPARMS NO.	DESCRIPTION	ACRONYM	DEFAULT VALUE
1	CPI for Transit Fares	CPIF	233.2
2	CPI for Fuel Prices	CPIAC	233.2
3	CPI for Income	CPINC	170.5
4	Auto Occupancy for HBNW Trips	AOCCHB	1.55
5	Auto OCC for NHB O-O Trips	A0CC00	1.46
6	Factor A for Adjusting WAIT1	WAITA	8.5
7	Factor B for Adjusting WAIT2	WAITB	0.4
8	Factor C for Adjusting WAIT3	WAITC	13.0
9	Factor Relating O-O NHB TRN Share to HBNW TRN Share	TFR1	0.3431
10	O-O NHB Mode Share (TRN) When HBNW Trips = 0	TPR2	0.0156
11	Gasoline Price (Cents/Gallon)	FPRICE	120.0
12	Average Fuel Economy (Miles/Gallon)	FECON	17.5
13	First Zone to be Processed by Model	FZONE	41
14	Auto OCC for NHB O-W Trips	AOCCOW	1.14
15	Factor Relating NHB O-W Transit Mode Share to HBNW Transit Share	TFR3	0.2608
16	NHB O-W Transit Share When HBNW Trips = 0	TFR4	0.0182
17	CPI For Parking Costs	CPIPR	170.5
18	Parking Time of Transit Station	PKGTM'	3.0
19	Bias Coefficiency for KNR M. Ch. Utility	AK	-1.397
20	Bias Coefficiency for PNR M. Ch. Utility	AP	-0.421
21	Transit Constant	C (1)	3.6274
22	Duffy COEFF (1 If Autos GT 0 and No Drivers Licensed)	C (2)	-3.76
23	Income Coefficient	C (3)	0.0738
24	Autos/Licensed Drivers Coefficient	C (4)	5.15
25	In-Vehicle Travel Time Coefficient	C (5)	-0.0292
26	Out-of-Vehicle Travel Time Coefficient	C (6)	-0.0905
27	Cost/Log (Income) Coefficient	C (7)	-0.287
28	1/Distance Coefficient (Auto EQ)	C (8)	7.87
29	1/Distance Coefficient (Transit EQ)	C (9)	5.15
30	Log (Population/Retail EMP) Coefficient	C (10)	0.293
31	Lot (Retail EMP) Coefficient	C (11)	1.0
32	CBD Dummy (Transit) Coefficient	C (12)	0.0
33	CBD Dummy (Auto) Coefficient	C (13)	0.0
34	Auto Constant (Mode Choice Model)	C (14)	0.0
35	CBD Dummy (Auto) Mode Choice Coefficient	C (15)	0.0
36	Coefficient for Access Time by PNR (M. Ch. Utility)	BP	-0.18

UPARMS NO.	DESCRIPTION	ACRONYM	DEFAULT VALUE
37	Coefficient for Access Time by KNR (M. Ch. Utility)	BK	-0.18
38	Coefficient for Access Time by Walk (M. Ch. Utility)	BW	-0.18
39	Coefficient for Parking Cost (M. Ch. Utility)	CP	-0.10
40	PNR Auto Occupancy	PNROCC	1.10
41	County Bias COEFF (Los Angeles)	UCO (1)	-0.5748
42	County Bias COEFF (Orange)	UCO (2)	-0.4554
43	County Bias COEFF (Riverside)	UCO (3)	-0.1402
44	County Bias COEFF (San Bernadino)	UCO (4)	-0.0078
45	County Bias COEFF	UCO (5)	0.1206
46	Not Used	-	-
47	Not Used	-	-
48	Not Used	-	-
49	Not Used	-	-
50	HBNW Coefficient -- Out-of-Vehicle Time	COOVI	0.200
51	HBNW Coefficient -- In-Vehicle Time	COIVT	0.008
52	HBNW Coefficient -- Cost	COCSI	0.012
53	HBNW Coefficient -- Transfers	COXFR	0.135
54	HBNW Coefficient -- Drive Alone Term. Time	COHWTO	0.340
55	HBNW Coefficient -- Shared Ride Term. Time	COHWTG	0.283
56	HBNW Coefficient -- Parking Cost	CPKRK	0.032
57	HBNW Bias Coefficient -- Transit	COBIAS	0.000
58	HBNW Bias Coefficient -- Drive Alone, INC 1	PBIAS (1,1)	0.093
59	HBNW Bias Coefficient -- Drive Alone, INC 2	PBIAS (1,2)	-1.180
60	HBNW Bias Coefficient -- Drive Alone, INC 3	PBIAS (1,3)	-2.140
61	HBNW Bias Coefficient -- Drive Alone, INC 4	PBIAS (1,4)	-2.929
62	HBNW Bias Coefficient -- Shared Ride, INC 1	PBIAS (2,1)	-1.528
63	HBNW Bias Coefficient -- Shared Ride, INC 2	PBIAS (2,2)	-2.217
64	HBNW Bias Coefficient -- Shared Ride, INC 3	PBIAS (2,3)	-2.742
65	HBNW Bias Coefficient -- Shared Ride, INC 4	PBIAS (2,4)	-3.111
66	HBNW Auto OCC. Bias COEFF -- Three Per Car, INC 1	PBIAS (3,1)	0.898
67	HNBW Auto OCC. Bias COEFF -- Three Per Car, INC 2	PBIAS (3,2)	0.954

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UPARMS NO.	DESCRIPTION	ACRONYM	DEFAULT VALUE
68	HNBW Auto OCC. Bias COEFF -- Three Per Car, INC 3	PBIAS (3,3)	1.025
69	HBNW Auto OCC. Bias COEFF -- Three Per Car, INC 4	PBIAS (3,4)	1.126
70	HBNW Auto OCC. Bias COEFF -- Four Per Car, INC 1	PBIAS (4,1)	1.124
71	HBNW Auto OCC. Bias COEFF -- Four Per Car, INC 2	PBIAS (4,2)	1.171
72	HBNW Auto OCC. Bias COEFF -- Four Per Car, INC 3	PBIAS (4,3)	1.229
73	HBNW Auto OCC. Bias COEFF -- Four Per Car, INC 4	PBIAS (4,4)	1.309
74	HBNW Auto OCC. Bias COEFF -- Five+ Per Car, INC 1	PBIAS (5,1)	1.505
75	HBNW Auto OCC. Bias COEFF -- Five+ Per Car, INC 2	PBIAS (5,2)	1.554
76	HBNW Auto OCC. Bias COEFF -- Five+ Per Car, INC 3	PBIAS (5,3)	1.614
77	HBNW Auto OCC. Bias COEFF -- Five+ Per Car, INC 4	PBIAS (5,4)	1.696
78	Not Used	-	-
79	Not Used	-	-
80	NHB Coefficient -- Out-of-Vehicle Time	CNOVT	0.025
81	NHB Coefficient -- In-Vehicle Time	CNIVT	0.010
82	NHB Coefficient -- Cost	CNCST	0.013
83	NHB Coefficient -- Number of Transfers	CNXFR	0.075
84	NHB Coefficient -- Drive Alone Term. Time	CNHWTO	0.2423
85	NHB Coefficient -- Shared Ride Term. Time	CNHWTG	0.3048
86	NHB Coefficient -- Parking Cost	CNPRK	0.0360
87	NHB Bias Coefficient -- Drive Alone	CNBIAO	-3.2191
88	NHB Bias Coefficient -- Shared Ride	CNBIAG	-3.0327
89	NHB Auto OCC. Bias Coefficient -- Three Per Car	CNBIAT	0.9930
90	NHB Auto OCC. Bias Coefficient -- Four Per Car	CNBIAF	1.1610
91	NHB Auto OCC. Bias Coefficient -- Five Per Car	CNBIAV	1.6280
92	Average Occupancy For Five Person/Car	AOCFIV	5.100
93	System Variable for Distribution -- RPT #1	IVDR (1)	1.0
94	System Variable for Distribution -- RPT #2	IVDR (2)	2.0
95	System Variable for Distribution -- RPT #3	IVDR (3)	3.0

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UPARMS NO.	DESCRIPTION	ACRONYM	DEFAULT VALUE
96	Highway Time Scaling Factor	HTINFA	0.01
97	Highway Distance Scaling Factor	HDINFA	0.01
98	Auto Occupancy for Intra Trips	AOCIIX	2.5
99	Not Used	-	-
100	Model Specification	IMODEL	2.0

1 = Both CSI Models
2 = CSI Non-Work/BAA NHB
3 = BAA Non-Work/CSI NHB
4 = Both BAA Models

11

Parameters and Options

The non-work program includes nearly 100 user-coded parameters (UPARMS) to control program operation. Table 8 describes these UPARMS and their default values. While use of most of the parameters is generally straightforward, those which are unique or of particular importance are described below:

1. Consumer Price Index Option. All input costs are adjusted to an equivalent dollar basis in the same manner as the work model program. UPARMS 1-3 and 17 are used for this purpose.

2. Initial Wait Time Adjustment Factors. The procedure used to adjust initial wait time for the work model is described in Volume II of CSI's final report documentation.[4] While these factors are also included in the non-work model program as UPARMS 6-8, they are not used in the utility calculations. This is consistent with the original CSI non-work program code.

3. Model Coefficients. The program contains a user-coded parameter for each coefficient and constant in each of the individual modal split models. the correspondence between parameters and model are as follows:

UPARMS	MODEL
5, 9-10, 14-16	CSI NHB
21-35, 41-45	CSI HBNW
50-77	BAA HBNW
80-92	BAA NHB
18-20, 36-40	SCA POST PROCESSOR

These parameters default to values determined during the calibration/adjustment process, and therefore, under normal circumstances can be ignored. An exception is the transferred Home-Based Non-Work model (UPARMS 50-77) which has not been adjusted to local observed data and should not be used.

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[4] Op. Cit.

4. System Variable Distribution Reports. These parameters (UPARMS 93-95) specify the system variable for the three distribution reports (see section on Standard Output Files and Reports for a description of these reports). The user has a choice of system variables as follows:

Parameter Code	System Variable	Units or Units Range
1	Highway In-Vehicle Time	2 Minutes
2	Highway Distance	Miles
3	Transit In-Vehicle Time	5 Minutes
4	Transit Walk Time	Minutes
5	Transit Initial Wait Time	Minutes
6	Transit Transfer Time	Minutes
7	Transit Out-of-Vehicle Time	Minutes
8	Transit Transfers	Number
9	Transit Fares	10 Cents
10	Highway Out-of-Vehicle Time	Minutes
11	Highway Running Cost	10 Cents
12	Highway Parking Cost/2	10 Cents
13	Total Highway Cost	20 Cents

5. Scaling of Highway Times and Distances. UPARMS 96 and 97 allow the user to communicate the proper units to the program.

6. Model Specification. Substantial flexibility in the application of individual models (by purpose) is provided by UPARMS 100. However, because the Barton-Aschman Non-Work model has not been calibrated, codes 3 and 4 should not be used.

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Standard Output Files and Reports

The basic output of the non-work mode choice program is a set of 24 modal trip tables. In addition, four trip-end summaries, system variable distribution reports, an average variable report, and a district trip summary report are produced.

The output trip tables are stratified by both trip purpose (Home-Based Non-Work, Other-to-Other, Other-to-Work) and mode (auto and transit). A definition of the individual output tables is contained in Table 9. These trip tables are output directly to a storage device (Tape or disk) and are not printed by the mode choice program. The UFMTR program can be used to obtain printed copies of these tables in various formats. The program does however, print four trip-end summary reports for each purpose and total, showing trips produced by and attracted to each zone. The formats of these summaries are provided in Table 10. Note that the parameter "REPORT = 4" must be coded on the "&SELECT" card in order to produce this report.

Three additional kinds of reports are also produced by the program:

1. System Variable Distribution Summary Report. Three of these reports are always printed for the three system variables identified by UPARMS 93, 94, and 95. This report takes the modal trips for each interchange and puts them in the row identified by the system variable value for that interchange. For example, if an interchange has a highway run time of 3.5 minutes, all trips for that interchange are included in the fourth row (3.001-4.000 minutes) of the highway run time system variable distribution summary report. This process is performed for all trips except intrazonal trips or trips to or from an external zone. Table 11 shows the report format.

2. Subarea Trip Summary. This report is a district-to-district modal trip table, including a trip-end summary of productions and attractions. Intrazonal trips and external station trips are included, with external stations designated as District 7. The zonal equivalences to districts are obtained from the county code and CBD indicator values input in the variable ID cards (see Table 7). Table 12 displays the report format.

TABLE 9

OUTPUT TRIP TABLES

Table Number	Definition
1	Total Automobile Person-Trips (HBNWK)
2	Total Transit Trips (HBNWK)
3	Auto Driver Trips (HBNWK)
4	Total Automobile Person-Trips (NHB O-O)
5	Total Transit Trips (NHB O-O)
6	Auto Driver Trips (NHB O-O)
7	Total Automobile Person-Trips (NHB W-O)
8	Total Transit Trips (NHB W-O)
9	Auto Driver Trips (NHB W-O)
10	Total Auto Person-Trips (HBNWK + NHB O-O, + NHB W-O)
11	Total Transit Trips (HBNWK + NHB O-O + NHB O-O)
12	Total Auto-Driver Trips (HBNWK + NHB O-O + NHB W-O)
13	HO KNR Trips
14	HO WLK Trips
15	HO PNR/D Trips
16	HO PNR/P Trips
17	OO KNR Trips
18	OO WLK Trips
19	OO PNR/P Trips
20	OO PNR/P Trips
21	Total KNR Trips (HO-OO-OW)
22	Total WLK Trips (HO-OO-OW)
23	Total PNR/D Trips (HO-OO-OW)
24	Total PNR/P Trips (HO-OO-OW)

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TABLE 10

TRIP-END SUMMARIES

Report Number	Table Number	Definition
1	1	Total Automobile Person-Trips (HBNWK)
1	2	Total Transit Trips (HBNWK)
1	3	Auto Driver Trips (HBNWK)
1	4 (Person)	Total Person-Trips (HBNWK)
2	1	Total Automobile Person-Trips (NHB O-O)
2	2	Total Transit Trips (HNBO-O)
2	3	Auto Driver Trips (NHB O-O)
2	4 (Person)	Total Person-Trips (NHB O-O)
3	1	Total Automobile Trips (NHB W-O)
3	2	Total Transit Trips (NHB W-O)
3	3	Auto Driver Trips (NHB W-O)
3	4 (Person)	Total Person-Trips (NHB W-O)
4	1	Total Auto Person-Trips (HBNWK, NHB O-O, NHB W-O)
4	2	Total Transit Trips (HBNWK, NHB O-O, NHB W-O)
4	3	Auto Driver Trips (HBNWK, NHB O-O, NHB W-O)
4	4 (Person)	Total Person-Trips (HBNWK, NHB O-O, NHB W-O)

TABLE 11
SYSTEM VARIABLE DISTRIBUTION
SUMMARY REPORT FOR UPARM 93

```
××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××××
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```
            SYSTEM VARIABLE DISTRIBUTION SUMMARY REPORT 1
            SYSTEM VARIABLE IS TRANSIT INITIAL WAIT TIME
            VARIABLE VALUE IS MINUTES (I.E., 1=0 TO 1 MINUTE, ETC.)

         ------- ESTIMATED TRIPS -------
```

VARIABLE VALUE	TRANSIT	AUTO DRIVER	AUTO PASSENGER	TOTAL PERSON	PERCENT TRANSIT	AUTO OCCUPANCY
1	0.	0.	0.	0.	0.0	0.0
2	119376.	369314.	202786.	693966.	17.20	1.55
3	46272.	244069.	134147.	425433.	10.88	1.55
4	60586.	398398.	218825.	679540.	8.92	1.55
5	72643.	671322.	368547.	1115941.	6.51	1.55
6	46812.	529509.	290746.	869524.	5.38	1.55
7	45645.	681289.	373968.	1104108.	4.13	1.55
8	50247.	1270407.	705579.	2050963.	2.45	1.56
9	8327.	166682.	91669.	267064.	3.12	1.55
10	9443.	469145.	257609.	737734.	1.28	1.55
11	10642.	328377.	180369.	520695.	2.04	1.55
12	24.	6476.	3562.	10061.	0.23	1.55
13	8200.	398557.	218863.	627056.	1.31	1.55
14	0.	0.	0.	0.	0.0	0.0
15	49792.	2948748.	1625473.	4738508.	1.05	1.55
16	0.	0.	0.	0.	0.0	0.0
17	0.	0.	0.	0.	0.0	0.0
18	0.	0.	0.	0.	0.0	0.0
19	0.	0.	0.	0.	0.0	0.0
20	0.	0.	0.	0.	0.0	0.0
21	0.	0.	0.	0.	0.0	0.0
22	0.	0.	0.	0.	0.0	0.0
23	0.	0.	0.	0.	0.0	0.0
24	0.	0.	0.	0.	0.0	0.0
25	0.	0.	0.	0.	0.0	0.0
26	0.	4032175.	2214741.	6312610.	0.0	1.55
TOTALS	528007.	12514464.	6886882.	20153200.	2.62	1.55

```
NOTE: THIS REPORT DOES NOT INCLUDE ANY INTERNAL-INTERNAL TRIPS OR ANY
      TRIPS PRODUCED IN OR ATTRACTED TO AN EXTERNAL ZONE.
      THE LAST ROW IN THIS REPORT CONTAINS ONLY TRIPS FOR INTERCHANGES
      THAT ARE NOT TRANSIT-CONNECTED.
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TABLE 12
SUBAREA TRIP SUMMARY REPORT

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C O U N T Y - T O - C O U N T Y   T R I P   S U M M A R Y

COUNTY P A		TRANSIT	AUTO DRIVER	AUTO PASSENGER	TOTAL PERSON	PERCENT TRANSIT	AUTO OCCUPANCY
1	1	0.	6130.	3571.	9501.	0.0	1.55
1	2	969.	3372.	1855.	6197.	15.64	1.55
1	3	1.	4.	2.	7.	10.30	1.55
1	4	0.	1.	0.	1.	0.0	1.55
1	5	0.	3.	1.	4.	0.63	1.55
1	6	0.	0.	0.	0.	0.0	0.0
1	7	0.	0.	0.	0.	0.0	0.0
2	1	165306.	91964.	50653.	308386.	53.60	1.55
2	2	300930.	7781999.	4234534.	12753156.	2.36	1.54
2	3	1600.	153504.	84057.	240454.	0.67	1.55
2	4	90.	10605.	5830.	16542.	0.55	1.55
2	5	401.	62507.	34358.	97322.	0.41	1.55
2	6	10.	13708.	7523.	21267.	0.05	1.55
2	7	0.	0.	0.	0.	0.0	0.0
3	1	2764.	5495.	3023.	11283.	24.49	1.55
3	2	2838.	159075.	86973.	251962.	1.13	1.55
3	3	30967.	2271442.	1251013.	3566945.	0.87	1.55
3	4	24.	8528.	4689.	13249.	0.18	1.55
3	5	15.	8442.	4642.	13109.	0.12	1.55
3	6	0.	394.	217.	611.	0.01	1.55
3	7	0.	0.	0.	0.	0.0	0.0
4	1	98.	540.	297.	935.	10.47	1.55
4	2	86.	5645.	3105.	8839.	0.97	1.55
4	3	35.	3388.	1863.	5287.	0.66	1.55
4	4	3420.	462974.	254577.	721336.	0.47	1.55
4	5	165.	25774.	14165.	40131.	0.41	1.55
4	6	0.	57.	32.	89.	0.01	1.55
4	7	0.	0.	0.	0.	0.0	0.0
5	1	241.	1115.	613.	1969.	12.25	1.55
5	2	219.	26980.	14824.	42063.	0.52	1.55
5	3	8.	3621.	1991.	5621.	0.15	1.55
5	4	83.	18351.	10087.	28535.	0.29	1.55
5	5	4780.	647844.	356204.	1009431.	0.47	1.55
5	6	0.	83.	46.	129.	0.00	1.55
5	7	0.	0.	0.	0.	0.0	0.0
6	1	118.	3405.	1873.	5396.	2.18	1.55
6	2	77.	37774.	20738.	58665.	0.13	1.55
6	3	1.	1590.	875.	2466.	0.04	1.55
6	4	0.	464.	255.	720.	0.03	1.55
6	5	0.	929.	511.	1440.	0.01	1.55
6	6	4602.	584064.	321183.	910155.	0.51	1.55
6	7	0.	0.	0.	0.	0.0	0.0
7	1	0.	0.	0.	0.	0.0	0.0
7	2	0.	0.	0.	0.	0.0	0.0
7	3	0.	0.	0.	0.	0.0	0.0
7	4	0.	0.	0.	0.	0.0	0.0
7	5	0.	0.	0.	0.	0.0	0.0
7	6	0.	0.	0.	0.	0.0	0.0
7	7	0.	0.	0.	0.	0.0	0.0

TRIP END TOTALS

PRODUCTIONS

	TRANSIT	AUTO DRIVER	AUTO PASSENGER	TOTAL PERSON	PERCENT TRANSIT	AUTO OCCUPANCY
1	970.	9509.	5230.	15709.	6.17	1.55
2	468338.	8114284.	4416951.	12999573.	3.60	1.54
3	36607.	2455375.	1350555.	3840537.	0.95	1.55
4	3805.	498378.	274039.	776222.	0.49	1.55
5	5331.	697994.	383765.	1087089.	0.49	1.55
6	4798.	628227.	345434.	978460.	0.49	1.55
7	0.	0.	0.	0.	0.0	0.0

ATTRACTIONS

	TRANSIT	AUTO DRIVER	AUTO PASSENGER	TOTAL PERSON	PERCENT TRANSIT	AUTO OCCUPANCY
1	168526.	108648.	59830.	337004.	50.01	1.55
2	505118.	8014844.	4362027.	12681989.	2.41	1.54
3	32612.	2433547.	1339800.	3805958.	0.86	1.55
4	3617.	500923.	275439.	779979.	0.46	1.55
5	5363.	745499.	409882.	1160743.	0.46	1.55
6	4612.	598307.	329000.	931919.	0.49	1.55
7	0.	0.	0.	0.	0.0	0.0

NOTE: THE COUNTY-TO-COUNTY TRIP SUMMARY INCLUDES INTERNAL-
-TO-INTERNAL TRIPS AND TRIPS GOING TO OR FROM EXTERNAL
STATIONS. COUNTY CODES ARE AS FOLLOWS: 1=CBD, 2=L.A. CO.,
3=ORANGE CO., 4=RIVERSIDE CO., 5=SAN BERNARDINO CO.,
6=VENTURA CO., 7=EXTERNALS.

18

3. <u>Average Variable Value Report</u>. This report specifies the average value of each of 11 system variables and variable combinations, weighted by the modal trip values and by person-trips. These average values can be used with the system variable distribution reports to perform sensitivity analyses on the model results. Highway costs and times are for the one person per car mode only. Table 13 shows the report format.

TABLE 13

AVERAGE VARIABLE VALUE REPORT

Variable and Units	Transit	Auto Driver	Auto Passenger	Total Person
1 Highway Distance (mi.)	6.69	5.92	5.86	5.87
2 Total Highway Time (min.)	18.63	17.06	16.86	16.65
3 Transit In-Veh. Time (min.)	21.01	14.73	14.61	14.69
4 Transit Excess Time (min.)	19.57	32.87	32.90	30.20
5 Total Transit Time (min.)	39.85	45.60	48.37	43.41
6 Transit Fare (cents)	33.55	32.76	32.53	30.43
7 Number of Transfers	0.40	0.52	0.52	0.52
8 Highway Running Cost	39.29	34.85	37.43	32.81
9 Total Highway Cost (cents)	92.48	38.38	41.64	37.98

Example Setup

The program setup for the non-work model is similar to that for the work model, except that a different set of data identification cards must be used. A typical listing of these cards is shown in Table 14.

1980 CSI NW MODE CHOICE MODEL -- FAR82VAL -- RE-CALIBRATED PERSON TRIPS

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```
           D A T A   I D E N T I F I C A T I O N   C A R D S
   +- ++  +--- +--- +- + +--- +--- +  +----------------------+------
   1---5---10---15---20---25---30---35---40---45---50---55---60---65---70---
      1 P     4     4  1 1           ZONE NUMBER
      2 P     5    11  2 1           HWY ACCESS TIME (MINUTES)
      3 P    12    18  3 1           HWY ACCESS DIST (MILES)
      4 P    19    25  4 1           TERMINAL TIME (MINUTES)
      5 A    26    29  5 1           PARKING COST
      6 A    30    31  6 1           CBD INDICATOR (1=CBD)
      7 P     5    11  7 2           FTRIPS(1)
      8 P    12    18  8 2           AO(1)
      9 P    19    25  9 2           LDRIVS(1)
     10 P    26    31 10 2           INCOME(1)
     11 P    32    38 11 2           PERSONS(1)
     12 P    39    45 12 2           FTRIPS(2)
     13 P    46    52 13 2           AO(2)
     14 P    53    59 14 2           LDRIVS(2)
     15 P    60    65 15 2           INCOME(2)
     16 P    66    72 16 2           PERSONS(2)
     17 P     5    11 17 3           FTRIPS(3)
     18 P    12    18 18 3           AO(3)
     19 P    19    25 19 3           LDRIVS(3)
     20 P    26    31 20 3           INCOME(3)
     21 P    32    38 21 3           PERSONS(3)
     22 P    39    45 22 3           FTRIPS(4)
     23 P    46    52 23 3           AO(4)
     24 P    53    59 24 3           LDRIVS(4)
     25 P    60    65 25 3           INCOME(4)
     26 P    66    72 26 3           PERSONS(4)
     27 X  1007                      ATIME
     28 X  1008                      ADIST
     29 X  3001                      TIVTT
     30 X  3002                      TWAIT1
     31 X  3003                      TWAIT2
     32 X  3004                      TWALK
     33 X  4001                      TFARE
     34 X  2001                      PERSON TRIPS (HBNW)
     35 X  2002                      PERSON TRIPS (O-O)
     36 X  2003                      PERSON TRIPS (O-W)
     37 X  3005                      NUMBER OF TRANSFERS
     38 P*          27               PCT. OF TRPS - 1ST INC QUARTILE
     39 P*          28               PCT. OF TRPS - 2ND INC QUARTILE
     40 P*          29               PCT. OF TRPS - 3RD INC QUARTILE
     41 P*          30               PCT. OF TRPS - RTH INC QUARTILE
     42 P*          31               PCT. OF TRPS WITHIN WALKING DISTANCE
     43 P*          32               1/LOG(INC) (MARKET SEGMENT 1)
     44 P*          33               1/LOG(INC) (MARKET SEGMENT 2)
     45 P*          34               1/LOG(INC) (MARKET SEGMENT 3)
     46 P*          35               1/LOG(INC) (MARKET SEGMENT 4)
     47 P    39    40 36  1          COUNTY CODE
     48 X  5001                      ACCESS STATION IN APTH
     49                              NOT USED
     50 X  6003                      AUTO STATION IN APTH
   1---5---10---15---20---25---30---35---40---45---50---55---60---65---70---
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C O U N T Y - T O - C O U N T Y   T R I P   S U M M A R Y

COUNTY P	A	TRANSIT	AUTO DRIVER	AUTO PASSENGER	TOTAL PERSON	PERCENT TRANSIT	AUTO OCCUPANCY
1	1	0.	6130.	3371.	9501.	0.0	1.55
1	2	969.	3372.	1855.	6197.	15.64	1.55
1	3	1.	4.	2.	7.	10.30	1.55
1	4	0.	1.	0.	1.	0.0	1.55
1	5	0.	3.	1.	4.	0.63	1.55
1	6	0.	0.	0.	0.	0.0	0.0
1	7	0.	0.	0.	0.	0.0	0.0
2	1	165306.	91964.	50653.	308386.	53.60	1.55
2	2	300930.	7781999.	4234534.	12753156.	2.36	1.54
2	3	1600.	153504.	84057.	240454.	0.67	1.55
2	4	90.	10605.	5830.	16542.	0.55	1.55
2	5	401.	62507.	34358.	97322.	0.41	1.55
2	6	10.	13708.	7523.	21267.	0.05	1.55
2	7	0.	0.	0.	0.	0.0	0.0
3	1	2764.	5495.	3023.	11283.	24.49	1.55
3	2	2838.	159075.	86973.	251962.	1.13	1.55
3	3	30967.	2271442.	1251013.	3566945.	0.87	1.55
3	4	24.	8528.	4689.	13249.	0.18	1.55
3	5	15.	8442.	4642.	13109.	0.12	1.55
3	6	0.	394.	217.	611.	0.01	1.55
3	7	0.	0.	0.	0.	0.0	0.0
4	1	98.	540.	297.	935.	10.47	1.55
4	2	86.	5645.	3105.	8839.	0.97	1.55
4	3	35.	3388.	1863.	5287.	0.66	1.55
4	4	3420.	462974.	254577.	721336.	0.47	1.55
4	5	165.	25774.	14165.	40131.	0.41	1.55
4	6	0.	57.	32.	89.	0.01	1.55
4	7	0.	0.	0.	0.	0.0	0.0
5	1	241.	1115.	613.	1969.	12.25	1.55
5	2	219.	26980.	14824.	42063.	0.52	1.55
5	3	8.	3621.	1991.	5621.	0.15	1.55
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5	6	0.	83.	46.	129.	0.00	1.55
5	7	0.	0.	0.	0.	0.0	0.0
6	1	118.	3405.	1873.	5396.	2.18	1.55
6	2	77.	37774.	20738.	58665.	0.13	1.55
6	3	1.	1590.	875.	2466.	0.04	1.55
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6	7	0.	0.	0.	0.	0.0	0.0
7	1	0.	0.	0.	0.	0.0	0.0
7	2	0.	0.	0.	0.	0.0	0.0
7	3	0.	0.	0.	0.	0.0	0.0
7	4	0.	0.	0.	0.	0.0	0.0
7	5	0.	0.	0.	0.	0.0	0.0
7	6	0.	0.	0.	0.	0.0	0.0
7	7	0.	0.	0.	0.	0.0	0.0

TRIP END TOTALS

PRODUCTIONS

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6	4798.	628227.	345434.	978460.	0.49	1.55
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3	32612.	2433547.	1339800.	3805958.	0.86	1.55
4	3617.	500923.	275439.	779979.	0.46	1.55
5	5363.	745499.	409882.	1160743.	0.46	1.55
6	4612.	598307.	329000.	931919.	0.49	1.55
7	0.	0.	0.	0.	0.0	0.0

NOTE: THE COUNTY-TO-COUNTY TRIP SUMMARY INCLUDES INTERNAL-
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