

Appendix A

Model Calibration and Validation

Trip Generation

Since the purpose of trip generation is to create trip productions to trip attractions, validation includes internal trips, balancing trip productions as well as trip attractions.

Table A-1 Average Motorized Person Trips per Household by Region

Region	Survey Year	Population	Person Trips/HH
Dubuque	2000 Model	77,018	8.24
Twin Cities, MN	1990	2,464,000	10..11
Nashua, NH	1990	154,000	10..08
Reno, NV	1987	254,000	8..58
Vancouver, WA	1985	259,000	5..83
Charlotte, NC	1985	511,433	9..29

Source: FHWA Analysis of Survey Trip Rates

Internal Trips

Several reasonable checks were run on socioeconomic data. As shown in **Tables A-1 and A-2**, the average motorized person trips per household were compared to other areas. This helps determine the rate, data was also averaged from zones with no employment. The DMATS area model has 8.24 motorized trips per household, which was determined reasonable when compared with other urban areas.

Table A-2 DMATS Average Motorized Person Trips per Household by Purpose

	Clinton 2000 Model	Houston 1985 Model	Dallas/Ft. Worth 1 984 Trvl Sur	Denver 1985 Trvl Sur	San Francisco 1985 Trvl Sur	Atlanta 1980 Trvl Sur	Delaware Valley 1 986 Trvl Sur
HBW	1.51	1.71	2.29	1.96	1.89	1.95	2.27
HBO	3.84	4. 80	4.32	3.40	4. 49	4.45	4.19
NHB	2.48	2.96	2.07	1.97	2.35	1.87	1.64
Total	8.24	9.47	8.68	7.33	8.73	8.27	8.10

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

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Balancing Productions and Attractions

The last step in trip generation is the balancing of trip productions and attractions. Before balancing begins, productions and attractions should be compared to determine if the socioeconomic data is reasonable. The total ratio of productions to attractions is in the recommended range of -10 percent to +10 percent. The ratio of total production to attractions is 0.13 percent in the DMATS model as shown in **Table A-3**.

Table A-3 DMATS Comparison of Production and Attractions Before Balancing

Purpose	Productions	Attractions	Ratio	FHWA
HBW	39,424	38,802	1.58%	+/- 10%
HBO	96,700	97,034	-0.35%	+/- 10%
NHB	65,191	65,191	0.00%	+/- 10%
CV	12,320	12,320	0.00%	+/- 10%
Total	213,63	213,347	0.13%	+/- 10%

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

Table A-4 DMATS Trip Length Comparisons Among Cities

City	Survey Year	Average Trip Lengths in Minutes		
		HBW	HBO	NHB
Dubuque	2000 Model	11.39	10.79	10.14
San Juan	1991	35.4	16.1	16.2
Denver	1985	22.7	12.9	13.8
Northern NJ	1986	23.2	15.3	17.1
Phoenix	1988	19.3	13	13.6
Charleston, WV	1993	20.7	17.3	15.7
Reno	1990	11.2	10.4	8.1

Source: NPTS

Trip Distribution

Since the purpose of trip distribution is to link trip productions to trip attractions, validation includes evaluating trip lengths and intrazonal trips.

Trip Lengths

Trip lengths were evaluated by purpose and then compared to rates in other areas. As shown in **Table A-4** average trip lengths look reasonable when compared to other areas. **Table A-5** shows the average trip length for home-based work trips; home base other trips and non home base trips. The trip lengths are within the ranges established by FHWA.

Intrazonal Trips

Intrazonal trips are trips the model assigns, which start and end in the same zone. Typically, intrazonal trips account for less than 5 percent of total trips. As shown in **Table A-6**, the intrazonal trips assigned in the DMATS model only account for 1.93 percent of the total trips, which is within the percentages recommended by FHWA.

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Table A-5 DMATS Average Trip Length

Type	Time (Minutes)	Standards
HBW	11.39	11 – 15
HBO	10.79	9.5 – 13
NHB	10.14	9.5 – 12.5
CV	9.00	N/A
Quick Sum	10.62	N/A

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

Table A-6 DMATS Intrazonal Trip Percentages by Purpose

Type	% of Internal Trips	Standards FHWA
HBW	1.53%	5.00%
HBO	1.64%	5.00%
NHB	2.50%	5.00%
CV	2.63%	5.00%
Total	1.93%	5.00%

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

Trip Assignment

The assignment of trips to the network is the final output of the modeling process. Validation of trip assignment includes reviewing like volumes and vehicle miles traveled from different grouping methods. The model review for DMATS included grouping information by functional class, linking AADT, and screenlines.

Table A-7 shows the deviation of volumes by functional class. Deviation target rates are compared to rates from FHWA, *Calibration and Adjustment of System Planning Models*. The DMATS model currently meets rates for principal, minor arterials and major collectors, but is above the recommended value for local streets due to the few number of traffic counts available for comparison. However, as the overall counts are within the range established by FHWA it can be justified that if there are more counts on major collectors the percentages will be within the percentages recommended by FHWA.

Table A-7 DMATS Volume Deviation by Function Classification

2000					
Function Class	No of Counts	Count	Loaded	% Difference	FHWA
Principal Arterial	124	1,302,100	1,281,168	1.61%	<10%
Minor Arterial	97	887,750	870,351	1.96%	<15%
Major Collector	44	200,700	196,380	2.15%	<25%
Local	10	43,500	27,588	36.58%	N/A
Total	276	2,434,050	2,375,487	2.41%	N/A

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

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Vehicle miles traveled was also calculated by functional class as shown in **Table A-8**. These values are within the ranges established by FHWA as shown in the table.

Table A-8 DMATS Vehicle Miles Traveled (VMT) Deviation by Function Class

2000 VMT				
Function Class	No of Counts	Count	Loaded	% Difference
Principal Arterial	124	371,384	373,901	-0.68%
Minor Arterial	97	126,670	128,232	-1.23%
Major Collector	44	42,576	37,598	11.69%
Local	10	12,763	8,307	34.92%
Total	276	553,393	548,038	0.97%

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

When the Root Mean Square Error (RMSE) for these volumes is calculated, values are within in the ranges established by FHWA as shown in the **Table A-9**.

Table A-9 DMATS Root Mean Square Error (RMSE) by Function Class

Function Class	RMSE%	FHWA
Principal Arterial	15.99%	0-30%
Minor Arterial	24.06%	0-30%
Major Collector	36.24%	0-30%
Local	73.67%	0-30%
Total	21.78%	0-30%

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

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Average Annual Daily Traffic

Table A-10 shows the deviation of volumes by AADT. All volume groups are in range when compared to target rates given by the FHWA as shown in the table. Deviations of vehicle miles traveled are also in range when compared by vehicle miles traveled as shown on **Table A-11**.

Table A-10 DMATS Volume Deviation by Average Annual Daily Traffic (AADT)

		2000			
Link AADT	No of Counts	Count	Loaded	% Difference	FHWA
7000+	160	1,968,850	1,870,793	4.98%	+/- 10%
5000-7000	36	215,250	244,319	-13.50%	+/- 15%
3000-5000	43	168,910	182,157	-7.84%	+/- 25%
1000-3000	34	79,080	76,338	3.47%	+/- 50%
Total	276	2,434,050	2,375,487	2.41%	

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

Table A-11 DMATS Vehicle Miles Traveled (VMT) Deviation by AADT

		2000 VMT			
Link AADT	No of Counts	Count	Loaded	% Difference	
7000+ (49)	160	418,513	403,513	3.67%	
5000-7000 (17)	36	49,989	57,023	-14.07%	
3000-5000 (19)	43	46,496	51,854	-11.52%	
1000-3000 (15)	34	38,130	35,729	6.30%	
Total	276	553,393	548,038	0.97%	

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

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Screenlines

Deviation comparisons were also compared across eight screenlines shown. Screenlines are selected at these locations because of their vital role in moving traffic in the study area and their diversity in function class. **Table A-12** shows the comparison of the actual traffic volumes to the volumes in the model.

Table A-13 compares the total vehicle miles traveled for screenlines and for the actual base year. Overall it proves that the model is well calibrated and is representing the existing traffic conditions in the study area.

Table A-12 DMATS Deviation of Screenline Volume

Screenline	Base Year Volume	Assigned Volume	Percent Deviation (Deviation/Count)	Model/ Count
1	45400	45656	1.60%	0.98
2	28510	29990	5.19%	1.05
3	55400	48304	12.81%	0.87
4	100300	100918	0.62%	1.01
5	43950	42190	4.00%	0.96
6	44500	44312	0.42%	1.00
7	68900	63011	8.55%	0.91
8	54100	61143	13.02%	1.06

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

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Table A-13 DMATS Screenline Vehicle Miles Traveled (VMT)

Screenline	Base Year VMT	Assigned VMT	VMT Model/ Count
1	222202	1473	0.97
2	10542	11207	1.06
3	18036	17484	0.97
4	18354	16245	0.89
5	33687	34589	1.03
6	19219	18808	0.98
7	16329	14110	0.86
8	19836	22811	1.15

Source: Model Validation and Reasonable Checking Manual (TMIP 2001)

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DMATS Socio Economic Data for Year 2000

TAZ 2000	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
1	49	25	15	10	25	0
2	69	30	0	15	15	0
3	279	125	4	46	50	24
4	233	75	15	30	45	29
5	164	60	4	56	60	8
6	194	55	0	40	40	25
7	228	75	20	80	100	28
8	160	55	10	10	20	4
9	109	65	4	31	35	0
10	65	25	4	0	4	0
11	53	25	0	10	10	0
12	420	140	4	61	65	34
13	34	10	15	20	35	14
14	229	95	25	45	70	35
15	1337	490	35	360	395	243
16	923	290	15	90	105	14
17	978	450	4	156	160	105
18	579	270	60	410	470	119
19	2003	860	55	980	1035	855
20	152	70	10	2415	2425	89
21	377	155	4	51	55	0
22	113	35	10	0	10	0
23	230	80	0	19	19	19
24	514	240	10	10	20	4
25	89	50	45	270	315	149
26	46	525	190	230	420	139
27	485	460	0	70	70	19
28	77	15	60	510	570	505
29	626	240	0	130	130	84
30	423	155	0	30	30	4
31	468	210	25	40	65	29
32	117	65	10	5	15	4
33	156	40	20	20	40	0
34	388	125	30	35	65	12
35	1036	445	15	90	105	55
36	0	0	0	355	355	328

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DMATS Socio Economic Data for Year 2000 continued

TAZ 2000	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
37	3259	1470	70	790	860	655
38	1039	645	0	145	145	114
39	102	20	780	990	1770	765
40	618	170	30	80	110	38
41	302	85	160	110	270	95
42	810	365	0	100	100	64
43	440	140	85	100	185	75
44	1116	365	70	295	365	174
45	5294	1320	280	715	995	485
46	141	4	125	1170	1295	335
47	827	512	65	565	630	445
48	14	90	0	29	29	29
49	35	10	155	95	250	48
50	378	170	85	140	225	27
51	11	4	515	405	920	314
52	0	0	0	15	15	4
53	428	10	565	60	625	35
54	681	315	240	350	590	270
55	628	205	10	115	125	43
56	369	180	4	41	45	19
57	99	30	0	4	4	
58	67	21	0	25	25	0
59	331	145	4	11	15	10
60	731	35	0	10	10	8
61	114	185	0	4	4	4
62	731	385	20	60	80	24
63	220	40	0	30	30	34
64	582	175	35	375	410	189
65	111	4	80	365	445	89
66	220	55	0	65	65	8
67	121	40	0	10	10	0
68	107	35	0	10	10	4
69	757	115	15	40	55	28
70	185	75	4	81	85	12

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DMATS Socio Economic Data for Year 2000 continued

TAZ 2000	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
71	26	4	30	1140	1170	169
72	228	60	0	4	4	4
73	438	135	10	115	125	99
74	316	105	0	20	20	0
75	303	105	0	60	60	50
76	91	45	0	0	0	0
77	181	50	10	110	120	18
78	586	185	25	105	130	10
79	19	6	0	0	0	0
80	3644	1230	30	1570	1600	1425
81	251	85	0	0	0	0
82	2068	800	40	560	600	440
83	0	0	25	1175	1200	669
84	828	355	0	330	330	219
85	216	255	30	250	280	129
86	1611	565	0	330	330	293
87	182	60	4	21	25	0
88	0	40	525	640	1165	450
89	369	100	0	40	40	4
90	49	20	0	20	20	4
91	31	10	0	175	175	10
92	143	70	0	20	20	10
93	47	20	0	0	0	0
94	31	4	0	10	10	10
95	57	17	0	20	20	19
96	100	35	0	10	10	10
97	327	140	10	30	40	14
98	1595	625	10	105	115	30
99	18	4	35	620	655	15
100	2390	770	20	810	830	700
101	1935	855	4	161	165	119
102	789	360	10	735	745	60
103	1612	615	15	220	235	99
104	0	0	0	30	30	0

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DMATS Socio Economic Data for Year 2000 continued

TAZ 2000	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
105	0	0	10	10	20	0
106	2931	1200	0	410	410	310
107	3266	1330	35	175	210	105
108	3664	1100	85	1340	1425	1225
109	655	292	1	24	25	5
110	1043	334	80	164	244	126
111	0	0	30	1475	1505	70
112	471	151	75	156	231	119
113	697	303	29	936	965	205
114	2519	1030	15	875	890	825
115	72	22	108	549	657	209
116	702	218	56	284	340	108
117	0	0	46	232	278	88
118	295	81	0	15	15	0
119	35	9	0	15	15	0
120	11	6	0	0	0	0
121	57	31	4	38	42	15
122	0	0	20	431	451	136
123	183	130	130	2819	2949	889
124	175	87	20	76	96	62
125	187	93	115	449	564	363
126	352	192	10	104	114	88
127	158	86	25	276	301	231
128	353	190	145	1263	1408	487
129	64	35	6	49	55	19
130	380	154	7	59	66	23
131	88	36	13	106	119	42
132	316	140	117	666	783	32
133	56	25	3	15	18	1
134	1181	435	35	2120	2155	2074
135	1757	686	19	247	266	171
136	599	234	6	83	89	58
137	0	0	60	1465	1525	0

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DMATS Trip Table 2000

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	CVP	CVA
1	39	21	88	51	38	38	13	13
2	45	12	113	24	37	37	11	11
3	176	42	408	104	141	141	46	46
4	120	37	287	107	120	120	31	31
5	92	50	214	107	108	108	22	22
6	90	33	223	85	102	102	20	20
7	126	83	291	199	162	162	32	32
8	86	17	196	43	74	74	22	22
9	113	29	250	60	67	67	24	24
10	34	3	77	9	27	27	10	10
11	36	8	84	16	27	27	9	9
12	221	54	519	136	204	204	51	51
13	22	29	53	79	40	40	8	8
14	179	58	425	160	138	138	40	40
15	726	328	1738	863	799	799	184	184
16	476	87	1044	193	418	418	107	107
17	551	133	1331	348	481	481	162	162
18	319	390	865	903	585	585	112	112
19	1083	859	2883	2410	1552	1552	321	321
20	104	2013	221	4031	1991	1991	28	28
21	221	46	512	92	180	180	56	56
22	65	8	145	23	49	49	15	15
23	129	16	301	46	98	98	29	29
24	309	17	772	43	202	202	88	88
25	74	261	177	664	283	283	30	30
26	656	349	1673	929	352	352	237	273
27	838	58	1878	129	232	232	164	164
28	31	473	71	1375	482	482	21	21
29	378	108	872	279	331	331	86	86
30	273	25	612	52	177	177	55	55
31	324	54	765	147	221	221	82	85
32	98	12	239	35	54	54	26	26
33	71	33	155	79	89	89	20	20
34	219	54	508	137	192	192	53	53

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DMATS Trip Table 2000 continued

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	CVP	CVA
35	567	87	1361	226	459	459	163	166
36	0	295	0	841	283	283	0	2
37	1613	714	4047	1975	1866	1866	543	543
38	817	120	1981	328	492	492	230	230
39	36	1469	85	4043	1450	1450	212	212
40	268	91	633	231	311	311	69	69
41	300	617	747	1731	604	604	198	198
42	530	83	1277	214	373	373	130	130
43	272	154	618	421	307	307	72	72
44	584	303	1400	783	695	695	149	149
45	1858	826	4440	2206	2711	2711	545	545
46	8	1075	12	2466	1085	1085	34	34
47	628	523	1622	1428	803	803	200	200
48	92	24	246	70	28	28	32	32
49	15	208	31	554	212	212	44	44
50	188	187	499	448	316	316	83	83
51	3	764	11	2111	739	739	137	137
52	0	12	0	28	12	12	0	0
53	11	519	25	1442	653	653	152	152
54	450	490	1063	1346	717	717	176	176
55	372	104	842	245	327	327	76	76
56	305	37	721	91	170	170	65	65
57	12	3	32	10	39	39	11	11
58	0	21	0	41	44	44	77	77
59	225	12	524	35	132	132	53	53
60	67	8	149	23	272	272	12	12
61	315	3	722	10	45	45	66	66
62	632	66	1473	164	328	328	143	143
63	66	25	148	76	103	103	14	14
64	277	340	641	844	537	537	72	72
65	6	369	12	853	396	396	22	22
66	90	54	221	112	132	132	20	20
67	63	8	156	16	52	52	14	14
68	72	8	167	20	47	47	12	12

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DMATS Trip Table 2000 continued

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	CVP	CVA
69	191	46	454	123	318	318	45	45
70	120	71	267	151	135	135	28	28
71	7	971	15	2063	943	943	9	9
72	100	3	236	10	85	85	21	21
73	217	104	517	290	259	259	51	51
74	173	17	387	33	130	130	37	37
75	188	50	399	138	157	157	37	37
76	71	0	154	0	33	33	16	16
77	85	100	223	217	161	161	20	20
78	265	108	634	237	316	316	73	73
79	0	0	0	0	7	7	2	2
80	1555	1328	3834	3769	2596	2596	447	447
81	160	0	352	0	91	91	30	30
82	1102	498	2714	1358	1228	1228	296	296
83	0	996	0	2509	958	958	7	7
84	289	274	815	713	563	563	127	127
85	359	232	867	581	301	301	99	99
86	793	274	1927	772	847	847	202	202
87	105	21	235	44	85	85	22	22
88	65	967	142	2626	930	930	152	152
89	176	33	423	68	165	165	36	36
90	40	17	93	36	34	34	7	7
91	19	145	44	293	151	151	4	4
92	107	17	228	41	67	67	25	25
93	36	0	88	0	17	17	7	7
94	8	8	18	16	19	19	1	1
95	42	17	97	48	37	37	6	6
96	61	8	139	23	44	44	12	12
97	189	33	440	83	151	151	53	53
98	878	95	2160	218	669	669	226	226
99	8	544	17	1104	530	530	11	11
100	823	689	2077	1927	1528	1528	280	280
101	1043	137	2637	367	832	832	306	306
102	392	618	1030	1269	880	880	131	131
103	704	195	1903	473	771	771	224	224
104	0	25	0	49	24	24	0	0

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DMATS Trip Table 2000 continued

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	CVP	CVA
105	0	17	0	40	16	16	3	3
106	1697	340	4028	916	1389	1389	428	428
107	1746	174	4324	451	1350	1350	484	484
108	1252	1183	3213	3362	2463	2463	415	415
109	368	21	909	45	257	257	105	105
110	415	203	1078	555	572	572	140	140
111	0	1249	0	2530	1202	1202	8	8
112	187	192	486	524	355	355	74	74
113	381	801	940	1757	1023	1023	116	116
114	1277	739	3187	2121	1622	1622	372	372
115	23	545	60	1314	551	551	36	36
116	233	282	616	680	526	526	93	93
117	0	231	0	556	221	221	12	12
118	141	12	329	24	119	119	29	29
119	14	12	34	24	25	25	3	3
120	7	0	17	0	4	4	2	2
121	22	35	58	83	54	54	12	12
122	0	374	0	858	360	360	5	5
123	13	2448	45	5609	2421	2421	81	81
124	48	80	144	220	139	139	36	36
125	51	468	152	1290	518	518	63	63
126	134	95	409	263	218	218	71	71
127	60	250	184	693	298	298	37	37
128	108	1169	299	2786	1251	1251	106	106
129	21	46	58	109	67	67	14	14
130	134	55	375	131	190	190	57	57
131	31	99	87	237	127	127	16	16
132	140	650	358	1384	740	740	81	81
133	24	15	63	32	35	35	10	10
134	393	1789	1101	5196	2147	2147	165	165
135	939	221	2358	584	849	849	250	250
136	319	74	802	196	288	288	85	85
137	0	1266	0	2528	1218	1218	16	16

Appendix A

DMATS Socio Economic Data for Year 2031

TAZ 2031	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
1	49	25	17	11	28	0
2	69	30	0	17	17	0
3	279	125	4	51	55	26
4	233	75	17	33	50	32
5	164	60	4	62	66	9
6	194	55	0	44	44	28
7	228	75	22	88	110	31
8	160	55	11	11	22	4
9	109	65	4	34	39	0
10	65	25	4	0	4	0
11	53	25	0	11	11	0
12	420	140	4	67	72	38
13	34	10	17	22	39	15
14	273	114	28	50	77	39
15	1522	559	39	397	436	268
16	975	307	17	99	116	15
17	978	450	4	172	177	116
18	606	283	111	760	871	220
19	2003	860	61	1081	1142	943
20	223	103	11	2665	2676	98
21	497	206	4	56	61	0
22	149	46	11	0	11	0
23	3265	1159	0	56	56	56
24	631	296	14	14	27	5
25	89	50	54	325	379	179
26	63	719	218	264	482	160
27	485	460	0	83	83	23
28	77	15	213	1807	2019	1789
29	1121	434	0	156	156	101
30	887	329	0	33	33	4
31	639	289	28	44	72	32
32	117	65	11	6	17	4
33	497	129	22	22	44	0
34	512	166	33	39	72	13

Appendix A

DMATS Socio Economic Data for Year 2031 continued

TAZ 2031	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
35	1036	445	17	99	116	61
36	0	0	0	436	436	402
37	3259	1470	81	919	1001	762
38	1039	645	0	160	160	126
39	102	20	878	1114	1992	861
40	1669	466	48	128	175	61
41	1496	420	2209	1519	3729	1312
42	1808	825	0	132	132	84
43	456	145	249	293	543	220
44	1140	373	83	350	433	206
45	5969	1492	342	873	1214	592
46	141	4	144	1350	1495	387
47	1211	671	187	737	924	599
48	14	90	0	32	32	32
49	35	10	214	131	345	66
50	387	174	163	268	431	52
51	11	4	589	463	1052	359
52	0	0	0	17	17	4
53	428	10	1002	106	1108	62
54	752	349	274	399	673	308
55	1481	489	13	155	168	58
56	401	196	6	62	68	29
57	99	30	0	4	4	4
58	145	46	0	28	28	0
59	421	185	4	12	17	11
60	1579	76	0	14	14	11
61	1879	650	0	4	4	4
62	2430	841	28	85	113	34
63	358	66	0	42	42	48
64	1257	382	60	638	698	322
65	408	115	331	1511	1843	369
66	220	55	0	100	100	12
67	160	53	0	11	11	0
68	1241	413	0	11	11	4

Appendix A

DMATS Socio Economic Data for Year 2031 continued

TAZ 2031	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
70	210	85	11	225	236	33
71	26	4	69	2641	2710	391
72	1041	279	0	4	4	4
73	929	289	19	222	241	191
74	4499	1522	0	22	22	0
75	4091	1444	0	66	66	55
76	1420	400	0	0	0	0
77	181	50	11	121	132	20
78	1291	412	146	613	759	58
79	19	6	0	0	0	0
80	3644	1230	34	1774	1808	1610
81	268	91	0	0	0	0
82	2144	695	47	651	698	512
83	0	0	34	1578	1612	899
84	828	355	0	364	364	242
85	234	276	53	440	493	227
86	1690	593	0	389	389	346
87	316	105	4	23	28	0
88	0	40	598	729	1326	512
89	1517	418	0	44	44	4
90	62	25	0	22	22	4
91	37	12	0	193	193	11
92	164	81	0	22	22	11
93	47	20	0	0	0	0
94	48	6	0	18	18	0
95	57	17	0	59	59	56
96	100	35	0	11	11	9
97	335	144	16	47	62	22
98	2762	1092	11	116	127	33
99	18	4	40	707	747	17
100	3007	973	23	944	967	815
101	1935	855	4	178	182	131
102	789	360	11	813	824	66
103	1612	615	17	243	259	109

Appendix A

DMATS Socio Economic Data for Year 2031 continued

TAZ 2031	Total Population	Occupied Dwelling Units	Retail Employment	Non Retail Employment	Total Employment	Service Employment
104	0	0	0	33	33	0
105	0	0	11	11	22	0
106	2931	1200	0	452	452	342
107	3266	1330	39	193	232	116
108	3664	1100	98	1546	1644	1413
109	655	292	1	26	28	6
110	1043	334	88	181	269	139
111	0	0	34	1672	1706	79
112	471	151	83	172	255	131
113	697	303	32	1033	1065	226
114	2519	1030	17	965	982	910
115	72	22	119	606	725	231
116	702	218	62	313	375	119
117	0	0	52	263	315	100
118	4471	1460	0	15	15	0
119	3224	1068	155	110	265	48
120	11	6	0	0	0	0
121	57	31	4	42	46	17
122	0	0	22	476	498	150
123	183	130	143	3110	3254	981
124	175	87	22	84	106	68
125	229	114	150	585	735	473
126	352	192	11	115	126	97
127	158	86	28	305	332	255
128	369	198	160	1394	1554	537
129	64	35	7	54	61	21
130	380	154	8	65	73	25
131	88	36	14	117	131	46
132	316	140	129	735	864	35
133	56	25	3	17	20	1
134	1299	479	41	2454	2495	2401
135	1757	686	21	273	294	189
136	599	234	7	92	98	64
137	0	0	66	1616	1683	0

Appendix A

DMATS Trip Table 2031

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	CVP	CNA
1	39	23	88	57	40	40	13	13
2	45	14	113	27	39	39	11	11
3	176	46	408	114	146	146	46	46
4	120	41	287	118	125	125	31	31
5	92	55	214	118	113	113	23	23
6	90	37	223	94	107	107	20	20
7	126	92	291	220	172	172	33	33
8	86	18	196	47	76	76	23	23
9	113	32	250	66	71	71	24	24
10	34	4	77	10	27	27	10	10
11	36	9	84	18	28	28	9	9
12	221	60	519	150	211	211	51	51
13	22	32	53	87	43	43	8	8
14	214	64	509	176	162	162	48	48
15	828	362	1983	952	907	907	210	210
17	551	147	1331	384	499	499	162	162
18	334	723	907	1674	921	921	130	130
19	1083	948	2883	2659	1650	1650	323	323
20	154	2221	327	4448	2235	2235	40	40
21	293	50	678	102	230	230	75	75
22	86	9	192	26	63	63	19	19
23	1862	46	4357	135	1236	1236	414	414
24	381	23	951	59	253	253	109	109
25	74	315	177	800	338	338	32	32
26	898	400	2293	1067	411	411	314	314
27	838	69	1878	153	244	244	164	164
28	31	1676	71	4872	1652	1652	61	61
29	683	130	1577	336	535	535	155	155
30	580	27	1298	57	350	350	117	117
31	445	60	1051	162	291	291	110	110
32	98	14	239	38	57	57	26	26
33	229	37	500	87	218	218	52	52
34	290	60	673	151	245	245	68	68
35	567	96	1361	249	471	471	163	163

Appendix A

DMATS Trip Table 2031 continued

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	CVP	CNA
36	0	362	0	1032	350	350	0	0
37	1613	831	4047	2298	1994	1994	546	546
38	817	133	1981	361	508	508	230	230
39	36	1654	85	4551	1641	1641	238	238
40	734	146	1734	368	750	750	179	179
41	863	5158	2151	14458	5544	5544	1209	1209
42	3777	133	9136	787	1619	2420	580	580
43	594	948	2008	1944	1087	1087	190	190
44	597	359	1431	928	765	765	155	155
45	3853	1796	10315	5343	8089	6392	1379	1379
46	8	1240	12	2846	1253	1253	39	39
47	823	823	2346	2271	1185	1185	289	289
48	92	27	246	78	31	31	32	32
49	30	497	62	1328	505	505	105	105
50	193	358	511	858	488	488	105	105
51	4	1214	16	3356	1178	1178	217	217
52	0	14	0	31	14	14	0	0
53	18	1285	42	3571	1499	1499	374	374
54	498	559	1176	1536	816	816	196	196
55	888	140	2011	330	677	677	178	178
56	332	56	785	138	201	201	72	72
57	12	4	32	11	40	40	11	11
58	0	23	0	45	75	75	16	16
59	288	14	670	39	167	167	67	67
60	146	12	325	32	587	587	27	27
61	689	4	1577	11	689	689	232	232
62	1381	94	3217	231	978	978	308	308
63	108	35	243	106	164	164	23	23
64	604	579	1400	1436	1020	1020	152	152
65	176	1529	353	3530	1632	1632	128	128
66	90	83	221	173	161	161	20	20
67	83	9	206	18	67	67	19	19
68	850	9	1968	22	462	462	147	147
69	299	543	712	1457	956	956	111	111

Appendix A

DMATS Trip Table 2031 continued

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	CVP	CNA
70	136	196	302	419	266	266	33	33
71	7	2249	15	4779	2189	2189	20	20
72	463	4	1099	11	383	383	100	100
73	465	200	1109	559	533	533	108	108
74	2504	18	5604	36	1659	1659	543	543
75	2580	55	5486	152	1546	1546	516	516
76	627	0	1370	0	518	518	143	143
77	85	110	223	239	172	172	21	21
78	590	630	1413	1386	1081	1081	186	186
79	0	0	0	0	7	7	2	2
80	1555	1500	4704	5113	3371	2784	448	448
81	171	0	376	0	97	97	32	32
82	957	579	2358	1579	1344	1344	260	260
83	0	1338	0	3369	1296	1296	9	9
84	289	302	815	787	595	595	127	127
86	833	323	2024	911	930	930	212	212
87	184	23	411	48	137	137	39	39
88	65	1101	142	2990	1067	1067	171	171
89	736	37	1769	75	589	589	149	149
90	51	18	117	40	41	41	9	9
91	23	160	53	324	169	169	4	4
92	123	18	263	45	78	78	29	29
93	36	0	88	0	17	17	7	7
94	12	15	28	29	32	32	2	2
95	29	49	66	140	68	68	6	6
96	61	9	139	25	45	45	12	12
97	194	52	452	130	172	172	55	55
98	1535	105	3775	241	1111	1111	393	393
99	8	620	17	1259	607	607	12	12
100	1041	802	2625	2245	1875	1875	354	354
101	1043	151	2637	405	852	852	306	306
102	392	684	1030	1405	951	951	131	131
103	704	215	1903	522	797	797	224	224
104	0	27	0	54	27	27	0	0

Appendix A

DMATS Trip Table 2031 continued

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	CVP	CNA
105	0	18	0	44	18	18	3	3
106	1697	375	4028	1011	1433	1433	428	428
107	1746	192	4982	566	1583	1378	485	485
108	1252	1364	3213	3878	2660	2660	418	418
109	368	23	909	50	262	262	105	105
110	415	223	1078	612	597	597	142	142
111	0	1416	0	2867	1372	1372	9	9
112	187	212	486	578	376	376	76	76
113	381	884	940	1939	1111	1111	117	117
114	1277	815	3187	2341	1709	1709	372	372
115	23	602	61	1450	610	610	39	39
116	233	311	617	750	559	559	94	94
117	0	261	0	629	253	253	14	14
118	2544	12	5939	24	1643	1643	521	521
119	1807	220	4147	579	1389	1389	422	422
120	7	0	18	0	5	5	2	2
121	22	38	58	92	58	58	12	12
122	0	413	0	947	400	400	6	6
123	13	2701	45	6189	2684	2684	84	84
124	48	88	143	243	148	148	37	37
125	63	610	188	1681	674	674	80	80
126	134	104	409	290	230	230	71	71
127	60	276	184	765	325	325	38	38
128	113	1289	313	3074	1385	1385	113	113
129	21	50	59	120	73	73	14	14
130	134	60	374	144	197	197	57	57
131	31	109	86	261	137	137	17	17
132	140	717	359	1527	810	810	84	84
133	25	16	64	36	36	36	10	10
134	433	2071	1245	6166	2543	2543	182	182
135	939	244	2358	644	877	877	250	250
136	320	82	804	216	298	298	85	85
137	0	1397	0	2789	1354	1354	17	17
138	2209	3314	5082	5965	3756	3756	0	0

Appendix A

DMATS Trip Table 2031 continued

TAZ	HBWP	HBWA	HBOP	HBOA	NHBP	NHBA	CVP	CNA
139	284	425	652	765	482	482	0	0
140	794	1191	1825	2143	1350	1350	0	0
141	1463	2194	3364	3949	2486	2486	0	0
142	563	844	1295	1521	958	958	0	0
143	1425	2136	3276	3846	2421	2421	0	0
144	10	15	23	27	17	17	0	0
145	30	45	69	81	51	51	0	0
146	520	780	1196	1404	884	884	0	0
147	140	210	322	378	238	238	0	0
148	1223	1835	2812	3302	2079	2079	0	0
149	457	686	1051	1234	777	777	0	0
150	202	303	465	545	343	343	0	0
151	170	255	391	459	289	289	0	0
152	35	53	81	95	60	60	0	0
153	71	107	163	192	121	121	0	0