SACSIM/05
Activity-Based Travel Forecasting Model for SACOG
Featuring ***DaySim***—the Person Day Activity and Travel Simulator

Technical Memo Number 8
Usual Location and Tour Destination Models
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Prepared for

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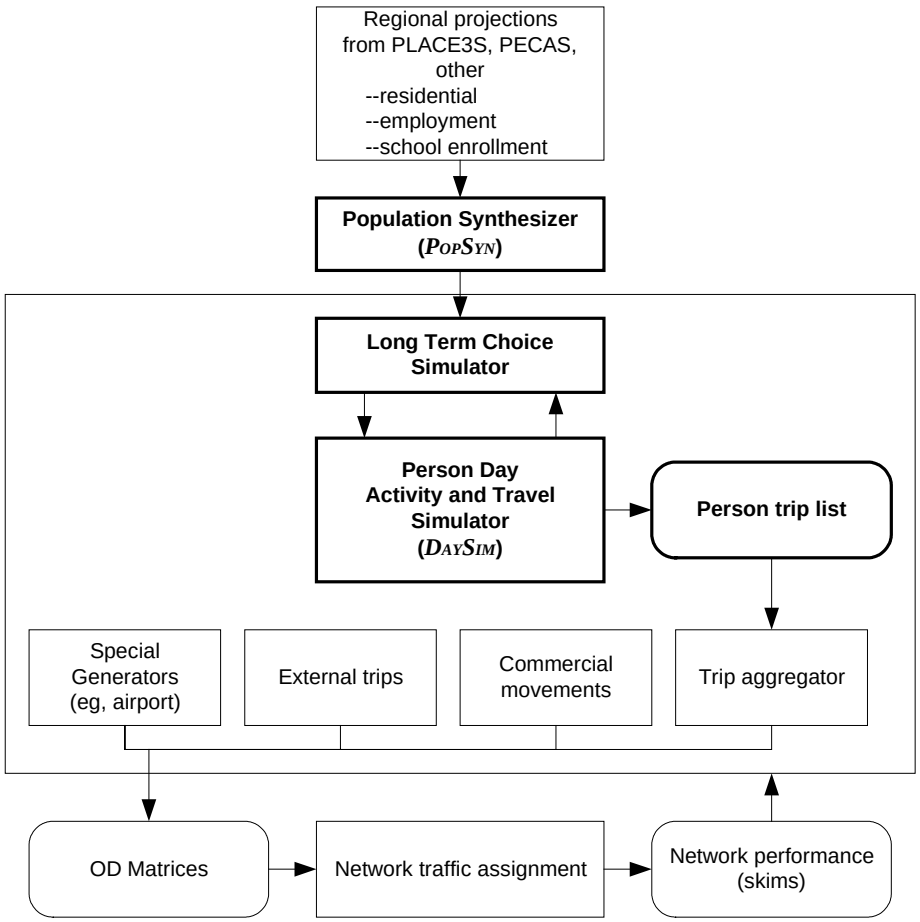
Introduction

This is the eighth in a series of technical memos being produced according to a work program in which Mark A. Bradley and John L. Bowman are developing the activity-based demand model components of a new travel demand forecasting model system for the Sacramento Area Council of Governments (SACOG), depicted in **Figure 1**. For a description of the entire model system, see memo 1 in this series, entitled Model System Design.

Figure 1: New SACOG Regional Travel Forecasting Model System



The current memo presents the estimation results for the usual work location, usual school location, and the tour destinations for all purposes. These models occur within the DaySim portion of the model system, occurring at model steps 1.2, 1.3 and 3.1, as highlighted in **Figure 2**.

Figure 2: DaySim models (numbered) within the program looping structure

Begin
  {Read run controls, model coefficients, TAZ data, LOS matrices,
    population controls, and Parcel data into memory}
  {Draw a synthetic household sample if specified}
  {Pre-calculate destination sampling probabilities}
  {Pre-calculate (or read in) TAZ aggregate accessibility arrays}
  {Open other input and output files}
  {Main loop on households}
    {Loop on persons in HH}
      {Apply model **1.1 Work Location for workers**}
      {Apply model **1.2 School Location for students**}
      {Apply model **1.1 Work Location for students**}
    {End loop on persons in HH}
    {Apply model **1.3 Household Auto Availability** }
    {Loop on all persons within HH}
      {Apply model **2.1 Activity Pattern** (0/1+ tours and 0/1+ stops)
        and model **2.2 Exact Number of Tours** for 7 purposes}
      {Count total home-based tours and assign purposes}
      {Initialize tour and stop counters and time window for the person-day before looping on tours}
      {If there are tours, loop on home-based tours within person in tour priority sequence,
        with tour priority determined by purpose and person type}
        {Increment number of home-based tours simulated for tour purpose (including current)}
        {Apply model **3.1 Tour destination**}
        {If work tour, apply model **3.2 Number and purpose of work-based subtours**}
        {Loop on predicted work-based sub tours and insert then tour array after current tour}
        {Apply model **3.3 Tour mode**}
        {Apply model **3.4 Tour primary destination arrival and departure times**}
        {Loop on tour halves (before and after primary activity)}
          {Apply model **4.1Half tour stop frequency and purpose**}
          {Loop on trips within home-based half tour (in reverse temporal order for 1st tour half)}
            {Increment number of stops simulated for stop purpose (including current)}
            {Apply model **4.2 Intermediate stop location**}
            {Apply model **4.3 Trip mode**}
            {Apply model **4.4 Intermediate stop departure time**}
            {Update the remaining time window}
          {End loop on trips within half tour}
        {End loop on tour halves}
      {End loop on tours within person}
      {Write output records for person-day and all tours and trips}
    {End loop on persons within household}
  {End loop on Households}
 {Close files}
 {Create usual work location flow validation statistics}
End.

Comparison to intermediate stop model

The unifying aspect of all the models covered in this memo is that they model location choice. Like the intermediate stop model (technical memo 5) the dependent variable is the parcel, and the reader is referred to that memo for a discussion of issues related to modeling at the parcel level of detail.

Unlike the intermediate stop model, all these models have a single anchor point, the tour origin, from which impedance is measured. That is, impedance is measured from the tour origin, to the destination, and back to the origin, without direct consideration of the impedance for stops on the way to and from the tour destination. For the usual location models and most tours, the anchor is the person's home; for work-based tours, it is the work location. This simplifies considerably the measurement of impedance, and as a result the model's impedance variables and the sampling of alternatives are much simpler than in the intermediate stop model.

Availability restrictions and alternative sampling

Modeling the choice of a particular parcel makes the universal choice set very large, and presents challenges to appropriately limit the number of alternatives considered when simulating choices.

The reduction of the universal choice set involves two conceptually different methods: availability constraints and sampling of alternatives. The first method removes from the universal choice set those alternatives that the decisionmaker would not even consider in making the decision, because they don't accommodate the desired activity or because they are too far away. Each parcel is assigned purpose-specific sizes; for a given purpose, if a parcel has zero size, then it is deemed unavailable. A parcel is also deemed unavailable if reaching it requires more than 125% of the maximum travel time observed in the survey sample for similar tours. **Table 1** lists the maximum travel time constraint for the 17 tour categories.

Table 1: Availability constraints based on travel time, derived from the household survey data

	Tour type	Maximum mid-day round-trip auto travel time of available TAZ (minutes)
01	primary work tours, fulltime worker, 1+ HH auto(s)	196
02	all other home-based work tours	153
03	work-based work tours	086
04	Home based school tours, adult, 1+ HH auto(s)	170
05	all other school tours	098
06	Home-based escort tours	173
07	Work-based escort tours	060
08	Primary personal business tours, 1+ HH auto(s)	170
09	all other personal business tours	138
10	Primary shopping tours, 1+ HH auto(s)	161
11	Other home-based shopping tours	158
12	Work-based shopping tours	098

	Tour type	Maximum mid-day round-trip auto travel time of available TAZ (minutes)
13	Home-based meal tours, 1+ autos per driver	131
14	Other meal tours	061
15	Primary social/recreation tours, 1+ HH auto(s)	170
16	Social/recreation tours, home based with 0 HH cars or secondary	200
17	Work-based social/recreation tours	100

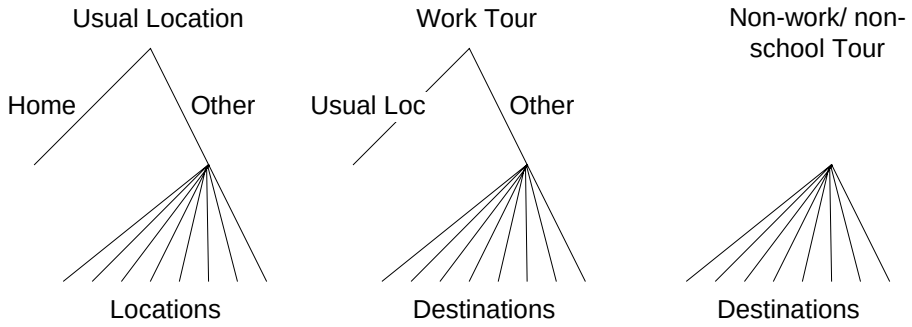
The second method involves taking the remaining alternatives, that would all be reasonable alternatives for the decisionmaker to consider, and drawing a sample of them to actually use in simulating the choice. This is simply a procedural technique to reduce the computational burden of the model. The employed sampling technique is called importance sampling with replacement. The available alternatives are sampled in a way that allows the probability of being drawn into the sample to be calculated for each drawn alternative. Statistical procedures are then used during model estimation and application to allow the sample to represent the entire set of available alternatives without biasing the results. **Appendix 1** describes the sampling procedure in detail.

Model structure and estimation data

The model structure of **Figure 2** imposes an assumed hierarchy of choice among the models, determining what is known and unknown at each level. For the usual location models, auto ownership is assumed to be unknown, based on the assumption that auto ownership is conditioned by work and school locations of household members, rather than the other way around. For the tour destinations, auto ownership levels are treated as given, and affect location choice. For university and grade school students who also work, the usual school location is known when usual work location is modeled; for other workers who also go to school, the work location is known when usual school location is modeled. For the tour destination models, all usual locations are known.

For the two usual location models (work and school), the home location is treated as a special location, because it occurs with greater frequency than any given non-home location, and size and impedance are not meaningful attributes. As a result, both of these models take the nested logit form, with all non-home locations nested together under the conditioning choice between home and non-home, as shown in **Figure 3**.

Figure 3: Structure of the usual location and tour destination models



The usual work location model was estimated using all survey person records of employed persons, with the reported usual work location as the dependent variable. Similarly, the school location model uses all survey person records of students, with the reported usual school location as dependent variable. Some persons are both employed and student, so they provide observed outcomes for both models. In the estimation data, all workers have a usual work location and all students have a usual school location (counter to our expectation that some workers would not have a usual location), so the model does not have an alternative called "no usual location".

Because a large majority of work tours go to the usual work location, the work tour destination model has this as a special alternative. Therefore, the model is nested, with all locations other than the usual location nested together under the conditioning binary choice between usual and non-usual, as shown in **Figure 3**. In addition, because in the survey sample there were almost no work-based work tours, or work tours by persons with usual work location at home, these alternatives are excluded from consideration.

Since most work tours go to the usual location, there are relatively few data records to provide good parameter estimates of the factors affecting choice among the "non-usual" alternatives. Therefore, the work destination choice model was estimated with a combined data set including all work tour records and also all person records of persons with a non-home usual location. The standard method of combining data from multiple sources was used. This includes the estimation of separate scale of the two data sets and, since ALOGIT was used for estimation, the specification of dummy nodes to accommodate the scale differences. For most utility variables, it was assumed that the effect is the same in the two data sets, but some distinct parameters were estimated for work tours, such as the attractiveness of the usual location, and the effects of distance and street connectivity.

Nearly all school tours go to the usual school location. Therefore, there is no school tour destination choice model. When students with a non-home usual location have a school tour, it is always assigned to the usual location. School tours are excluded from the day pattern choice set of students having home as the usual school location.

Since there are no modeled usual locations for activities other than work and school, the destination choice model of all remaining purposes is simply a multinomial logit model.

Utility function

Like the intermediate stop model (see technical memo 5 for a longer discussion), the utility function of each regular location alternative includes a regular utility component and a size function component. Equation 1 shows the form of the utility function, with size function included:

$$V_{in} = \sum_{k=1}^{K^v} \beta_k x_{ink} z_{nk} + \mu' \ln \sum_{k=K^v+1}^{K^v+K^s} \exp(\beta_k) x_{ink} z_{nk} \quad (1)$$

where:

V_{in} is the systematic utility of parcel alternative *i* for tour *n*,

K^v is the number of utility parameters,

K^s is the number of size parameters,

β_k, $k = 1, 2, ..., K^v + K^s$ are the utility and size parameters,

x_{ink} is an attribute of parcel alternative *i* for tour *n*,

z_{nk} is a characteristic of tour *n*,

μ' is a scale parameter measuring correlation among elemental activity opportunities within parcels (1—no correlation, 0+--high correlation)

Table 2 provides an overview of the variables (alternative attributes and person/tour characteristics) used in the utility and size functions to explain choice in the models. The left-hand column lists the alternative attributes for the binary choice (special vs. regular alternative) as well as for the conditional MNL choice among regular parcel alternatives. To the right is a column for each of the four models, and in each model's column are the characteristics associated with each of the applicable attributes.

Table 2—Utility function variables in the location choice models

Attributes	**Usual work location**	**Work tour destination**	**Usual school location**	**Non-work tour destination**
Binary choice	**Home vs other**	**Usual vs other**	**Home vs other**	**not applicable**
Constants	by person type*	By person type* tour type	By person type* HH size	
Disaggregte logsum among regular locations	Yes	Yes	yes	
Conditional MNL choice among regular locations				
Disaggregate mode choice logsum to destination	Yes	Yes	Yes	Yes
Piecewise linear driving distance function	For fulltime workers		For children under age 16	By Purpose Priority Pattern type
Natural log of driving distance	For other then fulltime workers by person type* income	By person type* tour type	For persons age 16+ by person type*	By tour type income person type* time available
Distance from usual work location		Yes	for not student aged	
Distance from usual school location	for student aged	for student aged		Yes

Aggregate mode-dest logsum at destination	By person type	By person type	By person type	By purpose
Parking and employment mix	For daily parking in parcel and in TAZ	for daily parking in parcel and TAZ		For hourly parking in parcel and TAZ by car availability
Ratio of neighborhood nodes with 3 or 4 entering links	Yes	By car availability		By car availability
employment, enrollment and households by category:	by person type income	By person type Income	by person type	by purpose (and by 'kids in household' for escort tours)
--Zonal density	--yes	--yes	--yes	--yes
--Parcel size	--yes	--yes	--yes	--yes
Person type categories in the models	full-time worker part-time worker not full- or part-time	full-time worker part-time worker not full- or part-time	child under 5 child 5 to 15 child 16+ university student not student aged	full-time worker part-time worker retired adult other adult university student child 16+ child 5 to 15 child under 5

Model estimation results

Tables 3 through **6** show the estimated parameters for all four of the models. Within each table, the parameters appear in the same order as the variables listed in **Table 2**.

In the binary choice between the special alternative and all other possible locations, an alternative specific constant captures the basic tendency to choose one or the other, and dummy variables capture significant differences in this effect among various population segments. The logsum variable from the regular alternatives captures the effect of level of service on this basic choice. In all three cases the parameter is larger than zero, but quite small; that is, the tendency to choose home as the usual location, or to choose the usual location for the work tour, is barely effected by level of service. In the case of the work tour choice, at parameter values close to zero the likelihood function is very flat, so it is difficult to accurately estimate its exact size. Therefore, it is constrained to a specific small value.

Two important variables in all four models are the disaggregate mode choice logsum and network distance. The logsum represents the expected maximum utility from the tour mode choice, and captures the effect of transportation system level of service on the location choice. Distance effects, independent of the level of service, are also present to varying degrees depending on the type of tour being modeled. Since the logsum variable and distance are highly correlated it was difficult in estimation to separately identify the magnitude of their parameters. Therefore, the logsum parameters are constrained to the value one, representing the simple assumption of a multinomial logit form for the joint choice of mode and destination. In nearly all cases, sensitivity to distance declines as distance increases; in some cases this is captured through a logarithmic form of distance. In other cases, where there is plenty of data to support a larger number of estimated parameters, a piecewise linear form is used to more accurately capture this nonlinear effect.

In most cases the models include an aggregate mode-destination logsum variable at the destination. A positive effect is interpreted as the location's attractiveness for making subtours and intermediate stops on tours to this location. A mix of parking and employment, at both the zone and parcel level, as well as street connectivity in the neighborhood, attract workers and tours for non-work purposes. Also, as in the case of intermediate stops, parcel size variables and TAZ-level density variables affect location choice.

Table 3—Usual Work Location Estimation Results

Row	Parm ID	Alternative Attribute	Person Type	HH Inc (annual)	Est.	Std. error	T-stat
1	1	Sampling adjustment factor for estimation			1.000		
2	192	Home location	constant		-1.6240	7.225	-0.2
3	193	Home location	PT worker		7.0933	3.569	2.0
4	194	Home location	child or univ. stud.		-11.5700	5.508	-2.1
5	195	Home location	female		-2.7963	1.369	-2.0
6	998	Dest choice logsum (in home vs other choice)			0.1496	0.065	2.3
7	2	Mode choice logsum	FT worker		1.0000		
8	4	Mode choice logsum	PT worker		1.0000		
9	5	Mode choice logsum	not FT/PT worker		1.0000		
10	18	One-way drive dist--0-3.5 mi (10s of mi)	FT worker		-4.0525	0.332	-12.2
11	27	One-way drive dist--3.5-10 mi (10s of mi)	FT worker		-0.1416	0.114	-1.2
12	28	One-way drive dist--10+ mi (10s of mi)	FT worker		-0.5787	0.040	-14.3
13	20	Nat log (1 + one-way drive dist (10s of mi))	PT worker		-2.8608	0.195	-14.7
14	21	Nat log (1 + one-way drive dist (10s of mi))	not FT/PT worker		-3.3753	0.329	-10.3
15	22	Nat log (1 + one-way drive dist (10s of mi))		<$15K	-0.3740	0.289	-1.3
16	23	Nat log (1 + one-way drive dist (10s of mi))		$50-75K	0.3497	0.114	3.1
17	24	Nat log (1 + one-way drive dist (10s of mi))		$75-100K	0.4282	0.152	2.8
18	29	Nat log (1 + one-way drive dist (10s of mi))	female		-0.4861	0.104	-4.7
19	35	Nat log (1 + one-way drive dist from school (10s of mi))	child or univ. stud.		-1.7998	0.335	-5.4
20	37	Aggr. mode-dest logsum at dest	FT worker		0.1081	0.035	3.1
21	38	Aggr. mode-dest logsum at dest	PT worker		0.0362	0.092	0.4
22	39	Aggr. mode-dest logsum at dest	not FT/PT worker		0.0657	0.133	0.5
23	52	Mix of daily parking & empl. in parcel: ln(1+prkg*empl/(prkg+empl))			0.1989	0.023	8.8
24	54	Mix of daily parking & (empl+stud) in TAZ: ln(1+prkgdens*(empldens+studdens)/(prkgdens+empldens+studdens)), (dens in units/Msqft)			0.1231	0.011	10.9
25	56	Street connectivity: (# 3 & 4 link nodes)/(# 1,3,4-link nodes) within a qtr mile			0.7375	0.121	6.1
26	69	dens of service empl in TAZ (ln[1+empl*100/Msqft])	FT worker	<$50K	-0.0525	0.019	-2.7
27	70	dens of households in TAZ (ln[1+HH*100/Msqft])	FT worker	<$50K	-0.0782	0.012	-6.4
28	71	dens of educ empl in TAZ (ln[1+empl*100/Msqft])	FT worker	>$50K	-0.0270	0.009	-3.1
29	72	dens of gov empl in TAZ (ln[1+empl*100/Msqft])	FT worker	>$50K	0.0268	0.008	3.6
30	73	dens of office empl in TAZ (ln[1+empl*100/Msqft])	FT worker	>$50K	0.1275	0.023	5.6
31	74	dens of service empl in TAZ (ln[1+empl*100/Msqft])	FT worker	>$50K	-0.0861	0.023	-3.7
32	75	dens of households in TAZ (ln[1+HH*100/Msqft])	FT worker	>$50K	-0.0711	0.009	-7.8
33	83	dens of office empl in TAZ (ln[1+empl*100/Msqft])	PT worker	>$50K	0.1243	0.072	1.7
34	84	dens of service empl in TAZ (ln[1+empl*100/Msqft])	PT worker	>$50K	-0.1452	0.075	-1.9
35	90	dens of households in TAZ (ln[1+HH*100/Msqft])	not FT/PT worker	reported	-0.0990	0.028	-3.6
36	91	dens of educ empl in TAZ (ln[1+empl*100/Msqft])		unreported	0.0124	0.025	0.5
37	92	dens of gov empl in TAZ (ln[1+empl*100/Msqft])		unreported	0.0024	0.019	0.1
38	93	dens of office empl in TAZ (ln[1+empl*100/Msqft])		unreported	0.1711	0.059	2.9
39	94	dens of service empl in TAZ (ln[1+empl*100/Msqft])		unreported	-0.1163	0.062	-1.9
40	95	dens of households in TAZ (ln[1+HH*100/Msqft])		unreported	-0.0564	0.025	-2.2

Row	Parm ID	Alternative Attribute	Person Type	HH Inc (annual)	Est.	Std. error	T-stat
41	999	Size function scale			0.4963	0.012	43.0
42	101	size: service empl. in parcel	FT worker	<$50K	-0.9521	0.316	-3.0
43	102	size: education empl. in parcel	FT worker	<$50K	-1.0527	0.408	-2.6
44	103	size: restaurant empl. in parcel	FT worker	<$50K	-1.5551	0.427	-3.6
45	104	size: gov empl. in parcel	FT worker	<$50K	0.0000		
46	105	size: office empl. in parcel	FT worker	<$50K	-0.8820	0.311	-2.8
47	106	size: other empl. in parcel	FT worker	<$50K	-1.5311	0.670	-2.3
48	107	size: retail empl. in parcel	FT worker	<$50K	-1.1755	0.349	-3.4
49	108	size: medical empl. in parcel	FT worker	<$50K	-0.3607	0.380	-1.0
50	109	size: industrial empl. in parcel	FT worker	<$50K	-1.2685	0.320	-4.0
51	111	size: # households in parcel	FT worker	<$50K	-10.9767	0.607	-18.1
52	114	size: service empl. in parcel	FT worker	>$50K	-1.2946	0.232	-5.6
53	115	size: education empl. in parcel	FT worker	>$50K	-0.3744	0.251	-1.5
54	116	size: restaurant empl. in parcel	FT worker	>$50K	-2.7613	0.341	-8.1
55	117	size: gov empl. in parcel	FT worker	>$50K	0.0000		
56	118	size: office empl. in parcel	FT worker	>$50K	-0.9407	0.218	-4.3
57	119	size: other empl. in parcel	FT worker	>$50K	-0.6419	0.342	-1.9
58	120	size: retail empl. in parcel	FT worker	>$50K	-2.1009	0.280	-7.5
59	121	size: medical empl. in parcel	FT worker	>$50K	-0.8232	0.267	-3.1
60	122	size: industrial empl. in parcel	FT worker	>$50K	-2.0504	0.253	-8.1
61	124	size: # households in parcel	FT worker	>$50K	-11.5899	0.536	-21.6
62	125	size: University enrollment in parcel	FT worker	>$50K	-3.3305	1.396	-2.4
63	127	size: service empl. in parcel	PT worker	<$50K	-0.3965	0.650	-0.6
64	128	size: education empl. in parcel	PT worker	<$50K	0.0000		
65	129	size: restaurant empl. in parcel	PT worker	<$50K	-0.9330	0.870	-1.1
66	130	size: gov empl. in parcel	PT worker	<$50K	-0.7620	1.021	-0.7
67	131	size: office empl. in parcel	PT worker	<$50K	-0.3803	0.629	-0.6
68	132	size: other empl. in parcel	PT worker	<$50K	-1.8330	1.976	-0.9
69	133	size: retail empl. in parcel	PT worker	<$50K	-0.7966	0.745	-1.1
70	134	size: medical empl. in parcel	PT worker	<$50K	-2.6180	1.362	-1.9
71	135	size: industrial empl. in parcel	PT worker	<$50K	-1.7761	0.749	-2.4
72	137	size: # households in parcel	PT worker	<$50K	-11.1622	1.202	-9.3
73	140	size: service empl. in parcel	PT worker	>$50K	-1.0957	0.778	-1.4
74	141	size: education empl. in parcel	PT worker	>$50K	0.5177	0.932	0.6
75	142	size: restaurant empl. in parcel	PT worker	>$50K	-2.2181	1.131	-2.0
76	143	size: gov empl. in parcel	PT worker	>$50K	0.1927	0.938	0.2
77	144	size: office empl. in parcel	PT worker	>$50K	-0.1419	0.707	-0.2
78	145	size: other empl. in parcel	PT worker	>$50K	-1.0089	1.423	-0.7
79	146	size: retail empl. in parcel	PT worker	>$50K	-0.8157	0.802	-1.0
80	147	size: medical empl. in parcel	PT worker	>$50K	0.1336	0.825	0.2
81	148	size: industrial empl. in parcel	PT worker	>$50K	-2.1698	0.854	-2.5
82	150	size: # households in parcel	PT worker	>$50K	-12.7760	1.617	-7.9
83	152	size: K-12 enrollment in parcel	PT worker	>$50K	0.0000		
84	153	size: service empl. in parcel	not FT/PT worker	reported	-1.8385	0.590	-3.1
85	154	size: education empl. in parcel	not FT/PT worker	reported	-1.9346	0.781	-2.5
86	155	size: restaurant empl. in parcel	not FT/PT worker	reported	0.0000		
87	156	size: gov empl. in parcel	not FT/PT worker	reported	-0.8038	0.833	-1.0
88	157	size: office empl. in parcel	not FT/PT worker	reported	-0.1983	0.490	-0.4
89	158	size: other empl. in parcel	not FT/PT worker	reported	-1.4767	1.185	-1.2
90	159	size: retail empl. in parcel	not FT/PT worker	reported	-0.8931	0.590	-1.5
91	160	size: medical empl. in parcel	not FT/PT worker	reported	-2.5169	1.000	-2.5
92	161	size: industrial empl. in parcel	not FT/PT worker	reported	-3.2164	0.745	-4.3
93	163	size: # households in parcel	not FT/PT worker	reported	-11.1020	0.984	-11.3
94	164	size: University enrollment in parcel	not FT/PT worker	reported	-1.4594	2.157	-0.7
95	175	size: total empl. in parcel		unreported	-0.3911	1.448	-0.3
96	176	size: # households in parcel		unreported	-9.5848	1.636	-5.9
97	177	size: University enrollment in parcel		unreported	0.0000		
98	178	size: K-12 enrollment in parcel		unreported	-1.4187	1.668	-0.9
		Summary statistics					
		Number observed choices			3862		
		Number of estimated parameters			88		
		Log likelihood w coeffs=0			-17723.0		
		Final Log likelihood			-15470.9		
		Rho squared			0.127		
		Adjusted rho squared			0.122		

Table 4—Work Tour Destination Estimation Results

Row	Parm ID	Alternative Attribute	Person/Tour Characteristics		Est.	Std. error	T-stat
1	1	Sampling adjustment factor for estimation			1.0000		
2	2	Usual location	constant		57.1879	4.476	12.8
3	3	Usual location	PT worker		-7.7853	3.121	-2.5
4	4	Usual location	child or univ. stud.		-8.7800	4.540	-1.9
5	12	Usual location	pattern has 2+ work tours	primary tour	-11.4371	3.259	-3.5
6	13	Usual location	pattern has intermediate work stop(s)		-14.2930	2.676	-5.3
7	16	Usual location		secondary tour	-18.2026	3.031	-6.0
8	994	Dest choice logsum (in usual location vs other choice)			0.0750		
9	17	Mode choice logsum	FT worker	usual location	1.0000		
10	18	Mode choice logsum	FT worker	tour dest.	1.0000		
11	19	Mode choice logsum	PT worker		1.0000		
12	20	Mode choice logsum	not FT/PT worker		1.0000		
13	21	Nat log (1 + one-way drive dist (10s of mi))	FT worker	usual location	-1.5039	0.054	-27.9
14	22	Nat log (1 + one-way drive dist (10s of mi))	FT worker	tour dest.	-0.8291	0.298	-2.8
15	23	Nat log (1 + one-way drive dist (10s of mi))	PT worker		-3.0011	0.164	-18.3
16	24	Nat log (1 + one-way drive dist (10s of mi))	not FT/PT worker		-3.5019	0.310	-11.3
17	35	Nat log (1 + one-way drive dist (10s of mi))		secondary tour	-2.3438	0.664	-3.5
18	37	Nat log (1 + one-way drive dist from work (10s of mi))		tour dest.	-0.2761	0.276	-1.0
19	38	Nat log (1 + one-way drive dist from school (10s of mi))	child or univ. stud.		-1.8451	0.327	-5.7
20	39	Aggr. mode-dest logsum at dest	FT worker		0.0867	0.034	2.5
21	41	Aggr. mode-dest logsum at dest	not FT/PT worker		0.0386	0.133	0.3
22	52	Mix of daily parking & empl. in parcel: ln(1+prkg*empl/(prkg+empl))			0.1974	0.022	8.8
23	54	Mix of daily parking & (empl+stud) in TAZ: ln(1+prkgdens*(empldens+studdens)/(prkgdens+empldens+studdens)), (dens in units/Msqft)			0.1259	0.011	11.5
24	56	Street connectivity: (# 3 & 4 link nodes)/(# 1,3,4-link nodes) within a qtr mile		usual location	0.7782	0.119	6.5
25	57	Street connectivity: (# 3 & 4 link nodes)/(# 1,3,4-link nodes) within a qtr mile	HH has 0 cars or less than drivers	tour dest.	2.3027	1.472	1.6
26	68	dens of service empl in TAZ (ln[1+empl*100/Msqft])	FT worker	HH inc <$50K	-0.0484	0.019	-2.5
27	69	dens of households in TAZ (ln[1+HH*100/Msqft])	FT worker	HH inc <$50K	-0.0680	0.012	-5.6
28	70	dens of educ empl in TAZ (ln[1+empl*100/Msqft])	FT worker	HH inc >$50K	-0.0231	0.009	-2.7
29	71	dens of gov empl in TAZ (ln[1+empl*100/Msqft])	FT worker	HH inc >$50K	0.0281	0.007	3.8
30	72	dens of office empl in TAZ (ln[1+empl*100/Msqft])	FT worker	HH inc >$50K	0.1244	0.022	5.5
31	73	dens of service empl in TAZ (ln[1+empl*100/Msqft])	FT worker	HH inc >$50K	-0.0889	0.023	-3.9
32	74	dens of households in TAZ (ln[1+HH*100/Msqft])	FT worker	HH inc >$50K	-0.0725	0.009	-8.1

33	82	dens of office empl in TAZ (ln[1+empl*100/Msqft])	PT worker	HH inc >$50K	0.1372	0.070	2.0
34	83	dens of service empl in TAZ (ln[1+empl*100/Msqft])	PT worker	HH inc >$50K	-0.1410	0.073	-1.9
35	89	dens of households in TAZ (ln[1+HH*100/Msqft])	not FT/PT worker	HH inc reported	-0.0970	0.028	-3.5
36	92	dens of office empl in TAZ (ln[1+empl*100/Msqft])		HH inc unreported	0.1861	0.054	3.4
37	93	dens of service empl in TAZ (ln[1+empl*100/Msqft])		HH inc unreported	-0.1343	0.058	-2.3
38	94	dens of households in TAZ (ln[1+HH*100/Msqft])		HH inc unreported	-0.0424	0.024	-1.8
39	999	Size function scale			0.4950	0.011	43.5
40	100	size: service empl. in parcel	FT worker	HH inc <$50K	-0.7498	0.312	-2.4
41	101	size: education empl. in parcel	FT worker	HH inc <$50K	-0.8826	0.402	-2.2
42	102	size: restaurant empl. in parcel	FT worker	HH inc <$50K	-1.4107	0.426	-3.3
43	103	size: gov empl. in parcel	FT worker	HH inc <$50K	0.0000		
44	104	size: office empl. in parcel	FT worker	HH inc <$50K	-0.6592	0.307	-2.2
45	105	size: other empl. in parcel	FT worker	HH inc <$50K	-1.3898	0.667	-2.1
46	106	size: retail empl. in parcel	FT worker	HH inc <$50K	-0.9463	0.345	-2.7
47	107	size: medical empl. in parcel	FT worker	HH inc <$50K	-0.2649	0.379	-0.7
48	108	size: industrial empl. in parcel	FT worker	HH inc <$50K	-1.0914	0.317	-3.4
49	110	size: # households in parcel	FT worker	HH inc <$50K	-10.8318	0.602	-18.0
50	113	size: service empl. in parcel	FT worker	HH inc >$50K	-1.3080	0.226	-5.8
51	114	size: education empl. in parcel	FT worker	HH inc >$50K	-0.4178	0.244	-1.7
52	115	size: restaurant empl. in parcel	FT worker	HH inc >$50K	-2.7440	0.332	-8.3
53	116	size: gov empl. in parcel	FT worker	HH inc >$50K	0.0000		
54	117	size: office empl. in parcel	FT worker	HH inc >$50K	-0.9488	0.211	-4.5
55	118	size: other empl. in parcel	FT worker	HH inc >$50K	-0.6469	0.334	-1.9
56	119	size: retail empl. in parcel	FT worker	HH inc >$50K	-2.1131	0.273	-7.7
57	120	size: medical empl. in parcel	FT worker	HH inc >$50K	-0.8517	0.261	-3.3
58	121	size: industrial empl. in parcel	FT worker	HH inc >$50K	-2.0475	0.246	-8.3
59	123	size: # households in parcel	FT worker	HH inc >$50K	-11.6581	0.532	-21.9
60	124	size: University enrollment in parcel	FT worker	HH inc >$50K	-3.2596	1.211	-2.7
61	126	size: service empl. in parcel	PT worker	HH inc <$50K	-0.6245	0.597	-1.0
62	127	size: education empl. in parcel	PT worker	HH inc <$50K	0.0000		
63	128	size: restaurant empl. in parcel	PT worker	HH inc <$50K	-1.1490	0.839	-1.4
64	129	size: gov empl. in parcel	PT worker	HH inc <$50K	-0.7867	0.959	-0.8
65	130	size: office empl. in parcel	PT worker	HH inc <$50K	-0.5929	0.577	-1.0
66	131	size: other empl. in parcel	PT worker	HH inc <$50K	-1.9033	1.992	-1.0
67	132	size: retail empl. in parcel	PT worker	HH inc <$50K	-0.8655	0.682	-1.3
68	133	size: medical empl. in parcel	PT worker	HH inc <$50K	-2.7120	1.359	-2.0
69	134	size: industrial empl. in parcel	PT worker	HH inc <$50K	-2.0559	0.707	-2.9
70	136	size: # households in parcel	PT worker	HH inc <$50K	-11.3527	1.182	-9.6
71	139	size: service empl. in parcel	PT worker	HH inc >$50K	-0.6517	0.791	-0.8
72	140	size: education empl. in parcel	PT worker	HH inc >$50K	0.8319	0.998	0.8
73	141	size: restaurant empl. in parcel	PT worker	HH inc >$50K	-2.0638	1.157	-1.8
74	142	size: gov empl. in parcel	PT worker	HH inc >$50K	0.3718	0.971	0.4
75	143	size: office empl. in parcel	PT worker	HH inc >$50K	0.1608	0.734	0.2
76	144	size: other empl. in parcel	PT worker	HH inc >$50K	-1.0027	1.446	-0.7
77	145	size: retail empl. in parcel	PT worker	HH inc >$50K	-0.6300	0.838	-0.8
78	146	size: medical empl. in parcel	PT worker	HH inc >$50K	0.3197	0.855	0.4
79	147	size: industrial empl. in parcel	PT worker	HH inc >$50K	-1.7929	0.864	-2.1
80	149	size: # households in parcel	PT worker	HH inc >$50K	-12.5391	1.636	-7.7
81	151	size: K-12 enrollment in parcel	PT worker	HH inc >$50K	0.0000		
82	152	size: service empl. in parcel	not FT/PT worker	HH inc reported	-1.7889	0.573	-3.1
83	153	size: education empl. in parcel	not FT/PT worker	HH inc reported	-1.7642	0.751	-2.3

84	154	size: restaurant empl. in parcel	not FT/PT worker	HH inc reported	0.0000		
85	155	size: gov empl. in parcel	not FT/PT worker	HH inc reported	-0.7816	0.822	-1.0
86	156	size: office empl. in parcel	not FT/PT worker	HH inc reported	-0.2222	0.476	-0.5
87	157	size: other empl. in parcel	not FT/PT worker	HH inc reported	-1.3686	1.227	-1.1
88	158	size: retail empl. in parcel	not FT/PT worker	HH inc reported	-0.9169	0.580	-1.6
89	159	size: medical empl. in parcel	not FT/PT worker	HH inc reported	-2.2593	0.955	-2.4
90	160	size: industrial empl. in parcel	not FT/PT worker	HH inc reported	-3.2709	0.743	-4.4
91	162	size: # households in parcel	not FT/PT worker	HH inc reported	-11.1263	0.980	-11.4
92	163	size: University enrollment in parcel	not FT/PT worker	HH inc reported	-1.5327	2.161	-0.7
93	174	size: total empl. in parcel		HH inc unreported	0.8463	1.275	0.7
94	175	size: # households in parcel		HH inc unreported	-8.4416	1.479	-5.7
95	176	size: University enrollment in parcel		HH inc unreported	0.0000		
96	177	size: K-12 enrollment in parcel		HH inc unreported	-0.3387	1.524	-0.2
97	188	size: # households in parcel		tour dest.	-5.6565	0.516	-11.0
98	992	Scale of usual location data			1.1702	0.106	11.1
99	993	Scale of tour data			1.0000		

Summary statistics	
Number observed choices	6538
Number of estimated parameters	86
Log likelihood w coeffs=0	-29957.4
Final Log likelihood	-15527.5
Rho squared	0.482
Adjusted rho squared	0.479

Table 5—School Location Estimation Results

Row	Parm ID	Alternative Attribute	Person Characteristic	Est.	Std. error	T-stat
1	1	Sampling adjustment factor for estimation		1.0000		
2	95	Home location	constant	-80.5728	65.388	-1.2
3	96	Home location	adult not univ. stud.	22.4107	11.362	2.0
4	102	Home location	HH size	7.3239	5.451	1.3
5	998	Dest choice logsum (in home vs other choice)		0.0675	0.047	1.4
6	2	Mode choice logsum	child age <5	1.0000		
7	3	Mode choice logsum	child age 5-15	1.0000		
8	4	Mode choice logsum	driving age stud.	1.0000		
9	5	Mode choice logsum	univ. stud.	1.0000		
10	6	Mode choice logsum	adult not univ. stud.	1.0000		
11	7	One-way drive dist--0-1 mi (10s of mi)	child age <5	-22.7384	5.052	-4.5
12	8	One-way drive dist--1-5 mi (10s of mi)	child age <5	-4.1532	0.795	-5.2
13	9	One-way drive dist--5+ mi (10s of mi)	child age <5	-1.6212	0.249	-6.5
14	10	One-way drive dist--0-1 mi (10s of mi)	child age 5-15	-16.2979	1.577	-10.3
15	11	One-way drive dist--1-5 mi (10s of mi)	child age 5-15	-8.0099	0.307	-26.1
16	12	One-way drive dist--5+ mi (10s of mi)	child age 5-15	-2.2769	0.154	-14.8
17	13	Nat log (1 + one-way drive dist (10s of mi))	driving age stud.	-6.1357	0.299	-20.5
18	14	Nat log (1 + one-way drive dist (10s of mi))	univ. stud.	-2.9403	0.188	-15.6
19	15	Nat log (1 + one-way drive dist (10s of mi))	adult not univ. stud.	-1.7008	0.235	-7.2
20	16	Nat log (1 + one-way drive dist from work (10s of mi))	adult not univ. stud.	-1.4594	0.254	-5.8
21	17	Aggr. mode-dest logsum at dest	child age <5	0.2850	0.159	1.8
22	18	Aggr. mode-dest logsum at dest	child age 5-15	0.1009	0.085	1.2
23	19	Aggr. mode-dest logsum at dest	driving age stud.	0.1085	0.161	0.7
24	20	Aggr. mode-dest logsum at dest	univ. stud.	1.3147	0.115	11.4
25	21	Aggr. mode-dest logsum at dest	adult not univ. stud.	1.0434	0.127	8.2
26	53	dens of educ empl in TAZ (ln[1+empl*100/Msqft])	child age 5-15	0.0884	0.019	4.7
27	56	dens of service empl in TAZ (ln[1+empl*100/Msqft])	child age 5-15	-0.0952	0.025	-3.8
28	71	dens of educ empl in TAZ (ln[1+empl*100/Msqft])	driving age stud.	0.0895	0.033	2.7
29	91	dens of gov empl in TAZ (ln[1+empl*100/Msqft])	adult or univ. stud.	0.0628	0.015	4.2
30	92	dens of office empl in TAZ (ln[1+empl*100/Msqft])	adult or univ. stud.	0.0793	0.038	2.1
31	93	dens of service empl in TAZ (ln[1+empl*100/Msqft])	adult or univ. stud.	-0.2318	0.040	-5.8
32	94	dens of households in TAZ (ln[1+HH*100/Msqft])	adult or univ. stud.	-0.1620	0.016	-9.8
33	999	Size function scale		0.2395	0.004	62.1
34	22	size: education empl. in parcel	child age <5	-6.4212	2.178	-2.9
35	28	size: service empl. in parcel	child age <5	-8.0189	1.212	-6.6
36	32	size: # households in parcel	child age <5	-18.3839	0.997	-18.4
37	34	size: K-12 enrollment in parcel	child age <5	0.0000		
38	40	size: education empl. in parcel	child age 5-15	-9.0152	0.740	-12.2
39	46	size: service empl. in parcel	child age 5-15	-22.4509	1.546	-14.5
40	50	size: # households in parcel	child age 5-15	-23.4589	0.553	-42.4
41	52	size: K-12 enrollment in parcel	child age 5-15	0.0000		
42	58	size: education empl. in parcel	driving age stud.	-8.5263	1.391	-6.1
43	64	size: service empl. in parcel	driving age stud.	-18.6746	1.854	-10.1
44	68	size: # households in parcel	driving age stud.	-21.0771	0.695	-30.3

Row	Parm ID	Alternative Attribute	Person Characteristic	Est.	Std. error	T-stat
45	70	size: K-12 enrollment in parcel	driving age stud.	0.0000		
46	76	size: education empl. in parcel	adult or univ. stud.	-5.9870	0.469	-12.8
47	85	size: total empl. in parcel	adult or univ. stud.	-24.9657	0.742	-33.6
48	87	size: University enrollment in parcel	adult or univ. stud.	0.0000		
		Summary statistics				
		Number observed choices		2109		
		Number of estimated parameters		38		
		Log likelihood w coeffs=0		-9131.7		
		Final Log likelihood		-6915.2		
		Rho squared		0.243		
		Adjusted rho squared		0.239		

Table 6—Non-work/Non-school Tour Destination Estimation Results

Row	Parm ID	Alternative Attribute	Person/Tour Characteristics		Est.	Std. error	T-stat
1	1	Sampling adjustment factor for estimation			1.0000		
2	2	Mode choice logsum			1.0000		
3	3	One-way drive dist--0-1 mi (10s of mi)	escort		-10.3465	2.251	-4.6
4	4	One-way drive dist--1-3.5 mi (10s of mi)	escort		-3.5546	0.554	-6.4
5	5	One-way drive dist--3.5-10 mi (10s of mi)	escort		-2.4826	0.271	-9.2
6	7	One-way drive dist--0-1 mi (10s of mi)	personal business		-13.4222	1.973	-6.8
7	8	One-way drive dist--1-3.5 mi (10s of mi)	personal business		-4.1386	0.439	-9.4
8	9	One-way drive dist--3.5-10 mi (10s of mi)	personal business		-2.1585	0.185	-11.6
9	10	One-way drive dist--10+ mi (10s of mi)	personal business		-0.7635	0.090	-8.5
10	11	One-way drive dist--0-1 mi (10s of mi)	shopping		-9.6628	2.168	-4.5
11	12	One-way drive dist--1-3.5 mi (10s of mi)	shopping		-7.1718	0.466	-15.4
12	13	One-way drive dist--3.5-10 mi (10s of mi)	shopping		-2.6892	0.215	-12.5
13	14	One-way drive dist--10+ mi (10s of mi)	shopping		-0.8238	0.110	-7.5
14	15	One-way drive dist--0-1 mi (10s of mi)	meal		-15.6510	2.741	-5.7
15	16	One-way drive dist--1-3.5 mi (10s of mi)	meal		-6.4441	0.723	-8.9
16	17	One-way drive dist--3.5-10 mi (10s of mi)	meal		-1.9888	0.317	-6.3
17	18	One-way drive dist--10+ mi (10s of mi)	meal		-1.1556	0.218	-5.3
18	19	One-way drive dist--0-1 mi (10s of mi)	social/recreation		-16.1538	2.471	-6.5
19	20	One-way drive dist--1-3.5 mi (10s of mi)	social/recreation		-3.4164	0.586	-5.8
20	21	One-way drive dist--3.5-10 mi (10s of mi)	social/recreation		-2.0259	0.234	-8.6
21	22	One-way drive dist--10+ mi (10s of mi)	social/recreation		-0.4468	0.104	-4.3
22	23	One-way drive dist--0-1 mi (10s of mi)	secondary tour	work/school pattern	3.2248	2.107	1.5
23	24	One-way drive dist--1-5 mi (10s of mi)	secondary tour	work/school pattern	-1.1027	0.320	-3.4
24	25	One-way drive dist--5-10 mi (10s of mi)	secondary tour	work/school pattern	0.0240	0.289	0.1
25	26	One-way drive dist--10+ mi (10s of mi)	secondary tour	work/school pattern	-0.4439	0.127	-3.5
26	27	One-way drive dist--0-1 mi (10s of mi)	secondary tour	not work/school pattern	-3.7189	2.064	-1.8
27	28	One-way drive dist--1-5 mi (10s of mi)	secondary tour	not work/school pattern	-0.8124	0.307	-2.6
28	29	One-way drive dist--5-10 mi (10s of mi)	secondary tour	not work/school pattern	-0.3132	0.278	-1.1
29	30	One-way drive dist--10+ mi (10s of mi)	secondary tour	not work/school pattern	-0.3648	0.118	-3.1
30	31	Nat log (1 + one-way drive dist (10s of mi))	work based tour		-1.2039	0.281	-4.3
31	32	Nat log (1 + one-way drive dist (10s of mi))		HH inc<$15K	0.5535	0.213	2.6
32	33	Nat log (1 + one-way drive dist (10s of mi))		HH inc unreported	0.4300	0.171	2.5
33	34	Nat log (1 + one-way drive dist (10s of mi))		nonworker age 65+	-0.4296	0.132	-3.3
34	35	Nat log (1 + one-way drive dist (10s of mi))		univ. stud.	0.3536	0.269	1.3
35	36	Nat log (1 + one-way drive dist (10s of mi))		child age 5-15	-0.8487	0.254	-3.3
36	37	Nat log (1 + one-way drive dist (10s of mi))		child age <5	-0.9308	0.272	-3.4
37	38	Nat log (1 + one-way drive dist (10s of mi))	home based tour	inverse of (hours avail. in 18 hour day)/(remaining HB tours, including this one)	-2.3372	1.122	-2.1
38	40	Nat log (1 + one-way drive dist from school (10s of mi))	home based tour		-0.5644	0.184	-3.1
39	41	Aggr. mode-dest logsum at dest	escort		0.1648	0.083	2.0
40	42	Aggr. mode-dest logsum at dest	personal business		0.0206	0.052	0.4
41	43	Aggr. mode-dest logsum at dest	shopping		0.1892	0.060	3.1
42	56	Mix of hourly parking & commercial empl in parcel: ln(1+prkg*empl/(prkg+empl))		Less cars than drivers	0.2506	0.060	4.2
43	57	Mix of hourly parking & commercial empl in parcel: ln(1+prkg*empl/(prkg+empl))		1+ cars per driver	0.1561	0.043	3.7
44	58	Mix of hourly parking & commercial empl.in TAZ: ln(1+ prkgdens*empldens/ (prkgdens+empldens)), (dens in units/Msqft)		Less cars than drivers	0.0607	0.024	2.5
45	59	Mix of hourly parking & commercial empl.in TAZ: ln(1+ prkgdens*empldens/ (prkgdens+empldens)), (dens in		1+ cars per driver	0.0479	0.015	3.3

Row	Parm ID	Alternative Attribute	Person/Tour Characteristics	Est.	Std. error	T-stat
		units/Msqft)				
46	60	Street connectivity: (# 3 & 4 link nodes)/(# 1,3,4-link nodes) within a qtr mile	HH has no car	0.7290	1.029	0.7
47	62	Street connectivity: (# 3 & 4 link nodes)/(# 1,3,4-link nodes) within a qtr mile	1+ cars per driver	0.2101	0.118	1.8
48	64	dens of gov empl in TAZ (ln[1+empl*100/Msqft])	escort, HH w/o kids	0.0570	0.021	2.8
49	67	dens of households in TAZ (ln[1+HH*100/Msqft])	escort, HH w/o kids	-0.1676	0.036	-4.7
50	68	dens of univ enroll. in TAZ (ln[1+students*100/Msqft])	escort, HH w/o kids	0.1113	0.047	2.4
51	74	dens of households in TAZ (ln[1+HH*100/Msqft])	escort, HH w kids	-0.2159	0.028	-7.8
52	75	dens of K-12 enroll. in TAZ (ln[1+students*100/Msqft])	escort, HH w kids	0.0926	0.014	6.5
53	76	dens of educ empl in TAZ (ln[1+empl*100/Msqft])	personal business	0.0218	0.010	2.2
54	78	dens of office empl in TAZ (ln[1+empl*100/Msqft])	personal business	0.0674	0.026	2.6
55	79	dens of service empl in TAZ (ln[1+empl*100/Msqft])	personal business	-0.1216	0.025	-4.8
56	80	dens of medical empl in TAZ (ln[1+empl*100/Msqft])	personal business	0.0618	0.012	5.3
57	81	dens of households in TAZ (ln[1+HH*100/Msqft])	personal business	-0.0790	0.012	-6.3
58	82	dens of univ enroll. in TAZ (ln[1+students*100/Msqft])	personal business	0.0739	0.025	3.0
59	83	dens of educ empl in TAZ (ln[1+empl*100/Msqft])	shopping	-0.0513	0.009	-5.6
60	86	dens of retail empl in TAZ (ln[1+empl*100/Msqft])	shopping	-0.0821	0.015	-5.4
61	98	dens of office empl in TAZ (ln[1+empl*100/Msqft])	social/recreation	0.0636	0.029	2.2
62	99	dens of service empl in TAZ (ln[1+empl*100/Msqft])	social/recreation	-0.0662	0.030	-2.2
63	100	dens of households in TAZ (ln[1+HH*100/Msqft])	social/recreation	-0.1166	0.016	-7.1
64	999	Size function scale		0.5114	0.011	45.6
65	101	size: education empl. in parcel	escort, HH w/o kids	-0.9176	0.763	-1.2
66	102	size: restaurant empl. in parcel	escort, HH w/o kids	-5.6366	2.038	-2.8
67	103	size: gov empl. in parcel	escort, HH w/o kids	-3.0659	1.230	-2.5
68	104	size: office empl. in parcel	escort, HH w/o kids	-2.3159	0.626	-3.7
69	105	size: other empl. in parcel	escort, HH w/o kids	-2.9968	1.963	-1.5
70	106	size: retail empl. in parcel	escort, HH w/o kids	-3.1226	0.838	-3.7
71	107	size: service empl. in parcel	escort, HH w/o kids	-1.1827	0.510	-2.3
72	108	size: medical empl. in parcel	escort, HH w/o kids	-1.7080	0.733	-2.3
73	109	size: industrial empl. in parcel	escort, HH w/o kids	-6.0840	1.396	-4.4
74	111	size: # households in parcel	escort, HH w/o kids	-5.6072	0.502	-11.2
75	113	size: K-12 enrollment in parcel	escort, HH w/o kids	0.0000		
76	114	size: education empl. in parcel	escort, HH w kids	-2.7619	0.491	-5.6
77	116	size: gov empl. in parcel	escort, HH w kids	-4.1676	1.046	-4.0
78	117	size: office empl. in parcel	escort, HH w kids	-5.5261	0.693	-8.0
79	118	size: other empl. in parcel	escort, HH w kids	-2.5723	0.693	-3.7
80	119	size: retail empl. in parcel	escort, HH w kids	-4.6152	0.525	-8.8
81	120	size: service empl. in parcel	escort, HH w kids	-3.3857	0.358	-9.4
82	121	size: medical empl. in parcel	escort, HH w kids	-5.3776	1.020	-5.3
83	122	size: industrial empl. in parcel	escort, HH w kids	-6.8507	0.881	-7.8
84	124	size: # households in parcel	escort, HH w kids	-6.7705	0.341	-19.9
85	126	size: K-12 enrollment in parcel	escort, HH w kids	0.0000		
86	127	size: education empl. in parcel	personal business	-2.6366	0.352	-7.5
87	128	size: restaurant empl. in parcel	personal business	-4.3771	0.527	-8.3

Row	Parm ID	Alternative Attribute	Person/Tour Characteristics	Est.	Std. error	T-stat
88	129	size: gov empl. in parcel	personal business	-2.4465	0.365	-6.7
89	130	size: office empl. in parcel	personal business	-2.2034	0.217	-10.1
90	132	size: retail empl. in parcel	personal business	-2.7544	0.285	-9.7
91	133	size: service empl. in parcel	personal business	-1.2135	0.195	-6.2
92	134	size: medical empl. in parcel	personal business	0.0000		
93	135	size: industrial empl. in parcel	personal business	-5.4169	0.405	-13.4
94	137	size: # households in parcel	personal business	-6.5677	0.270	-24.3
95	139	size: K-12 enrollment in parcel	personal business	-4.2720	0.491	-8.7
96	141	size: restaurant empl. in parcel	shopping	-3.8967	0.381	-10.2
97	143	size: office empl. in parcel	shopping	-7.4857	0.384	-19.5
98	145	size: retail empl. in parcel	shopping	0.0000		
99	146	size: service empl. in parcel	shopping	-4.7453	0.217	-21.9
100	154	size: restaurant empl. in parcel	meal	0.0000		
101	156	size: office empl. in parcel	meal	-8.2240	0.904	-9.1
102	162	size: total empl. in parcel	meal	-8.2056	0.343	-23.9
103	163	size: # households in parcel	meal	-11.1591	0.385	-29.0
104	166	size: education empl. in parcel	social/recreation	-3.0254	0.602	-5.0
105	167	size: restaurant empl. in parcel	social/recreation	-2.0484	0.552	-3.7
106	168	size: gov empl. in parcel	social/recreation	-4.2847	1.052	-4.1
107	169	size: office empl. in parcel	social/recreation	-3.7599	0.419	-9.0
108	170	size: other empl. in parcel	social/recreation	-4.6129	1.381	-3.3
109	171	size: retail empl. in parcel	social/recreation	-3.8140	0.527	-7.2
110	172	size: service empl. in parcel	social/recreation	0.0000		
111	173	size: medical empl. in parcel	social/recreation	-1.4894	0.373	-4.0
112	176	size: # households in parcel	social/recreation	-4.6660	0.218	-21.5
113	177	size: University enrollment in parcel	social/recreation	-2.5902	1.269	-2.0
114	178	size: K-12 enrollment in parcel	social/recreation	-3.4295	0.634	-5.4
		Summary statistics				
		Number observed choices		5772		
		Number of estimated parameters		106		
		Log likelihood w coeffs=0		-26382.2		
		Final Log likelihood		-21818.1		
		Rho squared		0.173		
		Adjusted rho squared		0.169		

An important test of the model estimation results involves applying the model to the sample used for estimation, and comparing its predictions to observed choices for various subsets of the sample, defined by population characteristics. This test was used during model estimation to identify poorly predicted population segments so that variables could be added or changed to improve the prediction. **Appendix 3** shows the application results for nearly final versions of the models.

An important aspect of the destination choice models, determined by the model structure and parameter estimates, is their sensitivity to travel time and cost. In order to test this, the models were applied on the estimation data set under the base conditions assumed for estimation, and then again with travel times increased by 10%. **Table 7** shows the average one-way tour distance predicted by the model for various population subsets under the base conditions, and the elasticity of distance with respect to travel time. The first column shows that aggregate elasticity for usual work locations is -.0.22. That is, if travel time increases by 10%, then predicted work location distance decreases, on average, by 2.2%. The elasticity of the work tour location choice

is quite small, in fact nearly zero. This is because the vast majority of work tours go to the usual work location, and the elasticity would come only from distance sensitivity on the small percent of tours to other locations, and any small shift to or from the usual location arising from the change in travel time. Elasticity for the school location choice is –0.14, smaller than for work location, and elasticity for other purposes is greater, at –0.29. Elasticities for some of the population segments differ considerably from the aggregate elasticities.

Table 7: Elasticity of distance with respect to travel time

	Average predicted distance (1-way miles, base conditions)					Elasticity of distance with respect to travel time			
Population Segment	**Usual work**	**Work tour**	**Usual school**	**Other tour**		**Usual work**	**Work tour**	**Usual school**	**Other tour**
Total	9.4	11.9	5.0	5.1		-0.22	-0.01	-0.14	-0.29
Purpose									
escort				3.9					-0.61
personal business				5.7					-0.25
shop				4.7					-0.21
meal				4.5					-0.20
social/recreation				6.1					-0.30
Person Type									
FT worker	10.2	12.3	9.4	4.7		-0.23	-0.01	-0.12	-0.27
PT worker	6.3	10.1		5.0		-0.24	-0.01		-0.34
Retired				5.3					-0.24
Non-worker				5.7					-0.32
University student	5.2	7.9	8.2	5.4		-0.17	-0.01	-0.17	-0.32
Drive student	5.2	6.2	3.9	5.1		-0.13	0.00	-0.08	-0.26
Student age 5-15			3.0	4.7				-0.10	-0.26
Under age 5			5.1	4.7				-0.16	-0.30
HH Income									
<15 K	6.5	10.2	4.8	4.9		-0.23	-0.01	-0.19	-0.28
15-50K	8.4	11.4	4.7	5.0		-0.23	-0.01	-0.13	-0.28
50-75K	10.2	12.7	5.2	5.0		-0.23	-0.01	-0.12	-0.28
75-100K	10.6	12.4	5.5	5.4		-0.22	-0.01	-0.11	-0.30
100K+	9.7	11.4	4.9	5.4		-0.21	-0.01	-0.12	-0.28
HH Size									
1	7.9	11.9	6.7	4.3		-0.21	-0.01	-0.15	-0.21
2	9.6	11.8	6.7	5.4		-0.22	-0.01	-0.15	-0.24
3	9.5	12.4	5.6	5.3		-0.22	-0.01	-0.13	-0.30
4	9.8	12.6	4.6	5.2		-0.22	-0.02	-0.13	-0.33
5	9.9	10.8	4.2	5.1		-0.22	-0.01	-0.14	-0.35
6	9.5	9.6	3.2	4.3		-0.20	-0.01	-0.13	-0.35
Gender									
Male	10.0	12.2	4.8	5.1		-0.22	-0.01	-0.13	-0.27
Female	8.8	11.6	5.2	5.1		-0.22	-0.01	-0.13	-0.29
Tour priority									
primary		12.3		6.0			-0.01		-0.30
secondary		7.6		4.8			-0.03		-0.27
workbased				3.4					-0.21
Auto Ownership									
0 autos		8.4		2.9			-0.01		-0.21
< 1 per driver		10.4		5.0			-0.01		-0.30
1+ per driver		12.3		5.2			-0.02		-0.29

Appendix 1—Sampling of Alternatives for Destination Choice

This appendix describes choice set sampling procedures used in the destination choice models. Modeling the choice of a particular parcel makes the universal choice set very large, and presents challenges to appropriately limit the number of alternatives considered when simulating choices.

The reduction of the universal choice set involves two conceptually different methods. The first method involves attempting to remove from the universal choice set those alternatives that the decisionmaker would not even consider in making the decision; they would appropriately be assigned a probability of zero. Examples of these include parcels that cannot be reached in the available time, and parcels that don't accommodate the desired type of activity. There is a behavioral basis for removing these parcels from the choice set, because there is no chance that they will even be considered.

The second method involves taking the remaining alternatives, that would all be reasonable alternatives for the decisionmaker to consider, and drawing a sample of them to actually use in simulating the choice. This is simply a procedural technique to reduce the computational burden of the model.

The procedures described in this paper employ both methods. The first method includes two aspects. First, each parcel is assigned purpose-specific sizes. For a given purpose, if a parcel has zero size, then it will be unavailable. Second, the approximate time required to reach a parcel is compared to an estimate of the available time. If the parcel can't be reached in time, then it is eliminated from consideration.

The second method uses a technique called importance sampling with replacement. The available alternatives are sampled in a way that allows the probability of being drawn into the sample to be calculated for each drawn alternative. Statistical procedures are then used during model estimation and application to allow the sample to represent the entire set of available alternatives without biasing the results.

The following material describes importance sampling with replacement, and then describes its implementation for usual locations and tour destinations, cases where the traveler is departing from a known location, visiting an unknown destination, and then returning to the original known location.

Importance sampling with replacement for MNL models—estimation procedure
(per Moshe Ben-Akiva, MIT course 1.205, Fall 1993)

The following procedure yields consistent MNL estimates:

Draw R times from the full choice set *C* with replacement and selection probabilities $q(j), j = 1,...,J$. Let $n_j, j = 1,...,J$ be the number of times alternative *j* was drawn.

Add the chosen alternative. Set $\tilde{n}_j = n_j + \delta_{jc}, j = 1,...,J$, where $\delta_{jc} = 1$ for $j = c$ and 0 otherwise and c denotes the chosen alternative.

Create the set $\tilde{D}$ as $\tilde{D} = \{ j \in C \mid \tilde{n}_j > 0 \}$

Estimate the following MNL: $\tilde{p}(i \mid \tilde{D}) = \dfrac{\exp[v_i - \ln(q(i)/\tilde{n}_i)]}{\sum_{j \in \tilde{D}} \exp[v_j - \ln(q(j)/\tilde{n}_j)]}$

Notes:

a. This procedure has **not** been proven to yield consistent estimates for nested logit models.

b. The correction factor expands the exponentiated utility of each sampled alternative by the inverse of the sampling probability, giving it the weight of all the unsampled alternatives it represents.

c. The correction factor is not part of the true model. It is removed for model application with a full choice set. However, it is retained when simulating choices with a similarly generated sample of alternatives.

d. In model application with a similarly generated sample of alternatives, it is not necessary to remove duplicates of sampled alternatives; instead, each occurrence of each alternative can simply be assigned $\tilde{n}_j = 1$. Statistically, the effect is identical; in one case there are $\tilde{n}_j$ identical alternatives with probability p, and in the other there is one alternative with probability $\tilde{n}_j p$.

Tour destination sampling

The procedure uses 2-stage importance sampling with replacement. For each parcel to be drawn, first a TAZ is drawn, and then a parcel within the TAZ. To formalize, define the following notation:

t_k, $k = 1,...,K$, are the TAZs with sampling probabilities $q(t_k)$

j, $j = 1,...,J$, are the parcels with conditional sampling probabilities $q(j \mid t_k)$

The unconditional parcel sampling probabilities are therefore calculated as $q(j) = q(t_k)q(j \mid t_k)$.

TAZ are sampled according to size and impedance based importance weights, and parcels are sampled according to size-based importance within TAZ, as follows:

$$q(t_k) \equiv W_{t_k h} / \sum W_{thg}$$
$$= M_{kh}^{p} \exp(-\alpha_h d_k) \Big/ \sum_{t_{\tilde{k}} | d_{\tilde{k}} < d_g} M_{\tilde{k}h}^{p} \exp(-\alpha_h d_{\tilde{k}}) \text{ if } d_k < d_g$$
$$= 0 \text{ otherwise}$$
$$q(j \mid t_k) = M_{jh}^{p} \Big/ M_{kh}^{p}$$

where

h is the importance weighting scheme

d_g is an impedance threshold beyond which locations are unavailable

$W_{t_k h} \equiv M_{kh}^{p} \exp(-\alpha_h d_k)$ is the importance weight for t_k, given h

$\sum W_{thg} \equiv \sum_{t_k | d_k < d_g} M_{kh}^{p} \exp(-\alpha_h d_k)$ is the sum of importance weights, given h and d_g.

$M_{kh}^{p} = \sum_{j \in t_k} M_{jh}^{p}$

M_{jh}^{p} is the size of parcel j for tour purpose p, given h

α_h is a mixing parameter that sets the relative influence of impedance and size

d_k is the impedance measured along the path from t^o to t_k and back,

t^o is the TAZ of the tour origin.

The importance weighting scheme, h, and the impedance threshold, d_g are selected at the time of the draw, and depend on known characteristics of the tour. h has a corresponding vector of parameters, θ_h, chosen from a small set of such vectors, $\boldsymbol{\theta} = (\theta_1, ..., \theta_h, ..., \theta_H)$, with $\theta_h = (\alpha_h, M_h)$. M_h are the parameters of a particular size function that generates the size of all TAZ. $\boldsymbol{\theta}$ will have been empirically derived to represent the full range of characteristics of all possible tour stop situations.

The tour destination sampling procedure:

To draw a sample of tour destinations for a given choice situation, the draw proceeds as follows:

Select the impedance threshold g and the importance weighting scheme, h, with its corresponding vector of weighting parameters, θ_h.

Look up the importance weight of all available TAZ in the region, $\sum W_{th}$, using the weight formula determined by θ_h.

For each needed destination alternative, draw a random number, *y*, between 0 and 1, and pass sequentially through TAZ in order of decreasing importance weight, $W_{t_k h}$, selecting the TAZ at the point where the cumulative importance weight exceeds $y^* \sum W_{thg}$. Retain its ID and its sampling probability, $q(t_k)$.

For each drawn TAZ, draw a random number between 0 and 1, and pass sequentially through its parcels in order of decreasing sampling probability, selecting the parcel at the point where the cumulative sampling probability exceeds the drawn random number. For each drawn parcel calculate and retain its unconditional sampling probability, $q(j) = q(t_k)q(j \mid t_k)$.

For estimation only, add the chosen parcel to the choice set (again, if it was already drawn randomly) and count the number of occurrences of each parcel. Retain only one copy of each distinct parcel ID, j, along with its unconditional sampling probability $q(j)$ and the number of times it was drawn, $\tilde{n}_j$

Appendix 2—Tour Destination Sampling Parameters

This appendix presents the details of the weighting schemes prescribed in appendix 3. The reason for weighting in the sampling of alternatives is to improve the statistical efficiency of the choice models. A choice model estimated and applied with a sample of alternatives is most efficient when the alternatives appear in the sample in proportion to their actual choice probabilities. If the sample is inefficient, the estimation or prediction is still statistically consistent, but less efficient (precise) than it might be. However, complex schemes designed for maximum statistical efficiency can cause severe computational inefficiency. Therefore, the choice of schemes constitutes a trade-off between statistical efficiency and computational efficiency.

Each scheme is defined by the attraction (size) variables used for sampling, and by the relative importance of travel impedance and activity attractiveness. Tours that have a similar spatial distribution, relative to tour origin, and that are attracted to the same kind of locations, share a weighting scheme. **Table A2.1** shows the groupings that have been chosen for sampling schemes, based on simple unweighted data analysis of the survey sample. The primary variable determining scheme is purpose, because attraction variables differ substantially by purpose. After that, the factors that affect the spatial distribution are primarily person type (especially full-time vs other persons for work tours), and tour priority (other things being equal, tours with longer distances are assigned higher priority in the sample).

Table A2.1—Groupings for tour sampling schemes

	Purpose	Person Type	Tour Priority
1	Work	Full-time worker	Usual location, Primary tour
2	Work	Full-time worker	Secondary tours Work-based tours
		Not full-time worker	Usual location and all tours
3	School	Full-time worker, Part-time worker, Non-worker 65+ Non-worker 18-64, University student	Usual location and all tours
4		Driving age student, Child age 5-15, Child under age 5	Usual location and all tours
5	Escort	All	All
6	Personal business	All	Primary tour
7		All	Secondary tours, Work-based tours
8	Shopping	All	Primary tour
9		All	Secondary tours, Work-based tours
10	Meal	All	Primary tour, Secondary tours
11		All	Work-based tours
12	Social/recreation	All	Primary tour, Work-based tours
13		All	Secondary tours

The following tables provide details from the sample data analysis upon which the grouping decisions were made.

Home-based work and school tours by purpose and person type

primary destination purpose type	person type	distance to tour dest
work	full time worker	
	Mean	1301.57
	N	2844
	part time worker	
	Mean	893.46
	N	324
	non-worker 65+	
	Mean	619.96
	N	22
	non-worker` 18-64	
	Mean	1262.24
	N	43
	university student	
	Mean	694.76
	N	96
	driving age student	
	Mean	451.51
	N	30
Mean		1232.31
N		3359
school	full time worker	
	Mean	990.48
	N	62
	part time worker	
	Mean	825.21
	N	2
	non-worker 65+	
	Mean	542.24
	N	1
	non-worker` 18-64	
	Mean	1015.50
	N	10
	university student	

Mean	868.93
N	237

Home-based work and school tours by purpose and person type, continued

primary destination purpose type	person type	distance to tour dest
	driving age student	
	Mean	448.52
	N	241
school	child age 5-15	
	Mean	300.28
	N	885
	child under 5	
	Mean	638.87
	N	104
Mean		466.91
N		1542

Home-based tours by purpose and priority

primary destination purpose type	tour priority	distance to tour dest
work	1.00	
	Mean	1295.09
	N	3086
	2.00	
	Mean	522.62
	N	273
Mean		1232.31
N		3359
school	1.00	
	Mean	450.85
	N	1394
	2.00	
	Mean	618.20
	N	148
Mean		466.91
N		1542
escort	1.00	
	Mean	524.01
	N	419
	2.00	
	Mean	429.32
	N	501
Mean		472.44
N		920
per.bus	1.00	
	Mean	799.39
	N	954
	2.00	
	Mean	605.15
	N	830
Mean		709.02
N		1784
shopping	1.00	
	Mean	702.28
	N	654

Home-based tours by purpose and priority, continued

primary destination purpose type	tour priority	distance to tour dest
	2.00	
	Mean	458.65
	N	885
Mean		562.18
N		1539
meal	1.00	
	Mean	732.95
	N	101
	2.00	
	Mean	693.58
	N	337
Mean		702.66
N		438
social/rec	1.00	
	Mean	937.01
	N	261
	2.00	
	Mean	673.21
	N	906
Mean		732.21
N		1167
Grand Total		
Mean		798.80
N		10749

Work-based tours by purpose

primary destination purpose type	distance to tour dest
work	
Mean	871.82
N	155
school	
Mean	915.89
N	5
escort	
Mean	433.14
N	18
per.bus	
Mean	477.40
N	121
shopping	
Mean	382.06
N	89
meal	
Mean	293.71
N	229
social/rec	
Mean	1190.02
N	32
Grand Total	
Mean	531.00
N	649

Appendix 3—Model application on estimation data

This appendix provides statistical results from applying the models on the estimation data. It is divided into four sections, with a separate section for each of the four models. In each section, each table is in two parts. The first part compares the observed and predicted distribution of travel time for various subsets of the tours (see column headings) under the base conditions used for model estimation. The comparison is made by identifying the number of tours (observed and predicted) falling into each of several travel time bands (see row headings in the left hand column), where travel time is the one-way mid-day travel time by automobile. The estimated standard deviation of the observed choices is also provided, and the number of stars for a prediction indicates the number of standard deviations by which the predicted deviates from the observed.

The second part of each table reports the predicted average value of ten tour attributes for each tour category. These attributes are:

ddist	one-way auto travel distance (10ths of miles)
dtime	round-trip auto travel time (minutes)
emped	medical employment at destination parcel
empsvc	service employment at destination parcel
empret	retail employment at destination parcel
emprest	restaurant employment at destination parcel
empofc	office employment at destination parcel
houses	households at destination parcel
studk12	grade school enrollment at destination parcel
studuniv	university enrollment at destination parcel

This section of the non-work table especially informative because it shows how effective the model is at matching trips of specific purposes with parcels that have appropriate levels of employment or enrollment of specific types.

Appendix 3.1—Usual work location model application

Table for perstype

	FT workr	PT workr	Re-tired	Non workr	Univ Stud	Driv Stud	Total
No. Chsn	222.0	14.0	.0	.0	1.0	.0	237.0
SD. Chsn	15.3	3.8	.0	.0	1.5	.8	15.8
1	*+	+			+	+	*+
No. Pred	238.1	14.8	.0	.0	2.2	.7	255.8
No. Chsn	1073.0	76.0	.0	.0	33.0	4.0	1186.0
SD. Chsn	31.9	8.8	.0	.0	4.6	3.0	33.5
2	*-	+			**-	*+	*-
No. Pred	1037.9	78.2	.0	.0	21.4	8.9	1146.4
No. Chsn	1093.0	174.0	.0	.0	54.0	32.0	1353.0
SD. Chsn	33.4	13.4	.0	.0	8.0	5.6	37.3
3	*+	+			*+	+	*+
No. Pred	1141.8	184.3	.0	.0	66.4	32.4	1424.9
No. Chsn	563.0	121.0	.0	.0	76.0	36.0	796.0
SD. Chsn	22.7	10.2	.0	.0	8.3	5.2	26.8
4	-	*-			-	*-	*-
No. Pred	542.2	110.6	.0	.0	74.4	29.7	756.8
No. Chsn	210.0	76.0	.0	.0	3.0	1.0	290.0
SD. Chsn	13.7	7.8	.0	.0	1.6	1.1	15.9
5	-	-			-	+	-
No. Pred	201.1	73.1	.0	.0	2.7	1.2	278.0
No. Chsn	3161.0	461.0	.0	.0	167.0	73.0	3862.0
Total							
No. Pred	3161.0	461.0	.0	.0	167.0	73.0	3862.0
ddist	101.9	63.3	.0	.0	51.9	51.9	94.2
dtime	29.9	20.1	.0	.0	17.7	17.8	28.0
empmed	14.4	12.3	.0	.0	12.6	6.2	13.9
empsvc	11.5	10.5	.0	.0	9.6	9.6	11.3
empret	8.8	8.7	.0	.0	12.6	14.1	9.1
emprest	3.4	3.6	.0	.0	6.8	6.9	3.6
empofc	22.2	21.1	.0	.0	23.3	22.8	22.2
houses	1.8	1.7	.0	.0	3.1	2.1	1.9
studk12	16.1	42.6	.0	.0	11.4	13.2	19.0
studuniv	30.9	24.4	.0	.0	101.3	78.7	34.1

INFORMATION 571: root-Mean-Square-Error is 9.094

INFORMATION 572: number of **stars** in table is 13

```
Table for inc6

-----------------------------------------------------
           | <15K |15-  |50-  |75-  |100K+|re-  | Total
           |      |50K  |75K  |100K |     |fuse |
-----------+-----------------------------------------
  No. Chsn |   5.0  47.0  98.0  44.0  32.0  11.0 237.0
  SD. Chsn |   2.2   7.7  10.0   6.8   5.4   3.6  15.8
 25+ mi    |         *+     +     +     -     +    *+
  No. Pred |   4.9  60.1 101.5  46.5  29.7  13.2 255.8
-----------+-----------------------------------------
  No. Chsn |  29.0 309.0 432.0 198.0 136.0  82.01186.0
  SD. Chsn |   5.2  17.0  20.7  13.5  11.1   8.7  33.5
10-25 mi   |    -     -     +     -    *-     -    *-
  No. Pred |  28.3 293.8 436.6 185.4 124.6  77.81146.4
-----------+-----------------------------------------
  No. Chsn |  51.0 440.0 476.0 175.0 117.0  94.01353.0
  SD. Chsn |   7.4  20.9  21.6  13.7  11.8  10.1  37.3
 3-10 mi   |    +     +     +    *+   **+    *+    *+
  No. Pred |  55.6 448.2 479.9 192.1 143.8 105.31424.9
-----------+-----------------------------------------
  No. Chsn |  57.0 251.0 225.0 101.0  89.0  73.0 796.0
  SD. Chsn |   7.2  15.3  14.5   9.3   8.7   7.8  26.8
  0-3 mi   |    -     -     -    *-    *-    *-    *-
  No. Pred |  55.6 246.7 221.5  90.4  79.4  63.3 756.8
-----------+-----------------------------------------
  No. Chsn |  14.0  92.0 101.0  34.0  31.0  18.0 290.0
  SD. Chsn |   3.2   9.0   9.2   5.9   5.0   4.1  15.9
  home     |    -     -     -     +     -     +     -
  No. Pred |  11.6  90.3  92.5  37.7  27.5  18.5 278.0
-----------+-----------------------------------------
  No. Chsn | 156.01139.01332.0 552.0 405.0 278.03862.0
Total      |
  No. Pred | 156.01139.01332.0 552.0 405.0 278.03862.0
-----------------------------------------------------

-----------------------------------------------------
ddist      |  64.6  84.4 102.0 105.9  97.0  86.2  94.2
dtime      |  20.5  25.5  29.8  31.1  29.0  26.1  28.0
empmed     |  15.9  13.7  14.3  14.2  14.1  11.6  13.9
empsvc     |  10.2  11.0  11.2  11.7  11.4  12.8  11.3
empret     |   9.2  10.1   8.4   8.3   8.9  10.0   9.1
emprest    |   3.6   3.8   3.4   3.3   3.6   4.6   3.6
empofc     |  20.3  18.4  23.3  24.4  25.7  23.4  22.2
houses     |   2.3   1.9   1.8   1.9   1.9   1.8   1.9
studk12    |  11.6  13.3  20.8  22.3  21.3  28.7  19.0
studuniv   |   9.3  24.3  36.2  26.6  38.5  85.8  34.1
-----------------------------------------------------

INFORMATION 571: root-Mean-Square-Error is    8.277

INFORMATION 572: number of **stars** in table is 13
```

Table for hhsize

	1	2	3	4	5	6	7	8	9	10	Total
No. Chsn	13.0	103.0	55.0	51.0	11.0	4.0	.0	.0	.0	.0	237.0
SD. Chsn	4.1	10.0	7.6	7.3	3.9	2.4	1.2	1.0	.3	.3	15.8
25+ mi	+	-	+	+	*+	+	*+	*+			*+
No. Pred	17.0	101.8	59.0	54.0	15.2	5.7	1.7	1.1	.1	.1	255.8
No. Chsn	117.0	449.0	281.0	226.0	72.0	28.0	5.0	5.0	3.0	.0	1186.0
SD. Chsn	10.1	20.6	15.9	14.9	8.4	5.7	2.5	2.5	1.3	.9	33.5
10-25 mi	*-	-	*-	-	+	+	+	+	-	+	*-
No. Pred	104.6	435.5	259.5	225.7	72.6	33.3	6.3	6.4	1.8	.8	1146.4
No. Chsn	157.0	496.0	302.0	250.0	81.0	40.0	8.0	11.0	4.0	4.0	1353.0
SD. Chsn	12.6	22.9	17.7	16.2	8.8	5.9	2.8	2.8	1.9	1.7	37.3
3-10 mi	+	*+	*+	*+	-	-	-	*-	-	-	*+
No. Pred	161.4	535.0	320.7	270.7	78.9	35.4	7.8	8.1	3.5	3.2	1424.9
No. Chsn	99.0	286.0	176.0	159.0	46.0	22.0	5.0	2.0	.0	1.0	796.0
SD. Chsn	9.8	16.3	12.9	11.3	6.0	4.0	2.0	1.7	1.0	.8	26.8
0-3 mi	+	-	-	**-	*-	*-	-	+	*+	-	*-
No. Pred	101.7	280.4	174.9	134.6	38.7	17.2	4.3	3.3	1.1	.7	756.8
No. Chsn	30.0	125.0	61.0	52.0	11.0	5.0	4.0	2.0	.0	.0	290.0
SD. Chsn	5.3	9.8	7.4	6.9	3.8	2.6	1.3	1.0	.6	.5	15.9
home	+	*-		+	*+	+	*-	-	+	+	-
No. Pred	31.3	106.3	60.9	53.0	15.6	7.4	1.9	1.1	.5	.2	278.0
No. Chsn	416.0	1459.0	875.0	738.0	221.0	99.0	22.0	20.0	7.0	5.0	3862.0
Total											
No. Pred	416.0	1459.0	875.0	738.0	221.0	99.0	22.0	20.0	7.0	5.0	3862.0

ddist	79.4	95.5	94.8	97.9	99.0	95.4	92.5	94.9	75.7	71.1	94.2
dtime	24.2	28.3	28.2	29.0	29.1	28.4	27.8	28.1	22.9	22.5	28.0
empmed	16.4	14.1	13.4	12.9	13.9	14.2	11.6	10.4	16.9	8.8	13.9
empsvc	12.6	11.2	11.0	11.1	11.1	12.2	10.0	9.7	7.2	8.7	11.3
empret	9.1	8.9	8.7	9.4	9.9	10.0	11.2	12.9	6.3	12.0	9.1
emprest	3.7	3.5	3.6	3.7	3.9	3.9	6.6	3.9	3.0	4.6	3.6
empofc	22.4	22.5	22.3	21.4	21.9	21.4	17.9	23.1	30.3	19.0	22.2
houses	1.8	1.8	1.9	1.9	2.0	2.2	2.9	2.3	1.0	2.7	1.9
studk12	15.9	18.9	19.0	21.4	18.0	22.6	18.0	11.9	20.6	7.5	19.0
studuniv	18.4	31.7	43.0	33.7	53.3	24.8	16.4	.0	.3	109.4	34.1

INFORMATION 571: root-Mean-Square-Error is 4.756

INFORMATION 572: number of **stars** in table is 21

Table for gend

	Male	Fe-male							re-fuse	Total
No. Chsn	154.0	83.0	.0	.0	.0	.0	.0	.0	.0	237.0
SD. Chsn	12.4	9.9	.0	.0	.0	.0	.0	.0	.3	15.8
25+ mi	+	*+								*+
No. Pred	156.6	99.2	.0	.0	.0	.0	.0	.0	.1	255.8
No. Chsn	660.0	525.0	.0	.0	.0	.0	.0	.0	1.0	1186.0
SD. Chsn	25.2	22.1	.0	.0	.0	.0	.0	.0	.7	33.5
10-25 mi	-	*-							-	*-
No. Pred	648.3	497.6	.0	.0	.0	.0	.0	.0	.5	1146.4
No. Chsn	686.0	667.0	.0	.0	.0	.0	.0	.0	.0	1353.0
SD. Chsn	26.6	26.1	.0	.0	.0	.0	.0	.0	.4	37.3
3-10 mi	*+	*+							+	*+
No. Pred	726.1	698.6	.0	.0	.0	.0	.0	.0	.2	1424.9
No. Chsn	381.0	415.0	.0	.0	.0	.0	.0	.0	.0	796.0
SD. Chsn	18.5	19.4	.0	.0	.0	.0	.0	.0	.4	26.8
0-3 mi	*-	-							+	*-
No. Pred	357.0	399.7	.0	.0	.0	.0	.0	.0	.2	756.8
No. Chsn	166.0	124.0	.0	.0	.0	.0	.0	.0	.0	290.0
SD. Chsn	12.0	10.4	.0	.0	.0	.0	.0	.0	.3	15.9
home	-	-								-
No. Pred	159.0	118.9	.0	.0	.0	.0	.0	.0	.1	278.0
No. Chsn	2047.0	1814.0	.0	.0	.0	.0	.0	.0	1.0	3862.0
Total										
No. Pred	2047.0	1814.0	.0	.0	.0	.0	.0	.0	1.0	3862.0

ddist	100.1	87.5	.0	.0	.0	.0	.0	.0	133.3	94.2
dtime	29.4	26.4	.0	.0	.0	.0	.0	.0	37.8	28.0
empmed	13.8	14.1	.0	.0	.0	.0	.0	.0	14.1	13.9
empsvc	11.5	11.0	.0	.0	.0	.0	.0	.0	9.4	11.3
empret	9.0	9.2	.0	.0	.0	.0	.0	.0	8.7	9.1
emprest	3.6	3.7	.0	.0	.0	.0	.0	.0	3.7	3.6
empofc	22.4	21.9	.0	.0	.0	.0	.0	.0	20.9	22.2
houses	1.9	1.9	.0	.0	.0	.0	.0	.0	.8	1.9
studk12	17.0	21.4	.0	.0	.0	.0	.0	.0	16.1	19.0
studuniv	32.6	35.7	.0	.0	.0	.0	.0	.0	.0	34.1

INFORMATION 571: root-Mean-Square-Error is 18.499

INFORMATION 572: number of **stars** in table is 9

Appendix 3.2—Work tour destination model application

Table for tcat

	prim usual	sec	Total
usu 25+ mi			
No. Chsn	265.0	5.0	270.0
SD. Chsn	3.0	.9	3.2
No. Pred	265.3	5.1	270.3
usu 10-25m			
No. Chsn	1085.0	60.0	1145.0
SD. Chsn	6.1	2.8	6.7
No. Pred	1083.3	55.5	1138.8
usu 3-10mi			
No. Chsn	923.0	65.0	988.0
SD. Chsn	5.6	3.0	6.4
No. Pred	915.7	66.8	982.5
usu 0-3 mi			
No. Chsn	367.0	67.0	434.0
SD. Chsn	3.6	3.0	4.7
No. Pred	375.8	69.7	445.5
tour 25+mi			
No. Chsn	7.0	.0	7.0
SD. Chsn	3.5	.7	3.5
No. Pred	12.2	.4	12.6
tour 10-25m			
No. Chsn	38.0	5.0	43.0
SD. Chsn	5.4	2.1	5.8
No. Pred	28.9	4.4	33.4
tour 3-10mi			
No. Chsn	28.0	14.0	42.0
SD. Chsn	6.2	3.9	7.3
No. Pred	38.2	15.2	53.4
tour 0-3 mi			
No. Chsn	23.0	14.0	37.0
SD. Chsn	4.1	3.6	5.4
No. Pred	16.7	12.9	29.6
Total			
No. Chsn	2736.0	230.0	2966.0
No. Pred	2736.0	230.0	2966.0

```
Table for tcat
 ..(continued)

------------------------------
           | prim |sec  | Total
           | usual|     |
-----------+--------------------

------------------------------
ddist      | 123.0  75.5 119.3
dtime      |  35.1  23.1  34.2
empmed     |  18.1   4.2  17.1
empsvc     |  13.2   7.3  12.8
empret     |   8.4   7.9   8.4
emprest    |   3.0   1.3   2.9
empofc     |  27.0  19.8  26.4
houses     |   2.1   1.7   2.1
studk12    |  22.3  28.6  22.7
studuniv   |  87.5   7.0  81.3
------------------------------

INFORMATION 571: root-Mean-Square-Error is    6.643

INFORMATION 572: number of **stars** in table is 14
```

Table for perstype

	FT workr	PT workr	Re-tired	Non workr	Univ Stud	Driv Stud	Total
No. Chsn	249.0	17.0	.0	.0	3.0	1.0	270.0
SD. Chsn	3.0	1.0	.0	.0	.4	.3	3.2
usu 25+ mi	+				-	-	+
No. Pred	249.7	17.0	.0	.0	2.8	.9	270.3
No. Chsn	1017.0	98.0	.0	2.0	26.0	2.0	1145.0
SD. Chsn	6.0	2.5	.0	.2	1.5	.3	6.7
usu 10-25m	-	*-			+		-
No. Pred	1013.3	95.1	.0	1.9	26.5	1.9	1138.8
No. Chsn	848.0	102.0	.0	.0	29.0	9.0	988.0
SD. Chsn	5.7	2.4	.0	.0	1.2	.7	6.4
usu 3-10mi	-	-			*-	-	-
No. Pred	844.9	101.8	.0	.0	27.4	8.5	982.5
No. Chsn	351.0	48.0	.0	1.0	21.0	13.0	434.0
SD. Chsn	4.0	2.0	.0	.2	1.3	.9	4.7
usu 0-3 mi	*+	*+			*+	+	**+
No. Pred	357.3	51.2	.0	.9	22.9	13.1	445.5
No. Chsn	6.0	1.0	.0	.0	.0	.0	7.0
SD. Chsn	3.5	.7	.0	.0	.3	.2	3.5
tour 25+mi	*+	-			+		*+
No. Pred	12.0	.4	.0	.0	.1	.0	12.6
No. Chsn	38.0	4.0	.0	.0	1.0	.0	43.0
SD. Chsn	5.5	1.6	.0	.2	.9	.4	5.8
tour 10-25m	*-	-			-	+	*-
No. Pred	29.9	2.5	.0	.0	.8	.1	33.4
No. Chsn	37.0	5.0	.0	.0	.0	.0	42.0
SD. Chsn	6.4	2.9	.0	.2	1.6	.7	7.3
tour 3-10mi	+	*+			*+	+	*+
No. Pred	41.5	8.6	.0	.1	2.6	.6	53.4
No. Chsn	21.0	9.0	.0	.0	6.0	1.0	37.0
SD. Chsn	4.3	2.7	.0	.2	1.7	.9	5.4
tour 0-3 mi	-	-			*-	-	*-
No. Pred	18.4	7.4	.0	.0	3.0	.8	29.6
No. Chsn	2567.0	284.0	.0	3.0	86.0	26.0	2966.0
Total							
No. Pred	2567.0	284.0	.0	3.0	86.0	26.0	2966.0

Table for perstype
..(continued)

	FT workr	PT workr	Re-tired	Non workr	Univ Stud	Driv Stud	Total
ddist	123.3	100.6	.0	102.9	79.4	61.8	119.3
dtime	35.1	30.1	.0	33.9	24.0	19.5	34.2
empmed	18.1	13.0	.0	.1	3.6	1.5	17.1
empsvc	13.4	10.0	.0	2.4	5.3	6.2	12.8
empret	8.0	11.3	.0	9.8	10.5	5.6	8.4
emprest	2.6	4.6	.0	12.5	4.1	9.7	2.9
empofc	27.6	17.4	.0	.3	27.4	3.3	26.4
houses	2.1	1.3	.0	.0	3.8	2.1	2.1
studk12	20.1	54.6	.0	.2	2.7	.8	22.7
studuniv	70.9	204.9	.0	1.6	9.5	3.9	81.3

INFORMATION 571: root-Mean-Square-Error is 2.121

INFORMATION 572: number of **stars** in table is 16

Table for asuf

	no car	<1per driv	1+per driv	Total
usu 25+ mi	No. Chsn	1.0	35.0	234.0	270.0
	SD. Chsn	.2	1.1	3.0	3.2
		*-	+	+	
	No. Pred	1.0	33.8	235.6	270.3
usu 10-25m	No. Chsn	8.0	193.0	944.0	1145.0
	SD. Chsn	.5	2.9	6.0	6.7
		-	-	-	-
	No. Pred	7.7	192.0	939.0	1138.8
usu 3-10mi	No. Chsn	17.0	209.0	762.0	988.0
	SD. Chsn	.6	2.8	5.7	6.4
		-	-	-	-
	No. Pred	16.6	206.2	759.7	982.5
usu 0-3 mi	No. Chsn	5.0	90.0	339.0	434.0
	SD. Chsn	.4	2.1	4.2	4.7
		-	+	**+	**+
	No. Pred	4.9	91.3	349.3	445.5
tour 25+mi	No. Chsn	.0	.0	7.0	7.0
	SD. Chsn	.2	1.4	3.2	3.5
		*+	*+	*+	
	No. Pred	.0	1.9	10.6	12.6
tour 10-25m	No. Chsn	.0	6.0	37.0	43.0
	SD. Chsn	.3	2.4	5.3	5.8
		-	*-	*-	
	No. Pred	.1	5.6	27.7	33.4
tour 3-10mi	No. Chsn	.0	9.0	33.0	42.0
	SD. Chsn	.6	3.2	6.5	7.3
		+	+	*+	*+
	No. Pred	.3	10.3	42.8	53.4
tour 0-3 mi	No. Chsn	.0	5.0	32.0	37.0
	SD. Chsn	.6	2.4	4.8	5.4
		+	+	*-	*-
	No. Pred	.4	5.8	23.4	29.6
Total	No. Chsn	31.0	547.0	2388.0	2966.0
	No. Pred	31.0	547.0	2388.0	2966.0

```
Table for asuf
 ..(continued)

-------------------------------------
           | no   |<1per|1+per| Total
           | car  | driv| driv|
-----------+-------------------------

-------------------------------------
ddist      |  83.7 104.0 123.3 119.3
dtime      |  25.1  30.7  35.1  34.2
empmed     |   9.6  25.8  15.1  17.1
empsvc     |   7.6  13.2  12.7  12.8
empret     |   9.1   9.4   8.1   8.4
emprest    |   3.7   3.3   2.8   2.9
empofc     |  45.5  21.6  27.3  26.4
houses     |    .9   1.5   2.3   2.1
studk12    |  21.1  23.3  22.6  22.7
studuniv   |    .8   3.2 100.2  81.3
-------------------------------------

INFORMATION 571: root-Mean-Square-Error is     .848

INFORMATION 572: number of **stars** in table is 14
```

Table for inc6

	<15K	15-50K	50-75K	75-100K	100K+	refuse	Total
No. Chsn	8.0	68.0	103.0	47.0	29.0	15.0	270.0
SD. Chsn	.5	1.6	1.9	1.2	1.2	.6	3.2
usu 25+ mi	-	+		+	-	-	+
No. Pred	7.7	69.3	103.0	47.4	28.4	14.6	270.3
No. Chsn	32.0	308.0	416.0	170.0	113.0	106.0	1145.0
SD. Chsn	1.3	3.5	4.0	2.5	2.2	2.1	6.7
usu 10-25m	*-	-	+	-	*-	-	-
No. Pred	30.2	305.2	419.2	169.3	110.6	104.3	1138.8
No. Chsn	34.0	312.0	317.0	150.0	109.0	66.0	988.0
SD. Chsn	1.1	3.6	3.5	2.4	2.2	1.8	6.4
usu 3-10mi	+	-	+	-	-	*-	-
No. Pred	34.7	310.8	317.3	147.9	108.8	63.1	982.5
No. Chsn	19.0	131.0	131.0	54.0	60.0	39.0	434.0
SD. Chsn	1.2	2.5	2.7	1.6	1.5	1.6	4.7
usu 0-3 mi	*+	-	+	**+	+	**+	**+
No. Pred	21.3	130.1	132.4	57.3	60.5	43.8	445.5
No. Chsn	1.0	1.0	4.0	1.0	.0	.0	7.0
SD. Chsn	.6	1.8	2.2	1.3	1.2	.9	3.5
tour 25+mi	*-	*+	+	+	*+	+	*+
No. Pred	.4	3.4	4.7	1.8	1.6	.8	12.6
No. Chsn	.0	12.0	16.0	4.0	5.0	6.0	43.0
SD. Chsn	1.0	3.0	3.4	2.2	2.1	1.7	5.8
tour 10-25m	+	-	*-	+	-	*-	*-
No. Pred	.9	9.0	11.4	4.8	4.3	2.9	33.4
No. Chsn	1.0	11.0	21.0	5.0	2.0	2.0	42.0
SD. Chsn	1.4	4.0	4.2	2.7	2.4	2.3	7.3
tour 3-10mi	+	*+	-	+	*+	*+	*+
No. Pred	2.0	15.7	17.4	7.1	5.9	5.3	53.4
No. Chsn	4.0	9.0	7.0	8.0	5.0	4.0	37.0
SD. Chsn	1.4	2.9	3.1	1.8	1.7	1.8	5.4
tour 0-3 mi	*-	-	+	**-	*-	-	*-
No. Pred	1.9	8.5	9.7	3.4	2.9	3.2	29.6
No. Chsn	99.0	852.0	1015.0	439.0	323.0	238.0	2966.0
Total							
No. Pred	99.0	852.0	1015.0	439.0	323.0	238.0	2966.0

Table for inc6
..(continued)

	<15K	15-50K	50-75K	75-100K	100K+	refuse	Total
ddist	101.9	114.3	126.8	124.2	114.1	110.3	119.3
dtime	29.4	33.0	35.9	35.5	33.3	32.2	34.2
empmed	1.2	15.0	20.9	21.0	15.5	9.0	17.1
empsvc	6.1	13.7	12.8	7.8	17.4	15.1	12.8
empret	6.9	12.5	7.7	5.3	6.3	5.7	8.4
emprest	2.0	4.0	2.3	2.5	3.2	2.6	2.9
empofc	18.5	18.7	24.6	26.4	52.2	30.2	26.4
houses	.7	2.2	2.4	2.7	1.6	.7	2.1
studk12	3.3	14.0	19.6	39.7	29.7	34.8	22.7
studuniv	1.8	70.7	30.1	68.4	186.8	250.8	81.3

INFORMATION 571: root-Mean-Square-Error is 1.883

INFORMATION 572: number of **stars** in table is 26

Table for hhsize

	1	2	3	4	5	6	7	8	9	10	Total
No. Chsn	22.0	106.0	66.0	63.0	10.0	3.0	.0	.0	.0	.0	270.0
SD. Chsn	.9	2.0	1.5	1.5	.6	.3	.0	.0	.0	.0	3.2
usu 25+ mi	*+	+	-	-	-						+
No. Pred	23.2	107.4	65.6	61.5	9.7	2.9	.0	.0	.0	.0	270.3
No. Chsn	143.0	427.0	260.0	224.0	53.0	28.0	2.0	3.0	3.0	2.0	1145.0
SD. Chsn	2.5	4.0	3.2	3.0	1.3	1.0	.2	.3	.3	.4	6.7
usu 10-25m	-	-	-	-	***+	*-				-	-
No. Pred	141.4	423.9	257.9	221.0	58.1	26.9	2.0	2.9	2.9	1.8	1138.8
No. Chsn	108.0	370.0	223.0	184.0	61.0	21.0	7.0	9.0	3.0	2.0	988.0
SD. Chsn	2.1	3.9	3.1	2.7	1.6	.8	.5	.6	.2	.3	6.4
usu 3-10mi	*+	*-	-	+	-	-	-	-			-
No. Pred	110.4	365.4	221.0	184.9	60.2	20.4	6.7	8.6	2.9	1.9	982.5
No. Chsn	32.0	193.0	88.0	78.0	22.0	15.0	3.0	2.0	.0	1.0	434.0
SD. Chsn	1.3	3.1	2.0	2.1	1.3	.7	.4	.5	.0	.2	4.7
usu 0-3 mi	*+	+	**+	+	+	+	-	*+			**+
No. Pred	33.8	194.5	92.5	79.5	23.2	15.4	2.8	2.8	.0	1.0	445.5
No. Chsn	2.0	3.0	.0	1.0	1.0	.0	.0	.0	.0	.0	7.0
SD. Chsn	1.1	2.3	1.7	1.5	.9	.5	.1	.2	.1	.0	3.5
tour 25+mi	-	+	*+	+	-	+					*+
No. Pred	1.1	5.2	2.9	2.3	.8	.2	.0	.0	.0	.0	12.6
No. Chsn	5.0	14.0	9.0	10.0	5.0	.0	.0	.0	.0	.0	43.0
SD. Chsn	2.0	3.6	2.7	2.6	1.3	.8	.3	.4	.2	.3	5.8
tour 10-25m	-	-	-	*-	**-	+		+			*-
No. Pred	3.8	12.7	7.4	6.7	1.8	.7	.1	.1	.0	.1	33.4
No. Chsn	5.0	14.0	11.0	6.0	6.0	.0	.0	.0	.0	.0	42.0
SD. Chsn	2.4	4.5	3.5	3.2	1.7	1.0	.6	.6	.2	.4	7.3
tour 3-10mi	+	*+	+	*+	*-	*+	+	+		+	*+
No. Pred	6.0	20.2	12.1	10.3	2.9	1.1	.3	.3	.0	.1	53.4
No. Chsn	6.0	13.0	9.0	7.0	.0	1.0	.0	1.0	.0	.0	37.0
SD. Chsn	1.8	3.3	2.6	2.6	1.2	.6	.3	.5	.1	.2	5.4
tour 0-3 mi	*-	-	-	-	*+	-	+	*-			*-
No. Pred	3.3	10.7	6.6	6.6	1.5	.4	.1	.3	.0	.1	29.6
No. Chsn	323.0	1140.0	666.0	573.0	158.0	68.0	12.0	15.0	6.0	5.0	2966.0
Total											
No. Pred	323.0	1140.0	666.0	573.0	158.0	68.0	12.0	15.0	6.0	5.0	2966.0

```
Table for hhsize
 ..(continued)

-------------------------------------------------------------------------------
           |  1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   |10   | Total
           |      |     |     |     |     |     |     |     |     |     |
-----------+-------------------------------------------------------------------

-------------------------------------------------------------------------------
ddist      | 119.1 117.6 123.7 126.3 108.1  95.7  72.2  68.4  95.4 102.7 119.3
dtime      |  34.1  33.7  35.2  36.1  32.0  29.6  23.7  21.7  28.7  26.9  34.2
empmed     |  19.4  15.7  23.1  17.1   4.0   6.5   4.8   4.6  15.0    .2  17.1
empsvc     |  13.9  12.6   9.7  12.9  24.8  11.5   4.5   3.0  53.2  10.6  12.8
empret     |   9.7   7.8  10.6   5.8  11.3   2.7  14.4  21.2   1.6   1.1   8.4
emprest    |   2.8   3.1   3.0   2.5   3.4   3.3   1.0   2.7   1.5   5.9   2.9
empofc     |  26.1  29.8  23.6  29.1  13.9  16.4   3.7   2.9  15.1   1.2  26.4
houses     |   2.2   1.9   2.9   1.1   3.4   2.2    .2   7.3   5.9    .1   2.1
studk12    |   9.2  33.6  11.6  26.4  13.6  16.8    .2    .8    .0    .0  22.7
studuniv   | 185.2   1.6 134.6 104.2 188.1   4.6    .3   2.9    .9    .0  81.3
-------------------------------------------------------------------------------

INFORMATION 571: root-Mean-Square-Error is    1.521

INFORMATION 572: number of **stars** in table is 28
```

Table for gend

	Male	Female	Total
usu 25+ mi	No. Chsn	151.0	119.0	270.0
	SD. Chsn	2.4	2.1	3.2
	No. Pred	151.1	119.2	270.3
usu 10-25m	No. Chsn	610.0	535.0	1145.0
	SD. Chsn	4.9	4.6	6.7
	No. Pred	607.5	531.3	1138.8
usu 3-10mi	No. Chsn	512.0	476.0	988.0
	SD. Chsn	4.8	4.2	6.4
	No. Pred	513.7	468.8	982.5
usu 0-3 mi	No. Chsn	222.0	212.0	434.0
	SD. Chsn	3.2	3.5	4.7
	No. Pred	220.5	225.0	445.5
tour 25+mi	No. Chsn	5.0	2.0	7.0
	SD. Chsn	2.7	2.2	3.5
	No. Pred	7.6	5.0	12.6
tour 10-25m	No. Chsn	22.0	21.0	43.0
	SD. Chsn	4.3	3.9	5.8
	No. Pred	18.5	14.9	33.4
tour 3-10mi	No. Chsn	28.0	14.0	42.0
	SD. Chsn	5.3	5.0	7.3
	No. Pred	28.0	25.4	53.4
tour 0-3 mi	No. Chsn	11.0	26.0	37.0
	SD. Chsn	3.7	3.9	5.4
	No. Pred	14.2	15.5	29.6
Total	No. Chsn	1561.0	1405.0	2966.0
	No. Pred	1561.0	1405.0	2966.0

```
Table for gend
 ..(continued)

------------------------------
           | Male |Fe-  | Total
           |      |male |
-----------+------------------

------------------------------
ddist      | 122.4 115.8 119.3
dtime      |  34.9  33.4  34.2
empmed     |  12.2  22.4  17.1
empsvc     |  12.7  12.8  12.8
empret     |   8.0   8.8   8.4
emprest    |   2.6   3.3   2.9
empofc     |  25.0  28.0  26.4
houses     |   1.7   2.6   2.1
studk12    |  17.4  28.7  22.7
studuniv   |  58.7 106.4  81.3
------------------------------

INFORMATION 571: root-Mean-Square-Error is    2.295

INFORMATION 572: number of **stars** in table is 16
```

Appendix 3.3—School location model application

Table for perstype

	FT workr	PT workr	Re-tired	Non workr	Univ Stud	Driv Stud	Stud 5-15	Under 5	Total
No. Chsn	46.0	.0	.0	1.0	60.0	9.0	18.0	12.0	146.0
SD. Chsn	6.6	.0	.8	1.1	7.6	2.7	4.6	2.8	11.8
15+ mi	+		+	+	+	-	+	*-	+
No. Pred	49.7	.0	.7	1.8	66.1	7.4	21.6	8.2	155.6
No. Chsn	106.0	.0	.0	6.0	109.0	49.0	141.0	33.0	444.0
SD. Chsn	9.6	.0	.4	1.9	9.9	7.9	12.4	6.2	21.2
5-15 mi	-		+	*-	+	*+	*+	*+	*+
No. Pred	105.8	.0	.2	4.0	111.3	63.8	155.1	40.4	480.7
No. Chsn	21.0	.0	.0	.0	23.0	22.0	47.0	10.0	123.0
SD. Chsn	4.0	.0	.1	1.0	4.6	4.8	7.1	3.1	11.0
4-5 mi	-			*+	+	+	+	-	+
No. Pred	18.5	.0	.0	1.1	23.9	23.7	51.3	9.8	128.3
No. Chsn	28.0	.0	.0	.0	35.0	46.0	89.0	17.0	215.0
SD. Chsn	4.4	.0	.1	.5	5.4	5.8	9.5	3.4	13.6
3-4 mi	*-			+	+	*-	+	*-	*-
No. Pred	22.9	.0	.0	.2	37.2	34.9	93.6	12.4	201.2
No. Chsn	21.0	.0	.0	.0	33.0	42.0	146.0	11.0	253.0
SD. Chsn	4.4	.0	.0	.7	5.4	6.4	11.6	3.7	15.5
2-3 mi	+			*+	*+	+	-	*+	+
No. Pred	23.6	.0	.0	.7	39.0	43.3	141.7	14.8	263.2
No. Chsn	20.0	.0	1.0	2.0	73.0	68.0	229.0	16.0	409.0
SD. Chsn	4.1	.0	.1	.6	6.0	6.7	14.3	4.0	17.9
1-2 mi	+		***-	**-	***-	**-	-	+	**-
No. Pred	21.0	.0	.0	.4	51.9	48.5	222.7	17.3	361.7
No. Chsn	12.0	.0	.0	.0	29.0	38.0	365.0	32.0	476.0
SD. Chsn	3.2	.0	.2	.5	4.8	7.0	17.2	5.0	20.1
0-1 mi	+			+	+	**+	*-	-	+
No. Pred	13.0	.0	.0	.3	33.7	53.4	346.4	29.4	476.2
No. Chsn	7.0	.0	.0	.0	3.0	6.0	24.0	3.0	43.0
SD. Chsn	2.5	.0	.1	.5	1.4	2.2	5.0	1.3	6.3
home	-			+	-	-	+	-	-
No. Pred	6.6	.0	.0	.3	1.8	5.1	26.7	1.8	42.2
No. Chsn	261.0	.0	1.0	9.0	365.0	280.0	1059.0	134.0	2109.0
Total									
No. Pred	261.0	.0	1.0	9.0	365.0	280.0	1059.0	134.0	2109.0

Table for perstype
..(continued)

	FT workr	PT workr	Re-tired	Non workr	Univ Stud	Driv Stud	Stud 5-15	Under 5	Total
ddist	93.7	.0	205.8	84.1	82.1	39.3	29.5	51.3	49.6
dtime	28.2	.0	48.2	27.6	25.1	14.3	11.1	17.3	16.6
empmed	5.5	.0	.5	5.9	8.8	.8	.8	1.8	2.8
empsvc	3.4	.0	2.9	3.2	3.5	1.4	1.2	3.6	2.1
empret	2.2	.0	1.3	2.5	2.0	.3	.2	1.1	.8
emprest	2.0	.0	.2	3.4	1.7	.2	.1	.7	.7
empofc	7.6	.0	4.4	10.5	8.7	1.6	1.7	2.5	3.7
houses	.8	.0	.4	.6	.7	1.3	1.4	1.7	1.2
studk12	51.2	.0	157.2	50.4	44.2	266.6	353.4	118.8	234.7
studuniv	5714.1	.0	5228.8	6520.8	7909.1	3.3	3.7	3.6	2108.8

INFORMATION 571: root-Mean-Square-Error is 3.175

INFORMATION 572: number of **stars** in table is 29

Table for inc6

	<15K	15-50K	50-75K	75-100K	100K+	refuse	Total
No. Chsn	9.0	37.0	47.0	28.0	17.0	8.0	146.0
SD. Chsn	3.7	6.4	6.8	4.5	3.5	2.4	11.8
15+ mi	**+	*+	+	*-	*-	-	+
No. Pred	16.5	46.0	52.4	21.7	13.1	5.9	155.6
No. Chsn	21.0	132.0	140.0	60.0	57.0	34.0	444.0
SD. Chsn	5.3	11.7	12.3	7.7	6.7	5.3	21.2
5-15 mi	*+	*+	*+	+	*-	-	*+
No. Pred	30.2	148.2	161.9	63.6	46.8	30.1	480.7
No. Chsn	6.0	43.0	45.0	13.0	10.0	6.0	123.0
SD. Chsn	2.8	6.1	6.4	3.8	3.5	2.8	11.0
4-5 mi	+	-	-	+	+	+	+
No. Pred	8.7	39.1	44.1	15.0	13.1	8.5	128.3
No. Chsn	19.0	81.0	65.0	27.0	15.0	8.0	215.0
SD. Chsn	3.7	7.8	7.7	4.8	4.0	3.2	13.6
3-4 mi	-	*-	-	-	+	*+	*-
No. Pred	16.0	67.8	64.2	25.0	16.9	11.3	201.2
No. Chsn	18.0	101.0	67.0	24.0	22.0	21.0	253.0
SD. Chsn	4.3	9.2	8.2	5.5	4.8	3.9	15.5
2-3 mi	+	-	+	*+	+	-	+
No. Pred	21.8	92.9	72.7	33.6	25.0	17.2	263.2
No. Chsn	61.0	132.0	117.0	38.0	43.0	18.0	409.0
SD. Chsn	5.6	10.4	9.6	6.1	5.6	4.3	17.9
1-2 mi	***-	-	*-	+	*-	+	**-
No. Pred	40.8	122.3	102.9	40.9	34.1	20.8	361.7
No. Chsn	46.0	145.0	182.0	48.0	34.0	21.0	476.0
SD. Chsn	5.8	11.5	11.7	6.3	6.4	4.5	20.1
0-1 mi	-	*+	**-	-	**+	+	+
No. Pred	41.6	159.0	158.5	45.9	47.6	23.6	476.2
No. Chsn	.0	19.0	6.0	13.0	2.0	3.0	43.0
SD. Chsn	2.0	3.8	3.5	2.3	1.8	1.3	6.3
home	**+	*-	*+	***-	+	-	-
No. Pred	4.4	14.8	12.4	5.3	3.4	1.8	42.2
No. Chsn	180.0	690.0	669.0	251.0	200.0	119.0	2109.0
Total							
No. Pred	180.0	690.0	669.0	251.0	200.0	119.0	2109.0

```
Table for inc6
 ..(continued)

-----------------------------------------------------
           | <15K |15-  |50-  |75-  |100K+|re-  | Total
           |      |50K  |75K  |100K |     |fuse |
-----------+-----------------------------------------

-----------------------------------------------------
ddist      |  48.1  46.7  52.0  54.6  48.5  46.1  49.6
dtime      |  16.0  15.7  17.1  18.4  16.6  15.8  16.6
empmed     |   6.4   3.1   2.0   2.7   1.7   2.8   2.8
empsvc     |   2.3   2.2   1.9   1.8   1.8   2.8   2.1
empret     |   1.0    .8    .8    .7    .9   1.4    .8
emprest    |    .9    .8    .5    .6    .6   1.0    .7
empofc     |   6.0   4.2   3.0   2.8   2.8   5.0   3.7
houses     |    .8   1.4   1.0   1.1   1.2   1.6   1.2
studk12    | 173.4 229.7 251.3 238.0 258.9 215.8 234.7
studuniv   |4513.72271.71738.61684.21002.32362.82108.8
-----------------------------------------------------

INFORMATION 571: root-Mean-Square-Error is    7.634

INFORMATION 572: number of **stars** in table is 33
```

Table for hhsize

	1	2	3	4	5	6	7	8	9	10	Total
No. Chsn	9.0	23.0	45.0	43.0	22.0	4.0	.0	.0	.0	.0	146.0
SD. Chsn	3.0	5.3	6.2	6.1	4.0	2.3	1.9	1.2	.4	.2	11.8
15+ mi	+	*+	-	-	*-	+	**+	*+	+		+
No. Pred	10.0	33.1	43.3	40.6	17.4	5.3	4.2	1.5	.1	.1	155.6
No. Chsn	26.0	77.0	117.0	150.0	47.0	18.0	6.0	2.0	1.0	.0	444.0
SD. Chsn	4.7	8.1	10.6	12.2	7.6	4.9	3.0	2.8	1.0	1.0	21.2
5-15 mi	-	-	+	+	*+	*+	*+	**+		*+	*+
No. Pred	24.2	71.4	121.7	158.9	60.6	24.2	9.3	8.5	.9	1.0	480.7
No. Chsn	3.0	27.0	29.0	37.0	16.0	9.0	1.0	1.0	.0	.0	123.0
SD. Chsn	2.2	3.7	5.5	6.4	4.3	2.8	1.8	1.2	.2	.6	11.0
4-5 mi	*+	***-	+	+	+	-	*+	+		+	+
No. Pred	5.7	14.5	32.0	42.8	20.0	7.8	3.6	1.4	.0	.3	128.3
No. Chsn	12.0	24.0	50.0	80.0	24.0	6.0	17.0	1.0	1.0	.0	215.0
SD. Chsn	2.8	4.6	6.5	8.1	4.8	3.5	2.6	2.0	.6	.7	13.6
3-4 mi	-	+	-	*-		*+	***-	*+	-	+	*-
No. Pred	10.2	24.7	47.0	69.4	24.0	12.7	7.7	4.7	.4	.5	201.2
No. Chsn	9.0	29.0	54.0	89.0	34.0	20.0	4.0	14.0	.0	.0	253.0
SD. Chsn	2.7	4.9	7.2	9.2	6.6	4.4	2.1	2.0	.8	.5	15.5
2-3 mi	+	-	+	+	*+	+	+	***-	+	+	+
No. Pred	9.9	28.2	57.0	91.1	46.0	21.4	4.6	4.2	.6	.3	263.2
No. Chsn	14.0	40.0	106.0	123.0	73.0	40.0	6.0	2.0	.0	5.0	409.0
SD. Chsn	3.0	5.6	8.3	10.9	7.1	4.8	3.1	2.3	.3	1.2	17.9
1-2 mi	-	-	***-	+	**-	***-	*+	*+	+	**-	**-
No. Pred	12.2	38.1	78.5	132.0	57.3	24.8	10.7	6.4	.1	1.6	361.7
No. Chsn	8.0	23.0	83.0	175.0	93.0	62.0	16.0	10.0	4.0	2.0	476.0
SD. Chsn	2.3	5.3	9.3	11.8	8.3	7.2	3.1	2.7	1.6	1.2	20.1
0-1 mi	+	**+	**+	-	*-	-	*-	-	-	-	+
No. Pred	8.4	35.4	103.9	163.3	80.0	60.1	12.3	8.3	2.8	1.7	476.2
No. Chsn	.0	4.0	4.0	12.0	4.0	4.0	6.0	9.0	.0	.0	43.0
SD. Chsn	.6	1.3	2.1	3.3	2.8	2.5	1.8	1.9	.9	1.1	6.3
home	+	*-	+	-	*+	*+	*-	**-	*+	*+	-
No. Pred	.3	1.7	4.6	11.0	7.9	6.6	3.5	4.0	.9	1.6	42.2
No. Chsn	81.0	247.0	488.0	709.0	313.0	163.0	56.0	39.0	6.0	7.0	2109.0
Total											
No. Pred	81.0	247.0	488.0	709.0	313.0	163.0	56.0	39.0	6.0	7.0	2109.0

Table for hhsize
..(continued)

	1	2	3	4	5	6	7	8	9	10	Total
ddist	67.3	67.3	55.6	46.3	41.8	31.6	42.3	41.9	26.3	22.8	49.6
dtime	21.5	21.4	18.2	15.7	14.4	11.6	14.3	14.5	9.1	8.0	16.6
empmed	8.9	6.1	3.1	1.8	1.5	2.1	1.4	1.2	.4	.1	2.8
empsvc	3.4	3.2	2.5	1.9	1.4	1.1	1.8	1.1	4.5	.5	2.1
empret	1.8	1.9	1.0	.6	.5	.4	.3	.5	.9	.0	.8
emprest	1.7	1.7	.9	.4	.3	.2	.2	.3	.0	.0	.7
empofc	14.0	6.4	3.9	2.6	2.2	2.5	1.9	1.6	12.4	1.0	3.7
houses	.8	1.1	1.1	1.2	1.2	1.7	.9	1.3	.6	.6	1.2
studk12	29.5	118.0	220.0	266.5	280.2	316.4	254.3	261.9	244.6	280.0	234.7
studuniv	7665.1	4998.9	2374.8	1223.3	965.1	741.9	2001.8	780.1	2.4	.3	2108.8

INFORMATION 571: root-Mean-Square-Error is 4.600

INFORMATION 572: number of **stars** in table is 56

Table for gend

	Male	Fe-male						refuse	Total
No. Chsn	63.0	83.0	.0	.0	.0	.0	.0	.0	146.0
SD. Chsn	7.9	8.8	.0	.0	.0	.0	.0	.3	11.8
15+ mi	+	+							+
No. Pred	68.2	87.3	.0	.0	.0	.0	.0	.1	155.6
No. Chsn	207.0	235.0	.0	.0	.0	.0	.0	2.0	444.0
SD. Chsn	14.6	15.3	.0	.0	.0	.0	.0	1.4	21.2
5-15 mi	*+	*+						-	*+
No. Pred	227.7	251.1	.0	.0	.0	.0	.0	1.9	480.7
No. Chsn	60.0	62.0	.0	.0	.0	.0	.0	1.0	123.0
SD. Chsn	7.5	7.9	.0	.0	.0	.0	.0	.8	11.0
4-5 mi	+	+						-	+
No. Pred	60.1	67.5	.0	.0	.0	.0	.0	.7	128.3
No. Chsn	111.0	104.0	.0	.0	.0	.0	.0	.0	215.0
SD. Chsn	9.7	9.4	.0	.0	.0	.0	.0	1.0	13.6
3-4 mi	-	-						*+	*-
No. Pred	102.8	97.3	.0	.0	.0	.0	.0	1.1	201.2
No. Chsn	124.0	125.0	.0	.0	.0	.0	.0	4.0	253.0
SD. Chsn	11.0	10.8	.0	.0	.0	.0	.0	1.3	15.5
2-3 mi	+	+						*-	+
No. Pred	133.4	128.0	.0	.0	.0	.0	.0	1.7	263.2
No. Chsn	200.0	205.0	.0	.0	.0	.0	.0	4.0	409.0
SD. Chsn	12.5	12.6	.0	.0	.0	.0	.0	1.8	17.9
1-2 mi	**-	*-						-	**-
No. Pred	175.0	183.4	.0	.0	.0	.0	.0	3.3	361.7
No. Chsn	245.0	228.0	.0	.0	.0	.0	.0	3.0	476.0
SD. Chsn	14.3	13.9	.0	.0	.0	.0	.0	2.0	20.1
0-1 mi	-	+						+	+
No. Pred	242.5	228.9	.0	.0	.0	.0	.0	4.8	476.2
No. Chsn	20.0	23.0	.0	.0	.0	.0	.0	.0	43.0
SD. Chsn	4.4	4.5	.0	.0	.0	.0	.0	.6	6.3
home	+	-						+	-
No. Pred	20.3	21.5	.0	.0	.0	.0	.0	.4	42.2
No. Chsn	1030.0	1065.0	.0	.0	.0	.0	.0	14.0	2109.0
Total									
No. Pred	1030.0	1065.0	.0	.0	.0	.0	.0	14.0	2109.0

Table for gend
..(continued)

	Male	Fe-male						re-fuse	Total
ddist	47.5	51.9	.0	.0	.0	.0	.0	.0	25.2	49.6
dtime	16.0	17.2	.0	.0	.0	.0	.0	.0	9.9	16.6
empmed	2.4	3.3	.0	.0	.0	.0	.0	.0	1.2	2.8
empsvc	1.9	2.2	.0	.0	.0	.0	.0	.0	1.1	2.1
empret	.8	.9	.0	.0	.0	.0	.0	.0	.4	.8
emprest	.6	.7	.0	.0	.0	.0	.0	.0	.2	.7
empofc	3.2	4.2	.0	.0	.0	.0	.0	.0	4.7	3.7
houses	1.2	1.1	.0	.0	.0	.0	.0	.0	.9	1.2
studk12	241.7	226.6	.0	.0	.0	.0	.0	.0	332.0	234.7
studuniv	1975.1	2265.8	.0	.0	.0	.0	.0	.0	.2	2108.8

INFORMATION 571: root-Mean-Square-Error is 9.619

INFORMATION 572: number of **stars** in table is 11

Appendix 3.4—Non-work/non-school tour destination model application

```
Table for tcat
-------------------------------------
           | prim |sec  |Work | Total
           | usual|     |based|
-----------+-------------------------
  No. Chsn |  50.0  37.0   6.0  93.0
  SD. Chsn |   7.8   6.6   1.2  10.3
   25+ mi  |   *+    *+  ***-    *+
  No. Pred |  62.1  44.5   1.5 108.1
-----------+-------------------------
  No. Chsn | 322.0 335.0  21.0 678.0
  SD. Chsn |  17.3  18.1   5.6  25.6
   10-25 mi|   *-     -    *+     -
  No. Pred | 303.0 330.9  31.7 665.6
-----------+-------------------------
  No. Chsn | 486.0 532.0  59.01077.0
  SD. Chsn |  22.0  24.6   8.0  33.9
   5-10 mi |    +  ***+     +   **+
  No. Pred | 491.1 615.9  65.01171.9
-----------+-------------------------
  No. Chsn | 354.0 603.0  64.01021.0
  SD. Chsn |  20.0  23.1   7.5  31.4
   3-5 mi  |  **+   **-     -     -
  No. Pred | 411.2 548.3  58.01017.6
-----------+-------------------------
  No. Chsn | 264.0 424.0  47.0 735.0
  SD. Chsn |  16.2  20.2   6.6  26.7
   2-3 mi  |    +     +     -     +
  No. Pred | 274.9 426.0  44.9 745.8
-----------+-------------------------
  No. Chsn | 166.0 288.0  32.0 486.0
  SD. Chsn |  12.5  16.3   5.7  21.4
  1.5-2 mi |    +     -     +     -
  No. Pred | 166.6 281.3  34.2 482.0
-----------+-------------------------
  No. Chsn | 198.0 302.0  47.0 547.0
  SD. Chsn |  12.7  16.8   6.8  22.1
  1-1.5 mi |   *-     +     +     -
  No. Pred | 174.1 302.2  48.8 525.0
-----------+-------------------------
  No. Chsn | 219.0 349.0  74.0 642.0
  SD. Chsn |  12.9  17.7   8.2  23.4
  0.5-1 mi |  **-     +     +    *-
  No. Pred | 183.7 349.9  75.3 608.9
-----------+-------------------------
  No. Chsn | 121.0 281.0  91.0 493.0
  SD. Chsn |   9.7  14.4   8.2  19.2
  0-0.5 mi |    -   **-    *-   **-
  No. Pred | 113.3 252.2  81.6 447.1
-----------+-------------------------
  No. Chsn |2180.03151.0 441.05772.0
Total      |
  No. Pred |2180.03151.0 441.05772.0
-------------------------------------
```

```
Table for tcat
 ..(continued)

-------------------------------------
           | prim |sec  |Work | Total
           | usual|     |based|
-----------+-------------------------

-------------------------------------
ddist      |  59.9  47.6  33.7  51.2
dtime      |  19.7  16.4  12.2  17.3
empmed     |  16.0  11.2  12.3  13.1
empsvc     |   9.6   9.4  17.8  10.1
empret     |  17.5  18.2  23.4  18.3
emprest    |   5.0   5.9  26.8   7.2
empofc     |  11.5   9.4  27.5  11.6
houses     |   1.5   1.7   1.7   1.6
studk12    |  45.0  43.8  13.3  42.0
studuniv   |  22.1  18.0   5.5  18.6
-------------------------------------

INFORMATION 571: root-Mean-Square-Error is   25.824

INFORMATION 572: number of **stars** in table is 26
```

Table for purp

	Work	Scho	Esco	Pers Busi	Shop	Meal	Soc Rec	Total
No. Chsn	.0	.0	8.0	36.0	20.0	3.0	26.0	93.0
SD. Chsn	.0	.0	2.9	5.9	5.0	2.2	5.8	10.3
25+ mi			+	-	*+	+	*+	*+
No. Pred	.0	.0	8.4	35.5	25.5	4.7	34.0	108.1
No. Chsn	.0	.0	68.0	212.0	155.0	67.0	176.0	678.0
SD. Chsn	.0	.0	7.5	15.1	11.8	8.3	12.9	25.6
10-25 mi			*-	*+	*-	+	-	-
No. Pred	.0	.0	57.2	231.6	140.0	69.5	167.3	665.6
No. Chsn	.0	.0	111.0	416.0	233.0	108.0	209.0	1077.0
SD. Chsn	.0	.0	12.1	19.9	16.0	10.8	15.4	33.9
5-10 mi			***+	-	*+	+	**+	**+
No. Pred	.0	.0	147.8	403.9	261.2	118.6	240.4	1171.9
No. Chsn	.0	.0	195.0	303.0	253.0	76.0	194.0	1021.0
SD. Chsn	.0	.0	13.0	17.9	15.4	9.0	13.5	31.4
3-5 mi			*-	*+	-	+	-	-
No. Pred	.0	.0	174.7	327.9	244.4	83.6	186.9	1017.6
No. Chsn	.0	.0	106.0	239.0	185.0	82.0	123.0	735.0
SD. Chsn	.0	.0	11.0	14.4	14.2	7.9	11.0	26.7
2-3 mi			*+	*-	*+	*-	+	+
No. Pred	.0	.0	126.3	215.3	213.0	66.3	124.8	745.8
No. Chsn	.0	.0	86.0	118.0	146.0	50.0	86.0	486.0
SD. Chsn	.0	.0	8.5	11.3	11.5	6.7	8.8	21.4
1.5-2 mi			*-	*+	-	-	-	-
No. Pred	.0	.0	76.6	134.4	142.1	47.4	81.5	482.0
No. Chsn	.0	.0	86.0	145.0	172.0	53.0	91.0	547.0
SD. Chsn	.0	.0	9.2	11.4	12.2	7.3	8.5	22.1
1-1.5 mi			+	-	-	+	*-	-
No. Pred	.0	.0	89.8	138.3	161.5	58.3	77.0	525.0
No. Chsn	.0	.0	115.0	163.0	191.0	87.0	86.0	642.0
SD. Chsn	.0	.0	9.7	11.8	12.2	8.5	9.7	23.4
0.5-1 mi			*-	*-	*-	-	*+	*-
No. Pred	.0	.0	102.7	150.4	169.4	82.9	103.4	608.9
No. Chsn	.0	.0	110.0	104.0	96.0	74.0	109.0	493.0
SD. Chsn	.0	.0	9.0	9.3	8.8	7.5	8.3	19.2
0-0.5 mi			-	-	-	-	**-	**-
No. Pred	.0	.0	101.4	98.5	93.8	68.7	84.6	447.1
No. Chsn	.0	.0	885.0	1736.0	1451.0	600.0	1100.0	5772.0
Total								
No. Pred	.0	.0	885.0	1736.0	1451.0	600.0	1100.0	5772.0

```
Table for purp
 ..(continued)

-------------------------------------------------------------
           | Work |Scho |Esco |Pers |Shop |Meal |Soc  | Total
           |      |     |     |Busi |     |     |Rec  |
-----------+-------------------------------------------------

-------------------------------------------------------------
ddist      |    .0    .0  39.3  56.5  47.2  45.3  61.0  51.2
dtime      |    .0    .0  14.0  18.9  16.2  15.6  19.9  17.3
empmed     |    .0    .0   5.3  31.5   3.8   2.9   8.3  13.1
empsvc     |    .0    .0   5.4   9.6  13.3   9.4  10.8  10.1
empret     |    .0    .0   4.2   6.7  51.2  18.5   4.7  18.3
emprest    |    .0    .0    .9   2.7   9.2  33.4   2.2   7.2
empofc     |    .0    .0   5.5  15.1  11.8  18.1   7.1  11.6
houses     |    .0    .0   1.5   2.0    .7   1.2   2.5   1.6
studk12    |    .0    .0 223.5  18.2    .8   2.0   9.5  42.0
studuniv   |    .0    .0  40.1  22.6   2.5   1.6  25.6  18.6
-------------------------------------------------------------

INFORMATION 571: root-Mean-Square-Error is   12.155

INFORMATION 572: number of **stars** in table is 32
```

Table for perstype

	FT workr	PT workr	Re-tired	Non workr	Univ Stud	Driv Stud	Stud 5-15	Under 5	Total
No. Chsn	27.0	4.0	18.0	34.0	3.0	3.0	4.0	.0	93.0
SD. Chsn	5.2	2.8	5.4	5.3	2.2	1.4	2.2	1.7	10.3
25+ mi	+	*+	**+	-	+	-	+	*+	*+
No. Pred	27.4	7.8	29.3	28.8	5.0	2.0	4.8	3.0	108.1
No. Chsn	218.0	50.0	170.0	136.0	27.0	11.0	35.0	31.0	678.0
SD. Chsn	13.9	6.8	12.9	12.2	5.1	4.1	6.3	4.7	25.6
10-25 mi	*-	-	-	*+	-	*+	+	*-	-
No. Pred	194.3	46.9	168.8	149.8	26.6	17.2	39.4	22.5	665.6
No. Chsn	296.0	74.0	325.0	223.0	36.0	30.0	58.0	35.0	1077.0
SD. Chsn	18.3	9.3	17.9	15.3	5.7	5.3	8.3	6.5	33.9
5-10 mi	**+	*+	+	*+	-	-	*+	*+	**+
No. Pred	340.3	88.3	327.4	239.4	33.2	29.0	70.9	43.4	1171.9
No. Chsn	296.0	79.0	258.0	206.0	28.0	30.0	82.0	42.0	1021.0
SD. Chsn	17.0	8.8	16.2	14.3	5.7	4.7	7.8	6.2	31.4
3-5 mi	+	+	+	+	+	*-	**-	-	-
No. Pred	297.5	79.3	271.5	211.2	33.0	23.0	62.4	39.6	1017.6
No. Chsn	221.0	53.0	204.0	141.0	29.0	23.0	52.0	12.0	735.0
SD. Chsn	14.7	7.3	13.6	12.0	4.9	4.2	6.9	5.1	26.7
2-3 mi	+	+	-	+	-	-	-	**+	+
No. Pred	225.3	55.8	193.7	150.6	24.7	18.8	49.6	27.2	745.8
No. Chsn	141.0	36.0	113.0	101.0	24.0	9.0	33.0	29.0	486.0
SD. Chsn	12.1	6.0	10.8	9.1	4.1	3.3	5.6	4.2	21.4
1.5-2 mi	*+	+	*+	*-	*-	+	+	**-	-
No. Pred	153.6	37.2	123.9	86.7	17.4	11.2	33.7	18.3	482.0
No. Chsn	178.0	40.0	154.0	90.0	13.0	15.0	35.0	22.0	547.0
SD. Chsn	12.8	6.3	10.7	9.5	4.1	3.5	5.6	4.6	22.1
1-1.5 mi	-	+	**-	+	*+	-	-	+	-
No. Pred	175.3	42.8	123.4	96.0	17.6	13.1	33.9	22.9	525.0
No. Chsn	230.0	59.0	151.0	108.0	22.0	6.0	34.0	32.0	642.0
SD. Chsn	13.9	6.5	11.3	9.4	4.5	3.7	6.1	5.0	23.4
0.5-1 mi	*-	*-	-	*-	+	**+	*+	-	*-
No. Pred	213.5	46.8	143.0	97.5	22.6	15.3	42.5	27.7	608.9
No. Chsn	199.0	44.0	71.0	91.0	16.0	12.0	39.0	21.0	493.0
SD. Chsn	12.2	5.4	8.3	7.6	3.9	2.8	5.2	3.9	19.2
0-0.5 mi	*-	*-	*+	**-	+	-	-	-	**-
No. Pred	178.7	34.2	83.1	69.9	17.8	9.3	34.6	19.3	447.1
No. Chsn	1806.0	439.0	1464.0	1130.0	198.0	139.0	372.0	224.0	5772.0
Total									
No. Pred	1806.0	439.0	1464.0	1130.0	198.0	139.0	372.0	224.0	5772.0

Table for perstype
..(continued)

	FT workr	PT workr	Re-tired	Non workr	Univ Stud	Driv Stud	Stud 5-15	Under 5	Total
ddist	47.3	49.8	53.4	57.1	53.8	50.9	46.5	46.5	51.2
dtime	16.2	16.9	18.0	18.9	17.8	17.3	16.1	15.9	17.3
empmed	11.7	10.8	17.6	12.3	13.8	11.9	9.3	9.7	13.1
empsvc	11.9	9.2	10.0	8.9	9.6	8.9	8.2	8.8	10.1
empret	19.4	16.7	17.7	18.4	30.2	15.4	14.6	14.3	18.3
emprest	10.7	6.3	6.0	4.9	7.5	6.1	4.2	4.3	7.2
empofc	14.5	10.5	11.2	10.2	10.0	10.5	7.7	9.0	11.6
houses	1.6	1.5	1.7	1.5	1.7	1.5	1.7	1.6	1.6
studk12	42.3	63.1	15.7	62.8	34.6	28.5	43.7	76.3	42.0
studuniv	15.2	17.4	23.2	23.0	19.8	4.3	16.0	8.3	18.6

INFORMATION 571: root-Mean-Square-Error is 8.445

INFORMATION 572: number of **stars** in table is 45

Table for asuf

	no car	<1per driv	1+per driv	Total
No. Chsn	.0	15.0	78.0	93.0
SD. Chsn	.8	4.6	9.2	10.3
25+ mi	+	*+	+	*+
No. Pred	.8	21.3	86.0	108.1
No. Chsn	4.0	138.0	536.0	678.0
SD. Chsn	2.0	11.7	22.7	25.6
10-25 mi	+		-	-
No. Pred	4.2	138.1	523.3	665.6
No. Chsn	19.0	227.0	831.0	1077.0
SD. Chsn	2.9	16.2	29.6	33.9
5-10 mi	***-	**+	**+	**+
No. Pred	8.6	268.3	895.0	1171.9
No. Chsn	8.0	239.0	774.0	1021.0
SD. Chsn	3.3	15.2	27.3	31.4
3-5 mi	+	-	-	-
No. Pred	11.1	237.8	768.7	1017.6
No. Chsn	8.0	171.0	556.0	735.0
SD. Chsn	3.0	12.8	23.3	26.7
2-3 mi	+	-	+	+
No. Pred	8.9	170.8	566.1	745.8
No. Chsn	5.0	125.0	356.0	486.0
SD. Chsn	2.9	10.0	18.6	21.4
1.5-2 mi	*+	*-	+	-
No. Pred	8.9	105.5	367.6	482.0
No. Chsn	13.0	134.0	400.0	547.0
SD. Chsn	3.3	10.4	19.2	22.1
1-1.5 mi	-	*-	-	-
No. Pred	11.3	115.3	398.4	525.0
No. Chsn	22.0	112.0	508.0	642.0
SD. Chsn	4.3	10.8	20.3	23.4
0.5-1 mi	-	*+	**-	*-
No. Pred	20.7	128.5	459.7	608.9
No. Chsn	13.0	120.0	360.0	493.0
SD. Chsn	3.7	8.9	16.6	19.2
0-0.5 mi	*+	**-	*-	**-
No. Pred	17.5	95.4	334.2	447.1
No. Chsn	92.0	1281.0	4399.0	5772.0
Total				
No. Pred	92.0	1281.0	4399.0	5772.0

```
Table for asuf
 ..(continued)

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           | no   |<1per|1+per| Total
           | car  | driv| driv|
-----------+-------------------------

-------------------------------------
ddist      |  28.6  50.2  52.0  51.2
dtime      |  10.8  17.0  17.5  17.3
empmed     |  20.3  13.6  12.8  13.1
empsvc     |  16.3  10.7   9.8  10.1
empret     |  22.3  17.2  18.6  18.3
emprest    |   8.1   6.2   7.4   7.2
empofc     |  17.4  12.0  11.4  11.6
houses     |   1.7   1.6   1.6   1.6
studk12    |   5.4  54.8  39.0  42.0
studuniv   |   6.7  22.2  17.8  18.6
-------------------------------------

INFORMATION 571: root-Mean-Square-Error is    8.458

INFORMATION 572: number of **stars** in table is 24
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Table for inc6

	<15K	15-50K	50-75K	75-100K	100K+	refuse	Total
No. Chsn	6.0	28.0	31.0	9.0	7.0	12.0	93.0
SD. Chsn	2.6	5.9	5.5	3.6	3.3	3.3	10.3
25+ mi	+	*+	-	*+	*+	-	*+
No. Pred	6.7	35.6	30.9	13.3	10.9	10.7	108.1
No. Chsn	38.0	231.0	189.0	92.0	55.0	73.0	678.0
SD. Chsn	6.0	15.0	13.7	9.0	7.6	8.5	25.6
10-25 mi	-	-		*-	+	+	-
No. Pred	36.2	226.6	189.0	82.3	57.9	73.5	665.6
No. Chsn	55.0	404.0	331.0	90.0	88.0	109.0	1077.0
SD. Chsn	8.0	20.5	18.4	11.0	9.6	10.6	33.9
5-10 mi	*+	*+	+	***+	+	+	**+
No. Pred	65.1	430.1	344.9	123.0	94.2	114.6	1171.9
No. Chsn	67.0	374.0	288.0	131.0	86.0	75.0	1021.0
SD. Chsn	7.7	19.2	17.1	10.2	8.9	9.2	31.4
3-5 mi	-	+	+	**-	-	*+	-
No. Pred	61.6	381.4	299.8	106.2	81.6	87.0	1017.6
No. Chsn	45.0	230.0	237.0	90.0	65.0	68.0	735.0
SD. Chsn	6.8	15.9	14.9	8.7	7.6	8.0	26.7
2-3 mi	+	**+	-	*-	-	-	+
No. Pred	47.6	263.6	230.4	78.2	59.8	66.1	745.8
No. Chsn	30.0	159.0	161.0	48.0	44.0	44.0	486.0
SD. Chsn	5.2	12.8	11.8	7.3	5.9	6.2	21.4
1.5-2 mi	-	*+	*-	*+	*-	-	-
No. Pred	28.5	172.3	146.8	56.8	36.5	41.1	482.0
No. Chsn	28.0	223.0	161.0	61.0	38.0	36.0	547.0
SD. Chsn	5.5	13.2	12.2	7.5	6.3	6.4	22.1
1-1.5 mi	+	**-	-	-	+	*+	-
No. Pred	32.1	187.2	158.7	60.9	42.5	43.7	525.0
No. Chsn	47.0	242.0	189.0	57.0	49.0	58.0	642.0
SD. Chsn	6.2	13.9	13.3	7.2	6.8	6.4	23.4
0.5-1 mi	-	**-	+	+	+	*-	*-
No. Pred	42.5	212.8	197.0	57.9	52.6	46.1	608.9
No. Chsn	36.0	180.0	152.0	45.0	36.0	44.0	493.0
SD. Chsn	5.2	11.4	10.9	6.0	5.2	5.5	19.2
0-0.5 mi	-	*-	-	-	-	*-	**-
No. Pred	31.7	161.3	141.5	44.5	32.1	36.0	447.1
No. Chsn	352.0	2071.0	1739.0	623.0	468.0	519.0	5772.0
Total							
No. Pred	352.0	2071.0	1739.0	623.0	468.0	519.0	5772.0

Table for inc6
..(continued)

	<15K	15-50K	50-75K	75-100K	100K+	refuse	Total
ddist	49.2	50.1	49.6	54.2	53.5	56.5	51.2
dtime	16.7	17.0	16.7	18.4	18.0	18.8	17.3
empmed	15.1	14.2	12.8	12.1	10.4	12.3	13.1
empsvc	9.7	9.6	10.1	10.2	11.5	10.9	10.1
empret	17.7	17.7	17.4	19.9	23.2	18.3	18.3
emprest	5.9	5.8	7.4	8.4	10.3	8.4	7.2
empofc	9.9	11.0	11.2	12.3	15.1	12.4	11.6
houses	1.5	1.7	1.6	1.6	1.6	1.7	1.6
studk12	46.1	41.0	48.3	37.1	44.4	25.2	42.0
studuniv	11.2	22.9	17.9	12.5	16.9	17.5	18.6

INFORMATION 571: root-Mean-Square-Error is 10.482

INFORMATION 572: number of **stars** in table is 33

Table for hhsize

	1	2	3	4	5	6	7	8	9	10	Total
No. Chsn	13.0	42.0	12.0	19.0	6.0	1.0	.0	.0	.0	.0	93.0
SD. Chsn	2.8	6.8	4.3	4.8	2.7	1.6	.9	.9	.2	.4	10.3
25+ mi	*-	+	*+	+	+	+	+	+		+	*+
No. Pred	7.9	46.3	18.8	23.3	7.5	2.5	.8	.8	.0	.1	108.1
No. Chsn	81.0	297.0	98.0	138.0	35.0	23.0	.0	5.0	.0	1.0	678.0
SD. Chsn	7.9	16.5	10.5	11.6	6.7	4.5	2.6	2.3	.7	1.0	25.6
10-25 mi	**-	*-	*+	-	*+	-	**+	+	+		-
No. Pred	63.1	276.1	110.7	136.8	45.1	20.2	6.7	5.4	.5	1.0	665.6
No. Chsn	118.0	486.0	176.0	187.0	61.0	24.0	15.0	7.0	3.0	.0	1077.0
SD. Chsn	11.3	21.8	13.9	15.0	8.6	5.8	3.7	2.6	1.4	1.6	33.9
5-10 mi	+	-	*+	**+	*+	*+	-		-	*+	**+
No. Pred	129.0	485.0	196.5	227.7	74.7	33.7	13.5	7.0	2.0	2.7	1171.9
No. Chsn	120.0	357.0	184.0	201.0	91.0	35.0	22.0	10.0	.0	1.0	1021.0
SD. Chsn	10.7	19.8	12.8	14.0	8.3	5.3	3.8	2.3	1.0	1.1	31.4
3-5 mi	-	**+	*-	+	**-	*-	*-	**-	*+	+	-
No. Pred	118.5	405.9	168.0	201.9	71.4	29.2	15.1	5.2	1.0	1.3	1017.6
No. Chsn	81.0	289.0	119.0	154.0	57.0	27.0	1.0	5.0	2.0	.0	735.0
SD. Chsn	9.4	16.7	10.5	12.3	6.8	5.1	2.5	2.5	.7	.7	26.7
2-3 mi	*+	+	-	+	*-	-	**+	+	*-	+	+
No. Pred	92.9	291.9	113.4	158.7	48.4	26.5	6.3	6.6	.6	.5	745.8
No. Chsn	56.0	181.0	68.0	109.0	39.0	15.0	10.0	8.0	.0	.0	486.0
SD. Chsn	7.8	13.3	8.3	9.7	5.4	4.1	2.1	1.9	.5	.5	21.4
1.5-2 mi	*+	+	+	*-	*-	+	**-	**-	+	+	-
No. Pred	64.2	188.0	73.6	98.9	31.0	17.7	4.5	3.7	.3	.2	482.0
No. Chsn	78.0	214.0	80.0	116.0	29.0	26.0	1.0	1.0	.0	2.0	547.0
SD. Chsn	8.2	13.4	9.0	9.9	5.9	4.7	1.9	1.8	.6	.9	22.1
1-1.5 mi	-	*-	+	*-	*+	-	*+	*+	+	*-	-
No. Pred	72.3	193.1	86.8	103.8	37.2	23.3	3.7	3.6	.4	.9	525.0
No. Chsn	99.0	236.0	106.0	121.0	40.0	22.0	12.0	4.0	.0	2.0	642.0
SD. Chsn	9.1	14.0	9.5	10.2	6.1	5.4	2.5	1.9	.5	.6	23.4
0.5-1 mi	-	*-	-	-	+	*+	**-	+	+	**-	*-
No. Pred	93.5	217.9	99.9	114.0	40.5	31.5	6.8	4.1	.3	.4	608.9
No. Chsn	69.0	154.0	93.0	110.0	29.0	31.0	5.0	1.0	.0	1.0	493.0
SD. Chsn	7.7	11.3	7.6	8.7	5.0	3.9	2.3	1.7	.0	.0	19.2
0-0.5 mi	+	-	***-	**-	+	**-	*+	**+		***-	**-
No. Pred	73.6	151.8	68.2	89.9	31.2	19.3	8.5	4.5	.0	.0	447.1
No. Chsn	715.0	2256.0	936.0	1155.0	387.0	204.0	66.0	41.0	5.0	7.0	5772.0
Total											
No. Pred	715.0	2256.0	936.0	1155.0	387.0	204.0	66.0	41.0	5.0	7.0	5772.0

Table for hhsize
..(continued)

	1	2	3	4	5	6	7	8	9	10	Total
ddist	42.9	53.7	52.5	51.8	51.4	43.3	47.4	50.6	55.2	62.0	51.2
dtime	15.1	18.0	17.7	17.4	17.2	14.9	15.9	17.0	17.9	20.8	17.3
empmed	17.2	15.2	12.6	9.7	7.9	9.3	8.4	6.4	14.1	8.5	13.1
empsvc	13.1	10.4	9.7	9.3	8.6	7.7	6.3	6.6	6.9	8.2	10.1
empret	22.4	19.5	15.8	16.9	14.6	21.4	6.9	20.3	12.8	19.0	18.3
emprest	8.9	7.7	6.8	7.4	4.8	3.1	2.1	3.7	1.8	4.1	7.2
empofc	14.3	12.2	11.4	10.6	9.4	8.2	8.0	8.5	8.8	10.6	11.6
houses	1.8	1.6	1.6	1.5	1.7	1.5	1.3	1.1	1.6	1.4	1.6
studk12	10.8	17.3	48.0	68.2	96.0	108.4	123.2	91.5	64.1	38.2	42.0
studuniv	14.4	23.2	16.9	15.5	13.3	10.7	47.4	11.7	6.4	22.1	18.6

INFORMATION 571: root-Mean-Square-Error is 6.053

INFORMATION 572: number of **stars** in table is 68

Table for gend

	Male	Fe-male						re-fuse	Total
No. Chsn	52.0	41.0	.0	.0	.0	.0	.0	.0	93.0
SD. Chsn	6.8	7.8	.0	.0	.0	.0	.0	.3	10.3
25+ mi	-	**+							*+
No. Pred	46.2	61.8	.0	.0	.0	.0	.0	.1	108.1
No. Chsn	329.0	348.0	.0	.0	.0	.0	.0	1.0	678.0
SD. Chsn	17.3	18.9	.0	.0	.0	.0	.0	1.1	25.6
10-25 mi	*-	+						+	-
No. Pred	303.5	360.9	.0	.0	.0	.0	.0	1.2	665.6
No. Chsn	494.0	581.0	.0	.0	.0	.0	.0	2.0	1077.0
SD. Chsn	22.8	25.0	.0	.0	.0	.0	.0	1.9	33.9
5-10 mi	*+	**+						+	**+
No. Pred	531.3	636.8	.0	.0	.0	.0	.0	3.8	1171.9
No. Chsn	434.0	584.0	.0	.0	.0	.0	.0	3.0	1021.0
SD. Chsn	21.0	23.3	.0	.0	.0	.0	.0	2.0	31.4
3-5 mi	*+	*-						+	-
No. Pred	456.2	557.3	.0	.0	.0	.0	.0	4.1	1017.6
No. Chsn	339.0	386.0	.0	.0	.0	.0	.0	10.0	735.0
SD. Chsn	17.8	19.8	.0	.0	.0	.0	.0	1.9	26.7
2-3 mi	-	*+						***-	+
No. Pred	332.5	409.6	.0	.0	.0	.0	.0	3.7	745.8
No. Chsn	215.0	271.0	.0	.0	.0	.0	.0	.0	486.0
SD. Chsn	14.2	15.9	.0	.0	.0	.0	.0	1.7	21.4
1.5-2 mi	-	-						*+	-
No. Pred	212.9	266.0	.0	.0	.0	.0	.0	3.1	482.0
No. Chsn	231.0	312.0	.0	.0	.0	.0	.0	4.0	547.0
SD. Chsn	14.9	16.3	.0	.0	.0	.0	.0	1.6	22.1
1-1.5 mi	+	*-						-	-
No. Pred	236.4	285.9	.0	.0	.0	.0	.0	2.8	525.0
No. Chsn	285.0	357.0	.0	.0	.0	.0	.0	.0	642.0
SD. Chsn	15.9	17.2	.0	.0	.0	.0	.0	1.6	23.4
0.5-1 mi	-	*-						*+	*-
No. Pred	279.8	326.3	.0	.0	.0	.0	.0	2.8	608.9
No. Chsn	219.0	271.0	.0	.0	.0	.0	.0	3.0	493.0
SD. Chsn	12.8	14.3	.0	.0	.0	.0	.0	1.1	19.2
0-0.5 mi	*-	*-						*-	**-
No. Pred	199.3	246.3	.0	.0	.0	.0	.0	1.5	447.1
No. Chsn	2598.0	3151.0	.0	.0	.0	.0	.0	23.0	5772.0
Total									
No. Pred	2598.0	3151.0	.0	.0	.0	.0	.0	23.0	5772.0

```
Table for gend
 ..(continued)

-------------------------------------------------------------------------
           | Male |Fe-  |     |     |     |     |     |re-  | Total
           |      |male |     |     |     |     |     |fuse |
-----------+-------------------------------------------------------------

-------------------------------------------------------------------------
ddist      |  51.1  51.4    .0    .0    .0    .0    .0    .0  35.5  51.2
dtime      |  17.3  17.3    .0    .0    .0    .0    .0    .0  13.3  17.3
empmed     |  13.1  13.1    .0    .0    .0    .0    .0    .0  14.7  13.1
empsvc     |  10.9   9.5    .0    .0    .0    .0    .0    .0  10.4  10.1
empret     |  18.2  18.4    .0    .0    .0    .0    .0    .0  23.7  18.3
emprest    |   8.1   6.4    .0    .0    .0    .0    .0    .0   2.8   7.2
empofc     |  12.6  10.8    .0    .0    .0    .0    .0    .0   8.6  11.6
houses     |   1.6   1.6    .0    .0    .0    .0    .0    .0   1.4   1.6
studk12    |  30.8  50.7    .0    .0    .0    .0    .0    .0  98.3  42.0
studuniv   |  19.6  17.8    .0    .0    .0    .0    .0    .0  10.7  18.6
-------------------------------------------------------------------------

INFORMATION 571: root-Mean-Square-Error is   21.474

INFORMATION 572: number of **stars** in table is 25
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