NOACA
Technical Memorandum

Systematic Error Checks of the Auto Ownership and Gravity Models

May 2003

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NOACA

Planning For Greater Cleveland

The Northeast Ohio Areawide Coordinating Agency (NOACA) is a public Organization serving the counties of and municipalities & townships within Cuyahoga, Geauga, Lake, Lorain and Medina (covering an area with 2.1 million people). NOACA is the agency designated or recognized to perform the following functions:

- **Serve as the Metropolitan Planning Organization (MPO), with responsibility for comprehensive cooperative and continuous planning for highways, public transit, and bikeways, as defined in the Transportation Equity Act for the 21st Century.**
- **Perform continuous water quality, transportation-related air quality and other environmental planning functions.**
- **Administer the area clearinghouse function, which includes providing local government with the opportunity to review a wide variety of local or state applications for federal funds.**
- **Conduct transportation and environmental planning and related demographic, economic and land use research.**
- **Serve as an information center for transportation and environmental and related planning.**
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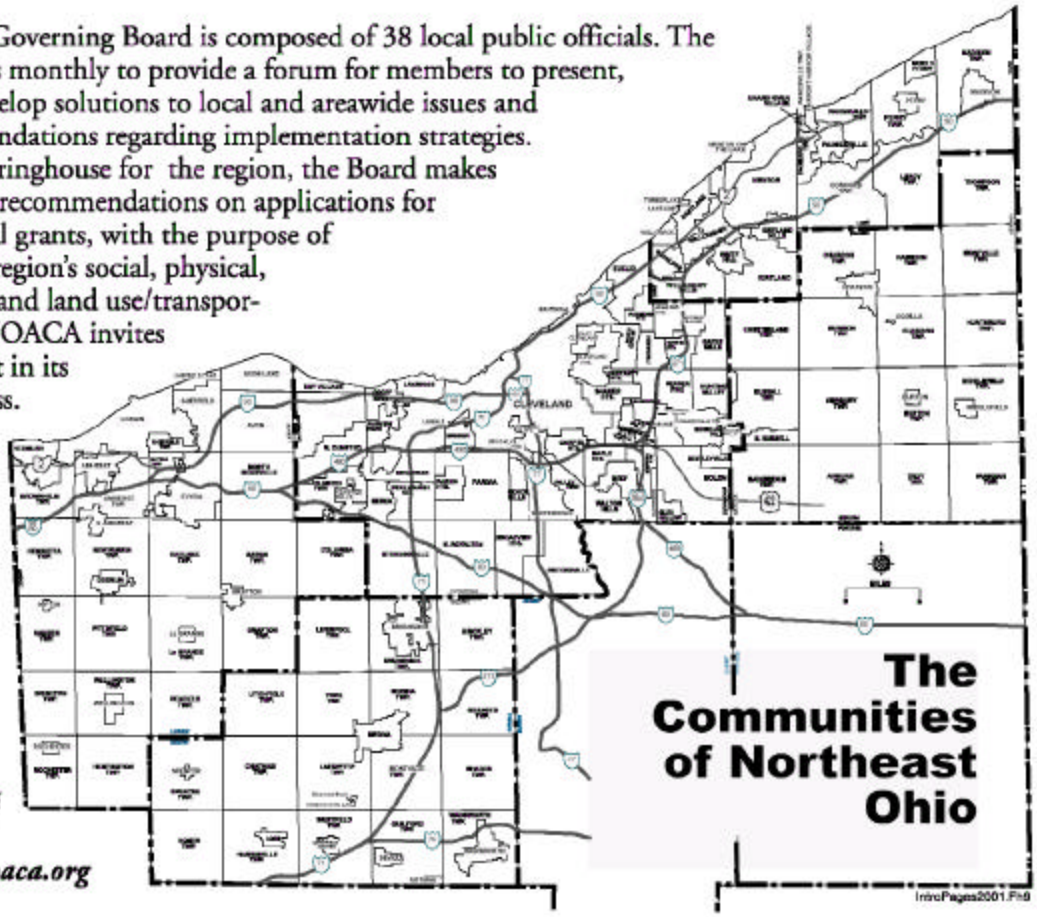

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1) Title & Subtitle **Systematic Error Checks of the Auto Ownership and Gravity Models**	**2) NOACA Report No.** **TM-03-03**
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8) Sponsoring Agency Name & Address **Ohio Department of Transportation** **1980 W. Broad St., Box 899** **Columbus, OH 43216-0899**	**9) Type of Report & Period** **July 1, 2002- June 30, 2003** **10) Sponsoring Agency Code**
11) Supplementary Notes **Federal funding for this project was provided by the Federal Highway Administration and administered by the Ohio Department of Transportation.**	
12) Abstracts **The peer review panel at the Travel Demand Model Peer Review held in May 2002 made some recommendations to NOACA about searching for systematic errors. Analyses of the auto ownership model and gravity model districts indicates that while the NOACA model performs well overall, there are some minor systematic errors that the modeling staff may want to research further for the 2000 model.**	
13) Key Words & Document Analysis **A. Descriptors** **Travel Demand Model, Systematic Error Check, Auto Ownership Model, Gravity Model** **B. Identifiers/Open Ended Terms**	
14) Availability Statement **NOACA**	**15) No. Pages** **17** **16) Price**

Systematic Error Checks of the Auto Ownership and Gravity Models

May 2003

Prepared by

NORTHEAST OHIO AREAWIDE COORDINATING AGENCY

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The preparation of this publication was financed through grants received from the Federal Highway Administration and the Ohio Department of Transportation and appropriations from the counties of and municipalities within Cuyahoga, Geauga, Lake, Lorain and Medina. The contents do not necessarily reflect official views or policies of the U.S. Department of Transportation or the Ohio Department of Transportation. This report does not constitute a standard or regulation.

ABSTRACT

The peer review panel at the NOACA Travel Demand Model Peer Review held in May 2002 recommended that NOACA examine the model for systematic errors, which are patterns that indicate inaccuracies in the model. Discovery and management of these errors serve to fine tune the model; in its current form, the NOACA travel demand model fulfills all of ODOT's requirements as confirmed during the calibration/validation process.

This technical memorandum reviews the results of systematic error checks for the auto ownership and gravity models. The Regional Travel Demand Forecasting Model Documentation (dated April 2001, and from here on referred to as 'TDM documentation') shows that NOACA's model generally performs very well; however, some minor inconsistencies were found during this analysis. In the auto ownership model, households with no workers and households with more than four people are consistently underestimated, while households with two or three workers are overestimated. In the gravity model, some trip purposes into or out of certain districts are over or underestimated. These phenomena are the result of regional social behaviors and may require recalibration. For the majority of trips, the gravity model districts work reasonably well.

INTRODUCTION

In May 2002, NOACA hosted a peer review of its Travel Demand Model (TDM). Experts in the field from around the country and Canada came to NOACA's offices to discuss and review the model over a two-day period. Their general comment on the model was:

> *Overall, the existing NOACA travel demand models compare quite favorably to peer large urban areas across the United States. The complete set of models represents "advanced best practice." The model system is clearly capable of addressing air quality conformity determinations, corridor specific studies, and analyzing regionally-significant highway and transit investments.* (Travel Demand Model Peer Review Summary, May 14-15, 2002, PB Consult Inc.)

The peer review panel divided their recommendations into three stages, near-term, mid-term and long-term. This technical memo covers two aspects of the near-term recommendations: auto ownership and district-level interchange comparisons. This technical memorandum is to supplement the TDM documentation.

AUTO OWNERSHIP

The number of trips produced per household is a function of household size, income, number of workers, and the number of vehicles available to the household. The assumption is that larger households, and particularly those with more members who work, will generate more trips Additionally, those with more disposable income or vehicles available for travel will make more trips.

The AUTOGEN module applies several sub-models for the joint household distribution. These are amply documented in the TDM Documentation. Table 1 examines the reasonableness of the models by county. Generally, there is an excellent re-creation of households by county, autos, worker, size and income group. However, two possible error trends can be observed. Households with no workers and households with more than four people are consistently underestimated, while households with two or three workers are overestimated. The error seems small, but since it is consistent in each county, the size and worker sub-models should be thoroughly examined with the 2000 Census data, and possibly recalibrated. The income and Auto Ownership sub-models perform very well.

Table 1: Household Distribution and Auto Ownership Submodel Check (Market Segmentation Model)

CUYAHOGA

AUTOS	ESTIMATED	%	OBSERVED	%	WORKERS	ESTIMATED	%	OBSERVED	%
0	88638	16	91814	16	0	169262	30	188196	33
1	201382	36	202061	36	1	208865	37	200446	36
2	189960	33	187959	33	2	147267	26	143215	25
3+	83155	15	81313	15	3+	37741	7	32486	6
Total	**563135**	**100**	**563147**	**100**	**Total**	**563135**	**100**	**564343**	**100**

SIZE	ESTIMATED	%	OBSERVED	%	INCOME	ESTIMATED	%	OBSERVED	%
1	163400	29	168692	30	0-15	147875	26	147868	26
2	182033	32	168557	30	15-30	138566	25	142172	25
3	95619	17	86513	15	30-50	147298	26	144885	26
4+	122094	22	140566	25	50+	129408	23	128222	23
Total	**563146**	**100**	**564328**	**100**	**Total**	**563147**	**100**	**563147**	**100**

GEAUGA

AUTOS	ESTIMATED	%	OBSERVED	%	WORKERS	ESTIMATED	%	OBSERVED	%
0	699	3	747	3	0	4304	16	4941	18
1	6539	24	6644	25	1	9450	35	9302	35
2	13042	48	12996	48	2	9961	37	9896	37
3+	6626	25	6519	24	3+	3191	12	2803	10
Total	26906	100	26906	100	Total	26906	100	26942	100

SIZE	ESTIMATED	%	OBSERVED	%	INCOME	ESTIMATED	%	OBSERVED	%
1	4211	16	4329	16	0-15	3287	12	3377	13
2	8367	31	7694	29	15-30	5241	20	5433	20
3	5681	21	5105	19	30-50	7585	28	7372	27
4+	8647	32	9848	36	50+	10794	40	10724	40
Total	26906	100	26976	100	Total	26907	100	26906	100

LAKE

AUTOS	ESTIMATED	%	OBSERVED	%	WORKERS	ESTIMATED	%	OBSERVED	%
0	4225	5	4357	5	0	15934	20	18135	23
1	25300	32	25581	32	1	29577	37	28874	36
2	34790	43	34662	43	2	27104	34	26723	33
3+	16106	20	15821	20	3+	7805	9	6803	8
Total	80421	100	80421	100	Total	80420	100	80535	100

SIZE	ESTIMATED	%	OBSERVED	%	INCOME	ESTIMATED	%	OBSERVED	%
1	18764	23	19355	24	0-15	13622	17	13762	17
2	26052	33	24092	30	15-30	19168	24	19531	24
3	15354	19	13874	17	30-50	24807	31	24436	31
4+	20251	25	23286	29	50+	22824	28	22692	28
Total	80421	100	80607	100	Total	80421	100	80421	100

LORAIN

AUTOS	ESTIMATED	%	OBSERVED	%	WORKERS	ESTIMATED	%	OBSERVED	%
0	7025	8	7161	7	0	22941	24	25783	27
1	31026	32	31315	33	1	35331	37	34251	36
2	40390	42	40273	42	2	29485	31	28951	30
3+	17623	18	17315	18	3+	8307	8	7220	7
Total	96064	100	96064	100	Total	96064	100	96205	100

SIZE	ESTIMATED	%	OBSERVED	%	INCOME	ESTIMATED	%	OBSERVED	%
1	19896	21	20501	21	0-15	21707	23	21761	23
2	30788	32	28436	30	15-30	24687	26	25150	26
3	19310	20	17426	18	30-50	28099	29	27757	29
4+	26069	27	29934	31	50+	21571	22	21396	22
Total	96063	100	96297	100	Total	96064	100	96064	100

MEDINA

AUTOS	ESTIMATED	%	OBSERVED	%	WORKERS	ESTIMATED	%	OBSERVED	%
0	1530	4	1591	4	0	7239	17	8277	20
1	11295	27	11432	27	1	14824	36	14548	35
2	19531	47	19483	47	2	15011	36	14887	35
3+	9436	22	9286	22	3+	4717	11	4138	10
Total	41792	100	41792	100	Total	41791	100	41850	100

SIZE	ESTIMATED	%	OBSERVED	%	INCOME	ESTIMATED	%	OBSERVED	%
1	7152	17	7357	18	0-15	6264	15	6385	15
2	13257	32	12219	29	15-30	9270	22	9473	23
3	8876	21	7993	19	30-50	13234	32	12939	31
4+	12508	30	14330	34	50+	13024	31	12995	31
Total	41793	100	41899	100	Total	41792	100	41792	100

Observed county-level household totals slightly vary due to Census source differences between STF1 and CTPP and availability of tables in these sources.

All percentages rounded to equal 100.

DISTRICT-LEVEL INTERCHANGES

The gravity model was checked for systematic errors by comparing model inputs with the home interview survey results. Data from both the survey and model were compressed using the MATRIX COMPRESS function into the recently updated 15 gravity model superdistricts (see map on page 7).

Ratios were calculated for estimated/observed numbers by O-D pair for the superdistricts. Ratios were considered reasonable if they were between 0.5 and 1.5. The ratios that do not fit within this range are shaded in the #-C tables. If the number of trips for both survey and model were less than about 1,000, the number of trips was considered insignificant and the ratio was not considered. The results are shown in Tables 2 through 10.

In general, the numbers were within reasonable limits. In particular, O-D pairs with high numbers of trips (over 10,000) were nearly always reasonable, with some exceptions for non-home-based work trips.

There were a few O-D pairs' ratios that did not fall between 0.5 and 1.5. For *home-based work trips*, District 13's (southern Medina county) trips were over-assigned to Districts 1, 2 and 3 (Cleveland CBD, East and West), and underassigned to District 10 (northern Median county).

The *home-based university* trips show the survey and model disagree on which districts have no universities or colleges. There is also a huge discrepancy between the number of trips to Districts 1, 6 and 7. Based on NOACA's GIS data and enrollment data available from the Ohio Department of Education, the model is more accurate than the survey for university trips.

The *home-based school* trips showed a good fit for district totals in all areas except in the districts representing Cleveland. The model appears to have underassigned in District 1 (Cleveland CBD) and overassigned in District 2 (Cleveland East). However, based on school trip productions in Districts 1 and 2, the model looks more reasonable than the home interview survey.

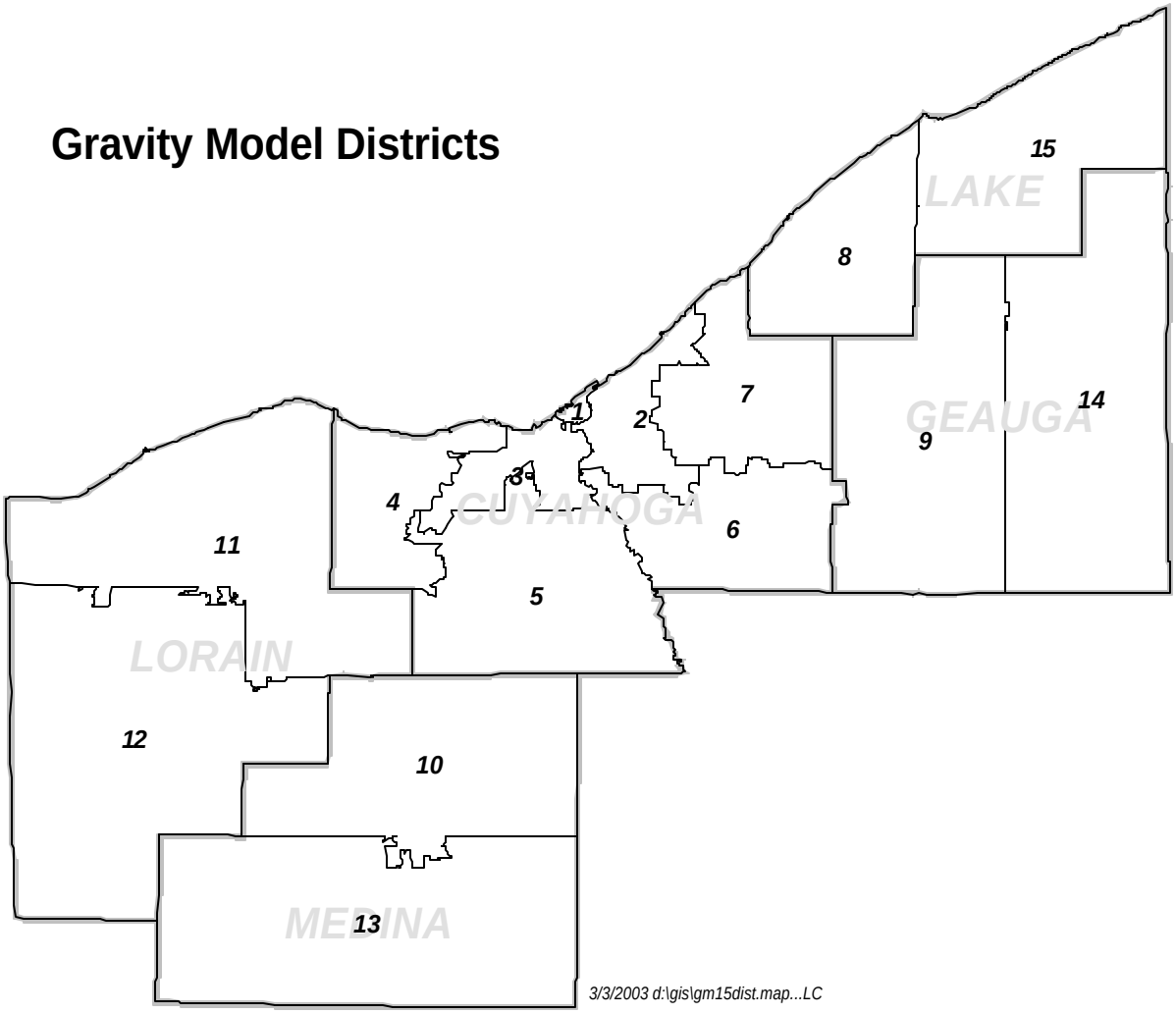
For *home-based shop* trips, a discrepancy worth mentioning is the model's overassignment of shopping trips to the Cleveland CBD (District 1)- it is assigning about four times as many trips as the survey indicated. Interestingly, the survey also shows that nearly all the shop trips to the Cleveland CBD are from adjacent districts served by GCRTA's rapid transit system.

The *home-based social/recreational* trips match fairly well, although some districts may need to be re-evaluated in their ability to attract trips for social and recreational purposes. Given the perpetual construction of new centers that provide entertainment, some outlying districts may need to be considered more "attractive", i.e., Lake County (Districts 8 and 15), and northern Medina county (District 10). Another interesting observation is that the model has overassigned trips from the districts in Cuyahoga County (Districts 4-7) to Cleveland (Districts 1, 2, and 3).

For *home-based other*, trips leaving District 2 are not accurately estimated with the model. The model underestimates trips by half, and assumes too many trips to zones 6 and 7. Additionally, District 11 has too few trips leaving and entering, particularly from faraway districts such as 7, 8 and 9. District 6 has too many trips coming in from adjacent districts.

Non-home-based work trips are fine for district totals as destinations, but the model under-assigned trips by half for intrazonal trips into the two districts with the most employment, Districts 1 and 4. Districts 2 and 6 are overassigned with ratios of 1.47 and 1.59, respectively.

When looking at total trips by all purposes, some general trends are revealed. District 14 (eastern Geauga county) should be reviewed because it has high estimated/observed ratios: 1.81 for outbound, and 1.42 for inbound. It may also be worthwhile to review other districts with smaller but still significant underassignments. Trips leaving District 1 (Cleveland CBD) are underassigned, with a ratio of 0.71. Trips entering and leaving District 14 (eastern Geauga) are overassigned. Trips ending in Districts 9 (western Geauga) and 10 (northern Medina) are underestimated with ratios as 0.73 and 0.71, respectively.


Gravity Model Districts
15
LAKE
8
7
14
GEAUGA
9
1
2
3
4
CUYAHOGA
6
11
5
LORAIN
12
10
MEDINA
13
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MODEL (ESTIMATED) VS. SURVEY (OBSERVED) TRIPS BY GM DISTRICT

Table 2-A: SURVEY: HOME-BASED WORK

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	260	56	34	11	4	3	17	0	0	0	0	0	0	0	0	**385**
2	20,158	40,989	13,026	1,214	5,221	15,142	13,741	2,617	297	35	290	50	46	30	492	**113,348**
3	18,970	20,403	36,529	9,300	19,377	6,357	2,545	686	49	380	1,122	127	30	15	286	**116,176**
4	22,250	14,247	20,723	53,189	17,525	4,409	3,172	839	116	579	4,301	401	148	10	172	**142,081**
5	23,489	18,616	20,850	10,739	82,631	15,586	5,162	1,049	204	2,096	1,520	162	206	66	177	**182,553**
6	9,809	15,284	6,489	1,174	7,560	48,601	11,138	1,751	1,034	176	225	8	40	63	352	**103,704**
7	23,856	35,235	8,247	1,737	4,802	13,313	64,638	8,591	1,202	48	421	174	18	106	1,041	**163,429**
8	6,752	11,087	2,514	623	1,971	5,246	20,526	50,038	1,377	51	961	266	0	108	6,665	**108,185**
9	2,570	3,555	648	517	950	6,150	7,689	3,282	10,824	70	82	35	23	1,144	1,109	**38,648**
10	3,055	3,227	3,465	1,695	11,979	1,886	598	146	10	19,427	875	185	1,994	10	40	**48,592**
11	5,000	4,382	5,774	14,514	8,482	1,817	664	159	15	992	94,459	3,996	147	0	51	**140,452**
12	331	309	557	910	1,256	225	64	3	0	525	10,409	8,262	130	0	10	**22,991**
13	574	524	452	396	1,805	551	205	47	0	8,329	337	141	10,124	5	21	**23,511**
14	312	694	179	195	204	1,100	1,226	1,017	4,653	1	12	0	15	4,378	996	**14,982**
15	1,426	1,883	439	148	417	1,005	3,615	14,557	1,418	0	152	77	15	146	23,992	**49,290**
	138,812	**170,491**	**119,926**	**96,362**	**164,184**	**121,391**	**135,000**	**84,782**	**21,199**	**32,709**	**115,166**	**13,884**	**12,936**	**6,081**	**35,404**	**1,268,327**

Table 2-B: MODEL: HOME-BASED WORK

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	584	383	177	77	134	85	112	40	5	7	30	2	1	1	7	**1,645**
2	25,067	46,101	9,071	2,856	5,735	13,062	20,806	3,478	500	90	400	34	11	20	273	**127,504**
3	22,620	15,730	30,404	12,518	18,139	4,883	2,841	666	108	329	1,585	148	17	7	55	**110,050**
4	19,220	13,404	27,517	47,381	21,143	3,548	2,510	606	85	834	9,469	662	28	14	55	**146,476**
5	17,066	15,571	28,402	13,313	71,403	11,222	3,599	594	207	3,022	2,700	322	125	19	65	**167,630**
6	7,288	13,332	5,162	1,398	6,993	30,945	11,497	1,317	1,176	76	274	39	6	67	109	**79,679**
7	21,998	49,691	6,419	1,841	3,474	16,670	66,641	12,249	1,738	54	326	32	4	82	858	**182,077**
8	6,776	10,547	2,000	591	899	3,505	19,554	46,215	2,373	36	194	34	8	120	7,476	**100,328**
9	1,518	3,138	700	209	745	6,075	6,744	3,513	8,705	17	129	20	8	851	1,640	**34,012**
10	2,026	1,851	3,148	2,763	11,160	1,023	563	209	68	17,194	1,819	644	1,311	16	61	**43,856**
11	4,753	3,872	6,845	16,085	7,229	1,273	878	285	87	987	90,433	5,055	46	20	66	**137,914**
12	709	641	1,002	1,643	1,296	294	249	114	44	886	7,800	6,814	132	9	40	**21,673**
13	1,595	1,457	1,115	815	2,317	688	748	359	118	4,877	990	534	9,440	36	123	**25,212**
14	569	744	286	156	270	1,105	1,293	1,274	2,928	32	170	27	11	3,927	1,498	**14,290**
15	1,524	2,085	560	241	384	821	3,201	10,902	2,366	51	249	41	15	294	20,942	**43,676**
	133,313	**178,547**	**122,808**	**101,887**	**151,321**	**95,199**	**141,236**	**81,821**	**20,508**	**28,492**	**116,568**	**14,408**	**11,163**	**5,483**	**33,268**	**1,236,022**

Table 2-C: ESTIMATED/OBSERVED RATIOS FOR HOME-BASED WORK

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	2.25	6.84	5.21	7.00	33.50	28.33	6.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.27
2	1.24	1.12	0.70	2.35	1.10	0.86	1.51	1.33	1.68	2.57	1.38	0.68	0.24	0.67	0.55	**1.12**
3	1.19	0.77	0.83	1.35	0.94	0.77	1.12	0.97	2.20	0.87	1.41	1.17	0.57	0.47	0.19	**0.95**
4	0.86	0.94	1.33	0.89	1.21	0.80	0.79	0.72	0.73	1.44	2.20	1.65	0.19	1.40	0.32	**1.03**
5	0.73	0.84	1.36	1.24	0.86	0.72	0.70	0.57	1.01	1.44	1.78	1.99	0.61	0.29	0.37	**0.92**
6	0.74	0.87	0.80	1.19	0.93	0.64	1.03	0.75	1.14	0.43	1.22	4.88	0.15	1.06	0.31	**0.77**
7	0.92	1.41	0.78	1.06	0.72	1.25	1.03	1.43	1.45	1.13	0.77	0.18	0.22	0.77	0.82	**1.11**
8	1.00	0.95	0.80	0.95	0.46	0.67	0.95	0.92	1.72	0.71	0.20	0.13	0.00	1.11	1.12	**0.93**
9	0.59	0.88	1.08	0.40	0.78	0.99	0.88	1.07	0.80	0.24	1.57	0.57	0.35	0.74	1.48	**0.88**
10	0.66	0.57	0.91	1.63	0.93	0.54	0.94	1.43	6.80	0.89	2.08	3.48	0.66	1.60	1.53	**0.90**
11	0.95	0.88	1.19	1.11	0.85	0.70	1.32	1.79	5.80	0.99	0.96	1.27	0.31	0.00	1.29	**0.98**
12	2.14	2.07	1.80	1.81	1.03	1.31	3.89	38.00	0.00	1.69	0.75	0.82	1.02	0.00	4.00	**0.94**
13	2.78	2.78	2.47	2.06	1.28	1.25	3.65	7.64	0.00	0.59	2.94	3.79	0.93	7.20	5.86	**1.07**
14	1.82	1.07	1.60	0.80	1.32	1.00	1.05	1.25	0.63	32.00	14.17	0.00	0.73	0.90	1.50	**0.95**
15	1.07	1.11	1.28	1.63	0.92	0.82	0.89	0.75	1.67	0.00	1.64	0.53	1.00	2.01	0.87	**0.89**
	0.96	**1.05**	**1.02**	**1.06**	**0.92**	**0.78**	**1.05**	**0.97**	**0.97**	**0.87**	**1.01**	**1.04**	**0.86**	**0.90**	**0.94**	**0.97**

Table 3-A: SURVEY: HOME-BASED UNIVERSITY

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2	585	9,440	508	0	0	0	1,026	0	0	0	0	0	0	0	0	**11,559**
3	0	0	446	1,368	2,678	0	0	0	0	0	0	0	0	0	0	**4,492**
4	4,588	0	0	2,023	1,258	0	0	0	0	0	1,150	0	0	0	0	**9,019**
5	1,815	1,040	0	517	5,657	0	0	0	0	0	0	0	0	0	0	**9,029**
6	684	0	0	0	0	8,975	0	0	0	0	0	0	0	0	0	**9,659**
7	1,112	5,863	0	0	0	2,924	8,489	1,157	0	0	0	0	0	0	0	**19,545**
8	0	0	0	0	0	0	0	1,867	0	0	0	0	0	0	0	**1,867**
9	0	0	0	0	0	822	0	0	1,236	0	0	0	0	0	0	**2,058**
10	0	0	0	1,258	0	0	0	0	0	1,052	0	0	0	0	0	**2,310**
11	0	0	0	449	851	0	0	0	0	0	9,783	0	0	0	0	**11,083**
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
13	0	0	0	0	0	0	0	0	0	1,258	0	0	0	0	0	**1,258**
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
15	0	1,176	0	0	0	0	930	0	520	0	0	0	0	0	1,885	**4,511**
	8,784	**17,519**	**954**	**5,615**	**10,444**	**12,721**	**10,445**	**3,024**	**1,756**	**2,310**	**10,933**	**0**	**0**	**0**	**1,885**	**86,390**

Table 3-B: MODEL: HOME-BASED UNIVERSITY

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	31	6	0	0	0	1	0	0	0	0	0	0	0	0	0	**38**
2	3,729	5,354	0	130	395	1,001	680	387	0	0	62	18	0	0	1	**11,757**
3	3,371	2,063	0	488	1,251	273	186	131	0	0	216	66	0	0	1	**8,046**
4	2,252	1,412	0	1,461	1,459	226	158	124	0	0	811	200	0	0	0	**8,103**
5	1,589	1,065	0	1,000	6,081	343	170	96	0	0	150	67	0	0	1	**10,562**
6	1,292	1,254	0	142	562	1,550	601	323	0	0	49	15	0	0	1	**5,789**
7	1,986	3,280	0	76	213	1,047	3,338	928	0	0	46	11	0	0	5	**10,930**
8	858	763	0	32	76	351	283	3,474	0	0	16	12	0	0	35	**5,900**
9	276	312	0	22	76	365	263	947	0	0	12	4	0	0	11	**2,288**
10	446	292	0	521	1,442	76	43	58	0	0	204	139	0	0	2	**3,223**
11	829	509	0	479	667	90	63	51	0	0	5,873	1,152	0	0	0	**9,713**
12	97	69	0	79	116	19	8	16	0	0	334	809	0	0	0	**1,547**
13	404	257	0	267	619	80	51	106	0	0	140	127	0	0	2	**2,053**
14	146	157	0	20	48	139	111	584	0	0	19	18	0	0	12	**1,254**
15	284	259	0	21	56	129	114	1,442	0	0	23	19	0	0	646	**2,993**
	17,590	**17,052**	**0**	**4,738**	**13,061**	**5,690**	**6,069**	**8,667**	**0**	**0**	**7,955**	**2,657**	**0**	**0**	**717**	**84,196**

Table 3-C: ESTIMATED/OBSERVED RATIOS FOR HOME-BASED UNIVERSITY

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
2	6.37	0.57	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.02**
3	0.00	0.00	0.00	0.36	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.79**
4	0.49	0.00	0.00	0.72	1.16	0.00	0.00	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.00	**0.90**
5	0.88	1.02	0.00	1.93	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.17**
6	1.89	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.60**
7	1.79	0.56	0.00	0.00	0.00	0.36	0.39	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.56**
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.16
9	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.11**
10	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.40**
11	0.00	0.00	0.00	1.07	0.78	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	**0.88**
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.63**
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
15	0.00	0.22	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	**0.66**
	2.00	**0.97**	**0.00**	**0.84**	**1.25**	0.45	**0.58**	2.87	**0.00**	**0.00**	**0.73**	**0.00**	**0.00**	**0.00**	0.38	**0.97**

Table 4-A: SURVEY: HOME-BASED SCHOOL

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	0	0	0	0	0	0	0	902	0	0	0	0	0	0	0	**902**
2	7,219	84,473	21,504	0	0	0	4,808	1,425	0	0	0	0	0	0	0	**119,429**
3	3,361	4,377	66,524	2,741	16,561	0	0	0	0	0	0	0	0	0	0	**93,564**
4	2,004	0	477	82,316	7,397	0	0	0	0	770	0	0	0	0	0	**92,964**
5	706	0	2,405	0	100,541	0	8,082	0	0	0	0	0	0	0	0	**111,734**
6	0	1,662	0	0	0	43,708	3,843	540	0	0	0	0	0	0	0	**49,753**
7	2,921	8,366	2,855	0	0	4,824	133,388	425	780	0	0	0	0	0	0	**153,559**
8	1,590	0	0	0	0	0	0	61,132	0	0	0	0	0	0	707	**63,429**
9	0	0	0	0	0	408	1,074	357	26,660	0	0	0	0	2,916	0	**31,415**
10	0	0	0	1,641	0	0	0	0	0	39,468	0	0	3,351	0	0	**44,460**
11	1,878	0	0	7,529	2,956	0	0	0	0	0	78,043	2,555	0	0	0	**92,961**
12	0	0	0	3,771	0	0	0	0	0	2,216	3,752	2,030	2,216	0	0	**13,985**
13	0	0	0	0	0	0	0	0	0	10,948	0	0	11,778	0	0	**22,726**
14	0	0	0	0	0	0	0	0	3,507	0	0	0	0	5,140	0	**8,647**
15	0	0	0	0	0	0	4,480	1,651	816	0	0	0	0	0	23,406	**30,353**
	19,679	**98,878**	**93,765**	**97,998**	**127,455**	**48,940**	**155,675**	**66,432**	**31,763**	**53,402**	**81,795**	**4,585**	**17,345**	**8,056**	**24,113**	**929,881**

Table 4-B: MODEL: HOME-BASED SCHOOL

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	45	157	81	10	6	5	7	1	0	2	1	0	1	0	0	**316**
2	949	119,747	5,211	1,214	1,338	8,035	25,323	917	221	158	343	59	67	18	111	**163,711**
3	839	4,749	75,888	11,664	8,616	1,107	866	191	99	264	628	63	53	11	49	**105,087**
4	111	674	6,499	76,992	2,674	198	268	93	52	200	2,681	83	46	8	30	**90,609**
5	124	1,732	8,521	5,473	98,378	1,789	665	193	145	2,213	1,319	80	129	19	74	**120,854**
6	76	7,441	1,249	460	1,748	50,198	4,734	279	540	138	237	33	50	27	64	**67,274**
7	155	17,076	784	406	410	2,181	100,804	3,342	626	126	247	49	58	28	173	**126,465**
8	35	864	232	194	169	229	4,220	58,830	802	82	159	31	49	29	844	**66,769**
9	22	408	184	194	225	2,447	1,384	850	18,683	105	200	45	57	282	490	**25,576**
10	15	163	184	342	1,790	98	146	78	56	33,186	565	175	368	10	38	**37,214**
11	22	312	457	3,628	1,326	172	284	145	97	302	108,761	2,317	85	23	68	**117,999**
12	29	349	306	633	416	186	340	176	143	742	4,161	10,380	345	24	119	**18,349**
13	21	230	180	251	300	134	230	127	100	2,698	342	150	19,223	24	82	**24,092**
14	38	448	296	339	354	374	596	434	2,293	230	439	84	120	9,351	520	**15,916**
15	12	223	134	145	141	114	282	1,832	572	89	168	36	55	328	30,879	**35,010**
	2,493	**154,573**	**100,206**	**101,945**	**117,891**	**67,267**	**140,149**	**67,488**	**24,429**	**40,535**	**120,251**	**13,585**	**20,706**	**10,182**	**33,541**	**1,015,241**

Table 4-C: ESTIMATED/OBSERVED RATIOS FOR HOME-BASED SCHOOL

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
2	0.13	1.42	0.24	0.00	0.00	0.00	5.27	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.37**
3	0.25	1.08	1.14	4.26	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.12**
4	0.06	0.00	13.62	0.94	0.36	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	**0.97**
5	0.18	0.00	3.54	0.00	0.98	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.08**
6	0.00	4.48	0.00	0.00	0.00	1.15	1.23	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.35**
7	0.05	2.04	0.27	0.00	0.00	0.45	0.76	7.86	0.80	0.00	0.00	0.00	0.00	0.00	0.00	**0.82**
8	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	1.19	**1.05**
9	0.00	0.00	0.00	0.00	0.00	6.00	1.29	2.38	0.70	0.00	0.00	0.00	0.00	0.10	0.00	**0.81**
10	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.84	0.00	0.00	0.11	0.00	0.00	**0.84**
11	0.01	0.00	0.00	0.48	0.45	0.00	0.00	0.00	0.00	0.00	1.39	0.91	0.00	0.00	0.00	**1.27**
12	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.33	1.11	5.11	0.16	0.00	0.00	**1.31**
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	1.63	0.00	0.00	**1.06**
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	1.82	0.00	**1.84**
15	0.00	0.00	0.00	0.00	0.00	0.00	0.06	1.11	0.70	0.00	0.00	0.00	0.00	0.00	1.32	**1.15**
	0.13	**1.56**	**1.07**	**1.04**	**0.92**	**1.37**	**0.90**	**1.02**	**0.77**	**0.76**	**1.47**	2.96	**1.19**	**1.26**	**1.39**	**1.09**

Table 5-A: SURVEY: HOME-BASED SHOP

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	0	0	0	0	0	0	726	0	0	0	0	0	0	0	0	**726**
2	2,748	71,920	0	0	2,006	3,981	19,159	4,342	0	0	671	0	0	0	0	**104,827**
3	2,593	4,350	43,382	5,352	22,421	0	0	0	0	0	0	0	0	0	0	**78,098**
4	2,352	1,763	5,820	103,181	5,809	0	0	0	0	1,056	3,636	0	0	0	0	**123,617**
5	0	0	5,208	3,920	95,992	0	5,806	0	0	1,932	0	0	0	0	0	**112,858**
6	0	0	0	0	3,764	67,718	4,278	0	2,658	0	0	0	0	0	0	**78,418**
7	1,000	12,310	0	0	0	4,845	104,174	9,384	1,202	0	0	0	0	0	0	**132,915**
8	0	0	0	0	0	0	1,480	63,621	0	0	0	0	0	0	1,570	**66,671**
9	0	0	0	0	0	7,923	254	2,537	21,452	0	0	0	0	1,200	0	**33,366**
10	0	0	493	0	7,589	0	0	0	0	20,964	485	0	2,032	0	0	**31,563**
11	0	0	0	13,032	5,976	0	0	0	0	0	62,978	0	0	0	0	**81,986**
12	0	0	0	3,284	0	0	0	0	0	796	5,771	5,760	0	0	0	**15,611**
13	0	0	0	0	0	0	0	0	0	7,790	0	0	7,446	0	0	**15,236**
14	0	0	0	0	0	0	0	371	971	0	0	0	0	1,616	0	**2,958**
15	0	0	0	0	1,078	0	0	9,882	0	0	0	0	0	0	22,463	**33,423**
	8,693	**90,343**	**54,903**	**128,769**	**144,635**	**84,467**	**135,877**	**90,137**	**26,283**	**32,538**	**73,541**	**5,760**	**9,478**	**2,816**	**24,033**	**912,273**

Table 5-B: MODEL: HOME-BASED SHOP

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	1,004	206	75	16	21	15	10	4	0	0	1	0	1	0	1	**1,354**
2	14,784	51,029	4,509	2,057	4,741	18,551	20,392	3,009	166	88	261	7	6	4	86	**119,690**
3	8,408	3,668	41,820	10,903	16,793	2,269	658	287	16	145	418	16	7	0	14	**85,422**
4	1,811	703	7,321	70,529	6,589	479	243	116	13	168	1,338	27	8	0	4	**89,349**
5	1,223	895	6,216	4,435	90,267	3,121	486	148	35	1,302	327	16	26	1	8	**108,506**
6	777	1,881	792	440	3,167	48,887	2,731	257	205	30	52	5	2	7	18	**59,251**
7	3,296	12,023	1,057	712	1,174	10,977	84,810	7,036	382	41	119	6	5	14	134	**121,786**
8	446	521	177	152	210	884	4,485	51,301	415	18	39	1	7	17	1,268	**59,941**
9	115	146	88	84	226	4,016	1,609	1,393	12,506	20	45	4	4	323	308	**20,887**
10	114	74	271	595	3,093	213	65	55	12	23,787	279	77	331	5	6	**28,977**
11	263	150	562	6,146	2,180	242	99	86	12	489	82,262	1,070	21	3	5	**93,590**
12	79	45	162	831	416	140	71	76	13	741	4,080	7,685	43	1	10	**14,393**
13	89	62	118	259	493	187	112	129	19	3,075	263	131	13,613	6	15	**18,571**
14	105	88	82	127	199	800	519	1,117	1,472	54	113	10	13	5,065	625	**10,389**
15	147	142	91	118	156	323	566	5,906	557	52	105	8	12	45	20,511	**28,739**
	32,661	**71,633**	**63,341**	**97,404**	**129,725**	**91,104**	**116,856**	**70,920**	**15,823**	**30,010**	**89,702**	**9,063**	**14,099**	**5,491**	**23,013**	**860,845**

Table 5-C: ESTIMATED/OBSERVED RATIOS FOR HOME-BASED SHOP

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.87**
2	5.38	0.71	0.00	0.00	2.36	4.66	1.06	0.69	0.00	0.00	0.39	0.00	0.00	0.00	0.00	**1.14**
3	3.24	0.84	0.96	2.04	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.09**
4	0.77	0.40	1.26	0.68	1.13	0.00	0.00	0.00	0.00	0.16	0.37	0.00	0.00	0.00	0.00	**0.72**
5	0.00	0.00	1.19	1.13	0.94	0.00	0.08	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	**0.96**
6	0.00	0.00	0.00	0.00	0.84	0.72	0.64	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	**0.76**
7	3.30	0.98	0.00	0.00	0.00	2.27	0.81	0.75	0.32	0.00	0.00	0.00	0.00	0.00	0.00	**0.92**
8	0.00	0.00	0.00	0.00	0.00	0.00	3.03	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.81	**0.90**
9	0.00	0.00	0.00	0.00	0.00	0.51	6.33	0.55	0.58	0.00	0.00	0.00	0.00	0.27	0.00	**0.63**
10	0.00	0.00	0.55	0.00	0.41	0.00	0.00	0.00	0.00	1.13	0.58	0.00	0.16	0.00	0.00	**0.92**
11	0.00	0.00	0.00	0.47	0.36	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	**1.14**
12	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.93	0.71	1.33	0.00	0.00	0.00	**0.92**
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	1.83	0.00	0.00	**1.22**
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.01	1.52	0.00	0.00	0.00	0.00	3.13	0.00	3.51
15	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.91	**0.86**
	3.76	**0.79**	**1.15**	**0.76**	**0.90**	**1.08**	**0.86**	**0.79**	**0.60**	**0.92**	**1.22**	**1.57**	**1.49**	**1.95**	**0.96**	**0.94**

Table 6-A: SURVEY: HOME-BASED SOCIAL/REC

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	0	1,548	0	0	0	0	0	0	0	0	0	0	0	0	0	**1,548**
2	11,681	55,064	0	0	3,688	1,850	8,341	0	0	0	0	0	0	0	0	**80,624**
3	1,122	11,746	44,965	11,980	6,747	3,138	0	0	0	0	0	0	0	0	0	**79,698**
4	2,943	576	6,225	125,576	8,493	0	0	0	0	0	3,261	2,168	0	0	0	**149,242**
5	2,201	3,352	10,141	5,460	92,738	4,080	6,529	0	0	4,913	0	0	0	0	0	**129,414**
6	1,304	1,912	630	0	0	53,771	2,603	0	1,112	0	0	0	0	0	0	**61,332**
7	2,664	9,735	3,419	0	2,721	7,688	130,396	8,344	4,182	0	0	0	0	0	0	**169,149**
8	948	2,242	0	0	0	0	11,041	71,148	1,025	0	0	0	0	0	8,455	**94,859**
9	400	4,764	0	1,200	0	3,538	2,479	1,733	11,498	0	0	0	356	0	1,942	**27,910**
10	0	0	0	0	1,927	0	0	0	0	25,109	630	0	527	0	0	**28,193**
11	5,202	0	2,516	8,854	0	0	0	0	0	0	106,069	0	0	0	1,616	**124,257**
12	0	3,312	0	852	0	0	0	0	0	0	2,890	5,750	0	0	0	**12,804**
13	0	0	0	4,656	0	0	0	0	0	6,091	0	0	17,929	0	0	**28,676**
14	0	0	0	0	976	0	0	1,451	642	0	0	0	0	0	2,383	**5,452**
15	0	0	0	0	1,344	0	0	1,344	1,032	0	0	0	0	0	28,443	**32,163**
	28,465	**94,251**	**67,896**	**158,578**	**118,634**	**74,065**	**161,389**	**84,020**	**19,491**	**36,113**	**112,850**	**7,918**	**18,812**	**0**	**42,839**	**1,025,321**

Table 6-B: MODEL: HOME-BASED SOCIAL/REC

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	482	281	200	36	29	10	47	1	0	0	0	0	0	0	0	**1,086**
2	7,288	68,333	8,177	1,870	2,854	9,177	29,191	705	44	4	40	1	1	0	14	**127,699**
3	5,332	6,529	51,723	14,338	10,938	1,243	1,452	75	7	24	156	3	4	0	2	**91,826**
4	1,624	2,057	16,041	70,278	6,702	412	634	38	8	85	1,850	53	3	0	0	**99,785**
5	1,730	3,997	21,634	8,684	81,128	3,372	1,291	53	15	1,155	475	18	19	2	1	**123,574**
6	994	8,959	3,608	667	4,574	38,003	9,150	229	477	7	16	0	0	2	5	**66,691**
7	1,789	27,100	1,767	527	664	6,135	93,270	3,156	274	2	20	2	0	1	38	**134,745**
8	667	4,660	711	255	191	723	17,483	41,282	593	2	17	0	0	15	2,114	**68,713**
9	138	1,097	305	98	302	3,611	5,486	1,385	11,497	5	9	2	2	270	614	**24,821**
10	201	410	1,628	1,689	6,488	220	186	17	4	22,065	449	197	828	0	2	**34,384**
11	430	743	3,266	13,134	2,669	234	313	20	8	254	84,387	2,002	12	0	1	**107,473**
12	78	153	558	1,240	491	76	103	16	8	509	4,809	8,693	96	0	1	**16,831**
13	73	163	339	330	666	74	149	28	9	3,024	175	210	16,516	1	2	**21,759**
14	86	429	175	106	166	732	1,313	563	2,213	5	32	3	6	6,052	890	**12,771**
15	166	855	211	100	80	200	2,286	4,639	690	9	24	3	1	161	23,815	**33,240**
	21,078	**125,766**	**110,343**	**113,352**	**117,942**	**64,222**	**162,354**	**52,207**	**15,847**	**27,150**	**92,459**	**11,187**	**17,488**	**6,504**	**27,499**	**965,398**

Table 6-C: ESTIMATED/OBSERVED RATIOS FOR HOME-BASED SOCIAL/REC

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.70**
2	0.62	1.24	0.00	0.00	0.77	4.96	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.58**
3	4.75	0.56	1.15	1.20	1.62	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.15**
4	0.55	3.57	2.58	0.56	0.79	0.00	0.00	0.00	0.00	0.00	0.57	0.02	0.00	0.00	0.00	**0.67**
5	0.79	1.19	2.13	1.59	0.87	0.83	0.20	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	**0.95**
6	0.76	4.69	5.73	0.00	0.00	0.71	3.52	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	**1.09**
7	0.67	2.78	0.52	0.00	0.24	0.80	0.72	0.38	0.07	0.00	0.00	0.00	0.00	0.00	0.00	**0.80**
8	0.70	2.08	0.00	0.00	0.00	0.00	1.58	0.58	0.58	0.00	0.00	0.00	0.00	0.00	0.25	**0.72**
9	0.35	0.23	0.00	0.08	0.00	1.02	2.21	0.80	1.00	0.00	0.00	0.00	0.01	0.00	0.32	**0.89**
10	0.00	0.00	0.00	0.00	3.37	0.00	0.00	0.00	0.00	0.88	0.71	0.00	1.57	0.00	0.00	**1.22**
11	0.08	0.00	1.30	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	**0.86**
12	0.00	0.05	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	1.66	1.51	0.00	0.00	0.00	**1.31**
13	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.92	0.00	0.00	**0.76**
14	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.39	3.45	0.00	0.00	0.00	0.00	0.00	0.37	2.34
15	0.00	0.00	0.00	0.00	0.06	0.00	0.00	3.45	0.67	0.00	0.00	0.00	0.00	0.00	0.84	**1.03**
	0.74	**1.33**	**1.63**	**0.71**	**0.99**	**0.87**	**1.01**	**0.62**	**0.81**	**0.75**	**0.82**	**1.41**	**0.93**	**0.00**	**0.64**	**0.94**

Table 7-A: SURVEY: HOME-BASED OTHER

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	1,311	0	0	1,877	0	0	0	0	0	639	1,521	0	0	0	0	**5,347**
2	14,778	261,120	30,684	8,558	1,326	1,332	608	491	0	1,486	1,133	0	0	0	2,591	**324,106**
3	2,450	25,911	94,371	26,661	7,121	0	1,472	0	1,114	0	1,884	0	0	0	988	**161,971**
4	4,891	5,116	27,687	99,621	37,878	2,819	2,757	5,762	0	0	10,630	0	0	0	0	**197,162**
5	2,928	4,580	10,138	29,411	137,442	11,829	1,400	503	1,139	566	1,003	0	0	0	0	**200,939**
6	4,733	731	0	3,471	12,797	22,906	18,045	4,285	0	1,585	2,316	0	0	0	0	**70,870**
7	9,086	0	0	1,433	7,705	3,942	74,944	9,497	2,183	14,167	6,759	3,450	0	0	0	**133,166**
8	0	0	0	0	1,962	0	9,115	56,862	1,004	4,623	14,790	2,324	0	0	0	**90,681**
9	1,341	0	3,887	0	0	2,557	848	3,253	22,464	8,459	8,253	0	0	0	0	**51,062**
10	0	0	0	0	0	0	6,549	0	4,118	30,423	10,313	0	0	0	0	**51,403**
11	11,108	872	950	5,660	1,500	7,294	12,943	11,447	8,207	9,436	187,272	16,517	3,757	630	3,536	**281,130**
12	1,611	0	0	0	416	0	1,688	667	0	0	5,645	22,914	3,719	0	2,623	**39,284**
13	2,896	2,238	0	890	0	0	604	0	0	0	9,062	3,250	17,812	361	13,755	**50,867**
14	0	0	0	0	1,327	0	0	0	0	0	1,130	1,605	622	1,999	5,638	**12,321**
15	941	0	0	0	0	0	0	0	0	0	1,487	6,777	6,407	9,355	48,380	**73,346**
	58,073	**300,569**	**167,719**	**177,580**	**209,475**	**52,679**	**130,972**	**92,768**	**40,231**	**71,383**	**263,198**	**56,836**	**32,317**	**12,346**	**77,511**	**1,743,655**

Table 7-B: MODEL: HOME-BASED OTHER

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	772	418	136	23	19	16	27	2	0	0	0	1	0	0	0	**1,414**
2	16,391	115,917	10,245	2,181	4,438	22,895	36,649	2,658	85	18	102	11	3	3	78	**211,674**
3	12,890	15,829	80,786	18,554	22,658	3,428	1,592	248	11	50	409	37	1	0	10	**156,503**
4	4,305	5,149	27,804	116,829	14,138	1,126	774	161	6	174	4,042	225	7	0	9	**174,749**
5	4,295	8,376	30,208	13,192	146,254	8,738	1,813	205	38	2,143	849	90	41	1	23	**216,266**
6	2,104	10,537	3,734	779	6,182	80,437	11,791	504	555	17	63	16	1	3	24	**116,747**
7	5,642	45,943	3,173	857	1,244	18,483	148,816	11,106	513	16	64	9	2	6	203	**236,077**
8	1,230	4,566	806	259	280	1,842	14,982	90,437	766	14	58	14	3	15	5,022	**120,294**
9	284	1,217	358	131	394	9,206	6,617	3,451	19,448	18	84	18	4	430	1,539	**43,199**
10	453	811	2,336	2,099	9,264	619	337	158	21	41,264	785	369	1,020	3	27	**59,566**
11	854	1,395	4,461	15,578	4,553	577	393	140	21	508	152,720	4,945	15	1	29	**186,190**
12	189	342	679	1,205	660	278	233	129	17	796	7,865	16,688	84	3	30	**29,198**
13	335	615	720	508	1,050	560	516	287	38	5,110	463	370	27,148	6	62	**37,788**
14	299	650	445	276	386	1,805	1,403	1,589	2,841	42	227	53	14	9,541	1,930	**21,501**
15	319	830	395	214	266	537	1,511	9,875	801	38	168	40	8	117	42,763	**57,882**
	50,362	**212,595**	**166,286**	**172,685**	**211,786**	**150,547**	**227,454**	**120,950**	**25,161**	**50,208**	**167,899**	**22,886**	**28,351**	**10,129**	**51,749**	**1,669,048**

Table 7-C: ESTIMATED/OBSERVED RATIOS FOR HOME-BASED OTHER

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	0.59	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
2	1.11	0.44	0.33	0.25	3.35	17.19	60.32	5.42	0.00	0.01	0.09	0.00	0.00	0.00	0.03	**0.65**
3	5.26	0.61	0.86	0.70	3.18	0.00	1.08	0.00	0.01	0.00	0.22	0.00	0.00	0.00	0.01	**0.97**
4	0.88	1.01	1.00	1.17	0.37	0.40	0.28	0.03	0.00	0.00	0.38	0.00	0.00	0.00	0.00	**0.89**
5	1.47	1.83	2.98	0.45	1.06	0.74	1.30	0.41	0.03	3.78	0.85	0.00	0.00	0.00	0.00	**1.08**
6	0.44	14.41	0.00	0.22	0.48	3.51	0.65	0.12	0.00	0.01	0.03	0.00	0.00	0.00	0.00	**1.65**
7	0.62	0.00	0.00	0.60	0.16	4.69	1.99	1.17	0.23	0.00	0.01	0.00	0.00	0.00	0.00	**1.77**
8	0.00	0.00	0.00	0.00	0.14	0.00	1.64	1.59	0.76	0.00	0.00	0.01	0.00	0.00	0.00	**1.33**
9	0.21	0.00	0.09	0.00	0.00	3.60	7.81	1.06	0.87	0.00	0.01	0.00	0.00	0.00	0.00	**0.85**
10	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.01	1.36	0.08	0.00	0.00	0.00	0.00	**1.16**
11	0.08	1.60	4.69	2.75	3.04	0.08	0.03	0.01	0.00	0.05	0.82	0.30	0.00	0.00	0.01	**0.66**
12	0.12	0.00	0.00	0.00	1.59	0.00	0.14	0.19	0.00	0.00	1.39	0.73	0.02	0.00	0.01	**0.74**
13	0.12	0.27	0.00	0.57	0.00	0.00	0.85	0.00	0.00	0.00	0.05	0.11	1.52	0.02	0.00	**0.74**
14	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.20	0.03	0.02	4.77	0.34	**1.75**
15	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.01	0.00	0.01	0.88	**0.79**
	0.87	**0.71**	**0.99**	**0.97**	**1.01**	2.86	**1.74**	**1.30**	**0.63**	**0.70**	**0.64**	0.40	**0.88**	**0.82**	**0.67**	**0.96**

Table 8-A: SURVEY: NON-HOME-BASED WORK

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	81,343	11,272	7,265	8,088	9,398	0	8,257	1,638	918	0	591	0	0	0	0	**128,770**
2	12,597	35,156	5,049	1,443	3,931	3,013	11,960	2,800	0	1,256	986	0	0	0	687	**78,878**
3	7,001	7,057	24,841	10,883	5,280	1,342	4,032	2,461	0	0	712	0	0	0	0	**63,609**
4	2,125	989	8,082	63,462	6,394	1,828	0	0	0	0	4,869	0	0	0	1,069	**88,818**
5	6,631	2,322	5,053	8,538	43,028	938	1,708	1,027	0	2,509	2,519	653	0	0	0	**74,926**
6	0	3,184	1,027	1,848	3,663	27,464	7,580	1,404	422	0	0	0	686	0	0	**47,278**
7	4,657	8,670	0	1,856	3,709	8,179	69,792	9,994	2,443	0	0	0	0	911	2,103	**112,314**
8	1,388	2,195	724	0	0	3,714	11,547	32,774	1,218	0	0	0	0	0	6,998	**60,558**
9	0	0	0	0	705	742	1,008	1,964	10,019	0	0	0	476	2,072	612	**17,598**
10	0	541	0	0	2,381	0	0	0	0	22,396	0	0	3,393	0	0	**28,711**
11	832	0	0	5,888	1,938	0	0	0	0	0	43,346	587	0	0	0	**52,591**
12	0	0	0	0	0	0	0	0	0	0	1,308	1,730	0	0	0	**3,038**
13	0	0	0	0	0	0	0	0	0	3,368	0	0	3,713	0	0	**7,081**
14	0	0	0	0	0	0	0	0	707	0	0	0	0	3,166	0	**3,873**
15	0	836	738	0	0	0	0	6,721	612	0	0	0	0	505	18,483	**27,895**
	116,574	**72,222**	**52,779**	**102,006**	**80,427**	**47,220**	**115,884**	**60,783**	**16,339**	**29,529**	**54,331**	**2,970**	**8,268**	**6,654**	**29,952**	**795,938**

Table 8-B: MODEL: NON-HOME-BASED WORK

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	42,148	16,888	8,718	1,892	2,656	1,916	2,106	557	67	69	296	35	31	15	76	**77,470**
2	17,876	49,049	6,938	1,891	3,856	6,664	13,290	1,870	228	115	457	54	50	40	195	**102,573**
3	8,741	7,255	27,285	7,737	12,425	2,869	1,410	426	99	262	914	98	67	27	79	**69,694**
4	2,248	2,140	8,058	31,275	6,879	918	635	228	52	280	2,819	174	66	21	63	**55,856**
5	3,145	4,418	12,876	6,701	55,198	5,622	1,350	389	162	1,366	1,181	147	175	42	103	**92,875**
6	2,381	7,390	3,134	911	5,688	45,333	8,327	910	1,076	122	386	59	67	83	153	**76,020**
7	2,887	14,399	1,574	653	1,384	8,213	46,024	5,381	839	79	310	48	62	72	370	**82,295**
8	945	2,341	547	285	448	1,120	6,266	30,797	701	61	207	45	47	72	2,691	**46,573**
9	151	398	149	78	207	1,373	1,180	811	7,891	28	95	19	20	283	528	**13,211**
10	157	222	349	386	1,736	174	130	75	34	15,564	306	101	674	11	39	**19,958**
11	606	783	1,333	3,726	1,508	493	423	224	100	289	55,001	1,737	108	43	102	**66,476**
12	79	107	170	293	254	87	89	45	20	116	2,009	4,997	48	10	21	**8,345**
13	84	125	111	104	256	103	104	67	25	902	122	57	7,273	11	28	**9,372**
14	45	84	51	30	66	147	125	101	398	14	48	9	11	3,675	128	**4,932**
15	180	359	133	96	155	222	559	2,973	527	39	119	25	29	117	14,310	**19,843**
	81,673	**105,958**	**71,426**	**56,058**	**92,716**	**75,254**	**82,018**	**44,854**	**12,219**	**19,306**	**64,270**	**7,605**	**8,728**	**4,522**	**18,886**	**745,493**

Table 8-C: ESTIMATED/OBSERVED RATIOS FOR NON-HOME-BASED WORK

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	0.52	1.50	1.20	0.23	0.28	0.00	0.26	0.34	0.07	0.00	0.50	0.00	0.00	0.00	0.00	**0.60**
2	1.42	1.40	1.37	1.31	0.98	2.21	1.11	0.67	0.00	0.09	0.46	0.00	0.00	0.00	0.28	**1.30**
3	1.25	1.03	1.10	0.71	2.35	2.14	0.35	0.17	0.00	0.00	1.28	0.00	0.00	0.00	0.00	**1.10**
4	1.06	2.16	1.00	0.49	1.08	0.50	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.06	**0.63**
5	0.47	1.90	2.55	0.78	1.28	5.99	0.79	0.38	0.00	0.54	0.47	0.23	0.00	0.00	0.00	**1.24**
6	0.00	2.32	3.05	0.49	1.55	1.65	1.10	0.65	2.55	0.00	0.00	0.00	0.10	0.00	0.00	**1.61**
7	0.62	1.66	0.00	0.35	0.37	1.00	0.66	0.54	0.34	0.00	0.00	0.00	0.00	0.08	0.18	**0.73**
8	0.68	1.07	0.76	0.00	0.00	0.30	0.54	0.94	0.58	0.00	0.00	0.00	0.00	0.00	0.38	**0.77**
9	0.00	0.00	0.00	0.00	0.29	1.85	1.17	0.41	0.79	0.00	0.00	0.00	0.04	0.14	0.86	**0.75**
10	0.00	0.41	0.00	0.00	0.73	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.20	0.00	0.00	**0.70**
11	0.73	0.00	0.00	0.63	0.78	0.00	0.00	0.00	0.00	0.00	1.27	2.96	0.00	0.00	0.00	**1.26**
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54	2.89	0.00	0.00	0.00	2.75
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	1.96	0.00	0.00	**1.32**
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	1.16	0.00	**1.27**
15	0.00	0.43	0.18	0.00	0.00	0.00	0.00	0.44	0.86	0.00	0.00	0.00	0.00	0.23	0.77	**0.71**
	0.70	**1.47**	**1.35**	**0.55**	**1.15**	**1.59**	**0.71**	**0.74**	**0.75**	**0.65**	**1.18**	2.56	**1.06**	**0.68**	**0.63**	**0.94**

Table 9-A: SURVEY: NON-HOME-BASED NON-W ORK

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	36,368	9,569	4,522	1,738	2,781	3,194	6,060	1,075	752	0	609	0	0	0	0	**66,668**
2	11,090	131,451	5,888	4,529	2,340	8,968	19,680	828	772	1,538	0	0	0	0	706	**187,790**
3	4,900	7,674	82,952	11,976	14,929	2,602	0	559	0	0	937	0	1,288	0	0	**127,817**
4	2,611	0	12,687	217,017	18,164	0	2,577	0	1,251	2,524	6,485	0	0	0	0	**263,316**
5	1,548	3,279	19,909	19,441	196,707	8,102	1,337	0	0	7,028	2,026	0	0	0	0	**259,377**
6	2,428	8,162	2,648	619	2,236	91,729	17,334	773	9,221	0	0	0	0	0	0	**135,150**
7	5,020	25,079	0	2,478	5,590	18,930	284,881	17,164	0	791	0	0	0	0	327	**360,260**
8	1,811	2,461	559	2,436	1,685	773	11,517	127,769	2,956	0	0	0	0	0	11,650	**163,617**
9	417	976	0	0	0	4,994	697	3,886	30,701	0	0	0	0	0	1,208	**42,879**
10	0	0	0	609	2,169	0	0	0	0	96,240	0	0	6,807	0	0	**105,825**
11	609	0	3,019	13,469	914	1,288	0	0	0	1,188	143,856	2,539	0	0	0	**166,882**
12	0	0	0	0	0	0	0	0	0	0	722	9,040	0	0	0	**9,762**
13	0	0	0	0	535	0	0	0	0	4,409	0	0	16,335	0	0	**21,279**
14	0	0	0	0	0	0	0	0	0	0	0	0	0	2,051	1,306	**3,357**
15	0	0	0	2,360	0	0	0	13,739	0	0	0	0	0	0	29,405	**45,504**
	66,802	**188,651**	**132,184**	**276,672**	**248,050**	**140,580**	**344,083**	**165,793**	**45,653**	**113,718**	**154,635**	**11,579**	**24,430**	**2,051**	**44,602**	**1,959,483**

Table 9-B: MODEL: NON-HOME-BASED NON-WORK

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	31,090	14,156	9,827	2,473	2,730	1,424	2,321	438	24	37	175	8	1	4	27	**64,735**
2	14,441	87,484	11,208	3,616	6,601	12,780	33,834	3,141	249	80	329	14	2	9	113	**173,901**
3	8,919	10,790	72,536	23,530	29,725	4,013	2,422	472	59	326	1,245	74	29	4	24	**154,168**
4	2,331	3,262	22,816	153,992	19,245	1,308	1,016	228	28	514	7,844	324	27	0	9	**212,944**
5	2,777	6,773	30,280	19,401	190,166	10,442	2,179	304	123	4,158	1,715	142	120	6	23	**268,609**
6	1,673	13,542	4,657	1,568	11,108	112,703	20,263	1,269	2,652	94	210	18	4	61	82	**169,904**
7	2,960	34,874	2,764	1,218	2,380	19,678	174,961	13,882	1,914	38	149	7	0	51	402	**255,278**
8	659	3,664	629	320	403	1,539	16,068	99,794	1,466	8	31	1	0	62	5,544	**130,188**
9	66	464	122	60	227	3,529	3,074	1,949	26,585	2	8	1	0	574	1,054	**37,715**
10	66	122	469	815	5,254	124	56	6	2	58,193	406	166	1,512	0	0	**67,191**
11	255	458	1,702	10,474	2,234	254	196	19	4	343	164,747	4,300	26	1	0	**185,013**
12	19	34	172	688	298	34	15	2	0	254	5,293	13,423	63	3	1	**20,299**
13	9	16	66	86	315	13	6	3	0	2,488	65	84	27,570	0	0	**30,721**
14	5	36	12	0	25	191	171	149	871	0	1	0	1	10,772	265	**12,499**
15	57	252	55	33	41	142	737	6,458	963	2	2	0	0	191	35,085	**44,018**
	65,327	**175,927**	**157,315**	**218,274**	**270,752**	**168,174**	**257,319**	**128,114**	**34,940**	**66,537**	**182,220**	**18,562**	**29,355**	**11,738**	**42,629**	**1,827,183**

Table 9-C: ESTIMATED/OBSERVED RATIOS FOR HOME-BASED NON-WORK

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	0.85	1.48	2.17	1.42	0.98	0.45	0.38	0.41	0.03	0.00	0.29	0.00	0.00	0.00	0.00	**0.97**
2	1.30	0.67	1.90	0.80	2.82	1.43	1.72	3.79	0.32	0.05	0.00	0.00	0.00	0.00	0.16	**0.93**
3	1.82	1.41	0.87	1.96	1.99	1.54	0.00	0.84	0.00	0.00	1.33	0.00	0.02	0.00	0.00	**1.21**
4	0.89	0.00	1.80	0.71	1.06	0.00	0.39	0.00	0.02	0.20	1.21	0.00	0.00	0.00	0.00	**0.81**
5	1.79	2.07	1.52	1.00	0.97	1.29	1.63	0.00	0.00	0.59	0.85	0.00	0.00	0.00	0.00	**1.04**
6	0.69	1.66	1.76	2.53	4.97	1.23	1.17	1.64	0.29	0.00	0.00	0.00	0.00	0.00	0.00	**1.26**
7	0.59	1.39	0.00	0.49	0.43	1.04	0.61	0.81	0.00	0.05	0.00	0.00	0.00	0.00	1.23	**0.71**
8	0.36	1.49	1.13	0.13	0.24	1.99	1.40	0.78	0.50	0.00	0.00	0.00	0.00	0.00	0.48	**0.80**
9	0.16	0.48	0.00	0.00	0.00	0.71	4.41	0.50	0.87	0.00	0.00	0.00	0.00	0.00	0.87	**0.88**
10	0.00	0.00	0.00	1.34	2.42	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.22	0.00	0.00	**0.63**
11	0.42	0.00	0.56	0.78	2.44	0.20	0.00	0.00	0.00	0.29	1.15	1.69	0.00	0.00	0.00	**1.11**
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.33	1.48	0.00	0.00	0.00	2.08
13	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.56	0.00	0.00	1.69	0.00	0.00	**1.44**
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.25	0.20	3.72
15	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	1.19	**0.97**
	0.98	**0.93**	**1.19**	**0.79**	**1.09**	**1.20**	**0.75**	**0.77**	**0.77**	**0.59**	**1.18**	**1.60**	**1.20**	5.72	**0.96**	**0.93**

Table 10-A: SURVEY: ALL PURPOSES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	119,282	22,445	11,821	11,714	12,183	3,197	15,060	3,615	1,670	639	2,721	0	0	0	0	**204,346**
2	80,856	689,613	76,659	15,744	18,512	34,286	79,323	12,503	1,069	4,315	3,080	50	46	30	4,476	**1,020,561**
3	40,397	81,518	394,010	80,261	95,114	13,439	8,049	3,706	1,163	380	4,655	127	1,318	15	1,274	**725,425**
4	43,764	22,691	81,701	746,385	102,918	9,056	8,506	6,601	1,367	4,929	34,332	2,569	148	10	1,241	**1,066,219**
5	39,318	33,189	73,704	78,026	754,736	40,535	30,024	2,579	1,343	19,044	7,068	815	206	66	177	**1,080,830**
6	18,958	30,935	10,794	7,112	30,020	364,872	64,821	8,753	14,447	1,761	2,541	8	726	63	352	**556,164**
7	50,316	105,258	14,521	7,504	24,527	64,645	870,702	64,556	11,992	15,006	7,180	3,624	18	1,017	3,471	**1,244,337**
8	12,489	17,985	3,797	3,059	5,618	9,733	65,226	465,211	7,580	4,674	15,751	2,590	0	108	36,045	**649,867**
9	4,728	9,295	4,535	1,717	1,655	27,134	14,049	17,012	134,854	8,529	8,335	35	855	7,332	4,871	**244,936**
10	3,055	3,768	3,958	5,203	26,045	1,886	7,147	146	4,128	255,079	12,303	185	18,104	10	40	**341,057**
11	24,629	5,254	12,259	69,395	22,617	10,399	13,607	11,606	8,222	11,616	725,806	26,194	3,904	630	5,203	**951,342**
12	1,942	3,621	557	8,817	1,672	225	1,752	670	0	3,537	30,497	55,486	6,065	0	2,633	**117,475**
13	3,470	2,762	452	5,942	2,340	551	809	47	0	42,193	9,399	3,391	85,137	366	13,776	**170,634**
14	312	694	179	195	2,507	1,100	1,226	2,839	10,480	1	1,142	1,605	637	18,350	10,323	**51,590**
15	2,367	3,895	1,177	2,508	2,839	1,005	9,025	47,894	4,398	0	1,639	6,854	6,422	10,006	196,457	**296,485**
	445,882	**1,032,924**	**690,126**	**1,043,580**	**1,103,304**	**582,063**	**1,189,325**	**647,739**	**202,715**	**371,702**	**866,449**	**103,532**	**123,586**	**38,004**	**280,339**	**8,721,268**

Table 10-B: MODEL: ALL PURPOSES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1	76,156	32,495	19,214	4,527	5,595	3,472	4,630	1,043	96	115	503	46	35	20	111	**148,058**
2	100,525	543,014	55,359	15,815	29,958	92,165	180,165	16,165	1,493	553	1,994	198	140	94	871	**1,038,509**
3	71,120	66,613	380,442	99,732	120,545	20,085	11,427	2,496	399	1,400	5,571	505	178	49	234	**780,796**
4	33,902	28,801	116,056	568,737	78,829	8,215	6,238	1,594	244	2,255	30,854	1,748	185	43	170	**877,871**
5	31,949	42,827	138,137	72,199	738,875	44,649	11,553	1,982	725	15,359	8,716	882	635	90	298	**1,108,876**
6	16,585	64,336	22,336	6,365	40,022	408,056	69,094	5,088	6,681	484	1,287	185	130	250	456	**641,355**
7	40,713	204,386	17,538	6,290	10,943	83,384	718,664	57,080	6,286	356	1,281	164	131	254	2,183	**1,149,653**
8	11,616	27,926	5,102	2,088	2,676	10,193	83,341	422,130	7,116	221	721	138	114	330	24,994	**598,706**
9	2,570	7,180	1,906	876	2,402	30,622	26,357	14,299	105,315	195	582	113	95	3,013	6,184	**201,709**
10	3,478	3,945	8,385	9,210	40,227	2,547	1,526	656	197	211,253	4,813	1,868	6,044	45	175	**294,369**
11	8,012	8,222	18,626	69,250	22,366	3,335	2,649	970	329	3,172	744,184	22,578	313	91	271	**904,368**
12	1,279	1,740	3,049	6,612	3,947	1,114	1,108	574	245	4,044	36,351	69,489	811	50	222	**130,635**
13	2,610	2,925	2,649	2,620	6,016	1,839	1,916	1,106	309	22,174	2,560	1,663	120,783	84	314	**169,568**
14	1,293	2,636	1,347	1,054	1,514	5,293	5,531	5,811	13,016	377	1,049	204	176	48,383	5,868	**93,552**
15	2,689	5,005	1,579	968	1,279	2,488	9,256	44,027	6,476	280	858	172	120	1,253	188,951	**265,401**
	404,497	**1,042,051**	**791,725**	**866,343**	**1,105,194**	**717,457**	**1,133,455**	**575,021**	**148,927**	**262,238**	**841,324**	**99,953**	**129,890**	**54,049**	**231,302**	**8,403,426**

Table 10-C: ESTIMATED/OBSERVED RATIOS FOR ALL PURPOSES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	0.64	1.45	1.63	0.39	0.46	1.09	0.31	0.29	0.06	0.18	0.18	0.00	0.00	0.00	0.00	**0.72**
2	1.24	0.79	0.72	1.00	1.62	2.69	2.27	1.29	1.40	0.13	0.65	3.96	3.04	3.13	0.19	**1.02**
3	1.76	0.82	0.97	1.24	1.27	1.49	1.42	0.67	0.34	3.68	1.20	3.98	0.14	3.27	0.18	**1.08**
4	0.77	1.27	1.42	0.76	0.77	0.91	0.73	0.24	0.18	0.46	0.90	0.68	1.25	4.30	0.14	**0.82**
5	0.81	1.29	1.87	0.93	0.98	1.10	0.38	0.77	0.54	0.81	1.23	1.08	3.08	1.36	1.68	**1.03**
6	0.87	2.08	2.07	0.89	1.33	1.12	1.07	0.58	0.46	0.27	0.51	23.13	0.18	3.97	1.30	**1.15**
7	0.81	1.94	1.21	0.84	0.45	1.29	0.83	0.88	0.52	0.02	0.18	0.05	7.28	0.25	0.63	**0.92**
8	0.93	1.55	1.34	0.68	0.48	1.05	1.28	0.91	0.94	0.05	0.05	0.05	0.00	3.06	0.69	**0.92**
9	0.54	0.77	0.42	0.51	1.45	1.13	1.88	0.84	0.78	0.02	0.07	3.23	0.11	0.41	1.27	**0.82**
10	1.14	1.05	2.12	1.77	1.54	1.35	0.21	4.49	0.05	0.83	0.39	10.10	0.33	4.50	4.38	**0.86**
11	0.33	1.56	1.52	1.00	0.99	0.32	0.19	0.08	0.04	0.27	1.03	0.86	0.08	0.14	0.05	**0.95**
12	0.66	0.48	5.47	0.75	2.36	4.95	0.63	0.86	0.00	1.14	1.19	1.25	0.13	0.00	0.08	**1.11**
13	0.75	1.06	5.86	0.44	2.57	3.34	2.37	23.53	0.00	0.53	0.27	0.49	1.42	0.23	0.02	**0.99**
14	4.14	3.80	7.53	5.41	0.60	4.81	4.51	2.05	1.24	377.00	0.92	0.13	0.28	2.64	0.57	**1.81**
15	1.14	1.28	1.34	0.39	0.45	2.48	1.03	0.92	1.47	0.00	0.52	0.03	0.02	0.13	0.96	**0.90**
	0.91	**1.01**	**1.15**	**0.83**	**1.00**	**1.23**	**0.95**	**0.89**	**0.73**	**0.71**	**0.97**	**0.97**	**1.05**	**1.42**	**0.83**	**0.96**

The systematic error checks of the auto ownership and district-level interchanges have indicated some systematic errors, but these problems are not major. When the model is calibrated and validated for the 2000 census, these analyses should be revisited to determine whether these patterns persist. If this proves to be the case, then the modeling staff may want to research further to find the source of these inconsistencies and recalibrate the model.