

TravelCount '94

**1994 SEMCOG
Household-Based Person Trip Survey**

Summary Findings

October 1995

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**Applied Management & Planning Group
Los Angeles**

TravelCount '94 was conducted by SEMCOG, the Southeast Michigan Council of Governments, in conjunction with the Michigan Department of Transportation (MDOT), U.S. Department of Transportation, Detroit Department of Transportation (D-DOT), Suburban Mobility Authority for Regional Transportation (SMART), Ann Arbor Transportation Authority (AATA), Ann Arbor Ypsilanti Urban Area Transportation Study (AAYUATS), and the St. Clair County Transportation Study (SCCOTS).

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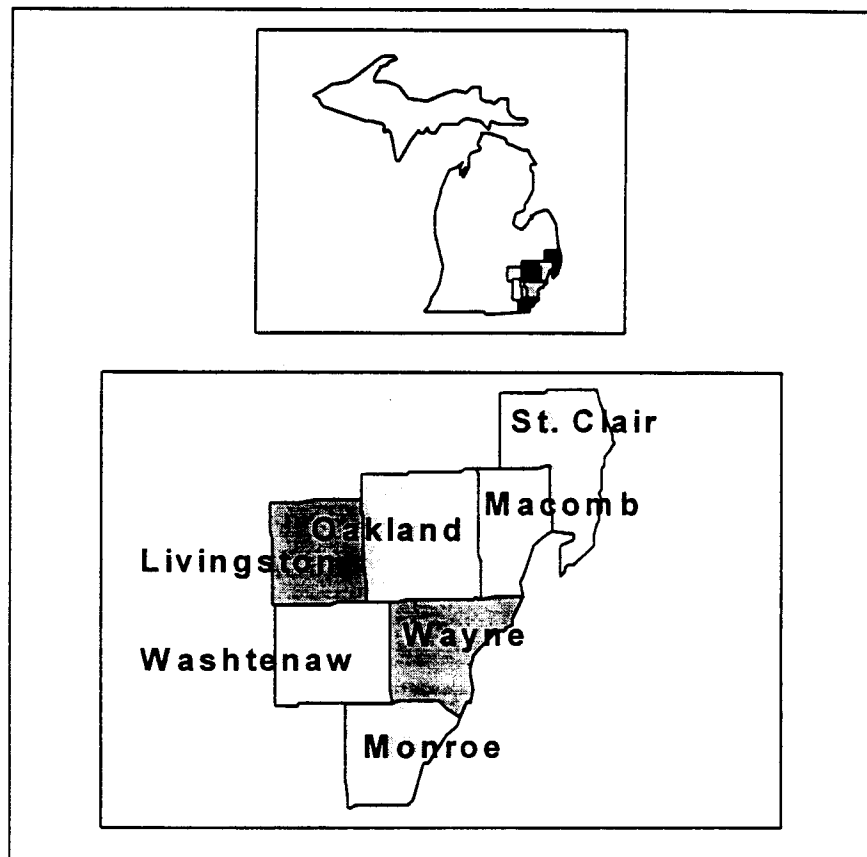
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I. INTRODUCTION

In November, 1993, the Southeast Michigan Council of Governments (SEMCOG), contracted with the Applied Management & Planning Group (AMPG) to conduct a travel behavior survey of 7,200 households. The primary purpose of this study was to provide SEMCOG with a new database of travel behavior to assist in updating the region's transportation models.

SEMCOG is the designated Metropolitan Planning Organization (MPO) for the Southeast Michigan region. This region encompasses the counties of Wayne (including the City of Detroit), Oakland, Macomb, Monroe, Livingston, St. Clair, and Washtenaw. **Figure 1.1** presents the Southeast Michigan region area map. The region covers 4,600 square miles and is home to 4.7 million residents. Created in 1968, SEMCOG's planning responsibilities include the collection and maintenance of a comprehensive transportation, demographic, environmental, and economic development database for developing regional policies and plans, and review and approval of applications for federal transportation funds. This database includes socioeconomic, travel, and mobile source emissions models for projecting future patterns of development, travel, congestion, and air pollution.

Figure 1-1
Southeast Michigan Area Map



SEMCOG's current regional transportation model consists of a standard four-step sequence of trip generation, trip distribution, mode split, and traffic assignment implemented in TRANPLAN. The trip generation model consists of cross-classification models for trip productions and regression equations for trip attractions. Gravity models by trip purpose are used for the trip distribution step. Multinomial logit models are used to predict the percent of travel by transit, automobile, and carpool modes for home-based work, home-based shopping, and non-home based trips. The standard TRANPLAN transit and highway traffic-assignment algorithms are used.

The prime source of data for model coefficients had been the 1965 Transportation and Land Use Study (TALUS) survey. This survey compiled the travel habits of 41,000 Southeast Michigan households, and separately surveyed external stations and truck travel. Model coefficients were, to a lesser extent, based on SEMCOG's 1980 Regional Travel Survey (RTS), which involved home interviews and collection of travel diaries from 2,446 households.

In 1993, SEMCOG completed a comprehensive review of the forecast accuracy and adequacy of its regional travel model. The results of this review confirmed the need to re-estimate all travel sub-models on new or updated transportation survey and travel pattern data. Several key reasons were cited for conducting the 1994 SEMCOG Household-Based Person Trip Survey:

- Since 1980 (and particular since 1965, the year upon which much of the travel mode coefficients and rates were based), this region has undergone a continued dispersion of residences and employment from older urban areas to the periphery, accompanied by a shift from suburb-to-city to a predominant suburb-to-suburb travel orientation.
- SEMCOG's travel model was not only used for regional plans but also for more detailed analyses such as transportation corridor studies and studies of site development impacts, freeway interchange modifications, and reconstruction detours.
- Provisions of the Clean Air Act Amendments of 1990 (CAAA '90) and the Intermodal Surface Transportation Efficiency Act (ISTEA) have promoted greater emphasis on examining transportation alternatives to standard road widening, including options such as road or parking pricing strategies, high-occupancy vehicle (HOV) lane development, as well as inducements for greater use of ridesharing and public transportation. These provisions may expand the number of important variables to be included in the travel models.
- Under CAAA '90 and ISTEA, transportation models require greater accuracy and need to withstand more detailed scrutiny from government agencies such as the U.S. Department of Transportation and the U.S. Environmental Protection Agency.

The primary objective of the household-based travel survey was to provide up-to-date information for re-estimating all components of the SEMCOG regional travel model. A second objective of the survey was to collect reliable information on off-peak travel patterns, particularly non-work related travel, so that the travel activity during these periods are better understood.

Overview of Travel Data Collection

Information about household characteristics and travel was collected using a one-day, activity-focused diary and a separate household survey. In an activity diary, respondents were asked about each activity they undertook during the day. Travel was assessed as the process of getting from one activity to another. Therefore, the trips reported in this document were generated by pairing activities to form a trip origin and destination.

The household was the basic interviewing unit, for which three basic types of data were collected:

- Household data;
- Person data; and,
- Travel characteristics of each person (5 or older).

Household Data

For each household, data collected included:

- Address;
- Housing structure type;
- Household size;
- Number of children 0-4 years old in household;
- Number of children 5-17 years old in the household;
- Income before taxes; and,
- Vehicles available.

Person Data

For each person aged 5 or older, data collected included:

- Age;
- Gender;
- Family role (father, sister, other related, etc.);
- Student status;
- Driver's license status;
- Employment status;
- Primary industry of employment; and,
- Type of work-place building.

Travel Characteristics

For a particular (assigned travel) day, the characteristics of all activities undertaken by each household member (5 or older) were collected, including:

- Activity purpose;
- Activity start and end time;
- Activity locale (business/store/place name, address or intersection, and city/town);
- Mode of transportation (including passenger/driver status and vehicle occupancy);
- Parking cost (if the respondent was the driver); and,
- Taxi fare (if applicable).

For this survey, a trip is defined as any travel by a person which involved: use of a motorized vehicle; walking (five minutes or more); or use of a bicycle. (Excluded as trips were walking as a form of exercise, neighborhood strolling, and recreational bicycling.) The survey recorded each sampled individual's trips by all motorized and non-motorized surface transportation modes except medium and heavy duty trucks (i.e., trips by light trucks, vans and pickup trucks were recorded; tractor/trailer and medium or heavy-duty truck trips were not recorded).

Project Team

The team that conducted the study consisted of the following:

- **Applied Management & Planning Group (AMPG)**, Los Angeles, California, with responsibility for overall project management; designing the survey instruments; managing the telephone data collection; packaging and mailing travel diaries to participating households; and data file creation and analyses;
- **Interviewing Service of America (ISA)**, Los Angeles, California, with responsibility for drawing the sample of telephone numbers, and conducting the telephone recruitment and computer-aided telephone interviewing (CATI) retrieval of travel information;
- **GIS/Trans, Ltd.**, Cambridge, Massachusetts, performed computer geocoding (to X- and Y- coordinates) of trip origin and destination addresses;
- **APB Associates**, Detroit, Michigan, provided local liaison with SEMCOG, and performed manual matching of addresses that were unable to be computer matched; and,
- **Dr. Peter Stopher**, Baton Rouge, Louisiana, reviewed the sampling plan, and provided technical review of the survey instruments and data cleaning plan. He also calculated the data expansion and adjustment factors.

Procedures Overview

Figure 1-2 is a graphic representation of the procedures used to conduct the survey. Briefly, the survey procedures were:

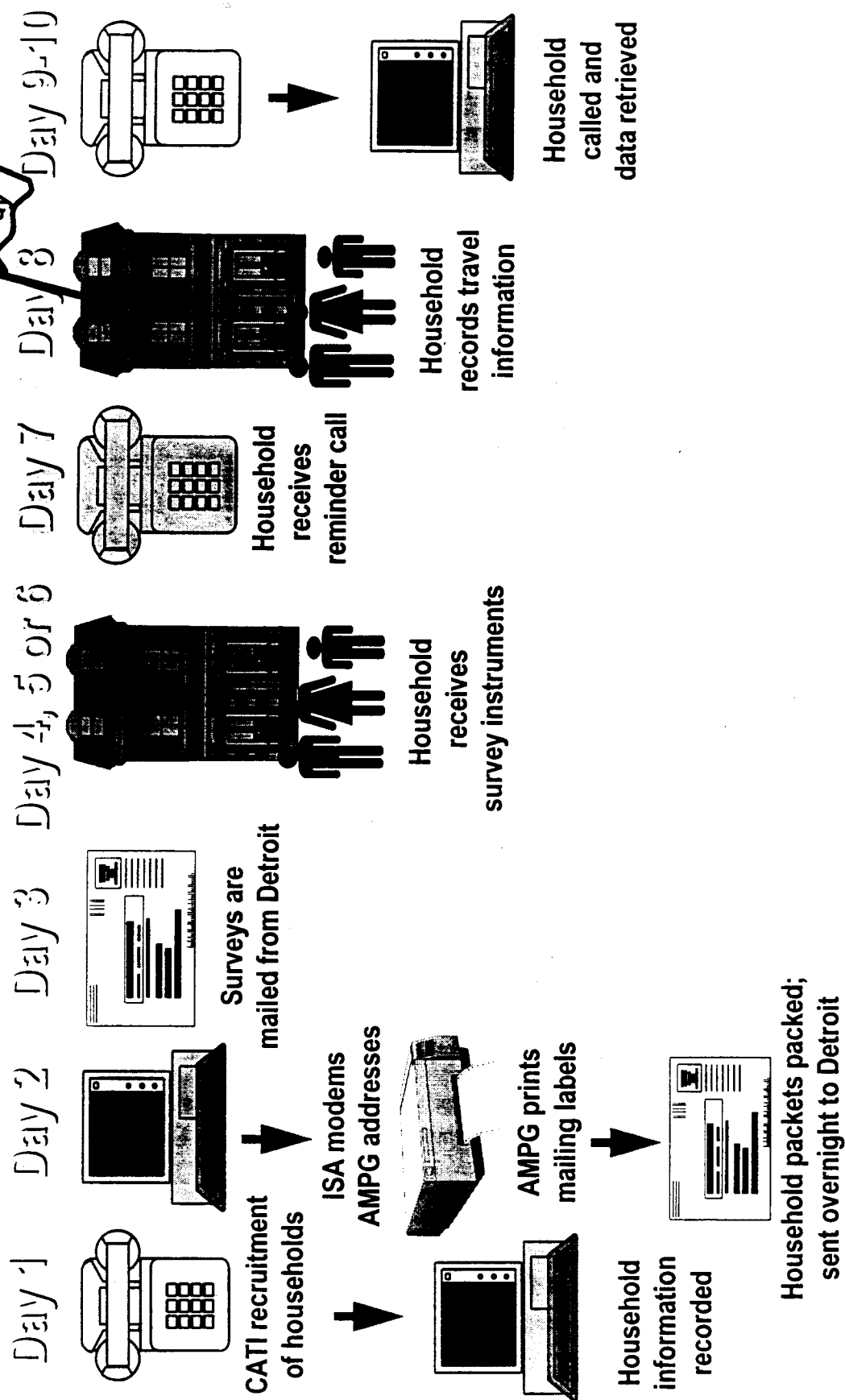
- **Recruitment** - Households were recruited using a computer-aided telephone interviewing system (CATI). Participating households were assigned a diary day that was the same day of the week as their telephone recruitment call. During the recruitment call, the characteristics of the household were collected, including household size, vehicles available, and geographic location, in order to place the household in the correct cell of the sampling matrix.
- **Materials Mailing** - For those households agreeing to participate, the AMPG team assembled a package containing: a cover letter from SEMCOG introducing the study; a fact sheet explaining the overall research effort; a household information form; a One-Day Diary for each member of the household five years of age or older; and a \$1 bill incentive per household.
- **Reminder Call** - The night before their assigned diary day, recruited households were telephoned to verify that they had received their package of materials, to remind them of the survey, and to answer questions.
- **Retrieval Call** - During the retrieval call, the household form and diary information data were collected for all members of the household. Since the calls were made using computer-aided telephone interviewing, the data were simultaneously entered into a database.

The survey included weekday information only, and an attempt was made to evenly distribute the diary days across all five days of the week. Complete households were any households in which the diary data were retrieved from all household members aged 5 or older. Households with four or more persons were considered complete if diary data were retrieved from all households for members aged five or older excluding one. This is standard industry practice, given the difficulty in retrieving full diary data from very large households. Excluding "incomplete" large households could artificially skew the sample toward smaller households.

In the Appendices accompanying this report are copies of all instruments, telephone scripts, and survey expansion methodology.

Figure 1-2

Telephone Retrieval Flow Chart



II. SURVEY INSTRUMENTS

Materials developed for the survey included computer-aided telephone interviewing scripts for the three telephone calls (recruitment, reminder, and retrieval), and the content of the survey packages. The following sections detail the development of these instruments.

Telephone Scripts

Scripts were developed for each of the three telephone contacts: the recruitment, the reminder, and the retrieval calls. Once the scripts were finalized by AMPG, ISA programmed them into a computer-aided telephone interviewing (CATI) system. This system allowed interviewers to work on a computer while talking to a respondent, and input answers to questions directly into a computer file. The system also allowed "blind" movement from question to question so that interviewers did not have to follow skip patterns, and were able to access information collected from households during previous interviews.

The scripts included qualifying questions; for instance, none of the telephone recruitment interviews were to be conducted with a household member under the age of 18, so one of the initial questions was to confirm that the respondent was 18 or older. Questions were also asked to verify that the telephone number dialed was a residential line, and that the household was located in a zip code within the study area. The recruitment, reminder, and retrieval scripts are included in **Appendix A**.

Built-in Checks and Verifications

ISA used Survent software developed by Computers for Marketing Corporation for its CATI system. The Survent software runs on a mainframe computer, with the CATI stations on a "live" network. Survent is fully interactive and has the advantage of permitting great flexibility to the interviewers while providing a live database for all respondents. For this study, ISA has built in the following key logic checks:

- Double verification of key data such as number of household members and vehicle availability;
- Automatically checking the number of persons in the household reported in the recruitment call against the number of persons reported in the retrieval call;
- Prompting the interviewer to probe for additional activities between home and work;
- Automatically requesting double verification if the amount of time between activities appeared to be too short (i.e. no travel time);

- Automatically comparing the start time of an activity with the end time of the previous activity, to ensure the second activity started later;
- Prompting the interviewer to probe if households without autos report having people drive to work;
- Prompting the interviewer to verify all reported travel times over a certain limit; and,
- Providing space for, and prompting the interviewers to ask for, other address information when the exact street address was not known. This address information included the nearest cross-streets, the name of the business establishment, etc.

All of these "checks" in the logic were hard-coded into the CATI program, so that there would be fewer internal inconsistencies in the final dataset. These logic checks also functioned as quality assurance components for the entire database.

Survey Materials

To provide a cohesive appearance and theme for all the survey efforts planned by SEMCOG, all materials were labeled and referred to as "TravelCount '94." The survey package contained a cover letter, a fact sheet, a household form, a diary for each member of the household aged 5 or over, and a \$1 bill. The contents were packaged in a 7"x11" envelope, and computer-generated mailing labels were placed on the outside. On a daily basis, packages were boxed and shipped overnight to APB Associates in Detroit for local mailing. The postage was metered to a Detroit post office. An example of the materials sent to each household, including the diary, household form, cover letter, and fact sheet, are contained in **Appendix B**.

Cover Letter

A cover letter on SEMCOG stationery explained the purpose of the study and requested the respondent's participation. A cover letter was enclosed with each survey package. The letter was signed by Carl Levin, U.S. Senator from Michigan.

Fact Sheet

A fact sheet about the overall research effort was prepared by SEMCOG in an easy-to-read Question-and-Answer format. The fact sheet explained:

1. Why the survey was being conducted;
2. How many people were involved;
3. Was the information kept confidential;
4. Why participants needed to keep a travel diary, even children;
5. Who was doing the transportation research;
6. How much money was involved;
7. How could information about 50,000 people represent 4.8 million;
8. Why participants were chosen; and,
9. Would respondents ever know the results.

Household Form

The Household Form was developed using CorelDRAW software on a 486-based personal computer. The form was printed on an 8¹/₂" x 11" card, double-sided and folded in the middle. Two versions of household forms were developed for households of different size. One was structured to collect answers for up to five household members, and the other was to collect answers for up to ten household members. Two household questions were placed on the front of the form, and the inside contained seven questions about each member of the household, including the year of birth. Two additional questions, the survey hotline number, and a "thank you" were placed on the back of the form. The household forms were printed on colored card stock to match the colors of the one-day diary covers, as described below.

One-Day Diary

To assist survey participants to keep track of their activities, a One-Day Diary was developed. Respondents were asked to record each activity they conducted during the 24-hour period from 3:00 a.m. on the diary day to 3:00 a.m. on the following day. Up to twelve activities could be recorded in the diary and, if more space was needed, respondents were asked to use a separate piece of paper.

The One-Day Diary was also developed using the CorelDRAW software. The diary was constructed of eight 8¹/₂" x 11" double-sided pages, folded in half and stapled together like a booklet. The covers of the diaries were printed in different colors, corresponding to the day of the week of the assigned travel day. Color-coding was used to assist those who packaged the survey envelopes to ensure that the correct day-of-the-week diaries were included. The following were the colors used for each day of the week:

Monday	-	Orange;
Tuesday	-	Blue;
Wednesday	-	Yellow;
Thursday	-	Pink; and,
Friday	-	Green.

The cover of the diary was printed with the words "Your One-Day Diary for Wednesday" (or the appropriate day of the week) to ensure that the diary was filled in on the correct day of the week. Respondents were asked to fill in several identifying questions on the cover, such as the year of birth and gender, so that the diaries could be matched with the information about each individual given on the household form.

Instructions and hints for completing the diary correctly were included in the front of the diary. An Activity Summary page was included in the front, with the intent that respondents could carry the diary with them on their diary day, open to this page, and make short notes about each activity. Each line of the Activity Summary represented one activity, and an example of a completed Activity Summary was provided in the diary.

Each activity was reported on two pages -- an activity page and a travel mode page. On the activity page, respondents were provided with ten main activity type categories in which to code their activities, as well as a catch-all "other" category. Respondents also were to fill in the start and stop times for each activity, as well as the place name and location of each activity. The travel mode page asked respondents to report the mode(s) of transportation they used to get to each activity. If the respondent traveled in an automobile/minivan, van/light truck, or carpool/vanpool, they were asked to report the vehicle occupancy and parking cost (driver only). If their travel mode was bus or taxi, respondents were asked to report the fare.

III. SURVEY PROCEDURES

The process used for the 1994 SEMCOG Household-Based Person Trip Survey involved the following steps:

1. Sample selection;
2. Initial recruitment telephone contact;
3. Mailing survey materials;
4. Reminder telephone contact;
5. Retrieval telephone contact;
6. Processing returned mail and resending packages;
7. Cleaning data;
8. Geocoding survey data;
9. Data expansion; and,
10. Data analyses and reporting.

The Interviewing Service of America (ISA) conducted the initial recruitment, reminder, and retrieval telephone calls. Mailing survey materials, processing returned mail and resending packages, cleaning data, and data analyses and reporting were performed by AMPG. GIS/Trans and APB Associates geocoded the survey data. Dr. Peter Stopher adjusted the survey data to reflect the entire study area population using data expansion factors.

Survey Bias

The 1994 SEMCOG Household-Based Person Trip Survey was designed both to recruit households and to retrieve travel data via household telephones. The requirement that participating households have telephones raises the issue of inherent sampling bias. SEMCOG and AMPG consulted with leading experts in the field of transportation survey design in determining the nature and extent of bias that might be expected. Past studies indicate that two primary biases result from telephone surveys:

- At one extreme, high trip rate households are less likely to participate in transportation surveys that require documentation of all household trips; and
- At the other extreme, households without telephones, which are likely to be low income and have lower trip rates, are also excluded from the study.

In the opinion of experts in the field, these two factors, with their conflicting biases, have the overall effect of canceling each other out. Thus, the decision to conduct the survey via telephone was judged to be methodologically acceptable.

Sample Selection

A stratified sample was used to conduct the survey. The sampling plan was prepared by SEMCOG and reviewed by AMPG. The following describes the detailed procedure of the sample selection process.

The present SEMCOG cross-classification trip production and regression-based trip attraction models were developed using data obtained from the 1965 Transportation and Land Use Study (TALUS) survey and 1980 Regional Travel Survey (RTS). Estimates of trip rate coefficients of variation (CVs), as well as frequency of households and trips are the major inputs to the determination of adequate sample size.

Home-based work trips and non-home-based trip productions can be estimated using simple regression equations, while home-based shopping and home-based other trip generation estimation requires more detailed cross-classification (household size by vehicles available). Therefore, in preparing the sampling plan, SEMCOG calculated the sample size using the cross-classification of household size by vehicles available. Sample quotas were based on home-based shopping CVs (1980 RTS) rather than home-based other trips since home-based shopping trips were the more widely varying of these two home-based non-work trip purposes.

Table 3-1 presents the calculation of trip rate CVs based on the 1980 RTS. Where mean trip rates and CVs were identical, trips were grouped from those categories to estimate a single rate (e.g., shopping trips of two-person household with one or two cars).

Table 3-1
Calculation of Trip Rate Coefficients of Variation
(Based on 1980 Regional Travel Survey)

Household Size (Persons)	Home Based Shopping Trips/Day Vehicle Availability (Car/Household)			
	0	1	2	3+
1 μ	0.23	0.50		
σ	0.61	0.89		
C.V.= σ/μ	2.65	1.78		
2 μ	0.42	0.90	0.90	
σ	0.97	1.47	1.47	
C.V.= σ/μ	2.31	1.63	1.63	
3 μ	0.42	0.90	0.90	1.19
σ	0.97	1.47	1.47	1.82
C.V.= σ/μ	2.31	1.63	1.63	1.53
4 μ	0.58	1.07	1.07	1.33
σ	1.21	1.65	1.65	1.83
C.V.= σ/μ	2.09	1.54	1.54	1.38
5 μ	0.58	1.44	1.44	1.44
σ	1.21	1.96	1.96	1.96
C.V.= σ/μ	2.09	1.36	1.36	1.36

Note: Where mean trip rates and CVs were identical, trips were grouped from those categories to estimate a single rate (e.g., shopping trips of two-person household with one or two cars.)

μ = Mean trip rate

σ = Standard deviation of trip rate

C.V.= σ/μ --> Trip rate coefficient of variation

Table 3-2 presents the number of households by household size and vehicles available in Southeast Michigan using the 1990 Census Public Use Microdata Sample (PUMS).

Table 3-2
Number of Households by Household Size and Vehicles Available
in Southeast Michigan
(1990 Census Public Use Microdata Sample/PUMS)

Household Size	Vehicles Available				Row Total (Percent)
	0	1	2	3+	
1	105,319	272,113	34,211	6,597	418,240 24.7%
2	39,793	152,000	272,490	48,451	512,734 30.2%
3	25,339	61,535	127,733	90,824	305,431 18.0%
4	16,129	37,171	127,515	84,482	265,297 15.6%
5+	18,936	32,946	76,355	68,398	193,635 11.4%
Column Total (Percent)	205,516 12.1%	555,765 32.8%	638,304 37.7%	295,752 17.4%	1,696,337 100.0%

Table 3-3 presents sample quotas based on 1980 RTS home-based shopping CVs. A single quota was computed for each 2 to 5+ person/1 to 3+ car household cell based on the weighted average of the CVs in these categories. These quotas additionally assumed that:

1. A 90 percent confidence level and 10 percent level of precision should be achieved for each household size/vehicle availability combination except for zero car households.
2. Given their relative rarity in the population, a single quota of 600 households was set for all zero car households, regardless of household size. This quota was set based on a 68 percent confidence level and 10 percent level of precision.
3. To maintain sampling costs to a reasonable level, 4 and 5+ household size categories were combined into one household size category. Given the large size of the SEMCOG region, households were sampled in proportion to their 1990 census distribution by county plus the City of Detroit in the survey area.

The following summarizes the method used to derive household survey sample sizes (shown in Table 3-3):

1. Calculate mean, standard deviation, and coefficient of variation of home-based shopping trip rates by household size and vehicles available category.

2. Means and standard deviations for some adjacent cells were grouped together in these analyses performed in 1983. Data for separate cells were not available (i.e., all four-person households with one or more cars had identical means, standard deviations, and CVs).
3. Calculate weighted CV for all zero-car households for all household sizes, using 1990 Census Public Use Microsample (PUMS) households as weights (Table 3-2). Resulting CV=2.45.
4. Households with zero cars are difficult to recruit and were relatively rare in the survey population, so one sample size quota was calculated for the entire 4 cell group based on a 68 percent confidence level, 10 percent precision. Resulting sample size was n=600.
5. The one-person, one-car household category in Table 3-3 had the highest CV after zero-car household categories, so the sample size was calculated separately. At the 90 percent confidence level, 10 percent precision level, sample size was n=857. Rounding to the nearest 10 households resulted in n=860.
6. Households with two-or-more persons, one-or-more cars had relatively close CVs (1.40-1.60). One CV was calculated for all categories using 1990 PUMS household counts. Resulting CV=1.57 was applied to each of the applicable 8 categories (2 person/1 car, 2 person/2 cars...4-5+ persons/3+ cars households).
7. Using CV=1.57 from Step 6, sample size was calculated. Resulting sample size of 667 was rounded up to 670 and was used as quota for each of the eight cells in the Step 7 categories, and all cells had a sample quota assigned.
8. Sum up all sample sizes by stratum. Resulting sample size for region was 6,820 households.

Table 3-3
Proposed Household Survey Sample Size
(Using 1980 Survey Home-Based Shopping Trip Coefficients of Variation)

Household Size	Coefficient of Variation (C.V.), Number of Households by Household Size and Vehicle Availability (Cars/Household)			
	0	1	2	3+
1 C.V.	2.65	1.78		
# 1990 Census PUMS HH	105,319	272,113		
Stratum Sample Size (HH)	No Quota	860		
2 C.V.	2.31	1.63	1.63	
# 1990 Census PUMS HH	39,793	152,000	272,490	
Stratum Sample Size (HH)	No Quota	670	670	
3 C.V.	2.31	1.63	1.63	1.53
# 1990 Census PUMS HH	25,339	61,535	127,733	90,824
Stratum Sample Size (HH)	No Quota	670	670	670
4, 5+ C.V. (Use data for 4 person households)	2.09	1.54	1.54	1.38
# 1990 Census PUMS HH	35,065	70,117	203,870	149,880
Stratum Sample Size (HH)	No Quota	670	670	670
Sample Size/% of Sample by Auto Avail. ('90 Census %)	600/9% (12%)	2,870/42% (33%)	2,010/29% (38%)	1,340/20% (17%)

Sample Size = 6,820 households

Note:

Coefficients of variation were based on home-based shopping trips which are the highest for all home-based non-work trips. A 10% precision level is set for strata where quotas are set. Zero-car household sample size are based on 68% confidence level; all other car availability columns have a 90% level of confidence. Sample size calculations were performed using the formula:

$$n = \frac{CV^2 Z^2}{e^2}$$

Where n = sample size required in each cell
 CV = coefficient of variation (sample standard deviation divided by sample mean in each cell)
 Z = level of confidence (i.e., 1.645=90%; 1.96=95%)
 e = level of precision (i.e., 0.05=5%, 0.1=10%)

Once, "n" is calculated using the above formula, the stratum sample size are rounded up to the nearest 10 (e.g., 667 is recorded as 670).

Table 3-4 presents proposed distribution of sample size by county plus the City of Detroit, and provides the number of additional samples required to estimate county-level mean total trip rates with a 90 percent confidence level, 10 percent precision. This was of particular concern in Washtenaw County and St. Clair County, for which county level transportation planning models are funded as a standard planning activity. Using an average CV of 1.60, as shown in Table 3-4, resulted in a minimum of 770 additional households being required for estimating total trip rates in Washtenaw and St. Clair counties at the above statistical accuracy.

Table 3-4
Proposed Distribution of Sample Size by County
(Sample Size Derived from 1980 SEMCOG Regional Travel Survey Data)

County by Major Sub-Area	'90 Census No. HH	Percent of HH by Area	Possible Sample Dist'n	Additional Samples Required to Achieve 10% Precision, 90% Confidence Interval for Each County Level Mean Total Trip Rate for
				CV=1.60, Total Trips Needed in County: N=700 # of Additional Households Needed
Detroit	374,057	22.0	1,500	0
Wayne (excluding Detroit)	406,478	23.9	1,630	0
Oakland	410,888	24.2	1,650	0
Macomb	264,991	15.6	1,064	0
Washtenaw	104,528	6.2	423	277
Monroe	46,508	2.7	184	516
St. Clair	52,882	3.1	211	489
Livingston	38,887	2.3	157	543
Total	1,699,309	100.0	6,820	1,825

Notes: Sample size calculations were performed using the formula:

$$n = \frac{CV^2 Z^2}{e^2}$$

Where n = sample size required in each cell
 CV = coefficient of variation (sample standard deviation divided by sample mean in each cell)
 Z = level of confidence (i.e., 1.645=90%; 1.96=95%)
 e = level of precision (i.e., 0.05=5%, 0.1=10%)

Due to budget constraints, SEMCOG was unable to fund the additional 700 households needed to achieve a 90 percent confidence level (± 10 percent) with a CV of 1.60. Recognizing that the initial CV chosen for the sample calculation was high (home-based shopping), the necessary samples for St. Clair and Washtenaw counties were recalculated using a CV of 1.0. This CV is similar to that found in other areas of the United States for home-based work trips. The sample calculation at the 90 percent confidence level (± 10 percent precision) using a CV of 1.0 is shown for St. Clair County in **Table 3-5** and for Washtenaw County in **Table 3-6**. The rows of these tables are the 10 sampling cells defined for this study based on the number of vehicles and the number of household members (HH size). The values for these variables are shown in columns A and B.

Column C shows the quota which was set for the total regional sample of 6,820 households. Column D displays the estimated percentages of the sampling cells which fall into each county. These were derived by dividing the county totals for the cell by the regional totals for the cell. Column E shows the expected number of households for the county within the regional quotas, calculated by multiplying Columns C and D.

Column F shows the expected household counts for the county supplements: 99 for St. Clair and 281 for Washtenaw. Column G totals Column E and F and is the expected number of households from this sample design for each county.

Column H indicates the cell sizes needed to achieve the 10 percent error rate for St. Clair and Washtenaw counties. The method used for calculating cells sizes is outlined by Michael E. Smith in *"Design of Sample Home Interview Travel Surveys"* (published in Application and Use of Transportation Data). The values in Column H are called the "Full Random Sample" in Smith's paper.) These values are the cell sizes which are the minimums to meet the criterion of 10 percent error rate with 90 percent confidence, using a CV of 1.0. With a CV of 1.0, the additional sample was 380 households (99 in St. Clair County, and 281 in Washtenaw County).

The final column shows the cells where shortages might be expected to occur, comparing the required sizes of Column H to those expected in Column G. There were no anticipated shortages in Washtenaw County and only three cells with potential shortages in St. Clair County.

Table 3-5
Planned Sample Allocation for St. Clair County

A	B	C	D	E	F	G	H	I
Vehi- cles Avail- able	HH Size	Quota for Main Study	Estimated % Of Cell in County from Quota	# Expected in County from quota	# Expected from supplement	Total expected in cell for St. Clair	Cell sizes needed for 10% overall error rate (CV's=1)	Cell shortage
0	Any Size	600	2.18%	13	8	21	22	1
1 +	1	860	2.84%	24	16	40	44	4
1	2	670	3.56%	24	10	34	27	0
1	3	670	3.27%	22	4	26	10	0
1	4+	670	2.88%	19	4	23	10	0
2+	2	670	3.35%	22	20	42	54	12
2	3	670	3.12%	21	7	28	20	0
2	4+	670	4.03%	27	15	42	42	0
3+	3	670	3.17%	21	5	26	15	0
3+	4+	670	3.47%	23	10	33	26	0
Total	-	6820	-	216	99	315	N/A	17

Table 3-6
Planned Sample Allocation for Washtenaw County

A	B	C	D	E	F	G	H	I
Vehi- cles Avai- lable	HH Size	Quota for Main Study	Estimated % Of Cell in County from Quota	# Expected in County from quota	# Expected from supplement	Total expected in cell for Washtenaw	Cell sizes needed for 10% overall error rate (CV's=1)	Cell shortage
0	Any Size	600	0.0355	21	19	40	18	0
1 +	1	860	0.0745	64	61	125	59	0
1	2	670	0.0609	41	24	65	23	0
1	3	670	0.0566	38	9	47	9	0
1	4+	670	0.0491	33	9	42	8	0
2+	2	670	0.0765	51	65	116	63	0
2	3	670	0.0711	48	24	72	23	0
2	4+	670	0.0570	38	31	69	30	0
3+	3	670	0.0612	41	15	56	14	0
3+	4+	670	0.0597	40	24	64	23	0
Total	-	6820	-	415	281	696	N/A	0

Table 3-7 presents the final sample design by household size and vehicles available. Note that the target sample provided by SEMCOG was not organized by county plus the City of Detroit. **Table 3-8** presents the target sample by county plus the City of Detroit which was prepared by AMPG. The actual sample obtained by county plus the City of Detroit is presented in **Table 3-9**.

Table 3-7
Final Sampling Design for
1994 SEMCOG Household-Based Person Trip Survey

Vehicles Available	Household Size	Target Sample Size
0	Any	627
1+	1	937
1	2	704
1	3	683
1	4+	683
2+	2	755
2	3	701
2	4+	716
3+	3	690
3+	4+	704
Total		7,200

Table 3-8
Target Sample by County Plus the City of Detroit

Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Total
1,459	1,624	1,665	1,077	189	315	165	706	7,200

Table 3-9
Actual Sample Obtained by County Plus the City of Detroit

Vehicles Available	HH Size	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Actual Sample Obtained
0	Any	353	82	48	42	10	9	2	34	580
1+	1	131	297	328	179	28	60	26	183	1,232
1	2	161	216	174	138	19	34	13	48	803
1	3	315	65	48	53	9	12	0	40	542
1	4+	258	80	44	37	4	13	3	27	466
2+	2	50	206	244	144	33	45	36	161	919
2	3	49	168	250	122	30	26	18	75	738
2	4+	32	203	196	130	30	38	30	79	738
3+	3	31	187	188	137	31	31	21	58	684
3+	4+	41	171	158	142	32	31	28	56	659
Total		1,421	1,675	1,678	1,124	226	299	177	761	7,361

The comparison of the sampling design and actual sample is presented in **Table 3-10**. The largest surplus was in the sampling cell of one-person households with one or more vehicles (+295), while the largest shortfall occurred in the sampling cell of four-person households with one vehicle (-217).

Table 3-10
Sampling Design and Actual Sample

Vehicles Available	Household Size	Target Sample	Actual Sample	Difference
0	Any	627	580	-47
1+	1	937	1,232	+295
1	2	704	803	+99
1	3	683	542	-141
1	4+	683	466	-217
2+	2	755	919	+164
2	3	701	738	+37
2	4+	716	738	+22
3+	3	690	684	-6
3+	4+	704	659	-45
Total		7,200	7,361	+161

Table 3-11 displays the difference of sampling design and actual sample by county plus the City of Detroit. The only two survey areas that had shortfalls were the City of Detroit (-38) and St. Clair County (-16). Note that the St. Clair County shortfall is close to that anticipated in Table 3-5.

Table 3-11
Sampling Design and Actual Sample by County Plus the City of Detroit

Survey Area	Target Sample	Actual Sample	Difference
City of Detroit	1,459	1,421	-38
Other Wayne	1,624	1,675	+51
Oakland	1,665	1,678	+13
Macomb	1,077	1,124	+47
Monroe	189	226	+37
St. Clair	315	299	-16
Livingston	165	177	+12
Washtenaw	706	761	+55
Total	7,200	7,361	+161

CONFIDENCE INTERVAL ESTIMATION

Table 3-12 presents 99 percent confidence intervals of the average total trips by area and their margin of error. Based on the regionwide sample at the 99 percent confidence level, the average total trip rate has a 0.0016 margin of error (i.e., the lower and upper confidence limits of the average total trips are within 0.16 percent of the mean). Table 3-12 was developed using expanded household data. (See page 27 of this report for a discussion of data expansion.)

Table 3-12
**99 Percent Confidence Interval of Average Total Trips Per Household
by County Plus the City of Detroit**

Survey Area	Lower Limit	Average Total Trip*	Upper Limit	Margin of Error
City of Detroit	5.75	5.77	5.79	0.0041
Other Wayne	8.96	8.99	9.02	0.0031
Oakland	9.69	9.71	9.74	0.0029
Macomb	9.70	9.73	9.77	0.0037
Monroe	9.58	9.66	9.74	0.0080
St. Clair	9.69	9.78	9.87	0.0092
Livingston	10.00	10.08	10.16	0.0078
Washtenaw	9.21	9.26	9.31	0.0053
Region	8.68	8.69	8.71	0.0016

* Average total trips per household is discussed in Chapter IX of this report. Variances between Table 3-12 and Table 9-1 are a result of displaying data with two vs. one decimal place. Two decimal places are used in Table 3-12 to more precisely indicate the upper and lower limits of the confidence intervals. Average total trip rates in both tables were computed using expanded data.

Initial Recruitment Telephone Contact

During the initial recruitment phase of the study, households were contacted by telephone to request their participation in the study. Screening questions verified that the number dialed was a residence, that the residence was within the counties being surveyed, and that the household member with whom the interviewer was speaking to was at least 18 years of age or older. (Refer to **Appendix A** for a complete copy of the CATI recruitment script.)

Respondents were asked several questions about their households' characteristics, including household size, auto ownership, and type of household dwelling. Following these questions, the respondent was introduced to the second phase of the survey, which involved collecting their name and address, and mailing survey instruments to be completed by all household members age five or older. If the household member agreed to participate, their name and address were collected; if the household member declined to participate, they were thanked for their time and the survey was terminated. Only households that gave a street address, city and zip code were considered a successfully recruited household. At the time of recruitment, each household was assigned a specific day of the week for completion of the one-day diaries. For example, if the household was recruited on Wednesday, the household was asked to complete the diaries on the following Wednesday. Households in Washtenaw County were assigned travel days before April 15, 1994, due to the large student population at the University of Michigan and Eastern Michigan University.

Recruitment calls were conducted between 5:00 p.m. and 9:30 p.m. Eastern Standard Time. Each recruitment day was assigned a consecutive number, 1 through 51, for the purpose of keeping track of each step in the survey process. At the end of the recruitment call, the respondent was given a toll-free survey hotline number in case of questions about or problems with the survey.

Mailing Survey Materials

The morning following each recruitment day, a computer file containing the information about each household recruited, including a unique identification number for each household, was transmitted via modem from ISA to AMPG. The transmitted ASCII file was read into Excel for Windows and then converted into formats compatible with WordPerfect and SPSS for Windows. WordPerfect was used to generate address labels, which were printed both on labels and on plain paper for packing purposes. SPSS was used as a database and analysis tool for keeping track of all households during survey implementation, and a frequency of the household size was printed on a daily basis to aid in the packing procedure.

Households that agreed to participate in the survey were sent a package containing the following:

- A cover letter explaining the purpose of the study;
- A Fact Sheet describing the overall research effort;
- A household form which requested basic characteristics of the household;

- The correct number of one-day diaries for each member of the household who was at least 5 years old; and,
- A \$1 bill.

Households were identified by a 5-digit identification number that appeared on the mailing label. The process of preparing the contents of the packages for stuffing involved gathering the correct number of diaries, and placing the diaries, a \$1 bill, the household form, the cover letter, and the fact sheet together. Then the process of stuffing and sealing the envelopes involved pulling the correct label for the household, placing it on the envelope, stuffing the envelope with the prepared contents and sealing it. Postage was placed on the envelopes prior to stuffing. A scale was developed which indicated the amount of postage needed for each size household (excluding persons under 5 years of age, since one diary was sent for each person aged 5 or older). Using the scale and a computerized frequency of household size, the correct number of envelopes for each size household were stamped prior to stuffing.

Reminder Telephone Contact

The evening before the assigned diary day, households received a reminder telephone call. The purpose of the call was fourfold: first to verify that the package arrived at the household; second to remind the household that tomorrow was their assigned day to complete the diaries; third to briefly review the forms with someone in the household to be sure that they were filled in correctly, and to answer any questions; and, fourth to set a date for the retrieval call. (The Reminder Script is located in **Appendix A**.)

The interviewer tried to speak with the member of the household who was recruited, but if not possible, any adult in the household could be a recipient of the reminder call. If the interviewer reached the answer machine, a reminder message was left.

Reminder calls were not possible for those households that could not be reached on the scheduled reminder day. A retrieval call was made to the household following the assigned diary day, at which time it was determined whether or not the household had received the package and completed the forms.

If the household did not receive the survey materials, the household address was confirmed to be sure that the package was sent to the correct address. A report of address corrections was maintained on a daily basis so that new packages could be resent, if necessary. The respondent was instructed that when the package arrived, the forms were to be filled out on the same day of the week that was originally assigned and that a second reminder call would be placed the evening before their assigned day.

Retrieval Telephone Contact

The main purpose of the retrieval telephone call was to collect the diary and household form information from each household. The first step in this call was to confirm that the package

was received and the forms were completed. This step was a backup for households who may not have received a reminder call, and also prevented an interviewer from wasting time on the telephone with a household that had not completed the majority of their forms.

When the respondent indicated that the forms were at hand, the interview first collected all the information from the household form, which included basic information about each member of the household. The total number of household members who were present in the home on the assigned diary day was also collected. This information was very important since the definition of a complete household was based on the total number of diaries received from members who were in the household on the assigned day.

Diary information was collected one person at a time, based on the numbering of persons in the household form. If the respondent had a completed diary for person number one, the interviewer would continue to collect all the information from that person's diary. If the respondent did not have a completed diary for a household member, a series of questions were asked to try to collect the information. The following procedures were followed:

- The incomplete diary belonged to the respondent on the phone:
If respondents could remember what they did on the diary day, the information was collected; if they could not remember, they were asked to complete one on the next assigned day.
- The respondent knew that the incomplete diary belonged to someone who had stayed home all day or was out-of-town all day on their diary day:
This information was noted - this was all the information needed to make this person's diary to complete since this person had no activities.
- The incomplete diary belonged to someone that was at home:
The person was asked to come to the telephone following collection of the other diaries. If the person could remember what he/she did on the diary day, the information was collected; if not, he/she was asked to complete the diary on the next assigned day.
- The respondent was aware of what the person with the incomplete diary did on the diary day:
The interviewer collected the information about the person's activities from the respondent on the phone.
- None of the above were true:
The respondent was asked to encourage the person to complete the diary and a second retrieval call would be placed within 48 hours.

Each subsequent diary was collected using the same procedures. A street address or intersection was also collected for those households who had initially given a P.O. Box number during the recruitment call. (A copy of the retrieval call script can be found in **Appendix A.**)

Processing Returned Mail

As with any mailout, some survey packages were returned to AMPG. The type of mail returned to AMPG was categorized into three types, and procedures were developed for each type as follows:

- **Refusals**

Envelopes were received from the post office with "refused" either stamped or hand-written on the outside of the envelope. AMPG also received envelopes marked "return-to-sender" or not marked at all, but obviously opened, sealed back up, and sent back. These envelopes were opened, the contents removed and recycled, and the household was recorded as a refusal. AMPG recorded a total of approximately 200 mail refusals.

- **Completes**

Some households did not follow the directions and sent back the completed diaries before they could be retrieved by telephone. Approximately 70 completed returned packages that had not been collected during a retrieval call, were sent to ISA for keypunching.

- **Undeliverable Packages**

Less than 30 packages were returned marked "no such number" or something similar. Due to the small number of such returned packages, these packages were counted as refusals.

Cleaning Data

AMPG was responsible for the data cleaning. The following details the most common types of errors in the data:

- Respondents were instructed in the diary and in the retrieval script that an activity was each time they did something at a different location. Some respondents missed that instruction, and therefore the data contained multiple activities at the same location.
- In most cases, the last activity should be at home, since the diary day ended at 3:00 a.m. Respondents sometimes forgot to report their trip back home in the evening.
- The computer program was not programmed to check the spelling of addresses. Therefore, some wrong addresses were input and caused some difficulty in the geocoding process.

- Interviewers occasionally input a.m. or p.m. incorrectly, which resulted in incorrect trip durations.

Geocoding Survey Data

The geocoding of the survey data was performed by GIS/Trans, in conjunction with APB Associates. The U.S. Census' topologically integrated geographic encoded referencing (TIGER) system was utilized in the geocoding process. GIS/Trans geocoded the addresses matching the TIGER files and SEMCOG's Traffic Analysis Zone (TAZ), and obtained the longitude-latitude coordinate values of each address location. To geocode effectively and accurately, GIS/Trans extended its ARC/INFO geocoding interface using the ARC/INFO Arc Macro Language (AML). Thus GIS/Trans used a graphical interface for address cleanup, geocoding and quality control.

The environment that was used by GIS/Trans include:

Hardware: HP 9000/720 Workstation, Gateway 2000 486/66 PC

Software: ARC/INFO 6.11, Borland dBASE IV

Data: Enhanced TIGER files (purchased from Geographic Data Technology)
Address Data Sets (from AMPG)
County TAZ coverages (from SEMCOG)

The automated geocoding process involved in the following steps:

1. Convert the address datasets into ARC/INFO data file:

The address datasets provided by AMPG were in the dBase format. To perform geocoding using ARC/INFO software, the data were converted into INFO format using the INFO command *import*.

2. Build the address coverage:

A coverage has addresses in the coverage feature attribute table or in a related file, but is not usable for geocoding directly. The address coverage must be created to associate addresses with coverage feature. GIS/Trans used the Geographic Data Technology (GDT) enhanced TIGER coverages as the base maps to create the address coverage for every county. The FIPS MCD (federal information processing standard, minor civil division) code was used to control for the general location of an address. The standard ARC/INFO SOUNDEX function was used to identify similar addresses for matching.

3. **Address matching:**

Address matching is the process of matching address data to the address coverage, and of creating a point coverage with the geographic coordinates of each address. In this step, addresses that do not initially match automatically are checked, and if possible, corrected in order to make an obvious match (i.e., obvious street name misspelling, wrong street type, record address just off street address range, obvious multiple address range or intersection resolution, or obvious parallel street "intersection" resolution.

4. **Assign TAZ code:**

To assign TAZ codes, the created point coverage of matched addresses were tagged with the TAZ number of the TAZ polygon coverage using the polygon overlay command of ARC/INFO. Using ARC/INFO's buffer capability, the TAZ codes of all TAZ's within 50 feet of the address was also provided.

After these steps, the geocoding rate was 85 percent. The output was exported in dBaseIV for APB Associates. APB checked the name aliases on unmatched streets and manually edited them. The major resources materials used by APB included:

- Telephone books for the region. In addition to those published by Ameritech, there were some privately-published phone books and some from other telephone companies. Several county planning agencies were very helpful in ferreting out the more esoteric books.
- A CD-ROM containing all the Bresser's directories for the seven-county region.
- Maps for the entire region, including those published by the Automobile Club of Michigan, by Universal Maps, and by individual counties themselves. For the densely populated suburban areas, "grid maps" were drawn showing the address points for each Mile Road or equivalent thoroughfare.
- Prior to beginning the actual work on the project, APB assembled a list of sites of major bank, supermarket, fast food, and drug stores, as well as other types of business. These were entered into a database and were organized by county.
- A copy of the TIGER file, and plots for each county provided by SEMCOG.
- A directory listing all schools in Michigan, organized by school district, and an accompanying map.

After APB returned the files to GIS/Trans, another automatic match was performed. The final geocoding rate was 95.6 percent, as shown in **Table 3-13**.

Table 3-13
Results of Geocoding Activity Locations

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Washtenaw	Total
Geocoded	12,511	19,537	20,317	13,766	2,566	3,516	2,146	8,805	83,164 95.6%
Out of region	45	44	196	55	257	44	131	110	882 1.0%
Address too new to geocode	0	1	2	12	0	4	2	0	21 0.02%
Failed to match the address/incomplete information/refused	786	651	473	417	112	125	73	311	2,948 3.4%
TOTAL	13,342	20,233	20,988	14,250	2,935	3,689	2,352	9,226	87,015

Data Expansion

The aim of data expansion was to estimate factors to be applied to each survey observation so that, using the factors, the survey data provide statistical estimates of totals of the population from which the sample was drawn. (For a complete analysis of the data expansion method, please see *Technical Memorandum: Data Expansion and Adjustment in Appendix C.*)

A set of expansion factors were computed for the sample data, based on the distributions provided by SEMCOG from updated census data, compared against the survey data. Expansion factors were computed by county and within county by vehicle ownership and household size groups. Data were expanded first by income, and then adjusted by dwelling unit type, number of workers, life-cycle stage, and urban/rural classifications. Once variables had been used for adjustment purposes, a final adjustment was made to reestablish correct county totals. This was necessary since each stage of adjustment was not constrained to produce the correct total number of households by county, nor for the region as a whole. This resulted from the presence of zeros in a few cells of each set of cross-tabulations. These adjustments, applied in a composite process, provided better approximations to the actual Census distribution than could be obtained from the simple expansion of the survey data.

IV. SURVEY EXECUTION

In this section we describe the survey execution and discuss certain procedural issues that emerged during the conduct of the study.

Pretest

Prior to the start-up of the survey, a pretest was conducted of all survey procedures. Recruitment of 50 households from the study area took place on February 23, 1994, and households were assigned March 2, 1994 as their diary day. A total of 30 households completed their surveys for an estimated response rate of 60 percent. The purpose of the pretest was to determine how accurately the survey instruments were collecting the information needed, and to examine the effectiveness of the survey procedures.

After the pretest, some changes were made to the parking cost questions. Respondents were asked to specify whether their parking cost was an hourly rate, daily rate, weekly rate, or monthly rate.

Survey Schedule

The detailed schedule for the survey is presented in **Figure 4-1**. This schedule served as the basic guideline for the entire data collection effort. As shown in **Figure 4-1**, travel days were assigned between March 28 and June 10, 1994. The last diary day for Washtenaw County was April 15, 1994 due to its large student population. During the study period, four days (the Friday before Easter, Easter Monday, the Friday before Memorial Day, and Memorial Day) were not assigned as travel days.

Interviewer Training

The actual interviews were conducted by staff from Interviewing Service of America (ISA). AMPG and ISA staff together trained ISA interviewers using the actual CATI operations. All survey supervisors and interviewers were provided a training session which included a walkthrough of all scripts as well as appropriate role playing. Training for replacement interviewers was accomplished through a video tape of the first training session, and by the supervisors.

Monitoring and Reporting

AMPG staff monitored a sample of all interviews through an off-site telephone link that permitted listening in on the live interviews. AMPG also provided weekly reports summarizing number of households recruited and completed, and the progress during the week.

Figure 4-1
Survey Schedule*

[illegible]

* Numbers represented the number of days spent for each activity. The number 1 indicated the starting date of an activity.

Interviewers were supervised and spot-checked by a supervisor during actual interviews. ISA's procedure is based on a four-tiered supervisory structure that features:

- A **Floor Manager** who monitored staff and project productivity;
- **Team Captains** who supervised teams of interviewers and resolved problems as they arise;
- **Editors** who reviewed each questionnaire upon completion; and,
- **Monitors** who “listened in” on interviews to ensure compliance with procedures concerning probing, verbatim, and skip patterns.

Survey Hotline

To enhance the participation rate, SEMCOG provided and staffed a toll-free hotline for participating households to contact if they had questions about the survey. The hotline was tremendously useful for the study team to monitor problems that occurred in the survey mailing and retrieval. Over 500 calls were received via the line. Calls were recorded 24 hours a day, seven days a week. All calls were responded to by trained SEMCOG staff. Relevant information/messages were relayed to AMPG and ISA.

Respondents used the hotline to ask questions about the survey, to provide suggestions and to voice concerns. The following summarizes the various type of calls received:

- Questions regarding the legitimacy of the survey effort. (Most individuals were satisfied once they spoke to a SEMCOG staff person and an explanation of the survey was given);
- Questions regarding how the information would be used and who would use it;
- Specific inquiries as to how to fill out the Household Form and record activities;
- Requests to cancel their household's participation in the study; and,
- Requests to provide more input than the survey allowed.

V. SELECTED ANALYSES OF UNEXPANDED SURVEY RESULTS

In this section, the characteristics of the final sample, and selected analyses of demographic questions and trip-related calculations are presented. This includes:

- Response rates;
- Day of week distribution;
- Demographics; and,
- Trip rates.

Response Rates

Of all the households contacted through the random digit-dial technique, 38 percent were successfully recruited to participate in the survey. As indicated in **Table 5-1**, of those recruited, 55 percent completed the survey. The City of Detroit was included in Wayne County in this table, because it was not possible to tell whether a household was in Detroit or other Wayne County when the household was initially contacted and refused to participate in the survey. Across counties, Macomb County had the highest percentage of completed households, while St. Clair County had the lowest.

Table 5-1
Household Response Rate

	Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Washtenaw	Total
Total Contacted	18,746	7,899	4,513	603	884	419	1,556	34,929
Total Recruited	5,502	3,360	1,857	450	603	342	1,295	13,409
Total Completed	3,096	1,678	1,124	226	299	177	761	7,361
% Recruited	29%	43%	41%	75%	68%	82%	83%	38%
% Completed/ Contacted	17%	21%	25%	37%	34%	42%	49%	21%
% Completed/ Recruited	56%	50%	61%	50%	50%	52%	59%	55%

Day of Week Distribution

The sample was carefully monitored to include diaries from all five days of the week under study (Monday through Friday). As can be seen in **Table 5-2**, this pattern was achieved. There were slightly more households completed diaries on Friday (23 percent), especially in

the City of Detroit. The sampling design requirement was to stratify by county, household size and vehicles available; however, balancing across days of the week was not one of the sampling strata. While an attempt was made to balance travel across all five weekdays, an unequal distribution of respondents was observed in Detroit.

Table 5-2
Completed Households by Diary Day of the Week

Survey Area	Monday	Tuesday	Wednesday	Thursday	Friday	Row Total
Detroit	158 11%	200 14%	221 16%	115 8%	727 51%	1,421 100%
Other Wayne	329 20%	333 20%	358 21%	359 21%	296 18%	1,675 100%
Oakland	388 23%	279 17%	344 21%	400 24%	267 16%	1,678 100%
Macomb	260 23%	211 19%	192 17%	271 24%	190 17%	1,124 100%
Monroe	55 24%	43 19%	41 18%	55 24%	32 14%	226 100%
St. Clair	64 21%	55 18%	52 17%	75 25%	53 18%	299 100%
Livingston	42 24%	46 26%	44 25%	34 19%	11 6%	177 100%
Washtenaw	139 18%	210 28%	154 20%	156 20%	102 13%	761 100%
Column Total	1,435 19%	1,377 19%	1,406 19%	1,465 20%	1,678 23%	7,361 100%

Non-Respondent Analysis

In the recruitment phase, basic demographic information was collected from all households that agreed to participate in the study. However, as shown earlier in Table 5-1, only 55 percent of those recruited actually provided complete activity information for all household members. This section presents an analysis of the demographic information from the non-responding households as compared to responding households.

In addition, households were defined as "complete" if activity information was retrieved from all household members, or, for households with four or more persons, one member less than the total household size. Households with activity information missing for two or more members were considered non-responding and are also included in these analyses.

Table 5-3 compares selected demographics for respondents and non-respondents. Statistical analyses (at .05 level) indicated that individuals who aged 15 to 24 years were more likely to withdraw from the survey; and that individuals holding valid driver's licenses or not enrolled in school were more likely to complete the survey.

Table 5-3
Respondent and Non-Respondent Demographics

Variable	Responses	Respondents		Non-Respondents	
		Total Persons Responding	Percent of Total Responding	Total Persons Responding	Percent of Total Responding
Gender	Male	8,637	47%	732	48%
	Female	9,707	53%	793	52%
Age	5 - 14 Years	2,951	16%	260	17%
	15 - 24 Years	2,612	14%	303	20%
	25 - 34 Years	2,933	16%	227	15%
	35 - 44 Years	3,502	19%	307	20%
	45 - 54 Years	2,656	15%	207	14%
	55 - 64 Years	1,575	8%	95	6%
	65 - 74 Years	1,420	8%	84	6%
	75+ Years	695	4%	42	3%
Driver's License¹	Yes	13,424	89%	1047	84%
	No	1,696	11%	198	16%
Employment²	Employed, One Full-Time Job (30+ hrs/week)	7,648	51%	614	53%
	Employed, One Part-Time Job (<30 hrs/week)	1,919	13%	183	16%
	Not Employed - Retired	2,304	15%	133	11%
	Not Employed - Homemaker	1,660	11%	96	8%
	Not-Employed - Student	855	6%	90	8%
	Not Employed - Seeking Work	578	4%	53	5%
School Enrollment³	Not Enrolled	12,992	70%	952	67%
	Preschool/Nursery School	114	1%	13	1%
	Kindergarten - 8th Grade	2,692	15%	200	14%
	9th - 12th Grade	1,071	6%	98	7%
	College/Technical/Trade School	1,475	8%	156	11%

¹ This variable reported for those respondents of driving age (aged 16 or older).

² This variable reported for those respondents aged 16 or older. Respondents indicating "None" were excluded.

³ Respondents who did not answer this question were included with those not enrolled in school.

Table 5-4 compares the reported total annual household income for both responding and non-responding households. Income was asked twice during data collection, once during the recruitment call, and again on the household form; therefore these figures are presented as a composite of the two questions. Statistical analyses (at .05 level) indicated that households that refused to report income were more likely to withdraw from the survey.

Table 5-4
Total Annual Household Income
of Responding and Non-Responding Households

Total Annual Household Income	Responding Households		Non-Responding Households	
	Households	Percent	Households	Percent
Less than \$10,000	660	9%	26	6%
\$10,000 - \$14,999	512	7%	22	5%
\$15,000 - \$24,999	923	13%	48	10%
\$25,000 - \$34,999	979	13%	63	13%
\$35,000 - \$49,999	1,377	19%	73	15%
\$50,000 - \$74,999	1,356	18%	79	17%
\$75,000 - \$99,999	599	8%	42	9%
\$100,000 or more	392	5%	34	7%
Refused to respond	563	8%	86	18%
Total	7,361	100%	473	100%

Unexpanded Trip Rates

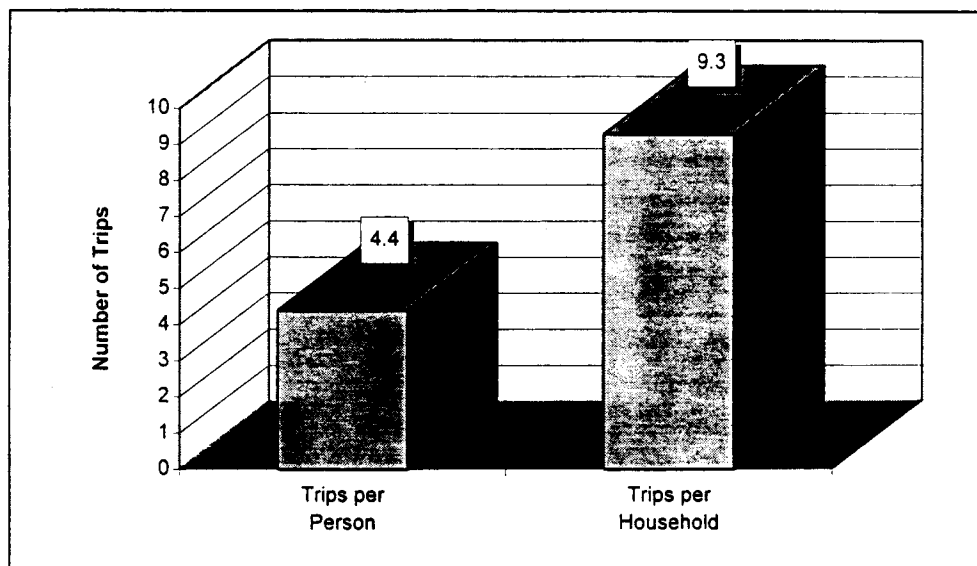
All analyses presented in this section are based on the unexpanded, raw data. **Table 5-5** presents summary totals for key variable for the survey area.

Total trips per person and total trips per household are reported in **Figure 5-1**. The average number of trips per person was 4.4. The average number of trips per household, which was based on the number of persons aged 5 or older in the household on the assigned diary day, was 9.3.

**Table 5-5
Unexpanded Survey Findings
by County Plus the City of Detroit**

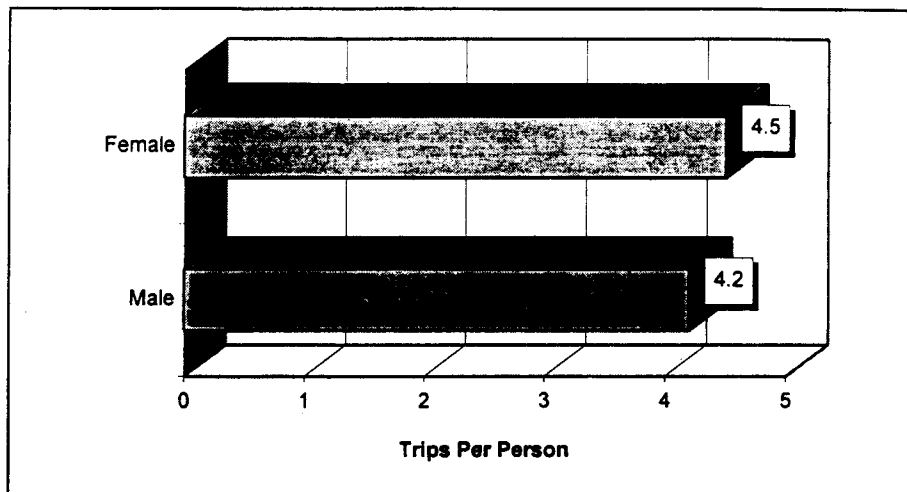
	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Total
Households	1,421	1,675	1,678	1,124	226	299	177	761	7,361
Persons (5 or older)	3,649	4,183	4,063	2,904	600	730	470	1745	18,344
Activities	13,342	20,233	20,988	14,250	2,935	3,689	2,352	9,226	87,015
Total Trips	9,693	16,050	16,925	11,346	2,335	2,959	1,882	7,481	68,671
Persons/ Household	2.6	2.5	2.4	2.6	2.7	2.4	2.7	2.3	2.5
Activities/ Household	9.4	12.1	12.5	12.7	13.0	12.3	13.3	12.1	11.8
Activities/ Person	3.7	4.8	5.2	4.9	4.9	5.1	5.0	5.3	4.7
Total Trips/ Household	6.8	9.6	10.1	10.1	10.3	9.9	10.6	9.8	9.3
Total Trips/ Person	3.6	4.5	4.7	4.5	4.4	4.6	4.5	5.0	4.4

**Figure 5-1
Average Total Trips per Person and
Average Total Trips per Household (Unexpanded Data)**



Total trips per person by gender is presented in **Figure 5-2**. Females had a slightly higher average number of trips than males, 4.5 compared to 4.2 trips per person.

Figure 5-2
Average Total Trips per Person by Gender (Unexpanded Data)



The average number of total trips per person by age, presented in **Figure 5-3**, ranged from a low of 4.2, for those 75 or older, to a high of 4.6, for those 25 to 34 years old. On average, trips per person decreased with age. (For the purpose of analysis, age was calculated based on the respondent's reported year of birth, and then categorized into the age ranges presented.)

Figure 5-3
Average Total Trips per Person by Age (Unexpanded Data)

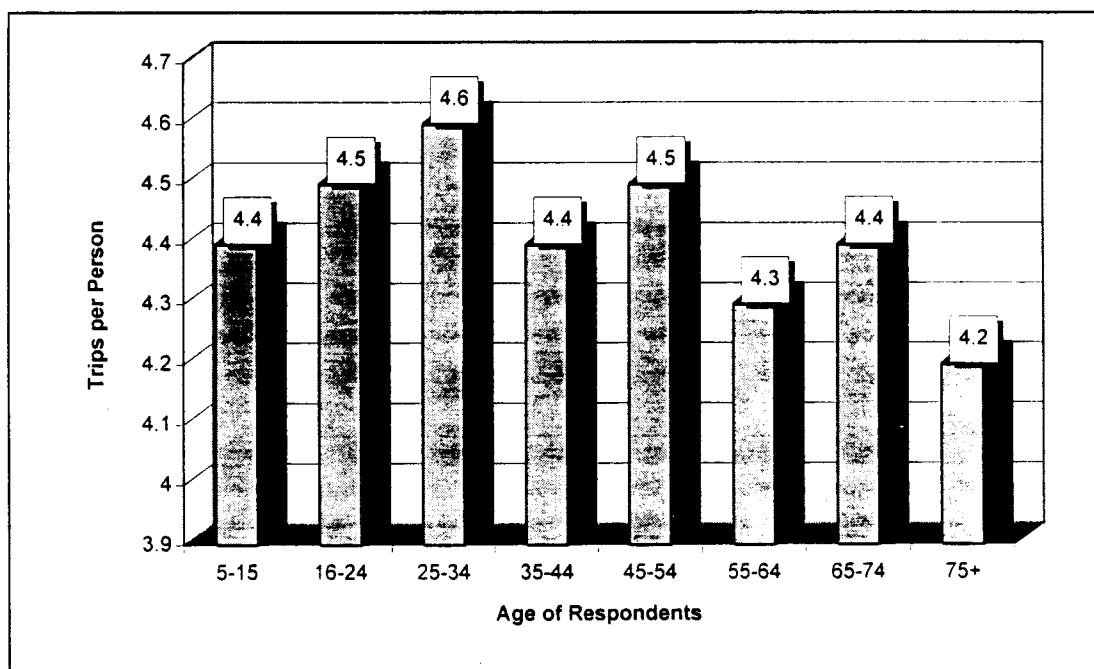
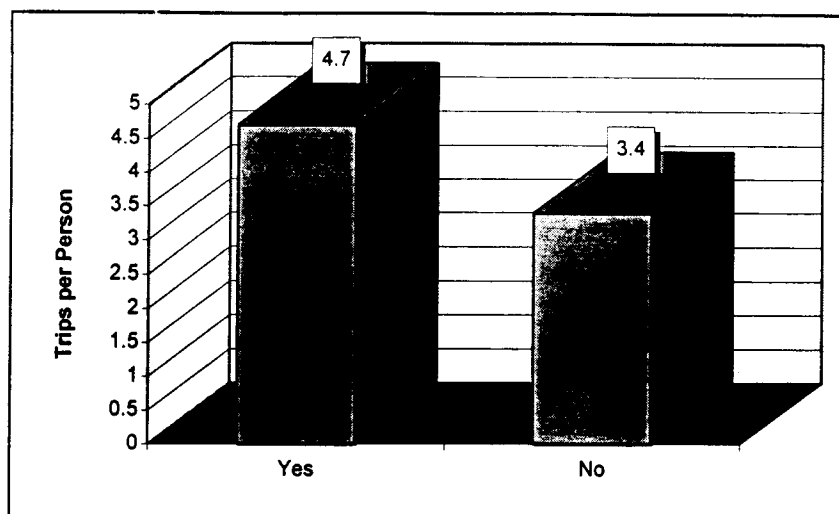


Figure 5-4 compares trips per person for respondents, 16 years of age or older, who had a valid driver's license versus those respondents who did not. Not surprisingly, respondents who possessed a valid driver's license had a higher average trip rate (4.7 trips) than respondents who did not (3.4 trips).

Figure 5-4
Average Total Trips per Person by Driver's License (Unexpanded Data)



Trips per person by employment is presented in **Figure 5-5**. Part-time workers and homemakers made, on average, more trips than other groups. Students and those not employed made the fewest trips.

Figure 5-5
Average Total Trips per Person by Employment (Unexpanded Data)

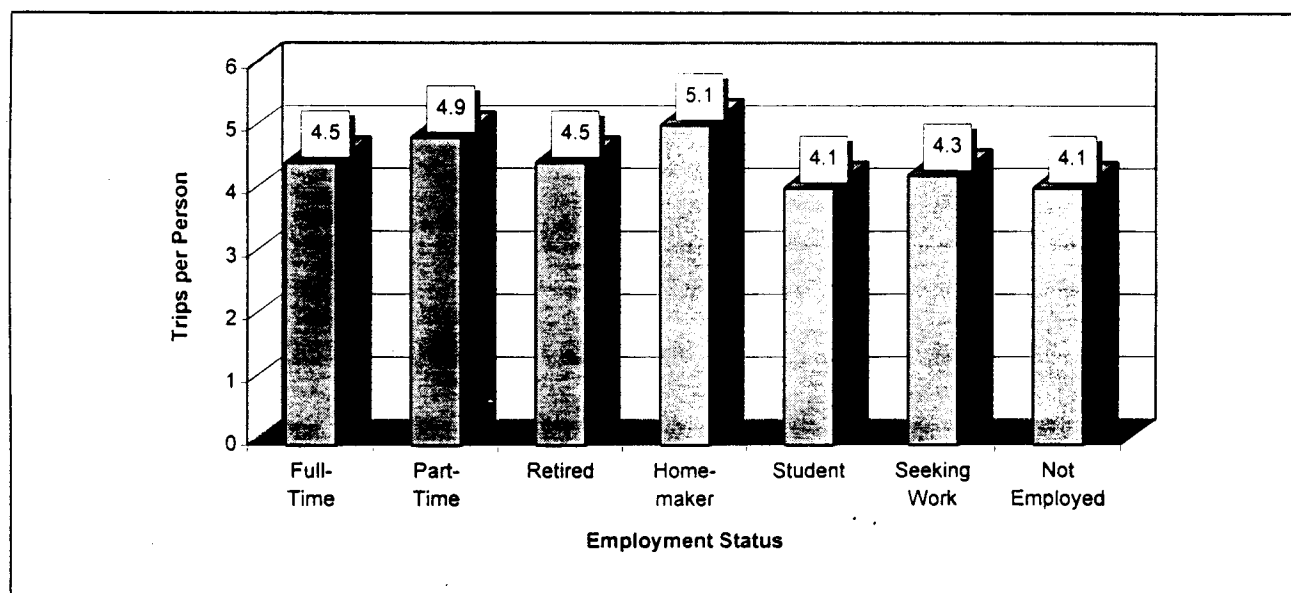


Figure 5-6 illustrates trips per household by household size. As would be expected, the number of trips per household increased as the household size increased.

Figure 5-6
Average Total Trips per Household by Household Size (Unexpanded Data)
(Based on Retrieval Data)

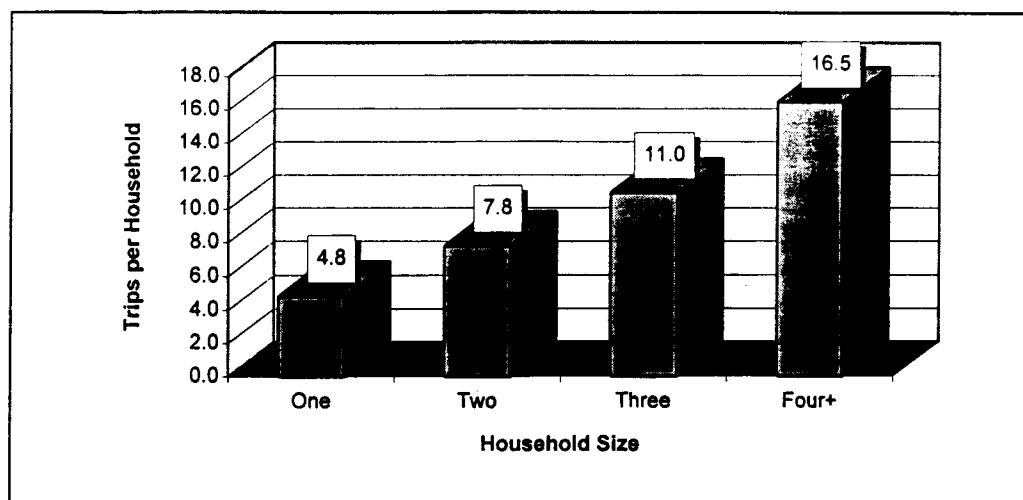


Figure 5-7 presents trips per person by household size. Interestingly, persons in smaller households had slightly more trips per person.

Figure 5-7
Average Total Trips per Person by Household Size (Unexpanded Data)
(Based on Retrieval Data)

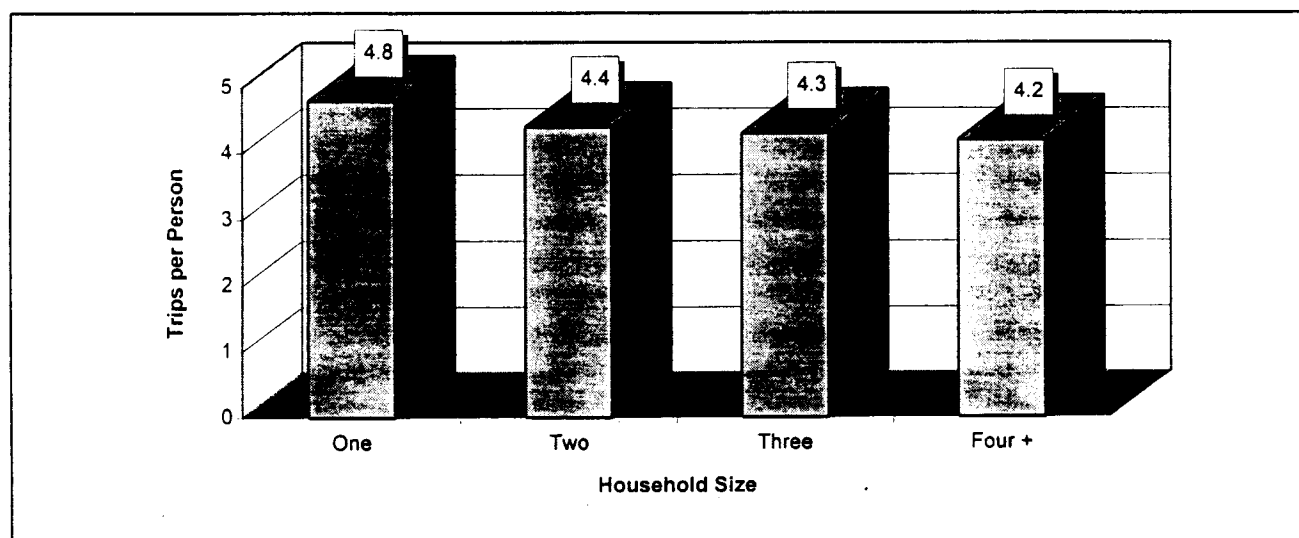


Figure 5-8 illustrates the average number of trips per household by vehicles available. As would be expected, as the number of household vehicles increased, the trips per household increased as well.

Figure 5-8
Average Total Trips per Household by Vehicles Available (Unexpanded Data)

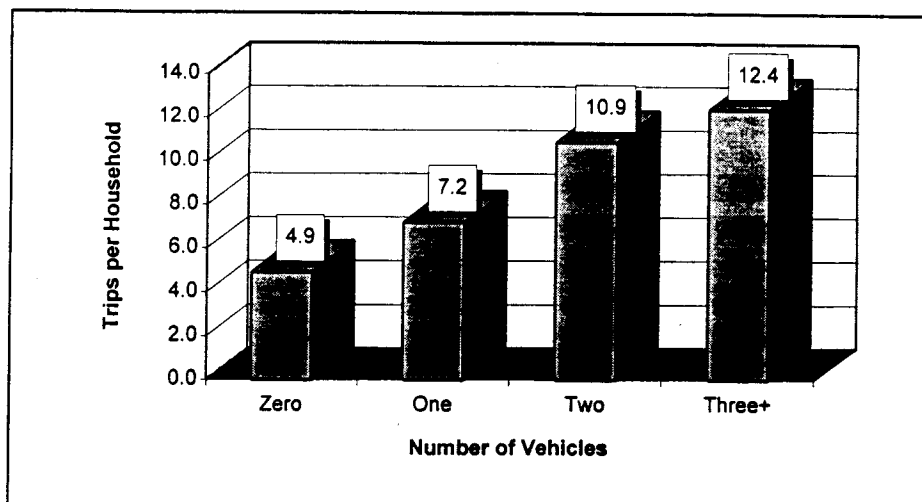
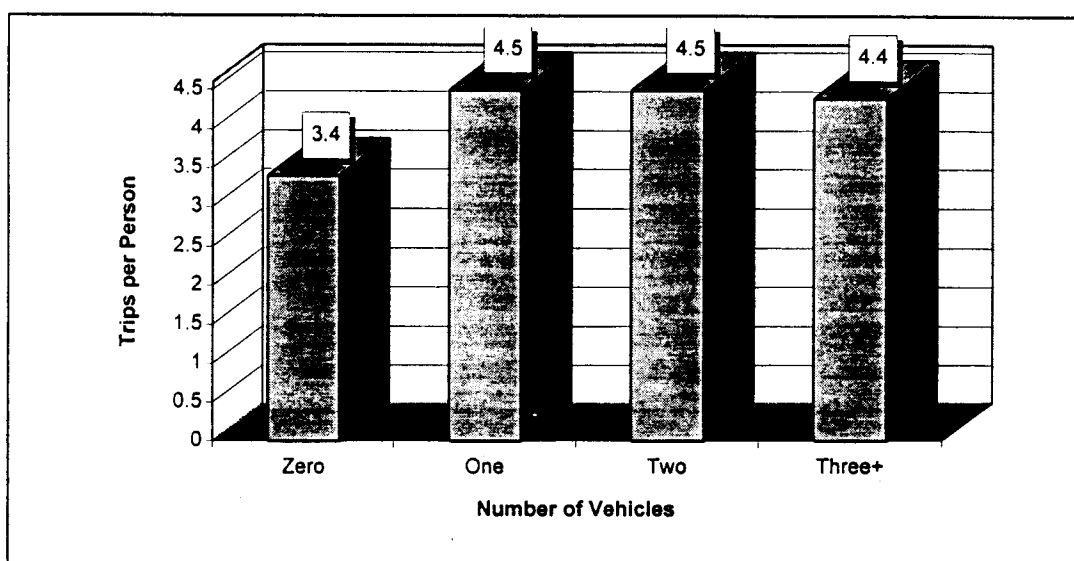


Figure 5-9 illustrates the average number of trips per person by vehicles available. In households with vehicles, the average number of trips per person was relatively constant at 4.5

Figure 5-9
Average Total Trips per Person by Vehicles Available (Unexpanded Data)



VI. SURVEY VALIDATION

The original data were adjusted to reflect the entire study area population using data expansion factors. **All data in Chapter 6 through Chapter 14 are expanded data.** To validate the expanded survey data against an external source, the total expanded households and population were compared to the 1993 totals developed by SEMCOG. The expanded number of workers were compared to the 1990 Census data. (Refer to *Technical Memorandum: Survey Data Expansion and Adjustment* for a complete discussion of the expansion method.)

As can be seen from **Table 6-1**, the expanded household total was within less than 1 percent of SEMCOG's estimated actual household total. The largest variance was in the Livingston County sample, where the expanded household total differed from actual by -5.7 percent.

Table 6-2 compares the expanded survey population with SEMCOG's estimated actual population total in the study area. The expanded total was within less than 1 percent of SEMCOG's estimated actual population total. The largest variance was in the Washtenaw County sample, where the expanded population total differed from the actual by -4.4 percent.

It should be noted that the survey data were expanded to the 1990 Census figures, but the survey validation was performed using 1993 estimated population and numbers of households provided by SEMCOG. In addition, the 1993 projected population included group quarters (e.g., prisons, dormitories, nursing homes, barracks) which were not eligible for inclusion in the 1994 SEMCOG survey. This discrepancy and other changes in population and number of households since 1990 may account for the variances observed in Tables 6-1 and 6-2.

Table 6-1
Comparison of Expanded Number of Households Versus
1993 Number of Households in the Survey Area

Survey Area	1993 Number of Households ¹	Expanded Number of households ²	Percent Difference
Detroit	366,693	368,180	0.4%
Other Wayne	417,487	414,186	-0.8%
Oakland	433,266	430,719	-0.6%
Macomb	280,565	278,968	-0.6%
Monroe	49,429	48,658	-1.6%
St. Clair	56,309	54,601	-3.0%
Livingston	44,229	41,709	-5.7%
Washtenaw	110,786	110,460	-0.3%
Total	1,758,764	1,747,480	-0.6%

¹ Data were obtained from the Southeast Michigan Council of Governments (1993).

² Expanded to 1990 Census.

Table 6-2
Comparison of Expanded Population
Versus 1993 Population in the Survey Area

Survey Area	1993 Population*	Expanded Population	Percent Difference
Detroit	1,006,808	983,522	-2.3%
Other Wayne	1,083,352	1,082,092	-0.1%
Oakland	1,133,993	1,118,400	-1.4%
Macomb	732,675	746,164	1.8%
Monroe	136,886	135,430	-1.1%
St. Clair	151,712	150,369	-0.9%
Livingston	125,523	124,464	-0.8%
Washtenaw	289,918	277,239	-4.4%
Total	4,660,867	4,617,681	-0.9%

* Data were obtained from the Southeast Michigan Council of Governments (1993).

As a third check, the expanded number of workers was compared with 1990 Census data. As shown in **Table 6-3**, the difference was only 0.1 percent.

Table 6-3
Comparison of Expanded Employment
Versus 1990 Employment in the Survey Area

Survey Area	1990 Employment*	Expanded Employment	Percent Difference
Detroit	335,462	323,174	-3.7%
Other Wayne	508,269	514,718	1.3%
Oakland	557,134	569,511	2.2%
Macomb	355,676	360,812	1.4%
Monroe	60,862	59,538	-2.2%
St. Clair	64,179	61,593	-4.0%
Livingston	58,567	55,961	-4.4%
Washtenaw	151,680	148,263	-2.3%
Total	2,091,829	2,093,570	0.1%

* Data were obtained from the U.S. Bureau of Census, Summary Tape File 3.

VII. SUMMARY FINDINGS

This chapter provides an overview of the basic findings of the study, including travel-related and demographic statistics. All data presented in the remainder of this report have been expanded from the survey sample to the population of the areas surveyed. Each of these findings is supported by detailed data analyses presented in later sections of this report. The reader is encouraged to carefully review the Glossary (Chapter XV) for the definition of each variable.

SUMMARY DATA

Table 7-1 presents the total number of households, persons, persons aged 5 or older, vehicles, full-time employees, licensed drivers, person trips, driver trips, vehicle passenger trips, and transit trips per study area. Transit trips in this report include only public bus trips.

Table 7-1
Summary of 1994 Household and Travel Characteristics,
Total by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Washtenaw	Row Total
Households	368,180	414,186	430,719	278,968	48,658	54,601	41,709	110,460	1,747,480
Persons (all ages)	983,522	1,082,092	1,118,400	746,164	135,430	150,369	124,464	277,239	4,617,681
Persons (5 or older)	851,032	996,658	1,010,383	687,651	119,160	131,410	108,401	256,337	4,161,031
Vehicles Available	394,261	752,020	829,290	540,674	101,588	106,630	94,324	200,906	3,019,694
Full-Time Employees	248,818	418,686	459,993	286,199	47,509	51,583	45,168	109,719	1,667,674
Licensed Drivers	473,660	752,467	800,835	532,446	89,839	102,645	83,355	203,707	3,038,953
Person Trips	2,124,673	3,723,209	4,184,295	2,714,771	469,924	533,978	420,487	1,022,437	15,193,774
Vehicle Driver Trips	1,116,044	2,635,146	3,042,086	1,917,668	334,971	347,384	297,187	668,467	10,358,954
Passenger Trips	438,193	631,831	630,071	493,704	74,892	102,621	68,000	173,594	2,612,906
Transit Trips	158,206	23,735	28,563	15,765	2,834	1,852	1,634	12,486	245,075

Table 7-2 presents statistics by household. The main findings are:

- The average household size was between 2.5 and 3.0 persons (all ages) per household. Livingston County had the largest average household size and Washtenaw County had the smallest;
- Consistent with larger household size, Livingston County had the highest average number of available vehicles, and licensed drivers;
- The average number of full-time employees per household was between 0.7 and 1.1 in all areas. The City of Detroit had the lowest average of 0.7; and,
- The City of Detroit had significantly fewer average trips per household and more transit trips per household, while Livingston County had more transit trips per household than any other survey area.

Table 7-2
Statistics per Household by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Washtenaw	Survey Area
Persons (all ages)	2.7	2.6	2.6	2.7	2.8	2.8	3.0	2.5	2.6
Persons (5 or older)	2.3	2.4	2.3	2.5	2.4	2.4	2.6	2.3	2.4
Vehicles Available	1.1	1.8	1.9	1.9	2.1	2.0	2.3	1.8	1.7
Full-Time Employees	0.7	1.0	1.1	1.0	1.0	0.9	1.1	1.0	1.0
Licensed Drivers	1.3	1.8	1.9	1.9	1.8	1.9	2.0	1.8	1.7
Person Trips	5.8	9.0	9.7	9.7	9.7	9.8	10.1	9.3	8.7
Vehicle Driver Trips¹	5.1	7.3	7.6	7.6	7.5	7.0	7.4	7.1	7.1
Passenger Trips²	3.8	4.2	3.9	4.1	4.1	5.0	4.2	4.2	4.0
Transit Trips³	2.6	1.9	2.4	1.9	2.2	2.1	4.6	2.3	2.4

¹ Average was based on households with vehicle driver trips.

² Average was based on households with passenger trips.

³ Average was based on households with transit (bus) trips.

VIII. DEMOGRAPHIC PROFILE

This chapter presents detailed information regarding the demographic characteristics of households in the 1994 survey study area. Sections on households, income, vehicles available, licensed drivers, and employment are included. It should be noted that this information is provided as a profile of study respondents, and that data on these characteristics can be found in the 1990 Census.

Households

Table 8-1 provides a breakdown of various household characteristics. Notable characteristics include the following:

- The majority (72 percent) of households lived in single-unit dwellings. For households residing in single-unit dwellings, the largest group (24 percent) were in the \$35,000 to \$49,999 income range. In multiple-unit dwellings, 24 percent of households earned less than \$10,000 in annual income;

Table 8-1
Household Characteristics by Housing Unit Type
(Single, Multiple, All)

		Single		Multiple		All	
		Number	Percent	Number	Percent	Number	Percent
Income	Less than \$10,000	105,576	8%	115,313	24%	220,889	13%
	\$10,000 - \$14,999	98,583	8%	70,146	14%	168,729	10%
	\$15,000 - \$24,999	133,462	11%	73,976	15%	207,438	12%
	\$25,000 - \$34,999	150,967	12%	68,438	14%	219,405	13%
	\$35,000 - \$49,999	301,441	24%	84,473	17%	385,915	22%
	\$50,000 - \$74,999	199,006	16%	34,191	7%	233,197	13%
	\$75,000 - \$99,999	96,384	8%	8,320	2%	104,704	6%
	\$100,000 or more	61,702	5%	5,498	1%	67,199	4%
	Refused	100,986	8%	19,589	4%	120,576	7%
	Don't know	14,062	1%	5,367	1%	19,429	1%
	Total	1,262,168	100%	485,312	100%	1,747,480	100%
Vehicles Available	Zero	100,613	8%	103,837	21%	204,450	12%
	One	341,322	27%	230,383	47%	571,706	33%
	Two	537,305	43%	124,773	26%	662,079	38%
	Three +	282,928	22%	26,318	5%	309,246	18%
	Total	1,262,168	100%	485,312	100%	1,747,480	100%
Household Size	One	200,422	16%	230,480	47%	430,903	25%
	Two	369,811	29%	157,553	32%	527,364	30%
	Three	259,173	21%	56,684	12%	315,856	18%
	Four +	432,762	34%	40,594	8%	473,356	27%
	Total	1,262,168	100%	485,312	100%	1,747,480	100%

- For households living in single-unit dwellings, 43 percent had two vehicles available to household members for travel. In multiple-unit dwellings, 47 percent of the households had only one vehicle available; and,
- Nearly half of the households in multiple-unit dwellings (47 percent) were one-person households, while the vast majority of households in single-unit dwellings were at least two-person households.

Figure 8-1 presents the distribution of household size for single and multiple dwelling types. Percentages in this figure are rounded.

Figure 8-1
Distribution of Household Size by Housing Unit Type

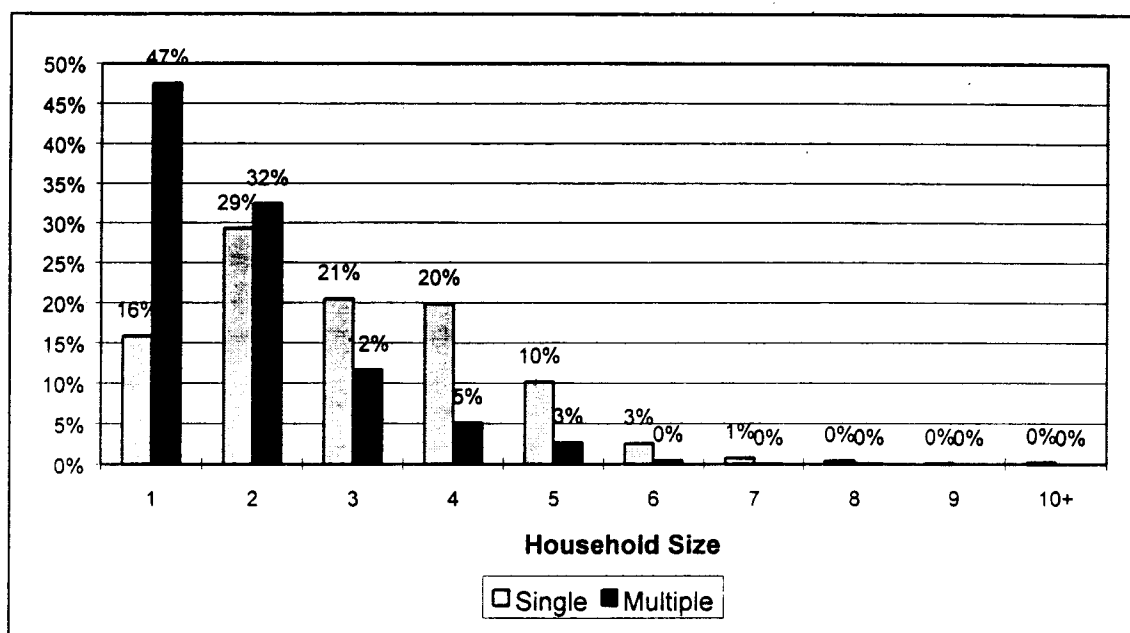


Table 8-2 presents the number of households by housing unit type and county plus the City of Detroit. As can be seen in Table 8-2, the majority of the households in the entire survey area lived in a single-unit dwelling. Washtenaw County had the highest percentage (44 percent) of households living in a multiple-unit dwelling, followed by the City of Detroit (36 percent).

Table 8-2
Number of Households by Housing Unit Type and County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Single	234,505	314,087	313,925	211,973	41,426	45,153	39,666	61,432	1,262,168
Multiple	133,676	100,099	116,794	66,994	7,231	9,447	2,042	49,028	485,312
Column Total	368,180	414,186	430,719	278,968	48,658	54,601	41,709	110,460	1,747,480

The number of households by housing unit type and urbanized area is shown in **Table 8-3**. The Census defines urban area as a contiguous area of 1,000 persons per square mile around a central city; it also includes incorporated places of over 2,500 persons. Urban areas were defined by Census block. To relate an urban area in the Census to an urban area defined by Traffic Analysis Zone (TAZ), population by block was aggregated to TAZ by the urban/rural condition of the block. If the majority of the population was living in urban blocks, the entire TAZ was considered an urbanized area (UAZ). Using this definition, urban areas were not always contiguous. In Southeast Michigan, there were three urban areas contained in the region: Detroit, Ann Arbor and Port Huron urbanized areas. **Figure 8-2** indicates the urbanized areas within the region. (A complete listing of all communities within each of the urbanized areas is included in **Appendix D**.)

Discrepancy in Margin Totals

Ninety-nine (99) expanded households' home addresses could not be geocoded, and therefore were not assigned UAZ codes. Thus, the grand total in Table 8-3 is less than that in Table 8-2. **In this report, the number of households in all tables categorized by UAZ is less than the number of households categorized by county plus the City of Detroit.** In addition, four home addresses were found to be inconsistent with their recruitment area county classifications. Adjustments to the UAZ codes will be made by SEMCOG for use in future analyses.

Table 8-3 indicates that in the Ann Arbor urbanized area, there were more households living in multiple-unit dwellings than single-unit dwellings, while in other urbanized areas, most households resided in single-unit dwelling.

Table 8-3
Number of Households by Housing Unit Type and Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Single	995,559	43,684	17,689	189,279	1,246,211
Multiple	398,605	51,123	6,946	20,217	476,890
Column Total	1,394,164	94,807	24,635	209,496	1,723,102

Defined Urbanized Area

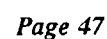


Table 8-4 presents the number of households by household size and county. Overall, there were fewer three-person households than any other household size, except in Livingston County where there were slightly more three-person households than one-person households.

Table 8-4
Number of Households by Household Size and County Plus the City of Detroit

Household Size	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
One	110,528	99,486	102,873	62,063	9,257	12,003	6,162	28,530	430,903
Two	93,583	126,981	139,227	86,394	14,927	16,588	12,839	36,824	527,364
Three	64,530	76,994	76,840	52,233	9,024	9,375	7,458	19,403	315,856
Four +	99,539	110,725	111,779	78,278	15,450	16,634	15,250	25,703	473,356
Column Total	368,180	414,186	430,719	278,968	48,658	54,601	41,709	110,460	1,747,480

The number of households by household size and urbanized area is presented in **Table 8-5**. Three person households were the least frequent in all three urbanized areas, while in "All Other Areas", the number of one-person households was the lowest.

Table 8-5
Number of Households by Household Size and Urbanized Area

Household Size	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
One	351,656	27,465	6,384	32,861	418,365
Two	415,458	32,200	8,261	65,603	521,522
Three	254,908	16,476	4,198	37,738	313,320
Four +	372,141	18,666	5,793	73,294	469,894
Column Total	1,394,164	94,807	24,635	209,496	1,723,102*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

The number of households by age group and county plus the City of Detroit is shown in **Table 8-6**. **Categories in this table are mutually exclusive, since households were classified according to their youngest member.** Households without children and headed by someone aged 35 to 64 accounted for one-third of the total number of households. This pattern was consistent across all survey areas.

Table 8-7 presents the distribution of households by age group and urbanized area. As explained earlier, the categories in this table are mutually exclusive. The largest categories in the Detroit urbanized area and "All Other Areas" were households without children and headed by someone aged between 35 and 64. In the Ann Arbor urbanized area, households without children and headed by someone ages between 18 and 24 was the largest group, while in the Port Huron urbanized area, the largest group was households with head over 65 and without children.

Table 8-6
Number of Households by Age Group and County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Washtenaw	Row Total
Households with children 5 or less	95,699	70,289	82,331	51,976	13,551	13,671	10,705	18,729	356,952
Households with children 6-17, but without children 5 or less	56,442	78,735	66,855	42,286	9,075	8,834	8,451	21,256	291,934
Head of household 18-34, no children	32,010	43,606	63,621	33,653	2,575	1,578	3,281	25,851	206,175
Head of household 35-64, no children	111,142	131,920	141,801	93,172	15,206	17,916	13,475	31,935	556,568
Head of household 65+, no children	72,887	89,636	76,111	57,880	8,250	12,601	5,796	12,689	335,851
Column Total	368,180	414,186	430,719	278,968	48,658	54,601	41,709	110,460	1,747,480

Table 8-7
Number of Households by Age Group and Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Households with children aged 5 or less	279,170	16,635	5,993	51,545	353,343
Households with children 6-17, but without children aged 5 or less	228,189	15,584	3,757	41,959	289,489
Head of household 18-34, no children	160,931	25,974	1,024	13,609	201,538
Head of household 35-64, no children	447,038	25,449	6,926	68,976	548,389
Head of household 65+, no children	278,836	11,165	6,935	33,407	330,343
Column Total	1,394,164	94,807	24,635	209,496	1,723,102*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

INCOME

Distribution of household income is presented in **Table 8-8** for all eight study areas. Other Wayne, Oakland, Macomb, Monroe, and Livingston counties exhibited fairly similar patterns, with less than 20 percent of households reporting incomes of less than \$15,000, and more than 30 percent of households reporting incomes of more than \$50,000. Half of the households in City of Detroit had annual household incomes of less than \$15,000, while one-quarter of the households in St. Clair County fell into the same income range.

In Other Wayne, Oakland, Macomb, Monroe, St. Clair, and Washtenaw counties, the largest percentage of respondents reported incomes in the \$35,000 to \$49,999 range (20 to 25 percent); Livingston County had the greatest percentage of its population (26 percent) in the \$50,000 to \$74,999 range; and the City of Detroit had 31 percent in the less than \$10,000 range.

Table 8-8
Distribution of Household Income* by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw
Less than \$10,000	31%	10%	6%	7%	8%	14%	3%	8%
\$10,000 - \$14,999	14%	9%	7%	9%	8%	10%	5%	13%
\$15,000 - \$24,999	13%	12%	11%	11%	11%	13%	8%	13%
\$25,000 - \$34,999	11%	13%	11%	13%	18%	16%	15%	15%
\$35,000 - \$49,999	15%	25%	25%	25%	23%	20%	22%	21%
\$50,000 - \$74,999	6%	13%	16%	16%	14%	14%	26%	14%
\$75,000 - \$99,999	2%	7%	8%	6%	9%	2%	8%	6%
\$100,000 or more	1%	4%	7%	3%	2%	3%	6%	5%
Don't know	6%	7%	8%	8%	6%	7%	7%	4%
Refused	2%	1%	1%	1%	1%	0%	0%	1%

* Income information in this table was obtained from the retrieval calls. If a household did not report income in the retrieval call, income information was obtained from the recruitment call.

Table 8-9 presents the number of households by income range and county plus the City of Detroit. Findings in this table parallel those in Table 8-8.

Table 8-9
Number of Households by Household Income Range and County Plus the City of Detroit*

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Less than \$10K	113,787	40,159	23,929	20,744	4,123	7,765	1,111	9,271	220,889
\$10K to < \$15K	52,797	36,710	29,759	23,909	3,709	5,569	2,006	14,271	168,729
\$15K to < \$25K	47,313	49,607	48,248	31,650	5,163	7,249	3,425	14,783	207,438
\$25K to < \$35K	41,295	53,152	47,842	37,222	8,679	8,825	6,149	16,241	219,405
\$35K to < \$50K	54,021	102,306	105,839	69,539	11,303	10,879	9,027	23,001	385,914
\$50K to < \$75K	21,928	53,734	70,763	45,257	6,995	7,679	10,928	15,914	233,197
\$75K to < \$100K	6,246	28,707	36,489	17,703	4,246	1,223	3,478	6,614	104,704
\$100K or more	3,064	16,585	29,008	8,465	972	1,365	2,515	5,224	67,199
Refused	20,874	28,696	34,422	22,458	2,832	4,008	3,069	4,215	120,576
Don't Know	6,856	4,530	4,421	2,022	636	39	0	927	19,429
Column Total	368,180	414,186	430,719	278,968	48,658	54,601	41,709	110,460	1,747,480

* Income information in this table was obtained from the retrieval calls. If a household did not report income in the retrieval call, income information was obtained from the recruitment call.

The number of households by income range and urbanized area is shown in **Table 8-10**. Over a quarter of households in the Detroit, Ann Arbor and Port Huron urbanized areas earned less than \$15,000 annually.

Table 8-10
Number of Households by Household Income Range and Urbanized Area*

Income Range	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Less than \$10K	189,429	8,955	3,759	12,963	215,106
\$10K to < \$15K	133,021	13,385	2,746	15,346	164,498
\$15K to < \$25K	165,098	12,595	3,367	23,383	204,443
\$25K to < \$35K	167,572	14,104	4,559	29,723	215,958
\$35K to < \$50K	308,880	22,002	4,242	48,557	383,681
\$50K to < \$75K	176,398	12,286	3,032	40,343	232,058
\$75K to < \$100K	82,949	4,243	162	16,033	103,386
\$100K or more	53,897	3,949	694	8,349	66,888
Refused	100,676	2,638	2,035	12,878	118,227
Don't Know	16,245	651	39	1,923	18,857
Column Total	1,394,164¹	94,807¹	24,635	209,496	1,723,102²

* Income information in this table was obtained from the retrieval calls. If a household did not report income in the retrieval call, income information was obtained from the recruitment call.

¹ Totals are off by 1 due to rounding error.

² Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Table 8-11 presents the number of households by household income range and number of vehicles available by urbanized area. The number of vehicles available was directly related to income. Note that the numbers in some cells are zero. For example, in the Ann Arbor urbanized area, the entry for the cell of less than \$10,000 and three+ vehicle is zero. This is due to the fact that in Washtenaw County (where the Ann Arbor urbanized area is located), no household with income of less than \$10,000 and with at least three vehicles was sampled.

Table 8-11
Number of Households by Household Income Range and
Number of Vehicles Available by Urbanized Area*

Urbanized Area	Income Range	Vehicles Available				Row Total
		Zero	One	Two	Three +	
Detroit	Less than \$10K	99,252	80,078	7,977	2,122	189,429
	\$10K to < \$15K	32,970	72,599	23,668	3,784	133,021
	\$15K to < \$25K	19,927	88,524	45,739	10,908	165,098
	\$25K to < \$35K	5,696	79,636	67,906	14,334	167,572
	\$35K to < \$50K	6,345	80,542	160,331	61,663	308,880
	\$50K to < \$75K	3,187	20,677	97,187	55,348	176,398
	\$75K to < \$100K	57	4,466	41,361	37,065	82,949
	\$100K or more	367	3,003	24,104	26,423	53,897
	Refused	11,789	31,116	39,785	17,986	100,676
	Don't Know	3,433	5,639	5,229	1,944	16,245
	Column Total	183,023	466,279	513,286	231,576	1,394,164
Ann Arbor	Less than \$10K	3,601	4,710	644	0	8,955
	\$10K to < \$15K	2,655	6,066	4,461	203	13,385
	\$15K to < \$25K	1,300	7,549	2,615	1,131	12,595
	\$25K to < \$35K	561	7,661	4,323	1,559	14,104
	\$35K to < \$50K	798	5,723	12,313	3,169	22,002
	\$50K to < \$75K	41	1,835	6,462	3,948	12,286
	\$75K to < \$100K	0	609	2,289	1,344	4,243
	\$100K or more	28	264	1,998	1,659	3,949
	Refused	0	1,009	1,491	138	2,638
	Don't Know	0	514	136	0	651
	Column Total	8,983	35,941	36,731	13,152	94,807
Port Huron	Less than \$10K	896	2,678	185	0	3,759
	\$10K to < \$15K	655	1,574	451	68	2,746
	\$15K to < \$25K	227	2,595	430	115	3,367
	\$25K to < \$35K	0	1,879	2,556	124	4,559
	\$35K to < \$50K	0	585	2,696	961	4,242
	\$50K to < \$75K	0	233	1,548	1,252	3,032
	\$75K to < \$100K	0	0	162	0	162
	\$100K or more	0	61	430	203	694
	Refused	0	785	988	261	2,035
	Don't Know	0	0	0	39	39
	Column Total	1,778	10,389	9,446	3,022	24,635
All Other Areas	Less than \$10K	3,478	7,676	1,327	483	12,963
	\$10K to < \$15K	1,910	10,446	2,642	348	15,346
	\$15K to < \$25K	152	10,522	9,889	2,820	23,383
	\$25K to < \$35K	292	7,579	16,632	5,220	29,723
	\$35K to < \$50K	56	6,139	30,250	12,111	48,557
	\$50K to < \$75K	0	2,255	18,560	19,528	40,343
	\$75K to < \$100K	0	74	7,412	8,546	16,033
	\$100K or more	0	91	2,498	5,760	8,349
	Refused	536	2,410	6,213	3,719	12,878
	Don't Know	24	92	1,133	674	1,923
	Column Total	6,447	47,285	96,556	59,208	209,496
Grand Total		200,231	559,894	656,019	306,958	1,723,102**

* Income information in this table was obtained from the retrieval calls. If a household did not report income in the retrieval call, income information was obtained from the recruitment call.

** Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

VEHICLES AVAILABLE

Households were asked the number of cars, minivans, light trucks and vans available to household members for travel. **Tables 8-12 and 8-13** present vehicles available in each study area. Excluding the City of Detroit, more than 40 percent of all households had two vehicles available. Mirroring findings in other parts of the country, across the entire study region 18 percent of the households had three or more vehicles.

Table 8-12
Number of Households by Number of Vehicles Available
and County Plus the City of Detroit

Vehicles Available	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Zero	117,976	35,608	22,661	15,521	2,029	3,395	173	7,086	204,450
One	144,550	133,459	127,325	87,877	13,735	17,725	8,692	38,342	571,706
Two	78,156	166,860	192,040	116,916	20,842	22,591	19,560	45,113	662,079
Three +	27,499	78,258	88,693	58,653	12,051	10,889	13,283	19,919	309,246
Column Total	368,180	414,186	430,719	278,968	48,658	54,601	41,709	110,460	1,747,480

Table 8-13
Number of Households by Number of Vehicles Available and Urbanized Area

Vehicles Available	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Zero	183,023	8,983	1,778	6,447	200,232
One	466,279	35,941	10,389	47,285	559,893
Two	513,286	36,731	9,446	96,556	656,020
Three +	231,576	13,152	3,022	59,208	306,957
Column Total	1,394,164	94,807	24,635	209,496	1,723,102*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Table 8-14 indicates the average number of vehicles available per household in each study area and urbanized area. Livingston County had the highest average number of vehicles available (2.3), while the City of Detroit had the lowest (1.1). The average number of vehicles available per household was almost the same among the three urbanized areas: Detroit, Ann Arbor, and Port Huron. "All Other Areas" had a higher average number of vehicles available.

Table 8-14
Average Number of Vehicles Available Per Household by County Plus the City of Detroit and Urbanized Area

County Plus the City of Detroit	Detroit	1.1
	Other Wayne	1.8
	Oakland	1.9
	Macomb	1.9
	Monroe	2.1
	St. Clair	2.0
	Livingston	2.3
	Washtenaw	1.8
Urbanized Area	Detroit	1.7
	Ann Arbor	1.7
	Port Huron	1.6
	All Other Areas	2.2

Tables 8-15 and 8-16 present the average number of vehicles available per household by housing unit type in each study area and urbanized area. Single-unit dwellers had higher average number of vehicles available than households living in multiple-units in all counties and urbanized areas.

Table 8-15
Average Number of Vehicles Available per Household by Housing Unit Type by County Plus the City of Detroit

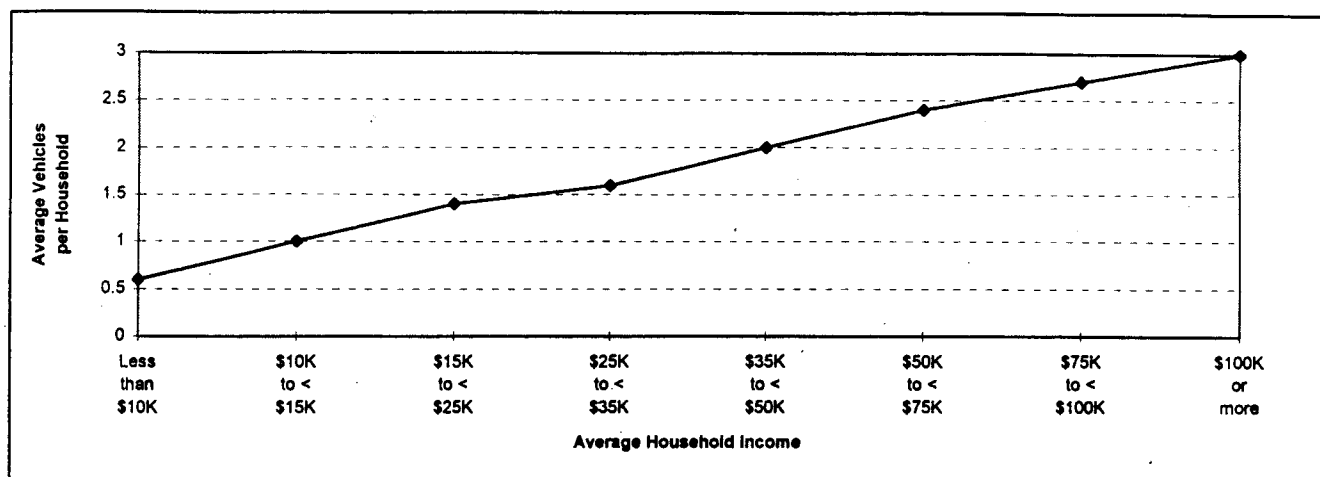
	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Washtenaw
Single	1.3	2.0	2.1	2.1	2.2	2.1	2.3	2.1
Multiple	0.7	1.2	1.4	1.4	1.4	1.2	1.5	1.4
Area Average	1.1	1.8	1.9	1.9	2.1	2.0	2.3	1.8

Table 8-16
Average Number of Vehicles Available per Household by Housing Unit Type by Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas
Single	1.9	2.0	1.8	2.3
Multiple	1.1	1.4	1.3	1.4
Area Average	1.7	1.7	1.6	2.2

Figure 8-3 presents average vehicles available per household as a function of average income. As expected, the number of vehicles per household increased as the household income increased.

Figure 8-3
Average Vehicles Available per Household As a Function of Average Income



LICENSED DRIVERS

Table 8-17 presents the average number of licensed drivers per household in each study area and urbanized area. The highest number of licensed drivers per household was found in Livingston County, and the lowest was in the City of Detroit. The three urbanized areas (Detroit, Ann Arbor, and Port Huron) had a slightly lower number of licensed drivers per household than "All Other Areas."

Table 8-17
Average Number of Licensed Drivers per Household by County Plus City of Detroit and Urbanized Area

County Plus the City of Detroit	Detroit	1.3
	Wayne	1.8
	Oakland	1.9
	Macomb	1.9
	Monroe	1.8
	St. Clair	1.9
	Livingston	2.0
	Washtenaw	1.8
Urbanized Area	Detroit	1.7
	Ann Arbor	1.8
	Port Huron	1.7
	All Other Areas	2.0

Tables 8-18 and 8-19 present the number of licensed drivers by age range in each study area and urbanized area. Approximately one-third of the licensed drivers were between ages 35 and 54.

Table 8-18
Number of Licensed Drivers by Age Range and
County Plus the City of Detroit

	16-19 Yrs. Old	20-34 Yrs. Old	35-54 Yrs. Old	55-64 Yrs. Old	65 Yrs. Old +	Row Total
Detroit	7,920	148,651	184,800	40,243	92,046	473,660
Other Wayne	20,112	224,160	291,611	79,551	137,033	752,467
Oakland	17,257	245,441	325,017	86,032	127,088	800,835
Macomb	12,220	168,105	194,137	57,709	100,274	532,446
Monroe	1,412	26,555	37,645	8,039	16,188	89,839
St. Clair	2,316	28,529	38,299	13,893	19,605	102,642
Livingston	1,164	19,119	39,262	13,631	10,174	83,351
Washtenaw	9,595	76,165	81,146	15,233	21,569	203,707
Column Total	71,997	936,725	1,191,917	314,331	523,976	3,038,946

Table 8-19
Number of Licensed Drivers by Age Range and Urbanized Area

	16-19 Yrs. Old	20-34 Yrs. Old	35-54 Yrs. Old	55-65 Yrs. Old	65 Yrs.+ Old	Row Total
Detroit	52,185	740,138	911,951	249,327	427,659	2,381,259
Ann Arbor	7,917	72,402	59,288	10,085	16,320	166,013
Port Huron	1,185	10,692	15,075	4,779	10,731	42,461
All Other Areas	10,629	103,205	191,180	47,851	62,677	415,542
Column Total	71,916	926,437	1,177,494	312,042	517,386	3,005,275*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

EMPLOYMENT

Respondents were asked to provide both household and employment addresses. In the employment data presented in Tables 8-20 through 8-29, the figures are based on respondents' home addresses. For example, an individual living in Monroe County but working in the City of Detroit is shown under Monroe County. However, if the person's household address was part of Detroit's urbanized area (UAZ), the individual would be included in the City of Detroit's UAZ.

As shown in Table 8-20, the average number of full-time employees per household was between 0.7 and 1.1. The City of Detroit had the lowest average number of full-time employees per household. Oakland and Livingston reported the highest average number of full-time employees.

Table 8-20
Average Number of Full-time Employees per Household by County
Plus the City of Detroit

Detroit	Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw
0.7	1.0	1.1	1.0	1.0	0.9	1.1	1.0

Table 8-21 presents the number of households by number of full-time and part-time workers in each study area. Over 43 percent of households in the City of Detroit had no working member in the household. Overall, over 27 percent of households had no worker in the household.

Table 8-21
Number of Households by Number of Workers per Household
and County Plus the City of Detroit

Workers	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Zero	160,110	106,832	88,936	69,164	12,328	16,872	7,207	19,104	480,554
One	122,879	148,513	162,098	95,214	16,598	18,229	14,906	44,929	623,366
Two	59,517	122,587	145,552	87,666	16,281	16,517	17,732	37,638	503,491
Three+	25,674	36,254	34,133	26,923	3,451	2,983	1,863	8,788	140,070
Column Total	368,180	414,186	430,719	278,968	48,658	54,601	41,709	110,460	1,747,480

Table 8-22 presents the number of households by number of workers in each study area. Port Huron had the highest percentage of households with no worker (33 percent) and Ann Arbor had the lowest (19 percent).

Table 8-22
Number of Households by Number of Workers per Household
and Urbanized Area

Workers	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Zero	399,329	18,436	8,212	43,954	469,931
One	495,479	37,487	7,931	72,024	612,920
Two	382,736	33,208	7,394	77,290	500,628
Three+	116,620	5,676	1,098	16,227	139,621
Column Total	1,394,164	94,807	24,635	209,496	1,723,102*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Table 8-23 presents the number of households by the number of full-time workers per household and number of vehicles available per household in each urbanized area. The percentage of households without any worker was inversely related with the number of vehicles available within each urbanized area. Households without vehicles had the highest percentages of zero workers. In Ann Arbor, 60 percent of households without vehicles had no working member. This percentage went up to 72 percent in Detroit; 81 percent in Port Huron; and, 85 percent in "All Other Areas."

Table 8-23
Number of Households by Number of Workers
and Vehicles Available per Household by Urbanized Area

	Workers	Vehicles Available				Row Total
		Zero	One	Two	Three +	
Detroit	Zero	131,191	195,183	64,758	8,197	399,329
	One	40,272	220,906	177,497	56,804	495,479
	Two	8,547	41,239	244,519	88,431	382,736
	Three+	3,014	8,951	26,512	78,143	116,620
	Column Total	183,023	466,279	513,286	231,576	1,394,164
Ann Arbor	Zero	5,349	11,082	1,757	249	18,436
	One	3,425	20,130	10,253	3,679	37,487
	Two	210	4,228	22,840	5,930	33,208
	Three+	0	501	1,881	3,294	5,676
	Column Total	8,983	35,941	36,731	13,152	94,807
Port Huron	Zero	1,437	5,109	1,292	374	8,212
	One	341	4,083	3,308	199	7,931
	Two	0	1,197	4,336	1,861	7,394
	Three+	0	0	510	588	1,098
	Column Total	1,778	10,389	9,446	3,022	24,635
All Other Areas	Zero	5,478	22,846	13,782	1,849	43,954
	One	732	19,548	35,421	16,322	72,024
	Two	237	4,654	45,137	27,262	77,290
	Three+	0	236	2,217	13,774	16,227
	Column Total	6,447	47,285	96,556	59,208	209,496
Grand Total		200,231	559,894	656,019	306,958	1,723,102*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Tables 8-24 and 8-25 present the number of full-time and part-time workers based on home address in each study area and urbanized area. All counties had similar distributions of full-time employed persons (from 74 percent in Washtenaw County to 84 percent in St. Clair County). Of all persons employed, 80 percent worked full-time, and 20 percent worked part-time.

Table 8-24
Number of Workers by Full-Time and Part-Time Employment
by County Plus the City of Detroit

Employment Status	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total	Percent
Full-Time	248,818	418,686	459,993	286,199	47,509	51,583	45,168	109,719	1,667,674	80%
Part-Time	74,356	96,032	109,519	74,613	12,029	10,010	10,792	38,544	425,895	20%
Column Total	323,174	14,718	569,511	360,812	59,538	61,593	55,961	148,263	2,093,570	100%

Table 8-25
Number of Workers by Full-Time and Part-Time Employment
by Urbanized Area

Employment Status	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Full-Time	1,317,320	89,881	20,682	225,276	1,653,159
Part-Time	331,830	32,112	5,442	53,217	422,600
Column Total	1,649,150	121,992	26,124	278,493	2,075,759*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Tables 8-26 and 8-27 present the number of full-time and part-time workers by industry type in each study area and urbanized area. Forty-three percent of all workers were employed in services industry, while another 16 percent worked in manufacturing jobs. Manufacturing was the major employer of those living in the Other Wayne area.

Table 8-26
Number of Workers by Industry Type
by County Plus the City of Detroit

Industry	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Construction	7,456	18,962	27,183	19,082	2,433	2,246	4,308	5,902	87,573
Manufacturing	39,014	90,216	88,205	68,671	10,148	13,729	12,980	14,670	337,632
Transport/Utility	19,019	29,994	29,311	17,782	5,379	4,495	2,181	4,247	112,407
Wholesale Trade	4,855	10,865	8,972	9,446	1,172	1,629	901	2,472	40,311
Retail Trade	20,060	43,935	38,229	32,366	4,839	4,400	3,318	13,866	161,013
Finance/Insurance	10,708	24,411	29,949	15,195	3,219	1,390	3,586	6,528	94,986
Services	146,101	21,446	269,091	145,795	23,419	19,716	17,909	69,788	902,263
Government	19,220	14,554	16,540	11,480	2,841	3,754	2,516	4,121	75,025
Other	47,238	70,689	60,465	39,771	5,957	10,041	8,001	26,008	268,169
Don't Know	6,949	450	1,427	1,015	131	194	261	214	10,642
Refused	2,555	197	140	209	0	0	0	446	3,547
Column Total	323,174	514,718	569,511	360,812	59,538	61,593	55,961	148,263	2,093,570

Table 8-27
Number of Workers by Industry Type
by Urbanized Area

Industry	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Construction	65,735	3,839	1,637	15,117	86,330
Manufacturing	262,362	10,159	4,965	57,520	335,007
Transport/Utilities	87,833	3,499	1,893	18,209	111,434
Wholesale Trade	33,001	1,416	1,173	4,721	40,311
Retail Trade	126,670	12,003	1,953	19,543	160,169
Finance/Insurance	75,664	5,706	144	12,632	94,146
Services	719,663	60,202	7,584	105,692	893,141
Government	58,375	3,846	2,005	10,370	74,596
Other	207,162	20,691	4,770	33,813	266,436
Don't Know	9,723	214	0	705	10,642
Refused	2,961	417	0	170	3,547
Column Total	1,649,150	121,992	26,124	278,493	2,075,759*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

The number of workers by housing unit type are presented in **Tables 8-28 and 8-29**. Overall, more workers lived in single-unit dwellings (79 percent) than in multiple-unit dwellings. This pattern was observed in all counties and urbanized areas, except in Ann Arbor.

Table 8-28
Number of Workers by Housing Unit Type
by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Single	239,683	421,899	449,715	295,088	53,233	55,256	54,430	89,376	1,658,681
Multiple	83,491	92,919	119,796	65,724	6,305	6,337	1,530	58,887	434,889
Column Total	323,174	514,718	569,511	360,812	59,538	61,593	55,961	148,263	2,093,570

Table 8-29
Number of Workers by Housing Unit Type by Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Single	1,304,535	60,482	20,843	261,340	1,647,200
Multiple	344,615	61,511	5,281	17,153	428,559
Column Total	1,649,150	121,992	26,124	278,493	2,075,759*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

IX. TRAVEL BEHAVIOR

This section presents detailed analyses of weekday travel behavior by the following household characteristics: household size; vehicles available; and housing type. The analyses presented in this section are in terms of average trip rates; total trips include all trips by all travel modes. (Please refer to the Glossary in Chapter XV for a complete definition of terms.) A discussion of zero-trip households is included at the end of the section.

Tables 9-1 and 9-2 present the average total trips and vehicle driver trips per household as a function of vehicles available in each survey area and urbanized area. As expected, the average total trips per household increased as vehicles available increased. The City of Detroit had the lowest average total trips and vehicle driver trip rates. Consistent with findings of household surveys in other parts of the country, average trip rates were higher in nonurbanized areas.

In Tables 9-1 and 9-2 there are vehicle driver trips from zero-vehicle households. Examination of the data revealed that 41 percent of the households that reported having no vehicle available at recruitment, subsequently reported having at least one vehicle available on the diary day. The total number of households who made vehicle driver trips yet initially reported that they had no vehicle available to their household was 149 (unexpanded).

Table 9-1
Average Total Trips and Vehicle Driver Trips per Household by Vehicles Available
by County Plus the City of Detroit

	Vehicles Available	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw
Total Trips¹	Zero*	4.2	4.2	4.2	4.3	3.2	4.8	3.5	5.5
	One	5.8	6.7	6.6	6.5	6.7	7.0	6.7	6.9
	Two	7.2	10.4	11.3	11.2	10.5	11.3	10.3	10.2
	Three+	8.6	12.1	12.3	13.0	12.7	12.6	12.1	12.9
	Total	5.8	9.0	9.7	9.7	9.7	9.8	10.1	9.3
Vehicle Driver Trips²	Zero*	3.8	6.4	4.5	5.6	4.3	2.6	1.0	6.1
	One	4.7	5.3	5.3	5.2	5.0	5.2	5.0	5.0
	Two	5.4	7.8	8.2	8.1	8.0	7.1	7.2	7.4
	Three+	7.3	9.7	9.5	9.8	9.3	10.0	9.3	9.8
	Total	5.1	7.3	7.6	7.6	7.5	7.0	7.4	7.1

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

* There were 149 households (unexpanded) who initially reported no vehicles at recruitment but had reported having access to vehicles on diary day.

Table 9-2
Average Total Trips and Vehicle Driver Trips per Household by Vehicles Available
by Urbanized Area

	Vehicles Available	Detroit	Ann Arbor	Port Huron	All Other Areas
Total Trips¹	Zero*	4.3	4.5	6.7	3.1
	One	6.4	6.8	7.5	7.3
	Two	10.4	10.2	13.2	10.7
	Three +	12.1	13.6	10.9	12.1
	Total	8.6	8.8	10.0	10.1
Vehicle Driver Trips²	Zero*	4.6	5.3	2.3	4.3
	One	5.1	4.8	5.9	5.3
	Two	7.7	7.3	7.8	7.5
	Three +	9.5	10.7	9.1	9.1
	Total	7.1	6.9	6.9	7.5

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

* There were 149 households (unexpanded) who initially reported no vehicles at recruitment but had reported having access to vehicles on diary day.

Tables 9-3 and 9-4 present average total trips and vehicle driver trips per household as a function of household size. As expected, the average total trips per household increased as household size increased. Livingston County had the highest average trip rates, while the City of Detroit had the lowest. "All Other Areas" in the region had higher trip rates than the three urbanized areas.

Table 9-3
Average Total Trips and Vehicle Driver Trips per Household by Household Size
by County Plus the City of Detroit

	Household Size	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw
Total Trips¹	One	2.9	4.3	4.6	4.5	3.7	4.2	5.3	4.6
	Two	4.7	7.5	7.8	7.4	7.7	6.9	7.7	8.4
	Three	6.4	9.9	11.0	10.7	12.0	10.0	9.7	10.6
	Four +	9.5	14.4	15.8	15.8	13.8	16.6	14.3	14.6
	Total	5.8	9.0	9.7	9.7	9.7	9.8	10.1	9.3
Vehicle Driver Trips²	One	4.2	4.7	4.8	4.9	4.2	4.2	4.7	4.6
	Two	4.8	6.7	6.9	6.6	6.8	5.5	6.3	6.6
	Three	5.3	8.1	8.6	8.2	9.1	8.0	8.0	8.1
	Four +	6.1	9.4	9.8	9.9	8.5	9.3	9.1	9.0
	Total	5.1	7.3	7.6	7.6	7.5	7.0	7.4	7.1

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

IX. TRAVEL BEHAVIOR

This section presents detailed analyses of weekday travel behavior by the following household characteristics: household size; vehicles available; and housing type. The analyses presented in this section are in terms of average trip rates; total trips include all trips by all travel modes. (Please refer to the Glossary in Chapter XV for a complete definition of terms.) A discussion of zero-trip households is included at the end of the section.

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In Tables 9-1 and 9-2 there are vehicle driver trips from zero-vehicle households. Examination of the data revealed that 41 percent of the households that reported having no vehicle available at recruitment, subsequently reported having at least one vehicle available on the diary day. The total number of households who made vehicle driver trips yet initially reported that they had no vehicle available to their household was 149 (unexpanded).

Table 9-1
Average Total Trips and Vehicle Driver Trips per Household by Vehicles Available
by County Plus the City of Detroit

	Vehicles Available	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw
Total Trips¹	Zero*	4.2	4.2	4.2	4.3	3.2	4.8	3.5	5.5
	One	5.8	6.7	6.6	6.5	6.7	7.0	6.7	6.9
	Two	7.2	10.4	11.3	11.2	10.5	11.3	10.3	10.2
	Three+	8.6	12.1	12.3	13.0	12.7	12.6	12.1	12.9
	Total	5.8	9.0	9.7	9.7	9.7	9.8	10.1	9.3
Vehicle Driver Trips²	Zero*	3.8	6.4	4.5	5.6	4.3	2.6	1.0	6.1
	One	4.7	5.3	5.3	5.2	5.0	5.2	5.0	5.0
	Two	5.4	7.8	8.2	8.1	8.0	7.1	7.2	7.4
	Three+	7.3	9.7	9.5	9.8	9.3	10.0	9.3	9.8
	Total	5.1	7.3	7.6	7.6	7.5	7.0	7.4	7.1

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

* There were 149 households (unexpanded) who initially reported no vehicles at recruitment but had reported having access to vehicles on diary day.

Table 9-2
Average Total Trips and Vehicle Driver Trips per Household by Vehicles Available
by Urbanized Area

	Vehicles Available	Detroit	Ann Arbor	Port Huron	All Other Areas
Total Trips¹	Zero*	4.3	4.5	6.7	3.1
	One	6.4	6.8	7.5	7.3
	Two	10.4	10.2	13.2	10.7
	Three +	12.1	13.6	10.9	12.1
	Total	8.6	8.8	10.0	10.1
Vehicle Driver Trips²	Zero*	4.6	5.3	2.3	4.3
	One	5.1	4.8	5.9	5.3
	Two	7.7	7.3	7.8	7.5
	Three +	9.5	10.7	9.1	9.1
	Total	7.1	6.9	6.9	7.5

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

* There were 149 households (unexpanded) who initially reported no vehicles at recruitment but had reported having access to vehicles on diary day.

Tables 9-3 and 9-4 present average total trips and vehicle driver trips per household as a function of household size. As expected, the average total trips per household increased as household size increased. Livingston County had the highest average trip rates, while the City of Detroit had the lowest. "All Other Areas" in the region had higher trip rates than the three urbanized areas.

Table 9-3
Average Total Trips and Vehicle Driver Trips per Household by Household Size
by County Plus the City of Detroit

	Household Size	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw
Total Trips¹	One	2.9	4.3	4.6	4.5	3.7	4.2	5.3	4.6
	Two	4.7	7.5	7.8	7.4	7.7	6.9	7.7	8.4
	Three	6.4	9.9	11.0	10.7	12.0	10.0	9.7	10.6
	Four +	9.5	14.4	15.8	15.8	13.8	16.6	14.3	14.6
	Total	5.8	9.0	9.7	9.7	9.7	9.8	10.1	9.3
Vehicle Driver Trips²	One	4.2	4.7	4.8	4.9	4.2	4.2	4.7	4.6
	Two	4.8	6.7	6.9	6.6	6.8	5.5	6.3	6.6
	Three	5.3	8.1	8.6	8.2	9.1	8.0	8.0	8.1
	Four +	6.1	9.4	9.8	9.9	8.5	9.3	9.1	9.0
	Total	5.1	7.3	7.6	7.6	7.5	7.0	7.4	7.1

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Table 9-4
Average Total Trips and Vehicle Driver Trips per Household by Household Size
by Urbanized Area

	Household Size	Detroit	Ann Arbor	Port Huron	All Other Area
Total Trips¹	One	4.1	4.5	4.6	4.4
	Two	7.0	8.3	8.2	7.5
	Three	9.5	10.6	9.2	11.0
	Four +	13.9	14.5	19.3	14.6
	Total	8.6	8.8	10.0	10.1
Vehicle Driver Trips²	One	4.7	4.3	4.2	4.6
	Two	6.4	6.5	6.2	6.4
	Three	7.7	8.1	8.3	8.5
	Four +	9.0	9.1	9.5	8.9
	Total	7.1	6.9	6.9	7.5

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Tables 9-5 and 9-6 present the average total trips and vehicle driver trips per household as a function of household income. Analyses indicate that the average number of total trips peaked at \$50,000 to \$100,000 or more, while the average number of vehicle driver trips peaked at \$100,000 or more household income. The only exceptions were for vehicle driver trips in Macomb and Monroe counties.

Table 9-5
Average Total Trips and Vehicle Driver Trips per Household by Household Income by
County Plus the City of Detroit

	Income Range	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw
Total Trips¹	Less than \$10K	4.4	5.0	5.6	5.0	3.1	5.9	8.7	5.6
	\$10K to < \$15K	5.1	5.3	5.1	6.4	8.4	5.2	6.3	6.5
	\$15K to < \$25K	6.4	7.6	7.7	8.0	8.5	8.7	7.9	7.8
	\$25K to < \$35K	5.7	8.7	8.9	9.1	7.7	12.4	8.9	8.4
	\$35K to < \$50K	7.7	9.4	9.9	11.4	12.2	11.8	10.0	9.5
	\$50K to < \$75K	9.4	11.5	11.8	11.7	14.4	11.8	11.3	12.9
	\$75K to < \$100K	8.4	13.0	12.7	13.2	10.9	18.6	12.6	12.5
	\$100K or more	10.3	12.9	12.2	11.6	8.1	18.3	14.4	13.4
	Refused	4.1	9.6	10.5	8.8	6.5	5.2	7.3	8.5
	Don't Know	3.3	8.1	9.1	6.9	6.2	11.0	N/A	15.3
	Total	5.8	9.0	9.7	9.7	9.7	9.8	10.1	9.3
Vehicle Driver Trips²	Less than \$10K	3.7	5.4	5.0	4.8	3.9	5.1	3.2	4.8
	\$10K to < \$15K	4.5	5.1	4.7	5.5	6.3	4.4	4.7	5.1
	\$15K to < \$25K	5.3	6.4	6.6	6.4	6.8	5.8	5.3	5.1
	\$25K to < \$35K	4.6	6.4	6.5	6.9	5.9	7.9	6.9	6.2
	\$35K to < \$50K	5.9	7.2	7.2	7.9	8.5	7.1	6.7	7.5
	\$50K to < \$75K	6.4	8.8	8.7	8.8	11.0	7.8	8.6	8.9
	\$75K to < \$100K	6.5	9.8	9.3	10.1	8.3	14.3	10.0	9.3
	\$100K or more	10.0	10.0	9.6	10.0	6.3	16.1	10.8	10.5
	Refused	5.1	7.5	8.5	7.1	4.2	4.8	5.9	6.6
	Don't Know	3.4	6.8	8.8	6.4	5.3	5.0	N/A	7.6
	Total	5.1	7.3	7.6	7.6	7.5	7.0	7.4	7.1

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Table 9-6
Average Total Trips and Vehicle Driver Trips per Household by Household Income
by Urbanized Area

	Income Range	Detroit	Ann Arbor	Port Huron	All Other Areas
Total Trips¹	Less than \$10K	4.9	5.6	7.4	4.2
	\$10K to < \$15K	5.6	6.2	4.6	6.1
	\$15K to < \$25K	7.4	7.2	8.7	9.0
	\$25K to < \$35K	8.1	8.6	13.3	9.9
	\$35K to < \$50K	9.8	8.7	10.5	11.3
	\$50K to < \$75K	11.4	13.0	17.1	12.0
	\$75K to < \$100K	12.7	12.6	19.7	13.0
	\$100K or more	12.3	14.1	10.7	12.9
	Refused	8.6	9.0	4.6	8.2
	Don't Know	6.7	9.9	11.0	8.8
	Total	8.6	8.8	10.0	10.1
Vehicle Driver Trips²	Less than \$10K	4.5	4.8	5.8	3.9
	\$10K to < \$15K	4.9	5.0	4.6	4.8
	\$15K to < \$25K	6.2	4.7	5.5	6.7
	\$25K to < \$35K	6.1	6.1	8.4	6.8
	\$35K to < \$50K	7.2	7.1	6.2	7.7
	\$50K to < \$75K	8.5	9.2	10.2	8.8
	\$75K to < \$100K	9.4	9.3	13.7	9.6
	\$100K or more	9.9	11.3	8.2	10.0
	Refused	7.4	6.5	4.5	6.4
	Don't Know	6.6	5.5	5.0	5.7
	Total	7.1	6.9	6.9	7.5

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

The average total trips and vehicle driver trips per household by housing unit type in each survey area and urbanized area are presented in **Tables 9-7** and **9-8**. Households in single-unit dwellings had higher trip rates and vehicle driver trip rates than those in multiple-unit dwellings.

Table 9-7
Average Total Trips and Vehicle Driver Trips per Household by Housing Unit Type
by County Plus the City of Detroit

	Survey Area	Single	Multiple	All
Total Trips¹	Detroit	6.5	4.5	5.8
	Other Wayne	9.9	6.3	9.0
	Oakland	10.8	6.8	9.7
	Macomb	10.7	6.6	9.7
	Monroe	10.3	6.1	9.7
	St. Clair	10.0	8.9	9.8
	Livingston	10.2	8.0	10.1
	Washtenaw	10.8	7.3	9.3
	Total	9.7	6.1	8.7
Vehicle Driver Trips²	Detroit	5.4	4.4	5.1
	Other Wayne	7.7	5.9	7.3
	Oakland	8.1	6.1	7.6
	Macomb	8.1	5.8	7.6
	Monroe	7.8	5.4	7.5
	St. Clair	7.1	6.1	7.0
	Livingston	7.5	6.1	7.4
	Washtenaw	8.0	5.7	7.1
	Total	7.6	5.7	7.1

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Table 9-8
Average Total Trips and Vehicle Driver Trips by Housing Unit Type by Urbanized Area

	Urbanized Area	Single	Multiple	All
Total Trips¹	Detroit	9.6	6.0	8.6
	Ann Arbor	10.7	7.2	8.8
	Port Huron	10.6	8.5	10.0
	All Other Areas	10.4	7.2	10.1
	Total	9.7	6.1	8.7
Vehicle Driver Trips²	Detroit	7.5	5.7	7.1
	Ann Arbor	8.1	5.6	6.9
	Port Huron	7.2	6.2	6.9
	All Other Areas	7.7	5.6	7.5
	Total	7.6	5.7	7.1

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Tables 9-9 and 9-10 present the average total trips and vehicle driver trips per household by household size and housing unit type in each survey area and urbanized area. Multiple-unit dwellers with three household members in Livingston County had the highest averages.

Table 9-9
Average Total Trips and Vehicle Driver Trips per Household by Household Size
by Housing Unit Type by County Plus the City of Detroit

Survey Area	Housing Unit Type	Total Trips ¹				Vehicle Driver Trips ²			
		Household Size				Household Size			
		One	Two	Three	Four +	One	Two	Three	Four +
Detroit	Single	3.2	4.7	6.6	9.6	4.1	5.2	5.4	6.2
	Multiple	2.7	4.7	5.9	9.0	4.3	4.0	4.9	5.0
Other Wayne	Single	4.3	7.6	10.0	14.5	4.6	6.8	8.3	9.5
	Multiple	4.3	7.0	9.1	11.8	4.8	6.5	7.2	7.7
Oakland	Single	4.9	7.8	11.1	15.8	5.0	6.9	8.6	9.9
	Multiple	4.4	7.9	10.6	16.7	4.6	6.9	8.3	9.3
Macomb	Single	4.4	7.5	11.0	15.8	4.8	6.8	8.4	10.0
	Multiple	4.7	7.0	8.7	15.6	5.0	6.1	6.7	8.2
Monroe	Single	3.2	8.1	12.0	13.9	3.9	7.0	9.1	8.8
	Multiple	4.7	6.5	10.6	10.6	4.7	6.3	6.4	3.1
St. Clair	Single	4.2	6.4	9.9	16.6	4.2	5.5	7.8	9.6
	Multiple	4.0	9.0	10.5	16.1	4.4	5.8	9.3	6.6
Livingston	Single	5.0	7.7	9.4	14.3	4.2	6.5	7.9	9.2
	Multiple	6.5	5.4	23.0	11.3	6.5	3.2	16.0	4.0
Washtenaw	Single	4.8	8.6	11.3	14.9	5.0	7.1	8.8	9.4
	Multiple	4.5	8.2	9.8	12.2	4.3	6.0	7.0	6.7

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Table 9-10
Average Total Trips and Vehicle Driver Trips per Household by Household Size
by Housing Unit Type by Urbanized Area

Urbanized Area	Housing Unit Type	Total Trips ¹				Vehicle Driver Trips ²			
		Household Size				Household Size			
		One	Two	Three	Four +	One	Two	Three	Four +
Detroit	Single	4.3	7.2	9.8	14.1	6.6	7.9	9.2	7.5
	Multiple	4.0	6.7	8.4	11.9	6.1	7.0	7.1	5.7
Ann Arbor	Single	3.9	8.9	11.5	14.9	4.4	7.6	9.1	9.4
	Multiple	4.7	8.0	9.5	12.4	4.3	6.0	6.8	7.3
Port Huron	Single	4.7	7.4	9.0	21.0	4.1	6.3	8.1	10.0
	Multiple	4.2	9.5	9.9	12.4	4.5	6.1	8.9	7.2
All Other Areas	Single	4.3	7.4	11.0	14.7	4.5	6.5	8.5	9.0
	Multiple	4.5	7.9	11.6	12.2	4.8	6.3	8.3	4.3

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Tables 9-11 and 9-12 present the average total trips and vehicle driver trips per household by household size and vehicles available in the survey area and urbanized area. With few exceptions, average trips per household increased as household size and number of vehicles available increased.

Table 9-11
Average Total Trips and Vehicle Driver Trips per Household by Household Size
by Vehicles Available by County Plus the City of Detroit

Survey Area	Vehicles Available	Total Trips ¹				Vehicle Driver Trips ²			
		Household Size				Household Size			
		One	Two	Three	Four +	One	Two	Three	Four +
Detroit	Zero	1.9	3.2	5.4	8.3	3.6	4.7	3.8	3.4
	One	3.7	5.2	7.0	9.1	4.3	4.5	5.1	5.4
	Two	3.5	5.1	6.2	10.7	4.1	4.9	5.1	6.4
	Three +	2.7	5.5	7.6	10.4	2.6	5.9	7.0	8.2
Other Wayne	Zero	2.5	4.2	9.6	9.5	4.2	5.4	8.8	9.9
	One	4.8	6.6	6.9	15.6	4.7	5.4	5.4	7.9
	Two	4.0	8.0	11.1	14.1	4.4	7.3	8.3	8.4
	Three +	4.5	8.3	10.0	14.8	5.3	6.9	9.0	11.0
Oakland	Zero	2.4	5.2	6.0	14.7	3.3	4.7	2.9	11.0
	One	4.9	6.8	9.9	14.1	4.8	5.8	6.0	7.0
	Two	5.5	8.2	11.2	17.0	5.1	7.3	8.5	9.9
	Three +	5.0	8.3	11.5	14.8	4.8	7.2	9.9	10.4
Macomb	Zero	2.8	4.8	11.1	14.3	4.8	3.9	7.5	9.4
	One	4.7	6.0	10.4	14.9	4.7	4.9	6.9	7.1
	Two	6.6	8.2	10.9	15.9	6.4	7.5	7.9	9.4
	Three +	5.7	8.2	10.6	16.0	4.3	7.0	9.1	11.1
Monroe	Zero	2.6	5.6	NA	NA	NA	4.3	NA	NA
	One	4.0	6.1	13.7	10.8	4.4	4.3	9.5	3.6
	Two	3.6	8.5	12.9	12.7	3.3	7.9	9.5	7.9
	Three +	3.0	8.5	9.9	15.5	5.9	7.7	8.4	10.3
St. Clair	Zero	3.6	10.0	NA	10.1	2.5	2.0	NA	8.1
	One	4.3	7.2	9.4	14.6	4.3	5.7	6.1	6.5
	Two	4.7	6.7	10.0	17.2	4.9	5.6	8.3	8.1
	Three +	5.9	6.0	10.2	16.4	5.6	6.0	8.9	12.0
Livingston	Zero	3.5	NA	NA	NA	1.0	NA	NA	NA
	One	5.4	7.7	NA	10.2	4.7	4.7	NA	7.2
	Two	4.8	7.6	8.1	15.0	4.8	6.9	6.2	8.4
	Three +	NA	7.9	11.0	14.0	NA	6.5	9.5	10.0
Washtenaw	Zero	3.6	6.9	14.0	10.4	3.0	5.7	9.0	4.1
	One	4.9	8.0	9.9	13.1	4.5	5.3	5.6	6.5
	Two	3.0	8.5	10.3	14.3	5.3	6.8	7.8	8.5
	Three +	5.5	9.5	11.4	15.7	5.6	8.3	9.8	10.6

Note: NA in a cell indicates there were no households of that type in the survey.

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Table 9-12
Average Total Trips and Vehicle Driver Trips per Household
by Household Size by Vehicles available by Urbanized Area

Urbanized Area	Vehicles Available	Total Trips ¹				Vehicle Driver Trips ²			
		Household Size				Household Size			
		One	Two	Three	Four +	One	Two	Three	Four +
Detroit	Zero	2.3	3.7	6.5	9.2	3.7	4.7	4.9	5.2
	One	4.7	6.3	8.0	11.9	4.7	5.2	5.6	6.4
	Two	5.1	7.8	10.3	14.9	4.9	7.1	7.8	8.9
	Three +	4.6	7.9	10.4	14.9	4.3	6.9	9.1	10.7
Ann Arbor	Zero	3.1	5.6	14.0	10.0	3.0	5.2	9.0	3.0
	One	5.0	7.8	9.9	11.7	4.3	5.2	5.6	5.8
	Two	2.7	8.7	10.0	14.3	3.9	7.0	8.0	7.9
	Three +	5.1	10.1	11.8	16.4	5.4	9.0	9.9	12.0
Port Huron	Zero	5.2	10.0	NA	NA	2.5	2.0	NA	NA
	One	4.3	8.6	8.9	15.6	4.4	7.1	8.3	7.3
	Two	5.4	7.8	8.6	22.4	5.1	6.2	7.5	10.0
	Three +	9.0	6.4	10.4	13.9	9.0	6.1	9.3	10.3
All Other Areas	Zero	2.4	6.1	4.0	11.6	3.0	5.5	4.0	7.7
	One	4.8	6.4	12.9	14.4	4.6	4.7	7.6	7.0
	Two	5.1	7.7	10.6	14.9	5.1	6.7	8.0	8.5
	Three +	3.6	8.3	11.0	14.3	4.5	7.3	9.3	9.7

Note: NA in a cell indicates there were no households of that type in the survey.

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Tables 9-13 and 9-14 present the average total trips and vehicle driver trips per household by household size and household income in the survey area and the urbanized area. Middle income groups (those with annual income from \$25,000 to \$50,000) had higher trip rates than low and high income groups.

Table 9-13
Average Total Trips and Vehicle Driver Trips per Household by Household Size
by Household Income by County Plus the City of Detroit (Part 1)

Survey Area	Household Income	Total Trips ¹				Vehicle Driver Trips ²			
		Household Size				Household Size			
		One	Two	Three	Four +	One	Two	Three	Four +
Detroit	Less than \$10K	2.4	3.4	5.8	8.3	3.5	3.3	4.1	4.1
	\$10K to <\$15K	3.9	4.1	5.6	8.0	6.0	3.4	4.5	4.3
	\$15K to <\$25K	2.3	5.5	7.2	9.7	3.3	5.4	5.5	6.0
	\$25K to <\$35K	3.2	3.9	6.8	11.3	4.1	4.0	6.3	4.7
	\$35K to <\$50K	4.5	7.4	7.2	9.3	4.0	6.5	5.3	6.6
	\$50K to <\$75K	5.1	5.5	5.9	15.2	5.7	5.2	5.2	8.1
	\$75K to <\$100K	NA	7.2	6.2	10.2	NA	5.4	4.8	7.8
	\$100K or more	5.0	12.0	10.8	10.8	5.0	10.0	8.9	11.2
	Refused	2.7	4.3	8.4	5.6	4.0	5.5	6.9	5.7
	Don't Know	0.8	3.0	5.2	5.2	2.0	4.1	5.0	2.8
Wayne	Less than \$10K	2.8	5.1	6.7	15.6	4.4	5.5	4.5	9.5
	\$10K to <\$15K	4.1	4.9	7.5	11.4	4.3	4.8	6.0	8.5
	\$15K to <\$25K	4.4	8.2	10.8	10.9	4.7	6.7	8.2	7.9
	\$25K to <\$35K	5.0	7.7	8.7	13.0	4.8	6.6	7.9	6.7
	\$35K to <\$50K	5.1	7.1	10.6	13.4	4.8	6.5	8.3	8.3
	\$50K to <\$75K	5.2	8.5	11.0	15.2	4.8	7.2	8.9	10.7
	\$75K to <\$100K	2.8	9.5	12.0	15.6	1.6	7.9	9.6	11.0
	\$100K or more	9.0	10.0	8.1	16.5	9.0	8.8	6.8	11.9
	Refused	4.9	7.0	9.5	20.0	5.1	6.2	7.5	12.2
	Don't Know	6.4	8.1	7.6	10.1	2.9	6.8	8.2	8.0
Oakland	Less than \$10K	3.8	11.6	8.0	10.6	4.1	8.8	6.4	4.7
	\$10K to <\$15K	3.5	5.7	7.8	9.1	3.8	6.2	3.7	5.7
	\$15K to <\$25K	4.9	7.6	11.8	12.2	5.0	7.2	8.1	7.6
	\$25K to <\$35K	5.1	7.2	10.0	14.7	5.0	5.6	7.4	8.6
	\$35K to <\$50K	5.6	8.1	10.0	15.6	5.3	6.9	7.4	8.9
	\$50K to <\$75K	5.6	7.4	11.3	17.2	5.4	6.4	9.2	11.2
	\$75K to <\$100K	3.5	8.3	13.2	16.0	5.9	7.2	10.7	9.7
	\$100K or more	6.4	9.6	12.3	15.9	6.4	8.8	10.1	10.5
	Refused	3.4	7.9	11.1	18.1	3.8	6.9	9.4	12.2
	Don't Know	0.6	3.9	8.0	15.8	1.0	5.3	8.0	10.9
Macomb	Less than \$10K	4.4	4.1	9.2	9.3	4.6	4.8	6.3	3.1
	\$10K to <\$15K	2.8	5.4	11.0	20.2	3.8	4.6	8.7	8.4
	\$15K to <\$25K	5.9	8.0	8.1	13.6	6.4	6.4	5.3	7.1
	\$25K to <\$35K	4.9	7.9	10.3	15.2	4.6	6.8	7.8	8.4
	\$35K to <\$50K	5.3	7.7	11.1	17.4	4.8	6.8	8.1	10.1
	\$50K to <\$75K	4.8	8.1	11.0	14.6	4.6	7.7	8.6	9.9
	\$75K to <\$100K	8.0	8.2	11.7	17.3	8.0	7.1	9.5	12.5
	\$100K or more	NA	7.7	11.4	15.5	NA	6.9	10.1	13.0
	Refused	3.6	6.9	10.9	14.1	4.4	6.0	9.0	9.1
	Don't Know	NA	7.4	9.2	3.0	NA	7.4	7.0	3.0

Note: NA in a cell indicates there were no households of that type in the survey.

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Table 9-13
Average Total Trips and Vehicle Driver Trips per Household by Household Size
by Household Income by County Plus the City of Detroit (Part 2)

Survey Area	Household Income	Total Trips ¹				Vehicle Driver Trips ²			
		Household Size				Household Size			
		One	Two	Three	Four +	One	Two	Three	Four +
Monroe	Less than \$10K	2.4	5.5	NA	NA	3.5	4.8	NA	NA
	\$10K to <\$15K	2.3	8.3	14.1	10.0	3.5	5.2	11.9	2.0
	\$15K to <\$25K	6.0	8.4	11.2	10.0	5.4	7.8	6.7	7.0
	\$25K to <\$35K	4.7	7.3	9.3	8.8	4.7	6.6	6.8	5.3
	\$35K to <\$50K	5.5	6.7	15.0	17.0	5.5	7.0	10.7	8.8
	\$50K to <\$75K	2.6	9.2	12.1	19.6	2.6	8.1	10.4	13.9
	\$75K to <\$100K	2.0	14.2	7.6	11.4	2.0	10.8	6.5	8.5
	\$100K or more	NA	11.0	9.1	6.5	NA	9.0	9.1	3.7
	Refused	3.5	5.1	8.6	10.6	2.3	3.7	7.7	5.2
	Don't Know	NA	8.5	4.0	NA	NA	6.6	4.0	NA
St. Clair	Less than \$10K	3.7	6.4	12.7	12.4	4.4	3.8	10.3	8.9
	\$10K to <\$15K	5.1	4.4	5.7	8.7	4.7	3.4	4.9	6.7
	\$15K to <\$25K	4.3	7.6	8.2	13.4	4.0	6.1	3.9	7.2
	\$25K to <\$35K	5.2	8.4	11.6	19.8	4.9	6.9	8.8	9.3
	\$35K to <\$50K	4.4	6.9	9.9	16.3	4.4	6.1	8.0	7.5
	\$50K to <\$75K	5.9	7.2	11.2	14.6	5.8	5.1	8.8	8.8
	\$75K to <\$100K	4.0	NA	11.5	20.7	4.0	NA	11.0	15.4
	\$100K or more	NA	9.5	11.7	30.2	NA	7.7	11.2	26.8
	Refused	2.7	5.2	8.7	26.0	2.7	4.9	8.3	16.0
	Don't Know	NA	NA	11.0	NA	NA	NA	5.0	NA
Livingston	Less than \$10K	7.6	NA	NA	14.0	3.0	NA	NA	4.0
	\$10K to <\$15K	4.4	9.2	NA	NA	4.4	5.1	NA	NA
	\$15K to <\$25K	3.0	8.3	6.0	15.2	3.0	3.9	6.0	9.7
	\$25K to <\$35K	5.4	7.9	4.5	16.6	5.9	6.6	2.8	10.0
	\$35K to <\$50K	7.0	7.1	11.2	12.2	6.3	5.7	8.4	6.3
	\$50K to <\$75K	9.0	7.4	9.1	13.3	9.0	7.5	7.6	9.3
	\$75K to <\$100K	NA	9.7	13.5	17.3	NA	9.1	10.5	11.2
	\$100K or more	1.0	12.0	8.7	23.2	1.0	12.0	8.9	13.6
	Refused	6.0	4.9	14.0	10.7	6.0	3.8	14.0	7.8
	Don't Know	NA	NA	NA	NA	NA	NA	NA	NA
Wash-tenaw	Less than \$10K	4.4	6.3	7.5	32.0	5.5	3.8	3.4	6.0
	\$10K to <\$15K	4.5	7.2	8.1	8.6	3.4	6.0	6.1	3.5
	\$15K to <\$25K	4.8	7.3	10.8	12.1	4.4	5.2	6.2	5.9
	\$25K to <\$35K	4.8	8.9	10.0	12.1	5.0	5.6	7.2	8.3
	\$35K to <\$50K	4.6	9.0	9.7	13.7	4.7	7.5	8.2	8.5
	\$50K to <\$75K	4.9	9.7	11.4	16.8	4.6	7.3	8.9	10.5
	\$75K to <\$100K	4.8	8.6	14.4	15.5	4.8	7.2	10.7	10.9
	\$100K or more	3.6	11.0	15.2	15.1	3.3	9.1	11.6	11.5
	Refused	4.6	7.1	11.7	16.8	4.1	6.5	6.3	10.7
	Don't Know	NA	4.0	5.4	22.2	NA	4.0	6.6	8.7

Note: NA in a cell indicates there were no households of that type in the survey.

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Table 9-14
Average Total Trips and Vehicle Driver Trips per Household by Household Size
and Household Income by Urbanized Area

Urbanized Area	Income	Total Trips ¹				Vehicle Driver Trips ²			
		Household Size				Household Size			
		One	Two	Three	Four +	One	Two	Three	Four +
Detroit	Less than \$10K	3.1	4.7	6.6	9.4	4.2	5.0	4.7	4.9
	\$10K to <\$15K	3.8	5.0	7.3	10.9	4.5	4.6	5.7	6.4
	\$15K to <\$25K	4.7	7.3	8.9	11.3	5.1	6.4	6.5	7.1
	\$25K to <\$35K	4.6	6.7	9.1	13.1	4.7	5.9	7.5	7.0
	\$35K to <\$50K	5.3	7.8	10.1	13.8	4.8	6.9	7.6	8.5
	\$50K to <\$75K	5.4	7.7	10.2	16.1	5.2	6.7	8.3	10.5
	\$75K to <\$100K	4.4	8.6	12.1	15.8	4.8	7.3	9.7	10.6
	\$100K or more	6.2	9.5	10.9	15.9	6.2	8.6	9.1	11.8
	Refused	3.6	6.8	10.1	16.2	4.4	6.2	8.1	10.8
	Don't Know	1.7	6.1	6.2	11.3	2.0	6.7	6.8	8.1
Ann Arbor	Less than \$10K	4.4	6.3	7.8	32.0	5.4	3.8	3.7	6.0
	\$10K to <\$15K	4.0	7.3	8.4	8.2	3.4	5.9	6.4	2.6
	\$15K to <\$25K	4.2	7.3	10.6	10.4	3.6	5.0	7.7	4.8
	\$25K to <\$35K	5.4	9.0	10.8	13.2	5.0	5.6	7.2	8.9
	\$35K to <\$50K	4.2	8.4	9.6	12.2	4.2	7.3	8.1	7.6
	\$50K to <\$75K	4.6	9.5	9.8	19.6	4.2	7.6	8.1	12.2
	\$75K to <\$100K	2.0	7.9	14.8	16.3	2.0	6.8	10.9	11.0
	\$100K or more	4.0	12.6	15.4	14.7	4.0	10.4	11.8	12.1
	Refused	5.3	9.2	13.3	13.2	4.1	7.7	6.1	8.8
	Don't Know	NA	4.0	4.0	32.0	NA	2.6	NA	14.0
Port Huron	Less than \$10K	4.6	8.3	11.0	13.0	4.6	4.4	11.0	10.3
	\$10K to <\$15K	4.8	6.5	0.0	9.0	4.1	5.2	NA	7.0
	\$15K to <\$25K	4.2	9.2	8.9	18.2	3.2	7.4	4.2	7.0
	\$25K to <\$35K	6.5	9.9	13.0	21.3	6.1	7.6	10.3	8.6
	\$35K to <\$50K	4.2	5.9	7.9	15.3	4.2	5.5	6.8	6.8
	\$50K to <\$75K	7.0	9.2	11.2	27.5	7.0	6.1	8.5	14.7
	\$75K to <\$100K	4.0	NA	NA	25.0	4.0	NA	NA	17.0
	\$100K or more	NA	8.9	8.0	21.0	NA	6.8	8.0	15.0
	Refused	3.0	5.5	1.3	NA	3.0	5.2	4.0	NA
	Don't Know	NA	NA	11.0	NA	NA	NA	5.0	NA
All Other Areas	Less than \$10K	3.3	4.5	13.8	9.9	3.2	4.2	7.4	5.2
	\$10K to <\$15K	3.5	6.2	11.7	8.3	4.1	4.6	7.8	3.4
	\$15K to <\$25K	5.1	8.8	11.1	11.6	4.8	7.0	7.6	7.2
	\$25K to <\$35K	5.3	7.7	8.7	14.5	5.5	6.5	6.3	7.9
	\$35K to <\$50K	6.9	6.6	11.7	16.5	6.3	5.9	8.7	8.9
	\$50K to <\$75K	4.3	8.7	11.2	13.7	4.4	7.6	8.9	9.4
	\$75K to <\$100K	4.2	10.2	11.6	15.1	4.2	8.9	9.5	10.1
	\$100K or more	3.0	8.7	11.1	18.3	2.0	7.9	10.2	11.4
	Refused	3.5	6.1	11.5	14.4	3.4	5.3	10.4	8.5
	Don't Know	NA	6.4	5.0	19.0	NA	5.7	4.6	7.0

Note: NA in a cell indicates there were no households of that type in the survey.

¹ Average was based on all households.

² Average was based on all households with vehicle driver trips.

Zero-Trip Households

There were 404 households (5 percent) that did not report any trips on their diary day. Of these 404 zero-trip households, all members of 47 households (12 percent) were outside of the survey area. **Table 9-15** shows the percentage of the remaining 357 zero-trip households by county and urbanized area categories. The City of Detroit and Livingston County had the highest and lowest percentages, respectively, of households without any trips.

Table 9-15
Percentage of Zero-Trip Households by County Plus
the City of Detroit and Urbanized Area

County Plus the City of Detroit	Detroit	15.4%
	Other Wayne	5.4%
	Oakland	3.0%
	Macomb	4.8%
	Monroe	5.1%
	St. Clair	4.7%
	Livingston	2.1%
	Washtenaw	3.6%
Urbanized Area	Detroit	6.6%
	Ann Arbor	5.0%
	Port Huron	4.2%
	All Other Areas	3.4%

Table 9-16 lists the reasons provided by the members of the 357 households for not having any trips and their expanded relative frequencies. The most common reason was homebound.

Table 9-16
Relative Frequency of Reasons Given for No Trips

Reasons	Relative Frequency (in Percent)
Homebound	24.2%
Temporary illness	15.9%
Full-time homemaker	12.7%
Vacation Day	8.8%
Day off	4.7%
Work at home	2.8%
Out of town all day	1.9%
Other	22.6%
Refused	6.4%

The second most reported reason was the "Other" category. Individuals participating in the survey identified reasons outside those listed in Table 13 for remaining at home during the day. This Other category included the following *respondent-reported* reasons for staying at home:

- Childcare-related or on maternity leave;
- Retired;
- Disabled;
- Poor weather;
- No available vehicle;
- Housekeeping and maintenance; and,
- Unemployed.

Households with three or more members who stayed at home were examined for respondents' under-reporting of activities. Only eight households had insufficient reasons for staying at home. Effects of these eight households with no trips on the average total trips per household were assessed by a sensitivity analysis comparing data with all households and data without the questionable households. **Table 9-17** presents the average total trips per household with the eight questionable households removed from the data. Values in the table can be compared with total trip values in Tables 9-1 and 9-3. Only two cell averages (see shaded cells) were higher than those in Tables 9-1 and 9-3. The magnitude of the difference was small (9.7 from 9.5 and 13.1 from 13.0) suggesting that the bias was negligible. The county and region averages did not change.

Table 9-17
Average Total Trips per Household by Vehicles Available and
Household Size by County Plus the City of Detroit
(Without Invalid Zero-Trip Households)

		Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Living- ston	Wash- tenaw
Vehicles Available	Zero	4.2	4.2	4.2	4.3	3.2	4.8	3.5	5.5
	One	5.8	6.7	6.6	6.5	6.7	7.0	6.7	6.9
	Two	7.2	10.4	11.3	11.2	10.5	11.3	10.3	10.2
	Three+	8.6	12.1	12.3	13.1	12.7	12.6	12.1	12.9
Household Size	One	2.9	4.3	4.6	4.5	3.7	4.2	5.3	4.6
	Two	4.7	7.5	7.8	7.4	7.7	6.9	7.7	8.4
	Three	6.5	9.9	11.0	10.7	12.0	10.0	9.7	10.6
	Four +	9.7	14.4	15.8	15.8	13.8	16.6	14.3	14.6
Area Total		5.8	9.0	9.7	9.7	9.7	9.8	10.1	9.3

* The eight zero-trip households which provided insufficient reasons for no travel have been removed from this analysis.

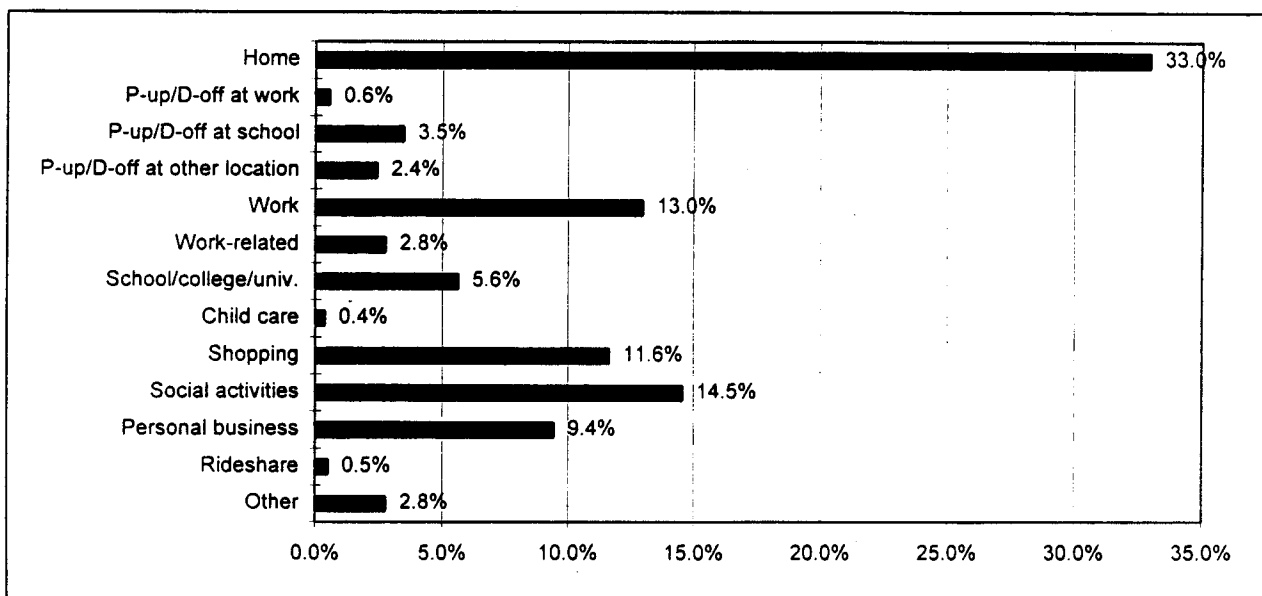
X. TRIP PURPOSE

This chapter includes analyses of trips by the following trip destination purposes:

- Home (including sleeping, working at home);
- Pick up or drop off a person(s) at work;
- Pick up or drop off a person(s) at school;
- Pick up or drop off a person(s) at other location;
- Work;
- Work-related;
- School/college/university;
- Child care (day care/after-school care);
- Shopping;
- Social activity (social activity/recreation/church/eating out);
- Personal business (banking/personal business);
- Rideshare (bus stop/carpool/vanpool/park n ride activities); and,
- Other.

The distribution of trip purposes for total trips is reported in **Figure 10-1**. Home accounted for one-third of all trip purposes. Other primary trip purposes included social activity (15 percent), work (13 percent), and shopping (12 percent).

Figure 10-1
Distribution of Trips by Destination Trip Purpose



Tables 10-1 and 10-2 present the number of trips by destination trip purpose in each survey area and urbanized area. These trip purposes were based on respondents' answer to the first question in the activity section of the travel diary. Rideshare figures did not match bus totals in **Table 11-1** since travel modes were obtained from the fourth question in the activity

section of the travel diary. While home was the top destination for every county, differences were observed in the number of work vs. social activity trips. Social activities were the second leading trip purpose for all areas except Livingston and Washtenaw counties.

Table 10-1
Number of Trips by Destination Trip Purpose by County Plus the City of Detroit

	Detroit	Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Washtenaw	Row Total
Home	722,459	1,226,880	1,370,128	898,517	158,213	163,122	134,421	334,355	5,008,094
P-up/d-off at work	20,648	19,220	17,226	9,556	3,449	3,723	360	9,614	83,796
P-up/d-off at school	83,864	133,172	130,710	92,190	15,586	20,496	19,547	29,665	525,230
P-up/d-off at other location	55,194	87,034	104,044	57,827	9,983	15,929	12,240	24,757	367,009
Work	244,725	496,556	577,367	339,756	58,815	59,706	54,974	139,079	1,970,981
Work-related	38,657	113,303	129,737	74,598	7,981	12,930	10,409	30,801	418,415
School/college/univ.	158,935	179,769	224,006	142,177	31,132	27,583	22,496	69,265	855,364
Child care	9,446	16,301	12,633	6,170	1,253	5,615	1,325	5,152	57,895
Shopping	205,016	429,352	512,647	335,255	46,506	61,795	61,268	114,934	1,766,774
Social activity	304,277	570,063	591,565	408,700	73,315	78,345	51,218	132,684	2,210,167
Personal business	182,061	341,867	382,251	257,408	51,965	58,571	37,170	121,725	1,433,020
Rideshare	18,503	11,921	21,008	11,752	1,453	2,879	2,648	5,912	76,076
Other	80,889	97,770	110,973	80,863	10,273	23,284	12,408	4,493	420,954
Column Total	2,124,673	3,724,208	4,184,295	2,714,771	469,924	533,978	420,487	1,022,437	15,193,773

Table 10-2
Number of Trips by Destination Trip Purpose by Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Home	3,772,304	266,218	81,549	744,031	4,864,102
P-up/D-off at work	60,642	9,082	2,748	8,997	81,469
P-up/D-off at school	395,892	30,327	10,045	74,798	511,063
P-up/D-off at other location	279,122	15,668	6,974	53,132	354,896
Work	1,468,347	110,222	32,020	295,203	1,905,792
Work-related	325,259	20,134	5,194	56,696	407,283
School/college/univ.	636,592	55,560	12,615	123,682	828,449
Child care	42,933	5,178	244	7,799	56,154
Shopping	1,344,992	81,352	27,421	258,677	1,712,442
Social activity	1,680,376	94,229	32,104	334,871	2,141,580
Personal business	1,051,414	87,510	24,907	228,613	1,392,444
Rideshare	59,137	4,109	2,022	7,862	73,132
Other	338,681	7,585	8,446	53,310	408,022
Column Total	11,455,693	787,175	246,288	2,247,672	14,736,829*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

The distribution of vehicle driver trips by destination purpose is presented in **Tables 10-3** and **10-4**. Of particular interest is the greater number of work trips compared to social activity trips, in contrast to Tables 10-1 and 10-2.

Table 10-3
Number of Vehicle Driver Trips by Destination Trip Purpose
by County Plus the City of Detroit

	Detroit	Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Home	351,026	841,700	953,058	613,266	107,857	102,989	93,820	213,162	3,276,876
P-up/D-off at work	17,652	16,877	16,475	7,554	3,242	2,307	360	7,451	71,918
P-up/D-off at school	59,509	109,500	111,050	75,374	13,763	16,250	16,221	23,813	425,480
P-up/D-off at other location	41,706	75,050	81,356	44,573	9,051	11,659	10,251	18,254	291,900
Work	176,194	447,861	526,165	311,220	52,637	51,453	48,670	113,594	1,727,794
Work-related	30,216	98,154	112,992	65,781	7,131	9,895	9,537	23,637	357,343
School/college/univ.	18,385	33,729	58,025	30,977	6,765	4,129	3,285	19,719	175,013
Child care	742	5,372	5,445	1,226	313	2,396	560	2,640	18,693
Shopping	114,490	321,144	411,537	251,027	37,389	43,640	41,213	82,838	1,303,277
Social activity	153,223	344,796	375,804	259,074	45,553	43,958	36,002	71,792	1,330,202
Personal business	111,970	267,823	305,937	202,717	44,287	42,360	28,018	88,777	1,091,889
Rideshare	782	1,337	4,718	1,179	0	110	1,146	1,235	10,507
Other	40,149	71,804	79,525	53,700	6,984	16,237	8,106	1,556	278,061
Column Total	1,116,044	2,635,146	3,042,086	1,917,668	334,971	347,384	297,187	668,467	10,358,954

Table 10-4
Number of Vehicle Driver Trips by Destination Trip Purpose
by Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Home	2,457,684	170,799	55,265	502,727	3,186,474
P-up/D-off at work	52,930	7,123	1,887	8,225	70,164
P-up/D-off at school	322,355	21,648	8,633	59,962	412,598
P-up/D-off at other location	219,920	12,679	5,223	43,367	281,188
Work	1,294,190	90,763	29,367	255,834	1,670,154
Work-related	280,224	14,943	4,071	48,808	348,046
School/college/univ.	131,641	14,961	3,670	19,462	169,734
Child care	13,556	2,277	244	2,048	18,124
Shopping	992,031	58,903	21,509	191,061	1,263,505
Social activity	1,010,771	51,747	19,720	211,050	1,298,289
Personal business	805,989	63,250	16,680	176,272	1,062,191
Rideshare	9,102	916	0	489	10,507
Other	221,401	5,135	5,698	37,220	269,454
Column Total	7,811,793	515,145	171,967	1,556,524	10,055,429*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Table 10-5 presents the number of trips by trip origin and destination in the region. More than 2.3 million trips were home-to-work and home-to-social trips. Average trips per household by destination trip purpose by household size by vehicles available in each survey area is presented in **Table 10-6**. Overall, the average number of trips increased as household size increased.

Table 10-5
Number of Trip by Trip Origin and Destination Purpose

Trip Origin	Trip Destination													
	Home	P-up/d-off at work	P-up/d-off at school	P-up/d-off at other location	Work	Work-related	School/college/univ.	Child-care	Shopping	Social	Personal	Ride-share	Other	Row Total
Home	230*	52,672	337,826	173,130	1,320,007	124,155	713,633	29,530	649,767	1,000,846	606,897	40,695	205,178	5,254,566
P-up/d-off at work	42,807	1,513	2,229	2,034	7,794	1,637	521	74	4,433	7,274	7,479	55	2,183	80,034
P-up/d-off at school	234,386	1,628	30,198	12,916	81,467	7,157	11,454	509	36,648	40,342	34,714	2,999	13,360	507,779
P-up/d-off at other location	169,462	1,779	5,166	22,519	22,142	4,578	9,003	299	35,723	51,812	28,750	580	8,636	360,451
Work	987,564	9,815	62,409	28,035	45,570	112,835	16,383	4,015	163,678	271,613	190,007	5,026	30,075	1,927,025
Work- related	112,522	1,398	4,991	3,235	82,264	94,922	3,597	997	31,281	39,712	24,887	1,194	4,568	405,567
School/college /university	591,179	325	11,041	7,944	17,403	3,908	23,124	13,605	26,595	89,615	22,792	10,000	17,525	835,055
Child care	25,860	74	1,070	1,096	3,287	540	5,948	1,609	4,361	8,346	916	1,764	1,435	56,307
Shopping	971,246	3,432	25,981	32,505	55,770	14,918	5,451	664	305,377	161,032	120,995	2,237	39,507	1,739,116
Social activity	1,130,562	6,264	22,329	46,844	201,473	30,098	29,107	3,491	189,967	310,532	120,296	2,522	33,363	2,126,848
Personal business	528,190	4,294	13,616	25,693	101,324	19,397	10,188	1,860	253,294	181,413	247,119	2,532	25,604	1,414,525
Rideshare	22,870	110	1,082	686	6,654	652	21,826	804	7,784	3,757	2,495	5,377	386	74,483
Other	191,216	89	7,292	10,371	5,825	3,620	5,130	437	57,865	43,872	25,672	1,095	39,133	412,017
Column Total	5,008,094	83,796	525,230	367,009	1,970,981	418,415	855,364	57,895	1,766,774	2,210,167	1,433,020	76,076	420,954	15,193,774

* Home-to-home trips in this table represent trips from home to second home.

Table 10-6
Average Trips* per Household by Destination Trip Purpose by Household Size
by Vehicles Available by County Plus the City of Detroit (Detroit)

	Destination Trip Purpose	Vehicles Available	Household Size			
			One	Two	Three	Four +
Detroit	Home	Zero	1.2	1.8	2.7	3.9
		One	1.4	2.0	2.7	4.0
		Two	1.5	1.8	2.5	4.8
		Three +	1.1	2.3	3.3	3.8
	P-up/D-off at work	Zero	NA	2.0	2.0	1.0
		One	1.3	1.6	1.6	2.3
		Two	1.0	1.0	1.9	1.0
		Three +	NA	NA	2.3	NA
	P-up/D-off at school	Zero	1.5	1.5	1.3	1.7
		One	1.9	1.8	1.7	1.9
		Two	1.5	1.0	1.6	2.4
		Three +	NA	1.0	1.4	2.0
	P-up/D-off at other location	Zero	1.8	1.5	1.9	1.2
		One	1.6	1.6	1.7	2.1
		Two	1.0	1.5	2.5	3.6
		Three +	NA	1.0	1.3	2.4
	Work	Zero	1.0	1.3	1.2	1.3
		One	1.4	1.2	1.6	1.6
		Two	1.3	1.8	1.3	1.5
		Three +	1.0	1.6	1.7	2.6
	Work-related	Zero	1.0	1.3	1.5	1.1
		One	1.5	1.3	1.3	1.2
		Two	1.0	6.1	1.8	2.2
		Three +	1.0	NA	3.3	2.2
	School/college/univ.	Zero	1.0	1.6	1.9	2.2
		One	1.0	1.2	1.4	2.1
		Two	1.0	1.0	1.2	2.5
		Three +	NA	1.0	1.2	2.1
	Child care	Zero	NA	1.0	1.0	1.0
		One	NA	1.0	1.9	1.0
		Two	NA	NA	1.0	1.3
		Three +	NA	NA	NA	1.2
	Shopping	Zero	1.2	1.6	1.5	1.7
		One	1.4	1.8	1.9	2.1
		Two	1.2	1.4	2.2	1.5
		Three +	2.9	1.2	1.8	1.8
	Social activity	Zero	1.5	2.0	1.6	2.4
		One	1.7	2.0	2.3	2.6
		Two	1.3	2.2	1.9	2.6
		Three +	1.0	2.1	2.2	2.6
	Personal business	Zero	1.3	1.6	1.3	1.3
		One	1.7	2.1	1.7	2.1
		Two	1.2	1.8	2.3	2.3
		Three +	2.0	1.6	2.2	2.4
	Rideshare	Zero	1.5	1.8	3.0	1.9
		One	NA	6.6	2.8	1.1
		Two	NA	NA	NA	3.0
		Three +	NA	1.0	NA	1.0
	Other	Zero	1.4	2.2	2.7	1.8
		One	1.4	1.5	1.5	2.3
		Two	3.0	1.0	1.4	1.9
		Three +	NA	NA	1.2	1.3

Note: NA in a cell indicates there were no households of that type in the survey.

*Average was based on all households with at least one trip.

Table 10-6
Average Trips* per Household by Destination Trip Purpose by Household Size
by Vehicles Available by County Plus the City of Detroit (Wayne County)

	Destination Trip Purpose	Vehicles Available	Household Size			
			One	Two	Three	Four +
Other Wayne	Home	Zero	1.6	1.8	3.4	4.4
		One	1.6	2.5	3.0	5.8
		Two	1.4	2.7	3.6	5.5
		Three +	1.4	2.7	3.6	5.2
	P-up/D-off at work	Zero	NA	NA	2.0	NA
		One	1.3	1.7	2.0	1.8
		Two	NA	1.1	2.0	1.6
		Three +	NA	2.0	1.0	1.1
	P-up/D-off at school	Zero	NA	NA	1.4	1.4
		One	1.2	1.7	2.1	1.9
		Two	NA	1.8	1.8	2.1
		Three +	NA	1.0	1.7	1.9
	P-up/D-off at other location	Zero	NA	NA	NA	1.0
		One	1.6	2.0	1.9	1.9
		Two	1.1	1.9	1.5	2.1
		Three +	1.0	2.0	1.4	1.7
	Work	Zero	1.7	1.0	2.0	1.3
		One	1.4	1.4	1.3	1.7
		Two	1.3	1.9	1.9	1.9
		Three +	1.0	2.0	2.1	2.6
	Work-related	Zero	3.3	1.4	NA	NA
		One	1.3	1.3	1.2	1.0
		Two	1.9	2.1	1.8	1.8
		Three +	6.3	1.3	2.1	1.8
	School/college/univ.	Zero	NA	NA	1.2	2.0
		One	1.0	1.1	1.4	2.5
		Two	NA	1.0	1.2	2.1
		Three +	NA	1.1	1.2	1.8
	Child care	Zero	NA	1.0	NA	NA
		One	1.0	1.0	1.0	4.4
		Two	1.0	2.0	1.3	1.1
		Three +	NA	1.0	1.0	1.7
	Shopping	Zero	1.4	1.9	1.2	1.9
		One	1.5	2.1	1.9	2.7
		Two	1.8	1.7	1.9	2.4
		Three +	1.4	2.0	2.3	2.5
	Social activity	Zero	1.1	1.8	3.3	2.6
		One	1.6	2.1	1.9	4.4
		Two	1.5	2.2	2.5	3.3
		Three +	1.4	2.3	2.3	2.9
	Personal business	Zero	1.4	2.9	1.0	2.0
		One	1.6	2.2	1.7	3.3
		Two	1.6	2.1	2.0	1.8
		Three +	1.1	2.1	2.0	2.7
	Rideshare	Zero	NA	NA	2.0	NA
		One	1.8	1.0	1.0	1.0
		Two	NA	NA	1.8	2.1
		Three +	NA	NA	1.0	1.0
	Other	Zero	1.5	1.3	NA	2.0
		One	1.4	1.5	1.6	2.0
		Two	1.0	1.7	1.4	2.2
		Three +	NA	1.7	1.8	1.9

Note: NA in a cell indicates there were no households of that type in the survey.

*Average was based on all households with at least one trip.

Table 10-6
Average Trips* per Household by Destination Trip Purpose by Household Size
by Vehicles Available by County Plus the City of Detroit (Oakland County)

	Destination Trip Purpose	Vehicles Available	Household Size			
			One	Two	Three	Four +
Oakland	Home	Zero	1.1	2.0	2.8	5.2
		One	1.5	2.5	3.3	5.7
		Two	1.7	2.8	3.7	6.0
		Three +	1.6	2.7	3.7	5.2
	P-up/D-off at work	Zero	NA	NA	NA	NA
		One	1.2	1.8	1.0	1.0
		Two	1.0	1.2	1.9	1.4
		Three +	NA	1.8	1.4	1.3
	P-up/D-off at school	Zero	NA	1.4	NA	1.0
		One	1.0	1.3	2.0	1.8
		Two	NA	1.6	1.7	2.2
		Three +	NA	1.0	1.7	2.2
	P-up/D-off at other location	Zero	NA	2.1	NA	4.0
		One	1.5	2.1	1.4	1.7
		Two	1.6	1.8	1.8	2.1
		Three +	2.0	3.0	1.5	1.8
	Work	Zero	1.7	2.0	1.1	1.0
		One	1.3	1.5	1.5	1.7
		Two	1.4	1.8	2.0	2.0
		Three +	1.4	1.6	2.4	2.5
	Work-related	Zero	1.0	1.0	NA	NA
		One	1.7	1.9	1.7	1.5
		Two	1.5	1.6	1.5	2.0
		Three +	NA	2.0	2.0	2.1
	School/college/univ.	Zero	1.0	1.0	1.0	2.0
		One	1.1	1.2	2.0	2.5
		Two	NA	1.4	1.2	2.2
		Three +	NA	1.4	1.3	1.8
	Child care	Zero	NA	NA	NA	NA
		One	1.0	1.1	2.0	3.2
		Two	1.0	NA	1.4	1.2
		Three +	NA	NA	1.6	1.0
	Shopping	Zero	1.5	2.3	1.8	5.0
		One	1.5	2.3	1.9	1.7
		Two	1.7	2.4	2.2	2.4
		Three +	1.3	2.2	2.1	2.2
	Social activity	Zero	1.2	1.2	1.3	NA
		One	1.6	3.2	2.0	2.6
		Two	1.3	1.9	2.4	3.7
		Three +	1.6	1.8	2.4	3.0
	Personal business	Zero	1.1	1.0	1.0	NA
		One	1.5	2.4	2.4	2.9
		Two	1.8	1.6	2.0	2.2
		Three +	2.7	2.0	2.0	2.2
	Rideshare	Zero	1.2	NA	NA	NA
		One	1.5	NA	1.6	1.2
		Two	NA	2.7	1.1	1.9
		Three +	NA	NA	1.0	1.8
	Other	Zero	1.0	NA	NA	3.0
		One	1.3	2.0	1.2	1.0
		Two	1.0	2.5	2.0	1.9
		Three +	1.4	1.2	1.8	2.1

Note: NA in a cell indicates there were no households of that type in the survey.

*Average was based on all households with at least one trip.

Table 10-6
Average Trips* per Household by Destination Trip Purpose by Household Size
by Vehicles Available by County Plus the City of Detroit (Macomb County)

	Destination Trip Purpose	Vehicles Available	Household Size			
			One	Two	Three	Four +
Macomb	Home	Zero	1.4	1.5	3.8	5.4
		One	1.4	2.4	3.7	6.2
		Two	1.8	2.7	3.7	5.8
		Three +	1.5	2.6	3.6	5.9
	P-up/D-off at work	Zero	NA	NA	NA	NA
		One	NA	1.6	1.3	1.2
		Two	2.0	1.0	2.0	1.1
		Three +	NA	NA	1.1	1.6
	P-up/D-off at school	Zero	NA	NA	1.0	1.0
		One	1.0	1.7	2.2	2.4
		Two	1.7	2.0	1.8	2.2
		Three +	1.0	1.0	1.5	1.6
	P-up/D-off at other	Zero	NA	NA	1.0	1.0
		One	1.4	1.5	1.7	3.1
		Two	2.0	1.8	1.8	2.3
		Three +	NA	1.0	1.9	1.3
	Work	Zero	1.2	1.0	2.8	1.6
		One	1.4	1.4	1.8	1.5
		Two	1.8	1.9	1.8	1.8
		Three +	1.7	1.8	2.1	2.5
	Work-related	Zero	NA	NA	NA	2.0
		One	2.8	1.1	1.6	2.1
		Two	2.0	1.7	2.1	1.5
		Three +	1.0	1.5	1.9	2.4
	School/college/univ.	Zero	NA	NA	1.1	3.0
		One	2.0	1.0	1.7	3.3
		Two	1.6	1.4	1.3	2.3
		Three +	1.0	NA	1.3	1.7
	Child care	Zero	NA	NA	NA	1.0
		One	NA	1.0	1.7	NA
		Two	NA	1.0	1.0	1.2
		Three +	NA	NA	1.0	1.0
	Shopping	Zero	1.4	1.8	1.0	1.5
		One	1.5	2.3	2.2	1.9
		Two	1.8	2.1	2.5	2.1
		Three +	2.2	2.4	2.1	2.6
	Social activity	Zero	1.3	1.7	2.9	3.3
		One	1.6	2.3	2.8	2.9
		Two	2.0	1.9	2.5	3.0
		Three +	1.9	1.9	2.5	3.7
	Personal business	Zero	1.4	2.0	1.2	2.7
		One	1.5	1.6	1.9	2.5
		Two	2.1	2.2	2.1	2.5
		Three +	1.1	1.6	2.1	2.4
	Rideshare activity	Zero	1.0	NA	3.0	NA
		One	1.5	2.0	1.8	2.0
		Two	NA	NA	1.7	1.8
		Three +	NA	NA	1.4	1.6
	Other	Zero	1.0	4.0	NA	NA
		One	1.7	1.5	1.6	1.8
		Two	1.7	2.0	1.9	2.6
		Three +	1.2	2.1	1.5	2.1

Note: NA in a cell indicates there were no households of that type in the survey.

*Average was based on all households with at least one trip.

Table 10-6
Average Trips* per Household by Destination Trip Purpose by Household Size
by Vehicles Available by County Plus the City of Detroit (Monroe County)

	Destination Trip Purpose	Vehicles Available	Household Size			
			One	Two	Three	Four +
Monroe	Home	Zero	2.1	1.6	NA	NA
		One	1.5	2.7	3.9	3.9
		Two	1.0	2.7	3.9	4.6
		Three +	2.2	3.0	3.3	6.0
	P-up/D-off at work	Zero	NA	NA	NA	NA
		One	NA	NA	1.0	NA
		Two	NA	NA	1.7	1.0
		Three +	NA	NA	3.0	2.0
	P-up/D-off at school	Zero	NA	2.0	NA	NA
		One	NA	1.0	2.0	2.0
		Two	NA	NA	1.6	1.8
		Three +	NA	3.0	1.0	1.9
	P-up/D-off at other location	Zero	NA	1.0	NA	NA
		One	NA	NA	1.3	2.4
		Two	NA	1.8	1.1	1.5
		Three +	1.0	NA	1.3	1.1
	Work	Zero	NA	1.0	NA	NA
		One	1.2	1.1	2.6	2.1
		Two	1.0	2.0	2.3	1.4
		Three +	1.0	1.7	2.0	2.0
	Work-related	Zero	NA	NA	NA	NA
		One	NA	1.0	1.3	NA
		Two	NA	1.9	1.1	1.4
		Three +	NA	1.8	1.4	1.9
	School/college/univ.	Zero	NA	1.0	NA	NA
		One	1.0	2.0	1.8	2.2
		Two	NA	1.0	1.9	1.9
		Three +	NA	NA	1.1	2.3
	Child care	Zero	NA	NA	NA	NA
		One	NA	NA	1.6	NA
		Two	NA	NA	2.3	NA
		Three +	NA	NA	1.0	1.0
	Shopping	Zero	1.0	2.0	NA	NA
		One	1.2	1.7	2.2	1.5
		Two	NA	2.5	2.1	1.3
		Three +	2.0	2.0	1.7	2.4
	Social activity	Zero	1.2	2.0	NA	NA
		One	2.2	2.1	1.9	1.4
		Two	1.0	2.2	2.9	3.4
		Three +	3.0	1.7	2.2	3.0
	Personal business	Zero	1.4	2.0	NA	NA
		One	1.6	2.3	2.3	1.3
		Two	1.4	1.6	2.1	2.1
		Three +	NA	3.3	2.0	2.9
	Rideshare	Zero	NA	NA	NA	NA
		One	NA	NA	1.0	NA
		Two	NA	NA	1.0	1.1
		Three +	NA	NA	1.1	NA
	Other	Zero	NA	1.0	NA	NA
		One	2.0	2.0	2.5	NA
		Two	1.0	2.0	1.3	1.8
		Three +	NA	2.0	2.6	1.5

Note: NA in a cell indicates there were no households of that type in the survey.

*Average was based on all households with at least one trip.

Table 10-6
Average Trips* per Household by Destination Trip Purpose by Household Size
by Vehicles Available by County Plus the City of Detroit (St. Clair County)

County	Destination Trip Purpose	Vehicles Available	Household Size			
			One	Two	Three	Four +
St. Clair	Home	Zero	1.6	2.0	NA	3.0
		One	1.4	2.5	2.7	6.4
		Two	1.5	2.5	3.4	5.4
		Three +	1.7	2.0	3.2	5.0
	P-up/D-off at work	Zero	NA	NA	NA	NA
		One	NA	2.0	NA	3.0
		Two	NA	NA	NA	2.6
		Three +	NA	2.0	NA	1.0
	P-up/D-off at school	Zero	NA	NA	NA	NA
		One	2.0	1.5	3.0	2.1
		Two	2.0	1.0	1.8	2.3
		Three +	NA	NA	1.4	1.5
	P-up/D-off at other location	Zero	NA	NA	NA	NA
		One	1.7	1.2	1.4	2.3
		Two	3.0	NA	3.4	5.4
		Three +	NA	2.0	1.0	2.7
	Work	Zero	NA	NA	NA	2.0
		One	1.2	2.3	1.9	1.6
		Two	1.1	2.0	1.9	2.0
		Three +	1.5	1.4	2.5	2.5
	Work-related	Zero	NA	NA	NA	3.0
		One	NA	1.7	NA	1.5
		Two	1.0	1.0	2.4	1.5
		Three +	2.0	6.0	2.0	2.2
	School/college/univ.	Zero	NA	1.0	NA	1.0
		One	1.0	1.3	1.0	2.1
		Two	NA	1.0	1.0	1.8
		Three +	NA	1.0	1.0	1.7
	Child care	Zero	NA	NA	NA	4.0
		One	NA	NA	5.0	1.0
		Two	NA	1.0	1.0	1.6
		Three +	NA	NA	NA	1.8
	Shopping	Zero	1.4	2.0	NA	2.0
		One	1.3	2.2	1.4	1.9
		Two	1.4	1.8	2.9	3.0
		Three +	1.0	1.5	2.0	2.2
	Social activity	Zero	1.5	2.0	NA	5.0
		One	1.7	2.4	1.3	5.3
		Two	1.4	1.8	2.0	3.2
		Three +	1.7	1.6	2.5	4.2
	Personal business	Zero	1.4	3.0	NA	NA
		One	1.3	2.5	4.3	3.0
		Two	1.1	1.9	1.6	2.8
		Three +	1.0	2.3	2.4	3.2
	Rideshare	Zero	NA	NA	NA	NA
		One	NA	NA	2.0	NA
		Two	NA	NA	NA	2.0
		Three +	NA	NA	NA	3.5
	Other	Zero	1.0	NA	NA	1.0
		One	1.8	2.2	2.4	2.0
		Two	2.6	1.0	1.8	3.2
		Three +	1.0	1.0	1.6	1.4

Note: NA in a cell indicates there were no households of that type in the survey.

*Average was based on all households with at least one trip.

Table 10-6
Average Trips* per Household by Destination Trip Purpose by Household Size
by Vehicles Available by County Plus the City of Detroit (Livingston County)

County	Destination Trip Purpose	Vehicles Available	Household Size			
			One	Two	Three	Four +
Livingston	Home	Zero	2.0	NA	NA	NA
		One	2.0	2.4	NA	3.1
		Two	1.7	2.7	2.7	5.2
		Three +	NA	2.3	3.5	4.9
	P-up/D-off at work	Zero	NA	NA	NA	NA
		One	NA	NA	NA	NA
		Two	NA	NA	NA	NA
		Three +	NA	2.0	1.0	NA
	P-up/D-off at school	Zero	NA	NA	NA	NA
		One	2.0	NA	NA	2.0
		Two	NA	2.0	1.8	2.0
		Three +	NA	NA	2.0	2.5
	P-up/D-off at other location	Zero	NA	NA	NA	NA
		One	3.3	1.0	NA	NA
		Two	NA	2.0	1.0	3.2
		Three +	NA	NA	1.0	1.8
	Work	Zero	1.0	NA	NA	NA
		One	1.8	1.8	NA	1.2
		Two	1.1	1.4	1.7	1.7
		Three +	NA	1.8	1.7	2.7
	Work-related	Zero	NA	NA	NA	NA
		One	1.2	1.0	NA	NA
		Two	3.0	1.6	1.0	1.0
		Three +	NA	1.3	2.0	1.2
	School/college/univ.	Zero	NA	NA	NA	NA
		One	1.0	1.0	NA	2.0
		Two	NA	NA	1.5	1.9
		Three +	NA	NA	1.3	2.0
	Child care	Zero	NA	NA	NA	NA
		One	NA	NA	NA	NA
		Two	NA	1.0	1.0	1.0
		Three +	NA	NA	NA	NA
	Shopping	Zero	1.0	NA	NA	NA
		One	1.6	2.6	NA	2.2
		Two	1.0	1.7	1.4	4.0
		Three +	NA	3.3	2.6	1.5
	Social activity	Zero	NA	NA	NA	NA
		One	1.2	2.6	NA	2.3
		Two	1.0	2.0	1.7	2.3
		Three +	NA	2.0	2.3	2.4
	Personal business	Zero	2.0	NA	NA	NA
		One	1.8	2.3	NA	1.4
		Two	1.0	1.9	1.6	2.9
		Three +	NA	2.5	1.9	2.2
	Rideshare	Zero	NA	NA	NA	NA
		One	NA	NA	NA	NA
		Two	NA	NA	1.0	1.8
		Three +	NA	2.0	2.0	1.1
	Other	Zero	NA	NA	NA	NA
		One	1.0	2.0	NA	NA
		Two	NA	1.0	1.0	2.5
		Three +	NA	1.0	1.7	1.3

Note: NA in a cell indicates there were no households of that type in the survey.

*Average was based on all households with at least one trip.

Table 10-6
Average Trips* per Household by Destination Trip Purpose by Household Size
by Vehicles Available by County Plus the City of Detroit (Washtenaw County)

County	Destination Trip Purpose	Vehicles Available	Household Size			
			One	Two	Three	Four +
Washtenaw	Home	Zero	1.6	2.6	5.0	3.4
		One	1.5	2.6	3.2	4.8
		Two	1.3	2.9	3.8	5.4
		Three +	1.6	2.6	3.8	5.2
	P-up/D-off at work	Zero	NA	2.0	NA	1.0
		One	1.0	1.5	2.0	2.2
		Two	NA	1.5	1.7	1.7
		Three +	1.0	NA	1.0	1.6
	P-up/D-off at school	Zero	NA	1.6	4.0	1.0
		One	1.0	2.0	2.4	1.9
		Two	NA	1.0	1.9	2.2
		Three +	NA	1.0	1.5	1.8
	P-up/D-off at other location	Zero	NA	1.2	NA	NA
		One	1.5	2.4	1.2	1.2
		Two	1.8	1.4	1.4	2.1
		Three +	NA	2.0	1.8	1.6
	Work	Zero	1.0	1.1	NA	1.3
		One	1.5	1.8	1.8	1.6
		Two	1.3	2.0	2.1	2.0
		Three +	1.3	2.3	2.3	2.0
	Work-related	Zero	1.0	1.0	NA	NA
		One	1.6	1.2	1.6	1.4
		Two	1.8	1.6	1.0	1.7
		Three +	2.0	2.2	1.6	1.8
	School/college/univ.	Zero	1.5	1.5	1.0	1.7
		One	1.5	2.1	2.0	3.0
		Two	1.0	1.8	1.7	2.3
		Three +	2.0	2.1	1.6	2.7
	Child care	Zero	NA	NA	NA	2.2
		One	1.0	NA	2.0	1.0
		Two	NA	NA	2.1	1.3
		Three +	NA	NA	1.0	1.3
	Shopping	Zero	1.0	2.2	3.0	1.0
		One	1.4	2.2	2.1	1.6
		Two	1.7	1.6	2.4	3.2
		Three +	1.0	1.8	2.0	2.1
	Social activity	Zero	1.4	1.7	1.0	NA
		One	1.6	1.8	2.1	3.4
		Two	1.3	2.1	2.0	3.2
		Three +	2.0	2.1	2.4	3.5
	Personal business	Zero	3.3	1.3	NA	2.0
		One	1.6	1.8	2.3	1.7
		Two	1.9	1.7	2.4	2.5
		Three +	1.4	2.9	2.1	2.4
	Rideshare activity	Zero	4.0	NA	NA	2.2
		One	2.0	2.3	1.0	3.0
		Two	NA	2.0	2.0	1.3
		Three +	NA	1.0	NA	1.8
	Other	Zero	1.0	1.0	NA	NA
		One	1.4	NA	1.0	2.0
		Two	NA	1.2	1.0	1.0
		Three +	NA	1.0	2.6	1.7

Note: NA in a cell indicates there were no households of that type in the survey.

*Average was based on all households with at least one trip.

XI. MODE CHOICE

Mode choice was defined as the primary mode among the following options:

- Walk (5 minutes or more);
- Van/light truck;
- Bus (SMART, DDOT, AATA);
- School bus (K-12);
- Bicycle;
- Other.
- Automobile/minivan;
- Carpool/vanpool;
- Shuttle/campus bus;
- Taxi;
- Motorcycle/moped; and,

Primary travel mode was self-determined and reported by each respondent. **Tables 11-1 and 11-2** present number of trips by travel mode in the survey area and urbanized area. The vast majority of the trips were made by car/minivan. Other frequent travel modes included van/light truck, walking (5 minutes or more), school bus, and bus. In the "Other" category were travel modes such as: work truck; private bus; tour bus; wheelchair; peplemover; airplane; roller-skates; heavy truck; train; flat-bed truck; trolley; semi-truck, police car; and 18-wheeler. Note that Tables 11-1 and 11-2 include both drivers and passengers.

Table 11-1
Number of Trips by Travel Mode by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Walk	316,771	193,526	185,152	117,761	15,991	30,828	13,331	104,329	976,688
Car/mini-van	1,519,033	3,012,883	3,376,783	2,183,378	354,775	394,562	323,488	783,741	11,948,644
Van/light truck	63,192	330,882	376,870	297,801	65,674	67,128	51,972	70,144	1,324,662
Carpool/vanpool	15,559	12,709	24,593	10,126	151	4,516	2,896	5,463	76,013
Bus	158,206	23,735	28,563	15,765	2,834	1,852	1,634	12,486	245,075
Shuttle/campus bus	1,854	5,388	2,262	1,428	74	621	2,802	5,670	20,098
School bus (K-12)	27,498	84,676	123,897	66,852	25,924	22,535	22,207	16,849	390,438
Taxi	9,665	2,389	1,902	573	0	555	0	1,697	16,781
Bicycle	6,008	29,339	41,199	15,447	3,679	4,640	544	9,319	110,176
Motorcycle/moped	963	10,154	2,091	0	0	337	0	868	14,413
Other	4,479	17,253	19,803	5,079	823	5,403	1,612	11,406	65,857
Don't know	1,446	1,276	1,181	560	0	0	0	465	4,929
Column Total	2,124,673	3,723,209	4,184,295	2,714,771	469,924	533,978	420,487	1,022,437	15,193,774

Table 11-2
Number of Trips by Travel Mode by Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Walk	681,953	75,653	17,974	163,335	938,915
Car/mini-van	8,984,859	613,063	194,509	1,791,916	11,584,347
Van/light truck	1,051,919	47,225	18,933	182,435	1,300,513
Carpool/vanpool	59,786	3,901	613	8,847	73,147
Bus	192,313	13,721	3,957	22,273	232,264
Shuttle/campus bus	13,712	2,793	420	3,053	19,977
School bus (K-12)	310,675	12,973	7,817	49,076	380,542
Taxi	13,784	1,570	0	1,218	16,571
Bicycle	86,201	7,723	741	12,174	106,839
Motorcycle/moped	11,326	0	0	3,087	14,413
Other	45,086	8,109	1,154	10,046	64,394
Don't know	4,079	444	170	213	4,905
Column Total	11,455,693	787,175	246,288	2,247,672	14,736,829*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Home-Based and Non-Home-Based Trips

Tables 11-3 and 11-4 present the number of trips by trip purpose and by county and urbanized areas. Home-based work trips were those trips going to a workplace that originated from home, as well as work-to-home trips. Home-based non-work trips were those trips going to places other than a workplace (e.g., school, recreational places, restaurants, churches) that originated from home or other places to home trips; these did not include home-to-school trips made by non-students. Non-home-based work trips were those trips going to a workplace that originated from a place other than home or work to other place trips. Non-home-based non-work trips were those trips going to a place other than home or work (e.g., school, recreational places, restaurants, churches) that originated from a place other than work or home; these did not include pick-up, drop-off and rideshare activities.

Table 11-3
Number of Trips by Trip Purpose by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Home-based Work	312,958	581,576	652,671	411,317	66,412	67,906	60,761	153,971	2,307,571
Home-based Non-Work	1,014,984	1,664,372	1,838,162	1,229,323	221,259	225,355	180,717	444,996	6,819,167
Non-Home-Based Work	42,696	134,000	174,148	88,386	18,567	16,675	14,052	44,393	532,916
Non-Home-Based Non-Work	413,807	860,660	988,948	641,759	101,435	143,018	97,886	240,778	3,488,290
P-up/D-off/ Rideshare	325,068	470,163	518,742	328,952	59,846	79,739	66,763	134,710	1,983,985
School-based Trips ¹	15,161	12,438	11,623	15,034	2,406	1,284	309	3,359	61,614
Column Total	2,124,673	3,723,209	4,184,295	2,714,771	469,924	533,978	420,487	1,022,437	15,193,544²

¹ School-based trips included trips to and from schools by non-students.

² One home to other home trip with a weight of 230 was excluded from the total and thus, totals differ from the totals in Table 11-1.

Table 11-4
Number of Trips by Trip Purpose by Travel Mode by Urbanized Area*

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Home-based Work	1,720,512	123,603	39,439	353,837	2,237,391
Home-based Non-Work	5,158,081	349,218	109,818	1,003,543	6,620,659
Non-Home-Based Work	393,742	34,096	7,972	73,203	509,013
Non-Home-Based Non-Work	2,632,359	166,822	48,602	537,691	3,385,474
P-up/D-off/ Rideshare	1,503,165	110,461	38,654	272,411	1,924,690
School-based Trips ¹	47,835	2,745	1,803	6,988	59,371
Column Total	11,455,693	786,945	246,288	2,247,672	14,736,599²

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

¹ School-based trips included trips to and from schools by non-students.

² One home to other home trip with a weight of 230 was excluded from the total and thus, totals differ from the totals in Table 11-2.

Home-based work trips by travel mode in the survey area and urbanized areas are presented in **Tables 11-5** and **11-6**. Again, car/minivan was the most frequently used travel mode, followed by van/light truck, walking (5 minutes or more), and bus.

Table 11-5
Number of Home-Based Work Trips by Travel Mode by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Walk	14,035	4,993	5,584	7,259	1,094	3,729	1,099	9,264	47,058
Car/mini-van	245,028	501,697	554,311	352,005	50,282	46,520	49,153	125,405	1,924,399
Van/light truck	14,052	66,443	80,642	47,839	14,047	13,363	9,271	13,931	259,588
Carpool/vanpool	3,387	3,035	3,523	1,904	0	908	194	478	13,431
Bus	32,813	1,984	1,712	705	332	551	0	1,709	39,806
Shuttle/campus bus	386	0	138	132	0	0	0	281	938
School bus (K-12)	136	396	465	0	0	1,181	642	68	2,888
Taxi	234	0	147	0	0	0	0	0	382
Bicycle	1,471	1,523	1,809	1,184	339	0	0	841	7,167
Motorcycle/moped	481	393	626	0	0	25	0	762	2,288
Other	683	1,110	3,713	288	318	1,629	402	1,232	9,375
Don't know	251	0	0	0	0	0	0	0	251
Column Total	312,958	581,576	652,671	411,317	66,412	67,906	60,761	153,971	2,307,571

Table 11-6
Number of Home-Based Work Trips by Travel Mode by Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Walk	30,093	6,134	153	9,590	45,970
Car/mini-van	1,434,045	106,496	32,963	292,983	1,866,488
Van/light truck	198,400	7,960	5,789	38,891	251,040
Carpool/vanpool	10,935	408	0	1,364	12,707
Bus	30,551	571	534	7,047	38,702
Shuttle/campus bus	657	281	0	0	938
School bus (K-12)	1,546	68	0	1,274	2,888
Taxi	322	0	0	0	322
Bicycle	5,568	809	0	572	6,948
Motorcycle/moped	1,463	0	0	825	2,288
Other	6,705	877	0	1,291	8,872
Don't know	227	0	0	0	227
Column Total	1,720,512	123,603	39,439	353,837	2,237,391*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

As can be seen in **Tables 11-7 and 11-8**, for non-home based work trips, car/minivan was again the most frequently used travel mode, followed by van/light truck, and walking (5 minutes or more).

Table 11-7
Number of Non-Home Based Work Trips by Travel Mode
by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Walk	3,146	10,581	9,015	5,420	208	915	911	5,656	35,851
Car/mini-van	35,612	108,473	144,124	68,711	12,141	12,280	11,365	33,700	426,405
Van/light truck	1,255	13,836	18,001	13,849	5,886	3,374	1,653	4,260	62,114
Carpool/vanpool	260	0	736	0	0	0	0	0	996
Bus	1,450	0	0	0	332	0	0	0	1,782
Shuttle/campus bus	755	879	137	0	0	0	0	222	1,994
School bus (K-12)	140	0	1,071	132	0	0	0	0	1,344
Bicycle	78	94	0	74	0	0	0	99	344
Motorcycle/moped	0	0	290	0	0	0	0	0	290
Other	0	137	332	200	0	106	123	445	1,343
Don't know	0	0	442	0	0	0	0	11	453
Column Total	42,696	134,000	174,148	88,386	18,567	16,675	14,052	44,393	532,916

Table 11-8
Number of Non-Home Based Work Trips by Travel Mode by Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Walk	23,091	4,239	215	6,972	34,518
Car/mini-van	314,789	25,588	6,694	59,256	406,329
Van/light truck	48,819	3,503	730	6,963	60,015
Carpool/vanpool	702	0	0	0	702
Bus	1,349	0	332	0	1,681
Shuttle/campus bus	1,772	222	0	0	1,994
School bus (K-12)	1,344	0	0	0	1,344
Bicycle	246	99	0	0	344
Motorcycle/moped	290	0	0	0	290
Other	898	445	0	0	1,343
Don't know	442	0	0	11	453
Column Total	393,742	34,096	7,972	73,203	509,013*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Tables 11-9 and 11-10 present the travel mode of home-based non-work trips. The predominant mode was car/minivan, followed by van/light truck, walking (5 minutes or more), school bus, and bus.

Table 11-9
Number of All Home Based Non-Work Trips by Travel Mode
by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Walk	216,107	123,223	118,510	71,051	11,549	15,125	5,622	52,565	613,753
Car/mini-van	641,852	1,271,232	1,408,118	957,649	154,688	161,289	131,133	331,192	5,057,153
Van/light truck	23,413	134,272	142,006	120,024	25,655	23,897	20,712	5,892	515,871
Carpool/vanpool	7,118	4,650	14,170	6,079	151	2,868	664	1,954	37,653
Bus	91,419	13,605	15,867	7,840	2,170	602	1,568	6,237	139,308
Shuttle/campus bus	383	3,105	1,807	219	74	429	1,834	1,797	9,647
School bus (K-12)	19,340	68,400	99,569	51,518	23,314	15,107	18,410	12,433	308,091
Taxi	6,866	2,389	1,754	441	0	0	0	807	12,257
Bicycle	3,877	25,242	25,219	11,793	3,340	3,114	544	6,514	79,643
Motorcycle/moped	481	6,387	1,175	0	0	312	0	106	8,462
Other	3,357	11,412	9,227	2,454	318	2,613	230	5,499	35,111
Don't know	768	456	739	254	0	0	0	0	2,217
Column Total	1,014,984	1,664,372	1,838,162	1,229,323	221,259	225,355	180,717	444,996	6,819,167

Table 11-10
Number of All Home Based Non-Work Trips by Travel Mode by Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
Walk	432,704	39,087	10,706	107,263	589,760
Car/mini-van	3,813,816	261,641	79,739	756,728	4,911,924
Van/light truck	410,961	18,073	9,167	69,900	508,101
Carpool/vanpool	31,684	1,412	333	2,937	36,366
Bus	105,950	9,403	1,864	13,437	130,654
Shuttle/campus bus	7,431	459	420	1,267	9,577
School bus (K-12)	248,095	10,128	6,174	36,321	300,719
Taxi	10,242	679	0	1,218	12,139
Bicycle	62,863	4,867	531	8,328	76,589
Motorcycle/moped	6,746	0	0	1,715	8,462
Other	25,562	3,468	884	4,237	34,152
Don't know	2,026	0	0	191	2,217
Column Total	5,158,081	349,218	109,818	1,003,543	6,620,659*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Table 11-11 presents the number of public transit trips by destination trip purpose. Public transit includes public bus; it does not include taxi, shuttle/campus bus or school bus (K-12). The most frequently cited trip purposes of transit trips were home, school/college, and work.

Table 11-11
Number of Transit Trips by Destination Trip Purpose
by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Wash-tenaw	Row Total
Home	58,695	5,110	7,894	5,773	855	554	779	3,845	83,504
P-up/D-off at school	1,841	195	289	644	0	121	0	0	3,091
P-up/D-off at other location	525	0	0	0	0	0	0	0	525
Work	22,578	1,616	2,293	588	664	526	0	1,107	29,372
Work-related	2,579	2,149	112	132	0	0	0	0	4,972
School/college/univ.	26,596	4,569	9,593	3,339	1,154	417	855	2,087	48,611
Child care	354	0	668	0	0	90	0	0	1,112
Shopping	11,308	3,063	956	3,381	162	0	0	1,100	19,969
Social activity	12,331	2,851	3,782	618	0	0	0	240	19,821
Personal business	10,815	2,177	1,683	0	0	0	0	3,564	18,238
Rideshare	4,445	1,018	1,293	1,028	0	144	0	374	8,301
Other	6,140	987	0	262	0	0	0	170	7,559
Column Total	158,206	23,735	28,563	15,765	2,834	1,852	1,634	12,486	245,075

XII. VEHICLE OCCUPANCY

This chapter presents analyses of average vehicle occupancy. Vehicle occupancy was measured for those trips that utilized a car, minivan, van, light truck, carpool, or vanpool. Two methods were used to calculate average vehicle occupancy. Both methods require some subset of the following variables:

- Driver Trips (DT) = Sum of trips with mode reported as **driver**;
- Passenger Trips (PT) = Sum of trips with mode reported as **passenger**; and
- Persons in Driver Trip Vehicles (PDTV) = Sum of reported persons in vehicles with mode reported as **driver**.

Both methods are designed to provide the average occupancy for trips made by vehicles available to surveyed households, rather than the average occupancy observed by vehicle trip makers. Because they are vehicle-based averages, they are the most likely to be consistent with averages based on observations of vehicles in the field. Differences will be likely, however, because both averages are in effect weighted by trip length, and because both data sources are based on relatively small samples.

Method One is SEMCOG's preferred way of determining vehicle occupancy and is based on reported occupancy levels by auto drivers. It is defined as PDTV divided by DT. Method Two is based on the reported numbers of driver and passenger trips. It is defined as (DT+PT) divided by DT. Ideally, if both vehicles and trip makers in the region are sampled without bias, the results of Method One and Two should closely match. However, experience in other metropolitan areas shows that this is often not the case. To make matters more difficult, the discrepancy between these two estimates generally are in opposite directions for work and non-work trips, and do not disappear for all-trip averages. Given the anomalies, both types of averages are reported in this section.

Table 12-1 presents the average vehicle occupancy by destination trip purpose in urbanized areas. The average vehicle occupancy rates calculated by Method One were higher than those calculated by Method Two, except that there was almost no difference in the work trip average vehicle occupancy rate. Child care, rideshare, picking up or dropping off, and social activities trips had the highest average vehicle occupancy rates, while work trips had the lowest.

Table 12-1
Average Vehicle Occupancy by Destination Trip Purpose by Urbanized Area

	Method One PDTV/DT				Method Two (DT + PT)/DT			
	Detroit	Ann Arbor	Port Huron	All Other Areas	Detroit	Ann Arbor	Port Huron	All Other Areas
Home	1.4	1.5	1.4	1.3	1.3	1.3	1.3	1.3
P-up/d-off at work	2.1	1.8	1.9	1.7	1.1	1.2	1.5	1.1
P-up/d-off at school	2.3	2.0	2.3	2.3	1.1	1.2	1.1	1.2
P-up/d-off at other location	2.1	2.3	2.1	2.0	1.2	1.2	1.3	1.2
Work	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1
Work-related	1.2	1.0	1.2	1.3	1.1	1.1	1.3	1.1
School/college/univ.	1.3	1.2	1.8	1.2	2.5	1.9	1.9	3.1
Child care	2.2	2.0	1.0	1.4	2.5	1.6	1.0	3.5
Shopping	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.3
Social activity	1.7	1.6	1.6	1.6	1.5	1.5	1.4	1.4
Personal business	1.3	1.4	1.4	1.4	1.2	1.2	1.3	1.2
Rideshare	1.9	1.7	N/A	1.6	1.6	2.4	N/A	5.8
Other	1.5	1.5	1.4	1.5	1.3	1.2	1.1	1.2
Total	1.6	1.4	1.4	1.4	1.3	1.3	1.2	1.3

Table 12-2 presents the average vehicle occupancy for vehicle (car, minivan, light truck, or van) trips in each county plus the City of Detroit and urbanized area. Again, calculations using Method One resulted in higher vehicle occupancy rates than did calculations using Method Two.

Table 12-2
Average Vehicle Occupancy by County Plus the City of Detroit and Urbanized Area

	Survey Area	Method One PDTV/DT	Method Two (DT + PT)/DT
County Plus the City of Detroit	Detroit	1.5	1.4
	Other Wayne	1.4	1.3
	Oakland	1.4	1.2
	Macomb	1.4	1.3
	Monroe	1.4	1.3
	St. Clair	1.6	1.3
	Livingston	1.5	1.3
	Washtenaw	1.4	1.3
Urbanized Area	Detroit	1.6	1.3
	Ann Arbor	1.4	1.3
	Port Huron	1.4	1.2
	All Other Areas	1.4	1.3

Table 12-3 presents average vehicle occupancy by trip duration range for work and non-work trips for the entire survey area. As expected, work trips had lower vehicle occupancy than non-work trips. Work trip vehicle occupancy did not increase when the trip duration increased, while non-work trips that lasted more than 50 minutes had higher vehicle occupancy.

Table 12-3
Average Vehicle Occupancy by Trip Duration Range for Work and Non-Work Trips
for the Region*

Trip Duration	Method One		Method Two	
	Work Trips	Non-Work Trips	Work Trips	Non-Work Trips
0-10 Minutes	1.1	1.4	1.1	1.4
11-19 Minutes	1.1	1.5	1.1	1.4
20-29 Minutes	1.1	1.4	1.1	1.3
30-39 Minutes	1.1	1.4	1.1	1.4
40-49 Minutes	1.1	1.4	1.1	1.3
50+ Minutes	1.1	1.5	1.1	1.4
All Durations	1.1	1.4	1.1	1.4

*Only trips with non-negative trip durations were included. See Chapter XIII for discussion of negative trip durations.

XIII. TRIP DURATION

This chapter presents analyses of trip duration, which was calculated as the travel time in minutes between the end of one activity and the start of the next activity. While the time between the end of one activity and the beginning of the next was automatically checked in the CATI system, there were 144 instances (unexpanded) where the calculated difference between the two times was a negative value. All analyses in this chapter excluded negative trip durations.

Table 13-1 presents the number of trips that had defined durations in minutes and trip purpose (regionwide). The majority of home-based work trips took more than 20 minutes, while the majority of home-based non-work trips and all trips required less than 20 minutes. As shown in **Table 13-2**, the average trip duration was 29.9 minutes for home-based work trips, 22.4 minutes for home-based non-work trips, and 23.8 minutes for all trips.

Table 13-1
Number of Trips by 10-Minute Duration and Trip Purpose
(Regionwide)

Trip Duration	Home-Based Work	Home-Based Non-Work	Non-Home-Based Work	Non-Home-Based Non-Work	P-up/D-off/Rideshare	School-Based Trips ¹	Total
0-10 Minutes	416,211	2,932,802	254,675	1,562,116	969,701	23,054	6,158,560
11-19 Minutes	407,731	1,523,406	110,639	668,480	374,540	14,005	3,098,801
20-29 Minutes	344,605	747,577	46,197	339,641	228,820	5,602	1,712,441
30-39 Minutes	625,219	857,644	50,112	382,310	183,403	10,541	2,109,229
40-49 Minutes	232,455	251,891	23,363	133,165	67,738	1,730	710,342
50+ Minutes	280,140	500,036	46,017	386,470	155,085	6,681	1,374,429
Total	2,306,362	6,813,356	531,001	3,472,182	1,979,287	61,614	15,164,032²
Negative Duration	1,209	5,811	1,916	16,108	4,698	0	29,742
Total	2,307,571	6,819,167	532,916	3,488,290	1,983,985	61,614	15,193,544²

¹ School-based trips included trips to and from schools by non-students.

² One home to other home trip was excluded from the total.

Table 13-2
Average Trip Duration in Minutes, Home-Based Work, Home-Based Non-Work
and All Trips (Regionwide)*

Home-Based Work	Home-Based Non-Work	All Trips
29.9	22.6	24.3

*Only trips with non-negative trip durations were included.

Table 13-3 presents the average trip duration by travel mode. Average durations of bus trips (over 50 minutes) were the longest, while average walking trip durations were no more than 23 minutes.

Table 13-3
Average Trip Duration in Minutes, Home-Based Work, Home-Based Non-Work
and All Trips by Travel Mode (Regionwide)*

	Home-Based Work	Home-Based Non-Work	All Trips
Walk	22.1	17.5	18.2
Car/mini-van	29.2	22.2	23.9
Van/light truck	30.1	23.0	25.4
Carpool/vanpool	34.6	19.2	26.9
Bus	64.3	50.1	53.4
Shuttle/campus bus	51.3	27.0	32.5
School bus (K-12)	37.7	26.5	27.1
Taxi	14.9	32.5	28.3
Bicycle	24.1	17.4	21.0
Motorcycle/moped	26.9	20.1	30.7
Other	37.8	32.0	34.3

*Only trips with non-negative trip durations were included.

XIV. TRIP START TIMES

This chapter presents analyses of trip purposes, trip types, and selected modes of travel by trip start time. **Table 14-1** and **Figure 14-1** present the number and distribution of total trips by trip start time in each county plus the City of Detroit. The trip distribution patterns in each survey area were similar. There were a significant number of trips between 6:00 a.m. and 7:00 p.m. (95 percent of all trips). Each of the three-hour time periods from 6:00 a.m. to 7:00 p.m. were roughly equal in number of trips.

Table 14-1
Number of Total Trips by Time of Day (Based on Start Time)
by County Plus the City of Detroit

	Detroit	Other Wayne	Oakland	Macomb	Monroe	St. Clair	Livingston	Washtenaw	Row Total
1 a.m.- 6 a.m.	63,524	79,150	83,399	65,380	8,995	15,285	10,367	18,341	344,441
6 a.m.-9 a.m.	433,025	676,607	734,431	473,942	88,167	92,522	72,322	171,650	2,742,665
9 a.m.-1 p.m.	426,483	783,256	907,593	644,114	107,243	127,570	98,237	233,387	3,327,883
1 p.m.-4 p.m.	501,506	805,475	909,229	599,135	109,141	137,515	93,427	222,219	3,377,648
4 p.m.-7 p.m.	428,720	844,491	947,943	564,913	96,556	108,635	100,762	240,354	3,332,374
7 p.m.-10 p.m.	202,265	448,929	522,752	305,971	51,514	45,088	38,629	111,558	1,726,707
10 p.m.-1 a.m.	69,150	85,300	78,949	61,315	8,307	7,363	6,744	24,928	342,055
Column Total	2,124,673	3,723,209	4,184,295	2,714,771	469,924	533,978	420,487	1,022,437	15,193,774

Figure 14-1
Distribution of Total Trips by Time of Day (Based on Start Time)
by County Plus the City of Detroit

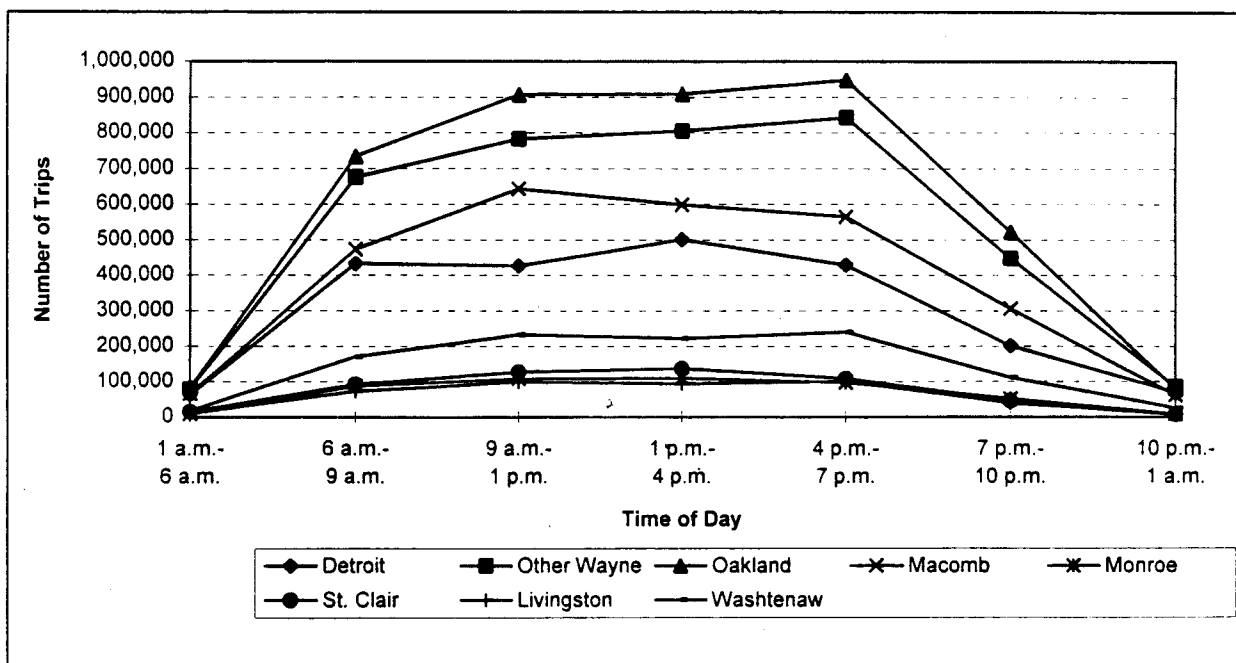


Table 14-2 and **Figure 14-2** illustrate the number and distribution of total trips by trip start time in the urbanized areas. Similar patterns were observed with most trips starting between 6:00 a.m. and 7:00 p.m. The Detroit Urbanized Area accounted for the majority of the trips (75 percent of all trips).

Table 14-2
Number of Trips by Time of Day (Based on Start Time) by Urbanized Area

	Detroit	Ann Arbor	Port Huron	All Other Areas	Row Total
1 a.m. - 6 a.m.	261,189	13,815	4,910	54,091	334,005
6 a.m. - 9 a.m.	2,073,340	141,961	45,389	393,965	2,654,655
9 a.m. - 1 p.m.	2,530,069	178,349	56,662	468,324	3,233,405
1 p.m. - 4 p.m.	2,542,716	180,202	52,893	506,030	3,281,841
4 p.m. - 7 p.m.	2,484,387	169,983	56,767	515,463	3,226,599
7 p.m. - 10 p.m.	1,305,907	83,927	25,648	258,550	1,674,032
10 p.m. - 1 a.m.	258,086	18,938	4,018	51,250	332,293
Column Total	11,455,693	787,175	246,288	2,247,672	14,736,829*

* Urbanized area totals do not match County Plus the City of Detroit totals. See page 46 for explanation.

Figure 14-2
Distribution of Total Trips by Time of Day (Based on Start Time) by Urbanized Area

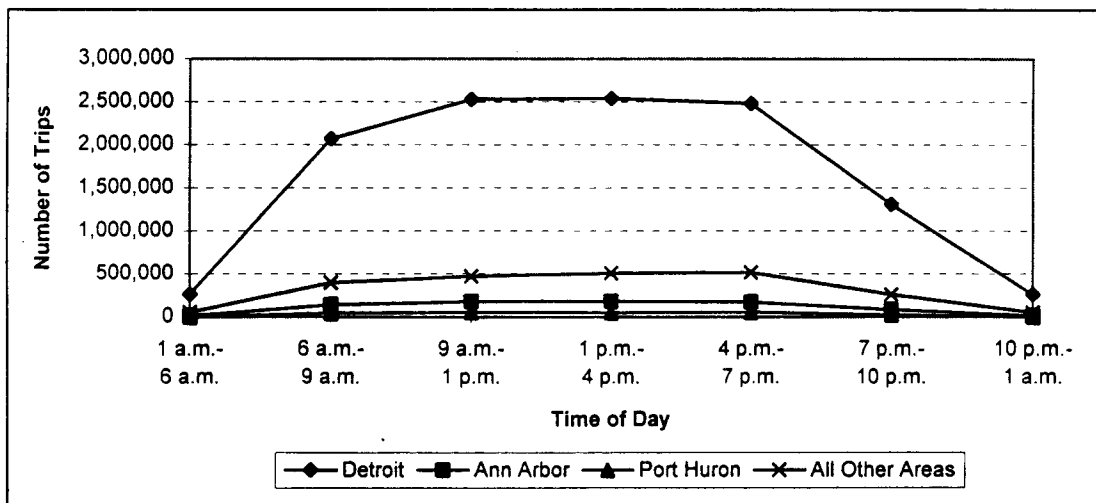


Table 14-3 presents the number of trips by trip start time by destination purpose. The number of trips by trip start time by travel mode is shown in **Table 14-4**. As expected, trips to work accounted for the most trips traveled between 6 a.m. to 9 a.m. Trips to home were most common in the afternoon and evening. Car and/or mini-van were the most popular mode of transportation across all time intervals.

Table 14-3
Number of Trips by Time of Day (Based on Start Time) by Destination Trip Purpose

	1 a.m. - 6 a.m.	6 a.m. - 9 a.m.	9 a.m. - 1 p.m.	1 p.m. - 4 p.m.	4 p.m. - 7 p.m.	7 p.m. - 10 p.m.	10 p.m. - 1 a.m.	Row Total
Home	58,721	146,750	669,308	1,399,288	1,453,124	1,016,561	264,344	5,008,094
P-up/D-off at work	4,062	27,379	11,265	15,655	16,644	5,277	3,514	83,796
P-up/D-off at school	4,166	226,732	83,866	128,663	72,214	8,179	1,411	525,230
P-up/D-off at other location	10,573	47,273	59,761	89,894	95,424	54,533	9,551	367,009
Work	211,228	1,015,029	382,417	246,428	75,799	26,068	14,011	1,970,981
Work-related	9,553	108,706	147,823	99,355	41,201	10,962	815	418,415
School/college/univ.	3,061	641,324	107,702	42,309	53,934	6,021	1,013	855,364
Child care	613	20,752	11,966	16,696	5,791	1,816	262	57,895
Shopping	5,049	84,920	574,710	477,847	432,225	185,157	6,867	1,766,774
Social activity	17,534	172,528	585,495	362,372	737,934	304,075	30,229	2,210,167
Personal business	12,016	156,122	560,072	379,635	249,900	68,742	6,534	1,433,020
Rideshare	2,783	34,372	10,084	17,653	8,811	1,455	917	76,076
Other	5,083	60,779	123,416	101,854	89,373	37,861	2,588	420,954
Column Total	344,441	2,742,665	3,327,883	3,377,648	3,332,374	1,726,707	342,055	15,193,774

Table 14-4
Number of Trips by Time of Day (Based on Start Time) by Travel Mode

	1 a.m. - 6 a.m.	6 a.m. - 9 a.m.	9 a.m. - 1 p.m.	1 p.m. - 4 p.m.	4 p.m. - 7 p.m.	7 p.m. - 10 p.m.	10 p.m. - 1 a.m.	Row Total
Walk	6,090	225,033	217,038	280,323	162,131	72,190	13,883	976,688
Car/mini-van	275,255	1,968,954	2,699,664	2,537,825	2,758,158	1,422,068	286,720	11,948,644
Van/light truck	50,176	231,124	273,639	266,903	295,808	176,688	30,325	1,324,662
Carpool/vanpool	2,333	22,521	10,368	17,491	14,205	7,871	1,226	76,013
Bus	6,493	75,291	58,088	68,131	28,572	5,678	2,822	245,075
Shuttle/campus bus	0	9,399	2,944	5,730	677	755	593	20,098
School bus (K-12)	557	182,723	35,070	165,328	5,567	1,194	0	390,438
Taxi	271	4,435	6,729	2,549	1,244	375	1,178	16,781
Bicycle	730	13,396	12,370	18,162	41,298	22,786	1,434	110,176
Motorcycle/moped	1,723	1,638	2,990	406	3,290	4,183	182	14,413
Other	560	7,670	7,824	14,380	21,272	10,618	3,534	65,857
Don't Know	254	482	1,160	422	152	2,301	159	4,929
Column Total	344,441	2,742,665	3,327,883	3,377,648	3,332,374	1,726,707	342,055	15,193,774

XV. GLOSSARY

This chapter presents detailed definitions of all terms and variables used in this report.

ARC MACRO LANGUAGE (AML)

ARC MACRO LANGUAGE is a ARC/Info (Version 7.03) programming language used to customize data processing procedures.

AVERAGE VEHICLE OCCUPANCY

Vehicle occupancy was measured for those trips that utilized a car, minivan, van, light truck, carpool, or vanpool. Two methods were used for the average vehicle occupancy calculation. **Method One** is based on reported occupancy levels by vehicle drivers. It is defined as the average number of persons in vehicles with the respondent being the driver. **Method Two** is based on the reported numbers of driver and passenger trips. It is defined as the total number of people arriving at a particular destination divided by the total number of automobiles, minivans, vans, or light trucks arriving at that destination.

CATI

CATI, computer-assisted telephone interview, allows interviewers to input responses directly into the computer database. This process results in greater accuracy in survey administration and increased flexibility in question design and phone number process (such as a skip pattern). The CATI system automatically dials numbers, eliminating misdials and ensuring random number selection.

EMPLOYEES

Full-time and part-time employees were calculated based on the total number of people in the household who reported that they were employed full-time or part-time (as reported on the household form). This variable does not include those who reported that they were self-employed.

FIPS MCD

FIPS stands for the federal information processing standard, and MCD stands for minor civil division. FIPS MCD was used to match city names in the survey dataset with that in the TIGER file.

HOME-BASED WORK TRIPS

Those trips going to a workplace that originated from home or work to home trips.

HOME-BASED NON-WORK TRIPS

Those trips going to other places other than a workplace (e.g., school, recreational places, restaurants, churches) that originated from home or other places to home trips. These did not include home to school trips made by non-students.

HOUSEHOLD SIZE

The total number persons of all ages who resided in the household as reported during the recruitment call.

LICENSED DRIVERS

Respondents reported on the household form how many persons living in the household had a valid driver's license. The total number of licensed drivers per household was then calculated by adding all positive responses to this question for each household.

MULTIPLE-UNIT DWELLING

A household whose living quarters were reported as being an apartment, flat, condominium/townhouse, group quarters, or other.

NON-HOME-BASED WORK TRIPS

Those trips going to a workplace that originated from another place other than home or work to other place trips.

NON-HOME-BASED NON-WORK TRIPS

Those trips going to a place other than home or workplace (e.g., school, recreational places, restaurants, churches) that originated from another place other than workplace or home. These did not include pick-up, drop-off and rideshare activities.

NON-RESPONDENTS

Non-respondents were those households that were recruited for the study but did not provide complete information during retrieval. Four-or-more person households that provided no information on two or more members on diary day were also considered non-respondents.

RESPONDENTS

Respondents were those households recruited for the study that had complete or almost complete information on household, vehicle, person and activity. Four-or-more person households with missing information on one member were considered to be complete.

SINGLE-UNIT DWELLING

A household whose living quarters were reported as being a single-family detached house or mobile home.

TIGER FILE

The topologically integrated geographic encoded referencing (TIGER) system is produced by the U.S. Census Bureau. The TIGER file contains major road network, and socio-economic and natural resource boundaries.

TOTAL TRIPS

All trips made by all modes, including those made by walking (5 minutes or more) or bicycling. Based only on those trips that involved a valid change of location. Trip records that were missing either the origin or destination type were excluded.

TRANSIT TRIPS

Those trips where the respondent's mode of transportation was a bus (SMART, D-DOT, AATA, BWATC, LETS, and LETC). Transit trips did not include school bus, shuttle or campus bus, and taxi modes.

VEHICLE DRIVER TRIPS

Those trips where the respondent's mode of transportation was a car, minivan, van, light truck, carpool or vanpool, and the respondent was the driver.

VEHICLES

Vehicles included in this study included cars, minivans, vans, and light trucks. Not included are medium and heavy duty trucks, tractors or trailers.

VEHICLES AVAILABLE

The number of cars, minivans, vans, or light trucks owned, leased, or available to household members for travel, as determined during the recruitment telephone contact.

APPENDIX A: TELEPHONE SCRIPTS

SEMCOG RECRUITMENT SCRIPT

- A. Hello, my name is _____ from Interviewing Service of America, and we are conducting a survey for the Southeast Michigan Council of Governments, sometimes referred to as SEMCOG. This study is part of a series of surveys known as **TravelCount '94**, which will provide information that will improve transportation in your community. I would like to ask you a few questions and your answers will remain completely confidential. This will take about three minutes. Is this a good time or can I make an appointment with you for a more convenient time?

- 1 willing to continue
- 2 refusal
- 3 call back (at specific time)
- 4 call back (no specific time)
- 5 no answer
- 6 busy
- 7 answering machine
- 8 disconnected number
- 9 language barrier (not spanish)
- 10 language barrier (spanish)
- 11 business number
- 12 no such person
- 13 fax machine
- 99 all other reasons

1. Is this your RESIDENCE?

- 1 Yes
- 2 No (GO TO 1a)

1a. I'm sorry, this study is for residences only. Thank you for your time.

2. Are you 18 or older?

- 1 Yes
- 2 No (GO TO 2a.)

2a. May I speak with someone in your household who is 18 or older?

- 1 Adult available (Read A., Go to 3.)
- 2 Adult not home (arrange for call back)
- 3 Refused/No such person (terminate)

3. In order to verify that you are located within our study area, can you please give me the zip code of your home address?

_____ (99999=DON'T KNOW/REFUSED - TERMINATE)
(check against list, if OK, continue, if not, GO TO 3a.)

3a. I'm sorry, this study does not cover your area. Thank you for your time.

4. How many CARS, or MINIVANS are available to members of your household for travel?

0 None	6 Six
1 One	7 Seven
2 Two	8 Eight or more
3 Three	98 Refused (TERMINATE)
4 Four	99 Don't Know (TERMINATE)
5 Five	

5. How many LIGHT TRUCKS or VANS are available to household members?

0 None	6 Six
1 One	7 Seven
2 Two	8 Eight or more
3 Three	98 Refused (TERMINATE)
4 Four	99 Don't Know (TERMINATE)
5 Five	

6. How many MOTORCYCLES or MOPEDS are available to household members?

0 None	6 Six
1 One	7 Seven
2 Two	8 Eight or more
3 Three	98 Refused (TERMINATE)
4 Four	99 Don't Know (TERMINATE)
5 Five	

7. INCLUDING YOURSELF, how many people currently live in your household?

1 One	8 Eight
2 Two	9 Nine
3 Three	10 Ten or more
4 Four	98 Refused (TERMINATE)

- 5 Five
- 6 Six
- 7 Seven
- 99 Don't Know (TERMINATE)

8. How many are four years old or younger?

- 0 None
- 1 One
- 2 Two
- 3 Three
- 4 Four
- 5 Five
- 6 Six
- 7 Seven
- 8 Eight
- 9 Nine
- 10 Ten or more
- 98 Refused (TERMINATE)
- 99 Don't Know (TERMINATE)

9. That means that you have _____ members of your household five or older

- 1 Yes
- 2 No (Go to Q7)

The Southeast Michigan Council of Governments is conducting a comprehensive survey of travel patterns in the (Detroit/County name) area. In order to complete this survey, we would like you and the other members of your household to record your travel patterns for one day next week. We will send you a diary for each person in your household who is 5 or older to keep track of their activities during the designated day, then telephone you again to collect the information. When you get the diaries, please have everyone in your household, including yourself, fill them out next (Monday/Tuesday/Wednesday/Thursday/Friday).

To send the diaries, I need your mailing address.

- 1 willing to participate
- 2 declines/refuses to participate

INTERVIEWER: Please use all capital letters when collecting the following series of questions about name, address, etc. Check all spelling with respondent. You are creating a mailing label so be EXTREMELY CAREFUL! DO NOT USE ANY COMMAS IN ANY LABELS. i.e. SMITH, JOHN.

First I would like to confirm the zip code you gave me earlier. You told me that your home zip code was ____.

Is that correct? (If not, re-enter) 99999=DON'T KNOW/REFUSED

What City is that? _____ 99999=DON'T KNOW/REFUSED

And may I have the address?

Street number _____
Street prefix _____
Street name _____
Street suffix _____
Apt. number _____

And whose name should we put on the envelope? _____

**VERIFY ADDRESS BY READING INFORMATION BACK TO RESPONDENT
AND MAKE CORRECTIONS AS NECESSARY**

10. One final question. I will read a series of income ranges. Please stop me when I read the range that is closest to your household's total annual income before taxes.

- | | |
|----|-----------------------------|
| 1 | Less than 10 thousand |
| 2 | 10 thousand to \$14,999 |
| 3 | 15 thousand to \$24,999 |
| 4 | 25 thousand to \$34,999 |
| 5 | 35 thousand to \$49,999 |
| 6 | 50 thousand to \$74,999 |
| 7 | 75 thousand to \$99,999 |
| 8 | 100 thousand or more |
| 98 | Refused.....(don't read) |
| 99 | Don't Know.....(don't read) |

THANK YOU VERY MUCH for helping us in this study. We will call you the evening before your diary day to make sure you received your diaries and to answer your questions. We also want you to know that by providing complete and accurate diary information -- including full street addresses for your trips during that one day -- you will be improving the transportation system in Southeast Michigan.

If you have any questions or comments about this study, you can call the Survey Hotline at 1-800-961-3334.

INTERVIEWER: Thank you and have a nice evening (day).

SEMCOG REMINDER CALL SCRIPT

ASK TO SPEAK TO CONTACT PERSON. IF THE PERSON IS AVAILABLE OR THERE IS NO NAME ON THE LIST GO TO A, OTHERWISE GO TO B.

A. Hi, my name is _____ and I'm calling on behalf of the Southeast Michigan Council of Governments. We called last week and asked you and your household to participate in **TravelCount '94** by filling out one-day diaries, which we have sent you. Have you received a package from us in the mail?

- 1 Yes, received package
- 2 No, did not receive package
- 3 Have received, must reschedule day

OPTIONAL ANSWERING MACHINE MESSAGE:

Good evening. I am calling for the Southeast Michigan Council of Governments to check that you have received a survey package from us. If you didn't receive a package or have questions about how to fill it out, please call the survey hotline at 1-800-961-3334. If you call after business hours, please leave a message and we will call you back. We appreciate your help with this important survey. Please don't forget to fill out your diaries tomorrow. We will be calling the following evening to collect the information from you.

Thanks again and goodnight.

A2. Could you please find the package and bring it to the phone, so that I can explain what to do? This will only take about two minutes.

- 1 Respondent returned with the package (skip to A3.)
- 2 Know they have it but can't find the package
- 3 Had it, but thrown away, wants to do it
- 4 Had it/have it but refuses to participate
- 5 Already completed diaries
- 6 Has package, but doesn't want explanation

Please try and find the package tonight because tomorrow is your diary day. It is very important to fill out your diaries on your specific diary day. When you find the package, look through it carefully and call the survey hotline number included if you have any questions about it. The number is 1-800-961-3334.

Thank you for your help in this study.

A3. WHEN THEY RETURN WITH THE PACKAGE:

You should find each of the following items in the package. If you don't find any of them as I list them, please stop me and tell me what you're missing.

1. A letter of introduction
2. A short household survey form on a colored card
3. A diary for each person in your household who is 5 years old or older, and
4. A \$1 bill, enclosed as a token for our appreciation for your help.
5. (Do not read)...already completed diaries

Did you find everything? (IF NO, CHECK WHAT IS MISSING)

1. Letter of intro
2. Household form
3. Diaries-number missing
4. One dollar bill

Make sure that the person has checked the entire contents of the envelope.)

Now, would you please take out one of the diaries. It should be labeled _____ (MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY), which is tomorrow. When you're ready to use the diary, please write in tomorrow's date and fill in the rest of the blanks on the cover.

If you open to the first page inside, you will see a set of instructions for how to use the diary. The key things we need to know are the location of your activities during the day, how you got from one location to the next, and the time you started and stopped each activity.

If you turn the page, you will find a filled-in example of the "Activity Summary," which we provided to help you remember what you did during your diary day. The opposite page is the Activity Summary for you to fill out tomorrow.

On page 6, you will find the FIRST ACTIVITY page. Fill this page in for whatever you were doing at 3:00 am on your diary day. If you were sleeping, fill in AT HOME ACTIVITIES. The stop time will be the time you left your home to do something else. If you turn to the next page, you will see

a SECOND ACTIVITY page and a HOW I GOT HERE page. There is a set of these two pages for each activity that you marked down on the Activity Summary. The activity numbers are the same as the line numbers of the Activity Summary. On page 5 there are some additional hints on how to fill in your diary.

While filling out your diary, please remember that COMPLETE ADDRESS INFORMATION FOR EACH ACTIVITY IS VERY IMPORTANT. Whenever possible, please get the exact address of your location. If you cannot find the correct address, please write down the name of the place and the nearest cross-streets. Also PLEASE remember to RECORD THE TIME YOU ARRIVED AND LEFT EACH ACTIVITY.

Do you have any questions? **(IF QUESTIONS, ANSWER ANYTHING THEY ASK ABOUT THIS.)**

Please have an adult assist with or complete the diary for any children 5 years or older in your household. Once the diaries are completed, please place them near the telephone.

Now please look at the **HOUSEHOLD FORM** which is printed on the colored card. The questions on this form concern the characteristics of your household, and are very important for this study. Your answers are strictly confidential. The results of this study will be reported for groups of households only, never by individual households. Your name will not be forwarded to any public or private agency.

Do you have any questions regarding this form? **(IF QUESTIONS, ANSWER ANYTHING THEY ASK, IF YOU CAN, OR TAKE A PHONE NUMBER IF THEY HAVE QUESTIONS YOU CANNOT ANSWER.)**

When you have completed the household form, please leave it by the telephone. We will call you back to collect the information from the household form and diaries within two days after your assigned diary day

Please be sure that everyone in your household knows how to fill in the diary and check that they did it correctly before we call you. **Thank you for going through the materials with me. Again, let me stress the importance of GETTING COMPLETE AND ACCURATE STREET ADDRESSES** in order to improve your local transportation system. We look forward to talking with you again in a few days. Have nice evening (day).

A4. Since you haven't received the package we sent, I would like to check to make sure we have your correct address.

(Display Name)

(Display Address)

(Display City)

(Display Zipcode)

- 1 Name is incorrect
- 2 Address is incorrect
- 3 City is incorrect
- 4 Zipcode is incorrect
- 5 All are correct

(John - this is a continual loop until they hit 5. Input address the same way as it is in the recruitment - 5 fields)

If you receive the package during the next few days, please keep it until the next (MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY) and fill out the diaries then. We will call you again next (SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY) to make sure you got them and so that we can answer any questions you have. You should get the package very soon -
- thank you for helping. **(END RECALL, AND NOTE FOR CALLING BACK SAME DAY NEXT WEEK.)**

ALTERNATE INTRODUCTORY SCRIPT IF ORIGINAL RESPONDENT IS UNAVAILABLE

- B1.** Hi, my name is _____ and I'm calling on behalf of the Southeast Michigan Council of Governments. We called and spoke with _____ (NAME OR "SOMEONE IN YOUR HOUSEHOLD") last week about a survey we are conducting on transportation in the (Detroit/County Name) area.

I need to speak to an adult who is home now. Are you 18 or over?

(IF NO, ASK TO SPEAK WITH ANY ONE AT HOME NOW WHO IS 18 OR OVER. WHEN THAT PERSON COMES TO THE TELEPHONE, GO TO B1. IF NO ONE IS OVER 18, CONTINUE.)

When could I call back this evening and talk to someone who is 18 or older?

- B2.** We asked for your household's help by having everyone fill out one-day diaries, which we've sent you. Have you received a package from us? **(IF THEY HAVE, GO TO A2. IF THEY HAVE NOT, GO TO A4)**

SEMCOG RETRIEVAL SCRIPT with LOGIC CHECKS

ASK TO SPEAK TO _____(NAME) OR ADULT OVER 18.

Hello, my name is _____. I'm calling on behalf of the Southeast Michigan Council of Governments. We called you last week and asked you and your household to participate in TravelCount '94 by filling out one-day diaries, which we have sent you.

A. Have you and your household members completed the household form and diaries?

(If so)I need to collect the information over the phone.

- 1 Yes (continue now)
- 2 Yes (have diaries but call back later)
- 3 No
- 4 Never received package (**skip to C**)
- 5 Received incomplete package (**skip to E**)
- 6 Refused to fill out diaries (**skip to D**)

B. Do you have the forms there by the phone?

- 1 Yes
- 2 No **REQUEST RESPONDENT GET THE HOUSEHOLD FORM,
THEIR OWN DIARY AND THOSE OF THE OTHER MEMBERS
OF THE HOUSEHOLD**

1. I'd like to begin by collecting the information from the household form. Do you live in a:

- 1 Single-family detached house
- 2 Rowhouse or Duplex
- 3 Apartment or Flat Number of units (please specify) _____
- 4 Mobile home
- 5 Group quarters (dormitory, barracks)
- 6 Other (please specify) _____

2. How many people aged 5 or older, excluding temporary guests, were in your household on the day you filled out the diaries?

- | | | | |
|---|-----|---|-------|
| 1 | One | 7 | Seven |
| 2 | Two | 8 | Eight |

3	Three	9	Nine
4	Four	10	Ten or more
5	Five		
6	Six		

(Verify from the recruit data to the retrieve data the following:
Number of household members.
 If there is a discrepancy, we must probe, ask why?

(Please specify) _____

3. Turning to the inside of the Household Form, I would like to collect the information about each person in order. **REPEAT UP TO 10 TIMES.**

3a. For Person ____ (1,2,3,4,5,6,7,8,9,10), What is the year of birth? _____

(Year of Birth - Accept no household data information or diaries from individuals born from 1990 to present or prior to 1884.)

3b. What is the relationship of this person to you?

- | | | |
|---|-------------------|---------------------------------------|
| 1 | self | |
| 2 | spouse | |
| 3 | son/daughter | |
| 4 | father/mother | (Use this info to change following |
| 5 | brother/sister | questions for "you" or "this person") |
| 6 | other related | |
| 7 | other non-related | |
| 9 | refused | |

3c. What is (your/this person's) gender?

- | | | | |
|---|------|---|--------|
| 1 | male | 2 | female |
|---|------|---|--------|

3d. Are (you/they) enrolled in school?

- | | |
|----|--------------------------------|
| 1 | Not enrolled |
| 2 | Preschool/Nursery School |
| 3 | Kindergarten - 8th Grade |
| 4 | 9th - 12th Grade |
| 5 | College/Technical/Trade School |
| 9 | Don't Know |
| 10 | Refused |

(Do not accept Preschool/Nursery School enrollment from individuals born before 1986.

Do not accept Kindergarten - 8th Grade enrollment from individuals born before 1977.

Do not accept 9th - 12th Grade enrollment from individuals born after 1983.)

(Ask 3e through 3h of all household members 16 years and older -- year of birth 1978 or earlier)

3e. Do(es) (you/this person) have a valid driver's license?

- 1 yes
- 2 no

(Those with driver's license must be at least 16 years of age-- born in 1978 or earlier.)

3f. What is (your/this person's) employment status?

- 1 Employed full time (30 or more hours per week) **SKIP to 3fa**
- 2 Employed part time (less than 30 hours per week) **SKIP to 3fa**
- 4 Not employed - Retired
- 5 Not employed - Homemaker
- 6 Not employed - Student
- 7 Not employed - Seeking work
- 8 Don't know
- 9 Refused

If 4, 5, 6, 7, 8 or 9 - SKIP TO Q.4.

(Probe if those who are retired are less than 50 years of age -- born in 1944 or later.)

3fa. Do you/does this person have more than one job?

1

- 1 yes How many? 1 2 3 4 5 or more
- 2 no

3g. What is the industry of your/this person's primary job?

- 1 Construction
- 2 Manufacturing
- 3 Transportation/communication/utilities
- 4 Wholesale trade
- 5 Retail trade
- 6 Finance/insurance/real estate
- 7 Services (business, repair, personal, professional)
- 8 Government
- 9 Other (must specify _____)
- 10 Don't know
- 11 Refused

3h. In what type of building do you/does this person work?

- 1 **Office building** (including government building, post office, bank, medical building)
- 2 **Commercial building** (including store, shopping center/mall, restaurant, theater, hotel, services)
- 3 **School building** (including nursery school, elementary/secondary school, college/university)
- 4 **Hospital complex** (including medical/surgical building, urgent care clinic)
- 5 **Other institutional building** (including nursing home, church, museum, library, prison)
- 6 **Transportation/Communications/Utilities Facility** (including air/rail/bus/truck terminal, parking garage)
- 7 **Industrial Building** (including plant, factory, warehouse, equipment storage)
- 8 **Residential** (including house, apartment building, mobile home, retirement home)
- 9 **Other** (must specify _____)
- 10 Don't know
- 11 Refused

4. Turning to the back of the form, how many automobiles, minivans, vans and light trucks were available for use by members of your household on your diary day?

- | | | |
|----|------------|-------------------|
| 1 | Zero | SKIP TO Q5 |
| 2 | One | |
| 3 | Two | |
| 4 | Three | |
| 5 | Four | |
| 6 | Five | |
| 7 | Six | |
| 8 | Seven | |
| 9 | Eight | |
| 10 | Don't know | SKIP to Q5 |
| 11 | Refused | SKIP to Q5 |

(Verify -- Number of vehicles available for use by household members. If there is a discrepancy from the recruit number, we must probe. Ask why?)

5. What is the total annual income -- before taxes -- of your entire household, or your best guess if you're not sure?

- | | | | |
|---|----------------------|----|----------------------|
| 1 | Less than \$10,000 | 7 | \$75,000 to \$99,999 |
| 2 | \$10,000 to \$14,999 | 8 | \$100,000 or more |
| 3 | \$15,000 to \$24,999 | 9 | Don't know |
| 4 | \$25,000 to \$34,999 | 10 | Refused |
| 5 | \$35,000 to \$49,999 | | |
| 6 | \$50,000 to \$74,999 | | |

EXTRA - COMPLETE THIS QUESTION FOR HOUSEHOLDS WHO GAVE P.O. BOX NUMBERS FOR ADDRESS ON RECRUITMENT CALL.

Before I begin with each of the diaries, I need to collect your street address. When we called last week you provided us with a P.O. box number. We need your street address or the nearest cross-streets so that we can locate your household on a census tract. This information will not be used to send literature and your name and address will not be forwarded to any public or private agency. This information is very important.

Could I get your Street address: _____

Could I get your City and Zipcode): _____

9 Refused

Please program in the following for all Address Fields -

Number of fields for complete addresses: 5

Number	East/West/No./So.	Street Name	Ave./Dr./Blvd./St.	No./Apt./Suite
--------	-------------------	-------------	--------------------	----------------

Number of fields for cross-streets: 2 fields with three subfields each

For Street 1:	East/West/No./So.	Street Name	Ave./Dr./Blvd./St.
---------------	-------------------	-------------	--------------------

For Street 2:	East/West/No./So.	Street Name	Ave./Dr./Blvd./St.
---------------	-------------------	-------------	--------------------

6. Now I would like to get the Diary information for each person who completed a Diary. It will help if the Diaries are numbered by person in the same order as the Household Form.

Do you have a completed diary for Person Number __ (1,2,3,4,5,6,7,8,9,10)?

1 Yes (INTERVIEWER--PUNCH IN PERSON ID NUMBER--SKIP TO Q8.)

2 No SKIP to Q6a

6a. Is the incomplete diary yours?

1 Yes (SKIP TO Q7a.)

2 No

6b. Do you know if you/this person stayed at home all day or was out-of-town all day on your diary day?

1 Yes, stayed home all day (SKIP TO Q6b1.)

2 Yes, was out-of-town (SKIP TO Q7b.)

3 No, neither (SKIP TO Q6c)

4 Don't Know (SKIP TO Q6c)

6b1. Why was that person at home all day?

1 Temporary illness

2 Homebound (does not leave the house)

3 Fulltime homemaker

4 Employed and works out of home

5 Day off -- employed away from home

6 Vacation day

7 Other (specify) _____

(SKIP to Q7b)

6c. Is this person available to come to the phone to tell me what he or she did on your diary day?

- | | | |
|---|-----|----------------------|
| 1 | Yes | (SKIP TO 7c.) |
| 2 | No | |

6d. Do you know what this person did on your diary day?

- | | | |
|---|-----|----------------------|
| 1 | Yes | (SKIP TO 7d.) |
| 2 | No | (SKIP TO 7e.) |

7a. I would like to collect the information about your diary day right now over the telephone if you can remember what you did on your diary day.

- | | | |
|---|-------------------------------------|-----------------------|
| 1 | OK/can remember/willing to continue | (SKIP TO Q7d.) |
| 2 | Can't remember | (Go to 7a1.) |
| 3 | Refused | (Go to 7a1.) |

7a1. We would still like you to complete a diary for us next _____ (DIARY DAY). We will call you after _____ (DIARY DAY) to collect the information from you. **(GO BACK TO NEXT PERSON IN Q6.)**

7b. Since this person was (home all day/out of town all day), this is all the information we need about this person. **(GO BACK TO NEXT PERSON IN Q6.)**

7c. Since this person is available, I would first like to collect all the information you have at hand now. Once we have completed it, I would like to speak with this person to collect their information. **(GO BACK TO NEXT PERSON IN Q6.)**

7d. Since you are aware of what this person did on their diary day, I will go through all the questions with you.

7e. We will call back for this person's information within the next 48 hours. It is very important that this person complete his or her diary as soon as possible. We would appreciate anything you can do to encourage or help this person to complete their diary. **(SKIP BACK TO NEXT PERSON IN Q6.)**

8. Can you tell me what is entered in the space for "Today's Date?"

_____ month _____ date.

9. What is (your/this person's) Year of Birth? _____

(IF Q3f. IS 1 or 2, ASK THIS QUESTION, IF NOT SKIP TO Q11.)

10. Please give me the exact address or cross-streets of (your/this person's) workplace.

Street Address or Nearest Cross-streets (How is that spelled?): _____

Is that a street, boulevard, avenue or drive?

City/Town (How is that spelled?): _____

Zip Code _____

11. (IF Q3d. IS 2, 3, 4 or 5, ASK THIS QUESTION, IF NOT SKIP TO Q12.)

Please give me the exact address or cross-streets of your (this person's) school.

Street Address or Nearest Cross-streets (How is that spelled?): _____

Is that a street, boulevard, avenue or drive?

City/Town (How is that spelled?): _____

Zip Code _____

12. Now please turn to the First Activity page.

At 3:00 a.m. on _____ (TRAVEL DAY), what were (you/they) doing?

1 At home activities (includes sleeping, working at home)

Verify they were at home address. If yes, do not ask 13b and 13c.

Picking up or dropping off a person(s):

- 2 At work
- 3 At School/child care
- 4 Other

5 Work **Verify they were at work address. If yes, do not ask 13b and 13c.**

6 Work-related

7 School/College/University **Verify they were at school address. If yes, do not ask 13b and 13c.**

8 Child Care (Day Care/After-School Care)

9 Shopping

10 Social Activities/Recreation/Church/Eating Out

11 Banking/Personal Business

12 Bus Stop/Carpool/Vanpool/Park N Ride Activities

13 Other (please specific) _____

(The first activity must begin at 3 a.m. their Diary Day.)

(For all 3 a.m. activities other than "at home activities" and "work", probe:

"This means that at 3 a.m. you were _____"

1 Yes

2 No

If no, please correct activity.

13. What time did (you/they) leave there? _____

13a. Is that a.m. or p.m.? _____

(The clock time must be a real time, e.g. 11:30.

The hour column should range from 1 to 12.

The minutes column should range from 00 to 59.

CONVERT ALL TIME TO MILITARY TIME.)

13b. Where were you/they?

(Please specify business/store/place name)

13c. Please give me the exact address or cross-streets and the town:

Street Address or Cross-streets (How is that spelled?):

Is that street, boulevard, avenue, or drive? _____

City/Town (How is that spelled?): _____

13d. Was that the last thing you/this person did today?

1 Yes

Now I would like to get the Diary information from other household members who completed a Diary. **GO BACK to Q6**

2 No

(Diaries with zero trips should be asked Q6b--

Do you know if you/this person stayed at home all day or was out-of-town all day on your dairy day?

Diaries with zero trips must be programmed for review by a supervisor on a daily basis.)

14. Now let's turn to the Second (Third, Fourth, up to Fourteenth) Activity. REPEAT UP TO FOURTEEN TIMES

14a. What was the next thing (you/they) did?

1 At home activities (includes sleeping, working at home)

Verify they were at home. If yes, DO NOT ASK 14e and 14f.

Picking up or dropping off a person(s):

- 2 At work
- 3 At School/child care
- 4 Other

- 5 Work **Verify they were at work. If yes, DO NOT ASK 14e and 14f**
- 6 Work-related
- 7 School/College/University
- 8 Child Care (Day Care/After-School Care)
- 9 Shopping
- 10 Social Activities/Recreation/Church/Eating Out
- 11 Banking/Personal Business
- 12 Bus Stop/Carpool/Vanpool/Park N Ride Activities
- 13 Other (please specific) _____

(Respondents cannot have two or more consecutive "at home activities".)

(When someone states "work" for "What was the next thing you did?"-- Probe for additional trips made prior to work.)

Likewise, when someone leaves "work" -- probe for additional trips they made after work.

14b. What time did (you/they) arrive at this activity? _____

Was that a.m. or p.m.? _____

14c. What time did (you/they) leave?

Was that a.m. or p.m.? _____

(We must make sure that the time for "What time did you LEAVE there?" is prior to the next activities' "What time did you ARRIVE there?")

(The amount of time lapsed between arrive and leave on all pick ups and drop offs should be 60 minutes or less. If more, probe:

"This means that it took you _____ minutes to drop off/pick up someone?

- 1 yes
- 2 no

If no, get the correct times or activity type.)

(Likewise, if the time you leave an activity and the time you begin the next is less than 10 minutes, please add the following question:

"In other words, it took you ____ minutes to get there?"

- 1 yes
- 2 no

If they say no, return to both time questions and correct these.

- 14d. That means it took you ____ (insert difference between 14c and 14b) minutes to arrive at your next destination.

- 1 yes
- 2 no

If they say no, return to both time questions -- 14b and 14c -- and correct these.

- 14e. What was the name of the place? _____

- 14f. Please give me the exact address or cross-streets and the town:

Street Address or Cross-streets (How is that spelled?):

Is that street, boulevard, avenue, or drive? _____

City/Town (How is that spelled?): _____

15. How did (you/they) get there?

- | | | |
|---|--------------------------|----------------------|
| 1 | Walk (5 minutes or more) | SKIP to Q16 |
| 2 | Automobile/Minivan | SKIP to Q15a1 |
| 3 | Van/Light Truck | SKIP to Q15a1 |
| 4 | Carpool/Vanpool | SKIP to Q15a1 |

- | | | |
|----|------------------------------|---------------|
| 5 | Bus (SMART, DDOT, AATA) | SKIP to Q15b9 |
| 6 | Shuttle/Campus Bus | SKIP to Q16 |
| 7 | School Bus (K-12) | SKIP to Q16 |
| 8 | Taxi | SKIP to Q15b9 |
| 9 | Bicycle | SKIP to Q16 |
| 10 | Motorcycle/moped | SKIP to Q16 |
| 11 | Other (please specify) _____ | SKIP to Q16 |
| 12 | Don't Know | SKIP to Q16 |

(If respondents have no auto in household, and they say they drove somewhere, probe by asking:

"You reported having no automobiles in your household, was this a borrowed vehicle?"

- | | |
|---|-----|
| 1 | yes |
| 2 | no |

15a. In the _____ (from Q15 insert automobile/minivan, van/light truck, or carpool/vanpool) were you/was he/she the:

- | | |
|---|-----------|
| 1 | Passenger |
| 2 | Driver |

15b1. Including yourself or your household member, how many persons were in the vehicle?

(Please specify) _____

(If a person checks automobile/minivan, the number of persons in the vehicle should not exceed 12. If it does, probe:

"Let me verify that there were ____ people in your automobile or minivan."

- | | |
|---|-----|
| 1 | yes |
| 2 | no |

If no, correct the number of individuals in the automobile or minivan, or the type of vehicle.

IF PASSENGER, SKIP TO Q17.

15b3. Did you/they -- as the driver -- pay to park?

- 1 yes
- 2 no SKIP to 15b8
- 3 Don't know SKIP to 17

15b5 How much did you/they pay? (specific amount) \$ _____

15b6 Is this a:

- 1 Daily rate
- 2 Monthly rate
- 3 Yearly rate
- 4 Other _____
- 5 Don't know

15b9. You/they indicated _____ (from Q15, insert bus or taxi) how much did you/they pay (including the tip)? (Do not accept a range)

16. Ask only if the following THREE conditions are met:

The respondent is:

- OVER AGE 16 -- born 1978 or earlier -- WITH DRIVER'S LICENSE
- NON-DRIVER (from Q15a) and NON-MOTORCYCLE-MOPED RIDER (from Q15); and
- ENGAGED IN A WORK OR WORK-RELATED ACTIVITY (from Q12).

Was a vehicle available to you for the trip?

- 1 yes
- 2 no

17. Was this the last thing you/they did that day?

- 1 Yes
- 2 No **SKIP TO Q.14**

(Verify: The last activity's ending time is recorded at 3 a.m. the day following their Diary Day.)

FINAL THANK YOU

Thank you VERY MUCH for completing your one-day travel diary(ies). Please hold onto your diaries for two weeks in case we need to recontact you with a question. Thanks again and good night.

- C. Since you haven't received the package we sent, I would like to check to make sure we have your correct address.

What is the Street Address (How is that spelled?): _____

Is that a street, boulevard, avenue or drive? _____

Is there an apartment number? _____

City/Town (How is that spelled?): _____

Zip Code _____

If you get the package in the next few days, please keep it until the next (MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY) and fill them out then. We'll call you again next (SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY) to make sure you got them and so that we can answer any questions you have. You should get the package very soon -- thank you for helping us. **(END RECALL, AND NOTE FOR CALLING BACK SAME DAY NEXT WEEK.)**

- D. Your participation in this study is very important and will help agencies in Southeast Michigan make good decisions about improvements in transportation. Your input can still count if you and the rest of your household fill in your diaries next _____ (TRAVEL DAY). Are you willing to do this?

1 Yes

2 No (code as refused and skip next paragraph)

When you have completed the diaries and the household form, please place them near your telephone. We will call you back within 48 hours to collect the information from you. When would be a convenient time for us to call you?

Date: __/__/__ Time: __/__/__

Thank you very much for assisting us. Have a nice evening.

E. I would like to check with you to determine what was missing from the package.

- 1 A One-Day Diary for each person in your household who is 5 year old or older.

How many were missing? _____

- 2 A short household survey form on a colored card
- 3 A \$1 bill
- 4 Letter of Introduction

We will resend materials to you. If you get the package in the next few days, please keep it until the next (MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY) and fill them out then. We'll call you again next (SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY) to make sure you receive it in the mail and so that we can answer any questions you have. You should get the package very soon -- thank you for helping us. **(END RECALL, AND NOTE FOR CALLING BACK SAME DAY NEXT WEEK.)**

APPENDIX B: SURVEY INSTRUMENTS

TravelCount '94

A comprehensive travel survey in Greater Detroit TravelCount '94 hotline: **1-800-961-3334**

Dear Survey Participant,

Thank you for agreeing to participate in TravelCount '94, a most important transportation research effort.

Over the next 20 years, more than \$10 billion in federal transportation funds will be invested in Southeast Michigan. You will help make certain that money is spent wisely. Your participation in the 7,200-household survey by filling out a travel diary will help determine where and how improvements are made to our highways and freeways as well as improvements in safety, congestion management, public transit and other key elements of our transportation system.

Enclosed with this letter is a Fact Sheet about the overall research effort, in an easy-to-use Question and Answer format. If you have questions not answered by this letter or by the Fact Sheet, you may call a free TravelCount '94 hotline: **1-800-961-3334**.

Another important point: let me assure you that extraordinary measures are being taken to make certain your privacy is protected. All individual information from your travel diary will be blended into data from the other 7,200 diaries, then your individual identification will be destroyed. All reports from the research survey will include only the cumulative data — no individual information will ever be distributed.

Again, thank you for participating in this important effort. You will make a difference in how people travel in Southeast Michigan.

Sincerely,



Senator Carl Levin

TravelCount '94 is being conducted by SEMCOG, the Southeast Michigan Council of Governments, in conjunction with the Michigan Department of Transportation (MDOT), U.S. Department of Transportation, Detroit Department of Transportation (D-DOT), Suburban Mobility Authority for Regional Transportation (SMART), Ann Arbor Transportation Authority (AATA), Ann Arbor Ypsilanti Urban Area Transportation Study (AAYUATS), St. Clair County Transportation Study (SCCOTS).

TravelCount '94 c/o 660 Plaza Drive, Suite 1900 Detroit, MI 48226

TravelCount '94

A comprehensive travel survey in Greater Detroit TravelCount '94 hotline: 1-800-961-3334

Why TravelCount '94?

This Fact Sheet provides background information about TravelCount '94, a comprehensive transportation research project. If you have additional questions, please call the TravelCount '94 hotline, toll-free, at 1-800-961-3334.

Q. Why is TravelCount '94 happening?

A. Because more than \$10 billion in federal funds will be spent on transportation improvements over the next 20 years. This travel survey will make certain that money is spent efficiently and effectively, that your tax dollars are spent wisely.

Q. How many people are involved?

A. More than 50,000 in the four-part research effort. The basic TravelCount '94 origin-and-destination survey will cover 7,200 households in Greater Detroit, surveying the travel activities of approximately 18,000 people. In addition, another element will survey some 24,000 motorists traveling into or out of the metropolitan area; several hundred truck drivers will be surveyed about their travel activities; and, several thousand public transit riders will be surveyed.

Q. Is the information I provide kept confidential?

A. Absolutely. All individual information will be blended into the other survey data. No individual data will be distributed. In fact, once individual information has been transferred to the cumulative files, individual identification will be removed. No individual travel activities or household schedules will be distributed.

Q. Why do I need to keep a travel diary for everyone in my household, even the kids?

A. Because the travel activities of everyone are important in understanding where people travel, why they make their trips and how they travel — by car, van, bus, bicycle, carpool, etc.

TravelCount '94 is being conducted by SEMCOG, the Southeast Michigan Council of Governments, in conjunction with the Michigan Department of Transportation (MDOT), U.S. Department of Transportation, Detroit Department of Transportation (D-DOT), Suburban Mobility Authority for Regional Transportation (SMART), Ann Arbor Transportation Authority (AATA), Ann Arbor Ypsilanti Urban Area Transportation Study (AAYUATS), St. Clair County Transportation Study (SCCOTS).

TravelCount '94 c/o 660 Plaza Drive, Suite 1900 Detroit, MI 48226

Q. Who is doing this transportation research?

A. There are several partners. The household survey is being done by a contractor working for SEMCOG, the Southeast Michigan Council of Governments. Other parts of the overall research are being done by the Michigan Department of Transportation and by the SMART and Detroit public transit agencies. Another important partner is the federal government, through the Department of Transportation's Federal Highway Administration, which is paying for the research effort.

Q. How much money is involved?

A. Well, the survey research itself will cost \$1 million. More importantly, the results will guide the expenditure of more than \$10 billion in federal transportation funds for Southeast Michigan over the next 20 years. The research cost is an investment on efficient and effective use of that \$10 billion, making certain it is used wisely on behalf of the 4.8 million people who live in Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw and Wayne Counties.

Q. How can information about 50,000 people tell you about 4.8 million?

A. Careful mathematical analysis tells us that sampling that many people reflects the activities of everyone in the region, in much the same way that a blood sample tells a doctor about all of a person's blood. Similar sampling has proven effective in identifying television viewing habits in the nation, for example, and is the basis for the U.S. Census taken every 10 years.

Q. Why was I chosen?

A. By random selection from everyone with a telephone. That random selection is the key to sampling — it does not emphasize any type of household or discriminate against any segment of the population.

Q. Will we ever know the results?

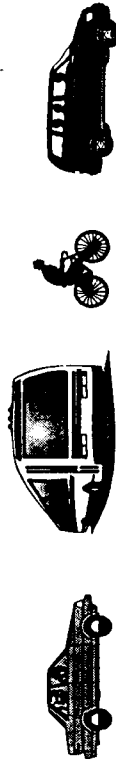
A. Yes. While the primary purpose of all this information gathering is for transportation planning at the federal, state, county and local levels, highlights of the research will be published by SEMCOG later this year.

Again, if you have additional questions,
you may call our toll-free TravelCount '94 hotline: 1-800-961-3334.

Travel Count '94

1994 Southeast Michigan
Council of Governments

Household Travel Survey



Please help us by having one person in the household fill out this form. Your answers are completely confidential and will help us provide better transportation to your community. Please answer all the questions as completely as you can.

1.

Do you live in a:

- ☐ Single-family detached house
- ☐ Rowhouse or Duplex
- ☐ Apartment or Flat (Number of units _____)
- ☐ Mobile home
- ☐ Group quarters (dormitory, barracks)
- ☐ Other _____

2.

How many people age 5 and older, excluding temporary guests, were in your household on the day you filled out the One-Day Diaries? (Please check ONE only)

- | | |
|--------------------------------|--------------------------------------|
| <input type="checkbox"/> One | <input type="checkbox"/> Six |
| <input type="checkbox"/> Two | <input type="checkbox"/> Seven |
| <input type="checkbox"/> Three | <input type="checkbox"/> Eight |
| <input type="checkbox"/> Four | <input type="checkbox"/> Nine |
| <input type="checkbox"/> Five | <input type="checkbox"/> Ten or more |

OVER →

4.

How many automobiles, vans and light trucks were available for use by members of your household on your Diary Day?

- | | |
|--------------------------------|--|
| <input type="checkbox"/> One | <input type="checkbox"/> Five |
| <input type="checkbox"/> Two | <input type="checkbox"/> Six |
| <input type="checkbox"/> Three | <input type="checkbox"/> Seven |
| <input type="checkbox"/> Four | <input type="checkbox"/> Eight or more |

5.

What is the total annual income before taxes of your entire household (or your best guess if you're not sure)?

- ☐ Less than \$10,000
- ☐ \$10,000 - \$14,999
- ☐ \$15,000 - \$24,999
- ☐ \$25,000 - \$34,999
- ☐ \$35,000 - \$49,999
- ☐ \$50,000 - \$74,999
- ☐ \$75,000 - \$99,999
- ☐ \$100,000 or more

If you have any questions about this form or the study, please call toll free:

1-800-961-3334

Thank you
for your help!

2 Please complete a separate column for each person age 5 and older in the household.

[illegible]

TravelCount '94

1994 Southeast Michigan
Council of Governments
Household Travel Survey



One-Day Diary
for
Wednesday

Today's Date:

/ /94

Month Date Year

Year of Birth:

Are you: ☐ Male ☐ Female

Instructions

Please use the Summary of Activities on Page 4 during your diary day to record what you do. Then turn to page 6 and complete the survey to record more specific information on what you did and how you got there for each activity on the Summary of Activities.



Thank You

for agreeing to participate in this important study for Southeast Michigan.

Your Information Counts!

No matter how much or how little you travel, YOU ARE IMPORTANT. You are one of the few people selected to help us understand travel patterns in Southeast Michigan.

By completing this ONE-DAY DIARY, you will be providing information that will help make improvements in transportation in Southeast Michigan. Please fill out the diary as COMPLETELY AS POSSIBLE.

Every time you stop to do something at a different location, that's an activity.

For example, all of the following are separate activities:

- ▲ Dropping someone off or picking someone up
- ▲ Eating at a restaurant
- ▲ Visiting friends or going to the movies
- ▲ Dentist or doctor appointments
- ▲ Shopping or running errands (bank, cleaners)
- ▲ Stopping to buy gas
- ▲ Waiting at a bus stop
- ▲ Parking at a Park N Ride

QUESTIONS?

Call toll-free:
1-800-961-3334



For each activity you do today, please record:

Start/Arrive Time

Write down when you started doing each activity

Activity

Write down each thing you did outside the home and each time you came back home (excluding travel)
See page 5 for helpful hints

End/Leave Time

Write down when you finished doing each activity

Activity Summary

How to fill out the Activity Summary

#	Start Time	Activity (Please don't record travel)	End Time
1	3:00am	At home	6:40
2	7:05	Dropped kids at school	7:10
3	7:56	At work	10:15
4	10:30	Meeting at City Hall	12:30
5	12:45	Lunch downtown	1:30
6	1:40	Got cash at ATM	1:42
7	2:00	At work	5:00
8	5:40	Picked up dry cleaning	5:45
9	5:45	Bought birthday card	5:55
10	6:25	At home	3:00am
11			
12			

Do not include travel as an activity



Summary of Activities

Please fill out during your Diary Day

#	Start Time	Activity (Please do not record travel)	End Time
1	3:00am		
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Please turn the page for more help.

Hints

on How to Fill Out Your One-Day Diary

▲ DO NOT INCLUDE TRAVEL ▲

When recording ACTIVITIES, do not include travel to and from the places you go as an activity.

▲ WALKING and JOGGING ▲

Walking for exercise, jogging in your neighborhood, and walking the dog are AT HOME ACTIVITIES.

▲ DRIVING for a LIVING ▲

If your work involves constant travel - truck driver, traveling sales person, mail delivery - tell us about where and when you STARTED WORK, where and when you ENDED WORK, and if you did any personal chores during the day between work stops.

▲ BUYING GAS, BANKING, etc. ▲

If you stop to buy gas, mail letters, do some banking at an ATM, or any other brief stop in your day, please fill out an activity and travel page about it.

▲ LEAVING TOWN OVERNIGHT? ▲

If you leave the Southeast Michigan area on your Diary Day and will be gone OVERNIGHT or longer, please write in LEAVING THE AREA as the LAST THING you do.

1st Activity

1. What were you doing at 3 a.m.? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	At Work <input type="checkbox"/>
	At School/Child Care <input type="checkbox"/>
	Other <input type="checkbox"/>
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify) _____	

2. What time did you ARRIVE there? ☒ a.m. ☐ p.m.

What time did you LEAVE there? : ☐ a.m. ☐ p.m.

3. WHERE were you?

Business/Store/Place Name _____

Address or Nearest Cross-streets _____

City/Town _____

2nd Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	<input type="checkbox"/> At Work <input type="checkbox"/> At School/Child Care <input type="checkbox"/> Other
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify) _____	

2. What time did you ARRIVE there?

<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
---	--

What time did you LEAVE there?

<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
---	--

3. WHERE were you?

Business/Store/Place Name
Address or Nearest Cross-streets
City/Town

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>	
Automobile/Minivan:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger	Including yourself, how many persons were in the vehicle? <input type="text"/>
Van/Light Truck:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger	Including yourself, how many persons were in the vehicle? <input type="text"/>
Carpool/Vanpool:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger	Including yourself, how many persons were in the vehicle? <input type="text"/>
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>	
Shuttle/Campus Bus	<input type="checkbox"/>	
School Bus (K-12)	<input type="checkbox"/>	
Taxi	<input type="checkbox"/>	
Bicycle	<input type="checkbox"/>	
Motorcycle/moped	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle?	<input type="checkbox"/> Yes <input type="checkbox"/> No
How much did you pay?	Is this an <input type="checkbox"/> Hourly Rate? <input type="checkbox"/> Daily Rate? <input type="checkbox"/> Weekly Rate? <input type="checkbox"/> Monthly Rate? <input type="checkbox"/> Other _____

6. If you checked bus or taxi:

How much was your fare?	\$ <input type="text"/>
-------------------------	-------------------------

7. Was this the last activity you did today?

Yes <input type="checkbox"/>	STOP! Please turn to the inside back cover
No <input type="checkbox"/>	Please turn to next page →

3rd Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	
At Work	<input type="checkbox"/>
At School/Child Care	<input type="checkbox"/>
Other	<input type="checkbox"/>
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify)	

2. What time did you ARRIVE there? : a.m. ☐ p.m. ☐

What time did you LEAVE there? : a.m. ☐ p.m. ☐

3. WHERE were you?

Business/Store/Place Name

Address or Nearest Cross-streets

City/Town

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>
Automobile/Minivan:	
Driver	<input type="checkbox"/>
Passenger	<input type="checkbox"/>
Van/Light Truck:	
Driver	<input type="checkbox"/>
Passenger	<input type="checkbox"/>
Carpool/Vanpool:	
Driver	<input type="checkbox"/>
Passenger	<input type="checkbox"/>
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>
Shuttle/Campus Bus	<input type="checkbox"/>
School Bus (K-12)	<input type="checkbox"/>
Taxi	<input type="checkbox"/>
Bicycle	<input type="checkbox"/>
Motorcycle/moped	<input type="checkbox"/>
Other	<input type="checkbox"/>

Including yourself, how many persons were in the vehicle?

Including yourself, how many persons were in the vehicle?

Including yourself, how many persons were in the vehicle?

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? Is this an \$

☐ Hourly Rate? ☐ Daily Rate?

☐ Weekly Rate? ☐ Monthly Rate?

☐ Other

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOPI Please turn to the inside back cover

No ☐ Please turn to next page ➡

4th Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)		<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	At Work	<input type="checkbox"/>
	At School/Child Care	<input type="checkbox"/>
	Other	<input type="checkbox"/>
Work		<input type="checkbox"/>
Work-Related		<input type="checkbox"/>
School/College/University		<input type="checkbox"/>
Child Care (Day Care/After-School Care)		<input type="checkbox"/>
Shopping		<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out		<input type="checkbox"/>
Banking/Personal Business		<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities		<input type="checkbox"/>
Other (Please Specify)		

2. What time did you ARRIVE there? ☐ a.m. ☐ p.m.

What time did you LEAVE there? ☐ a.m. ☐ p.m.

3. WHERE were you?

Business/Store/Place Name

Address or Nearest Cross-streets

City/Town

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>	
Automobile/Minivan:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
	Passenger <input type="checkbox"/>	
Van/Light Truck:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
	Passenger <input type="checkbox"/>	
Carpool/Vanpool:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
	Passenger <input type="checkbox"/>	
Bus (SMART, DDOT, AAIA)	<input type="checkbox"/>	
Shuttle/Campus Bus	<input type="checkbox"/>	
School Bus (K-12)	<input type="checkbox"/>	
Taxi	<input type="checkbox"/>	
Bicycle	<input type="checkbox"/>	
Motorcycle/moped	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? Is this an

☐ Hourly Rate? ☐ Daily Rate?

☐ Weekly Rate? ☐ Monthly Rate?

☐ Other

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOP! Please turn to the inside back cover

No ☐ Please turn to next page →

5th Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	<input type="checkbox"/> At Work <input type="checkbox"/> At School/Child Care <input type="checkbox"/> Other
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other. (Please Specify)	<input type="text"/>

2. What time did you ARRIVE there?

<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
---	--

What time did you LEAVE there?

<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
---	--

3. WHERE were you?

Business/Store/Place Name	<input type="text"/>
Address or Nearest Cross-streets	<input type="text"/>
City/Town	<input type="text"/>

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>	
Automobile/Minivan:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger	Including yourself, how many persons were in the vehicle? <input type="text"/>
Van/Light Truck:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger	Including yourself, how many persons were in the vehicle? <input type="text"/>
Carpool/Vanpool:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger	Including yourself, how many persons were in the vehicle? <input type="text"/>
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>	
Shuttle/Campus Bus	<input type="checkbox"/>	
School Bus (K-12)	<input type="checkbox"/>	
Taxi	<input type="checkbox"/>	
Bicycle	<input type="checkbox"/>	
Motorcycle/moped	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? \$

Is this an

☐ Hourly Rate? ☐ Daily Rate?
☐ Weekly Rate? ☐ Monthly Rate?
☐ Other

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOP! Please turn to the inside back cover
 No ☐ Please turn to next page →

6th Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	<input type="checkbox"/> At Work <input type="checkbox"/> At School/Child Care <input type="checkbox"/> Other
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify) _____	

2. What time did you ARRIVE there? : a.m. ☐ p.m. ☐

What time did you LEAVE there? : a.m. ☐ p.m. ☐

3. WHERE were you?

Business/Store/Place Name _____

Address or Nearest Cross-streets _____

City/Town _____

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>	
Automobile/Minivan:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger	<input type="checkbox"/> Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
Van/Light Truck:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger	<input type="checkbox"/> Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
Carpool/Vanpool:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger	<input type="checkbox"/> Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>	
Shuttle/Campus Bus	<input type="checkbox"/>	
School Bus (K-12)	<input type="checkbox"/>	
Taxi	<input type="checkbox"/>	
Bicycle	<input type="checkbox"/>	
Motorcycle/moped	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? \$ **Is this an**

☐ Hourly Rate? ☐ Daily Rate?
☐ Weekly Rate? ☐ Monthly Rate?
☐ Other _____

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOP! Please turn to the inside back cover

No ☐ Please turn to next page ➡

7th Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	<input type="checkbox"/>
At Work	<input type="checkbox"/>
At School/Child Care	<input type="checkbox"/>
Other	<input type="checkbox"/>
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify)	<input type="text"/>

2. What time did you ARRIVE there? : a.m. ☐ p.m.

What time did you LEAVE there? : a.m. ☐ p.m.

3. WHERE were you?

Business/Store/Place Name

Address or Nearest Cross-streets

City/Town

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>	
Automobile/Minivan:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="text"/>
	Passenger <input type="checkbox"/>	
Van/Light Truck:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="text"/>
	Passenger <input type="checkbox"/>	
Carpool/Vanpool:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="text"/>
	Passenger <input type="checkbox"/>	
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>	
Shuttle/Campus Bus	<input type="checkbox"/>	
School Bus (K-12)	<input type="checkbox"/>	
Taxi	<input type="checkbox"/>	
Bicycle	<input type="checkbox"/>	
Motorcycle/moped	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? \$ **Is this an**

☐ Hourly Rate? ☐ Daily Rate?

☐ Weekly Rate? ☐ Monthly Rate?

☐ Other

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOP! Please turn to the inside back cover

No ☐ Please turn to next page ➡

8th Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	<input type="checkbox"/>
At Work	<input type="checkbox"/>
At School/Child Care	<input type="checkbox"/>
Other	<input type="checkbox"/>
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify) _____	<input type="checkbox"/>

2. What time did you ARRIVE there? : a.m. ☐ p.m. ☐

What time did you LEAVE there? : a.m. ☐ p.m. ☐

3. WHERE were you?

Business/Store/Place Name _____

Address or Nearest Cross-streets _____

City/Town _____

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>	
Automobile/Minivan:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
	Passenger <input type="checkbox"/>	
Van/Light Truck:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
	Passenger <input type="checkbox"/>	
Carpool/Vanpool:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
	Passenger <input type="checkbox"/>	
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>	
Shuttle/Campus Bus	<input type="checkbox"/>	
School Bus (K-12)	<input type="checkbox"/>	
Taxi	<input type="checkbox"/>	
Bicycle	<input type="checkbox"/>	
Motorcycle/moped	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? \$ **Is this an**

☐ Hourly Rate? ☐ Daily Rate?

☐ Weekly Rate? ☐ Monthly Rate?

☐ Other _____

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOPI Please turn to the inside back cover

No ☐ Please turn to next page ➡

9th Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	<input type="checkbox"/>
At Work	<input type="checkbox"/>
At School/Child Care	<input type="checkbox"/>
Other	<input type="checkbox"/>
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify)	<input type="text"/>

2. What time did you ARRIVE there?

: ☐ a.m. ☐ p.m.

What time did you LEAVE there?

: ☐ a.m. ☐ p.m.

3. WHERE were you?

Business/Store/Place Name

Address or Nearest Cross-streets

City/Town

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>	
Automobile/Minivan:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="text"/>
	Passenger <input type="checkbox"/>	
Van/Light Truck:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="text"/>
	Passenger <input type="checkbox"/>	
Carpool/Vanpool:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="text"/>
	Passenger <input type="checkbox"/>	
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>	
Shuttle/Campus Bus	<input type="checkbox"/>	
School Bus (K-12)	<input type="checkbox"/>	
Taxi	<input type="checkbox"/>	
Bicycle	<input type="checkbox"/>	
Motorcycle/moped	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

5. if you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? Is this an

\$ ☐ Hourly Rate? ☐ Daily Rate?
☐ Weekly Rate? ☐ Monthly Rate?
☐ Other

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOPI Please turn to the inside back cover

No ☐ Please turn to next page ➡

10th Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	<input type="checkbox"/> At Work <input type="checkbox"/> At School/Child Care <input type="checkbox"/> Other
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify) _____	

2. What time did you ARRIVE there? : a.m. ☐ p.m.

What time did you LEAVE there? : a.m. ☐ p.m.

3. WHERE were you?

Business/Store/Place Name _____

Address or Nearest Cross-streets _____

City/Town _____

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>
Automobile/Minivan:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger
Van/Light Truck:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger
Carpool/Vanpool:	<input type="checkbox"/> Driver <input type="checkbox"/> Passenger
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>
Shuttle/Campus Bus	<input type="checkbox"/>
School Bus (K-12)	<input type="checkbox"/>
Taxi	<input type="checkbox"/>
Bicycle	<input type="checkbox"/>
Motorcycle/moped	<input type="checkbox"/>
Other	<input type="checkbox"/>

Including yourself, how many persons were in the vehicle? ☐

Including yourself, how many persons were in the vehicle? ☐

Including yourself, how many persons were in the vehicle? ☐

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? \$

Is this an

☐ Hourly Rate? ☐ Daily Rate?
☐ Weekly Rate? ☐ Monthly Rate?
☐ Other _____

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOPI Please turn to the inside back cover
 No ☐ Please turn to next page ➔

17th Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	<input type="checkbox"/>
At Work	<input type="checkbox"/>
At School/Child Care	<input type="checkbox"/>
Other	<input type="checkbox"/>
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify) _____	<input type="checkbox"/>

2. What time did you ARRIVE there? : a.m. ☐ p.m. ☐

What time did you LEAVE there? : a.m. ☐ p.m. ☐

3. WHERE were you?

Business/Store/Place Name _____

Address or Nearest Cross-streets _____

City/Town _____

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>	
Automobile/Minivan:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
	Passenger <input type="checkbox"/>	
Van/Light Truck:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
	Passenger <input type="checkbox"/>	
Carpool/Vanpool:	Driver <input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
	Passenger <input type="checkbox"/>	
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>	
Shuttle/Campus Bus	<input type="checkbox"/>	
School Bus (K-12)	<input type="checkbox"/>	
Taxi	<input type="checkbox"/>	
Bicycle	<input type="checkbox"/>	
Motorcycle/moped	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? \$

Is this an

<input type="checkbox"/> Hourly Rate?	<input type="checkbox"/> Daily Rate?
<input type="checkbox"/> Weekly Rate?	<input type="checkbox"/> Monthly Rate?
<input type="checkbox"/> Other _____	

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOPI Please turn to the inside back cover

No ☐ Please turn to next page ➔

12th Activity

1. What was the next thing you did? (Check ONE only)

At Home Activities (including sleeping, working at home)	<input type="checkbox"/>
Pick Up or Drop Off a Person(s)	<input type="checkbox"/>
At Work	<input type="checkbox"/>
At School/Child Care	<input type="checkbox"/>
Other	<input type="checkbox"/>
Work	<input type="checkbox"/>
Work-Related	<input type="checkbox"/>
School/College/University	<input type="checkbox"/>
Child Care (Day Care/After-School Care)	<input type="checkbox"/>
Shopping	<input type="checkbox"/>
Social Activities/Recreation/Church/Eating Out	<input type="checkbox"/>
Banking/Personal Business	<input type="checkbox"/>
Bus Stop/Carpool/Vanpool/Park N Ride Activities	<input type="checkbox"/>
Other (Please Specify) _____	

2. What time did you ARRIVE there? : a.m. ☐ p.m. ☐

What time did you LEAVE there? : a.m. ☐ p.m. ☐

3. WHERE were you?

Business/Store/Place Name _____

Address or Nearest Cross-streets _____

City/Town _____

4. How did you get there? (Please check)

Walk (5 minutes or more)	<input type="checkbox"/>	
Automobile/Minivan: Driver	<input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
Passenger	<input type="checkbox"/>	
Van/Light Truck: Driver	<input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
Passenger	<input type="checkbox"/>	
Carpool/Vanpool: Driver	<input type="checkbox"/>	Including yourself, how many persons were in the vehicle? <input type="checkbox"/>
Passenger	<input type="checkbox"/>	
Bus (SMART, DDOT, AATA)	<input type="checkbox"/>	
Shuttle/Campus Bus	<input type="checkbox"/>	
School Bus (K-12)	<input type="checkbox"/>	
Taxi	<input type="checkbox"/>	
Bicycle	<input type="checkbox"/>	
Motorcycle/moped	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

5. If you checked Automobile/Minivan, Van/Light Truck or Carpool/Vanpool and you were the driver:

Did you pay to park your vehicle? ☐ Yes ☐ No

How much did you pay? \$ Is this an ☐ Hourly Rate? ☐ Daily Rate?
☐ Weekly Rate? ☐ Monthly Rate?
☐ Other _____

6. If you checked bus or taxi:

How much was your fare? \$

7. Was this the last activity you did today?

Yes ☐ STOPI Please turn to the inside back cover
 No ☐ Please turn to next page ➡

For More than 12 Activities



Please use this space to keep track of all activities beyond the 12 recorded in this Diary.

This concludes your One-Day Diary



Please go back over your Activity Summary to be sure you included all of your activities.



In the next few days, you will receive a phone call to collect this information.

Thank you!

TravelCount '94

This study is being conducted by SEMCOG, the Southeast Michigan Council of Governments, in conjunction with:

Michigan Department of Transportation (MDOT)

U.S. Department of Transportation

Detroit Department of Transportation (D-DOT)

Suburban Mobility Authority for Regional Transportation (SMART)

Ann Arbor Transportation Authority (AATA)

Ann Arbor Ypsilanti Urban Area Transportation Study (AAYUATS)

St. Clair Transportation Study (SCOTS)

START

Start using your ONE-DAY DIARY
at 3 a.m. on

Wednesday

FINISH

Finish using your ONE-DAY DIARY
at 3 a.m. on

Thursday

APPENDIX C: TECHNICAL MEMORANDUM: DATA EXPANSION AND ADJUSTMENT

TECHNICAL MEMORANDUM

SURVEY DATA EXPANSION AND ADJUSTMENT

PREPARED BY

PlanTRANS

PREPARED FOR

SEMCOG

JANUARY, 1995

SURVEY DATA EXPANSION AND ADJUSTMENT

Expanding Survey Data

THEORY OF SURVEY-DATA EXPANSION

The aim of data expansion is to estimate factors to be applied to each survey observation so that, using the factors, the survey data provide statistical totals that equal the totals of the population from which the sample was drawn. In very simple terms, if the sample was drawn as a simple random sample, there was no nonresponse to the survey, and the sample was a true equal probability sample, then the expansion factor to apply to each survey observation would be N/n , where N is the population of the surveyed region, and n is the number of observations in the sample. Thus, for the 1994 *Travel Count*, for which the final sample is 7,401 households and the estimated population of the SEMCOG region is 1,758,769 households, a simple random sample would produce an expansion factor to apply to each survey observation of 237.64 (i.e., $1,758,769/7,401$). This means that, on the average, each surveyed household represents approximately 238 regional households. By applying such a factor to each household statistic, all values would sum to the total of 1,758,769 households. Of course, there is also a sampling error associated with each statistic that should be estimated and described with the expanded statistic, to show the uncertainty that exists in the statistics, based on the fact that only a sample of households was used for the measurements on household characteristics.

When a more complex sampling strategy is used, as in the case of the *Travel Count* survey, and when there is also nonresponse in the survey that is distributed disproportionately among households, it is no longer possible to derive a single expansion factor to apply to the sample data. Instead, it becomes necessary to develop a number of factors, based on the realized sampling rates for each population segment used in the sampling design. Under these circumstances, it is necessary to estimate the population in each segment used to control sampling and then to compute an expansion factor based on the number of households actually sampled in each segment. Thus, if the j th segment has a regional population of N_j and a sample of n_j was achieved in that segment, the expansion factor for the segment is N_j/n_j . It should be

clear that this will still lead to estimation of population totals, identical to the process described in the preceding paragraph, by considering the following:

$$\left(\frac{N_1}{n_1}\right)*n_1 + \left(\frac{N_2}{n_2}\right)*n_2 + \dots + \left(\frac{N_J}{n_J}\right)*n_J = N_1 + N_2 + \dots + N_J = N$$

where it is assumed that there are J segments of the population and N is the total regional population.

There is one additional immediate concern with expansion. Any cell of a sampling design that is empty of observations in the survey cannot be expanded. Therefore, if expansion is to be performed across cells that may be empty, computation of the expansion factors as listed above will result in an expanded population total that is less than the actual population. This might occur, for example, if sampling were performed for household size by vehicle availability by geographic area, but that the sampling strategy was to draw a sample of zero-car households without regard to size, within each geographic area. If a full matrix of households by geography, size, and vehicle ownership is used for expansion purposes, some cells of the zero-car households may be empty for certain household sizes in one or more geographic areas. Expansion at this more disaggregated level than the original sampling will then generate a loss of total expanded data, as a result of the inability to expand empty cells. Such a procedure is quite acceptable, and will have the effect of causing the expanded sample to replicate the division of households among the household-size categories more correctly than if a single expansion factor were applied to all zero-car households. However, the resulting loss of sample can be corrected by determining the shortfall in total households in those cells and adjusting the factors in the cells that do have sample observations.

It is important to note that this adjustment process will not produce correct totals by geographic area. To obtain correct totals by geographic area will require that individual cell values are no longer correct, in order that total households by each of household size and vehicle ownership are correct in each geographic unit. It is suggested that this may not be worth doing if the population by geographic unit is in error by less than 1 percent, particularly where population data are estimates in the first instance.

EXPANDING THE *TRAVEL COUNT* DATA

To expand the *Travel Count* data, SEMCOG produced estimated cross-tabulations of households in each of the seven counties covered by the survey, with Wayne County split into metropolitan Detroit and the remainder of Wayne County (referred to in the following tabulations as "Out-Wayne"). The cross-tabulations provided estimated numbers of households by vehicles owned and household size, with categories of vehicle ownership of 0, 1, 2, and 3 or more, and categories of household size of 1, 2, 3, 4, and 5 or more. The estimated numbers were developed from the 1990 census data and projected to 1994, with the distributions of households by household characteristics being assumed generally to be the same as in 1990. The tabulations provided the full matrix of household sizes by vehicle ownership, although the sampling design aggregated a number of cells together. The relationship between the sample design and the full matrix is shown in Table 1. Table 1 shows the ten categories used for sampling purposes.

Table 1

Sample Design Categories Related to Household Size and Vehicle Ownership

Vehicles	Household Size				
	1	2	3	4	5+
0	1	1	1	1	1
1	2	3	4	5	5
2	2	6	7	8	8
3+	2	6	9	10	10

As can be seen from this table, sampling was done for zero-car households without regard for household size, for one-person households with one or more cars, without regard to number of cars, for two-person multi-car households without regard to number of cars, and for multi-car households with four or more people, without regard to number of persons in the household. These groupings allow the potential that any of these cells that are undifferentiated in the sampling scheme may contain no sampled households. There are, therefore, two alternative procedures that can be used to expand the data. Under the first, expansion is done strictly for the sampling scheme on a county-by-county basis. This procedure will achieve correct total households in each county by using those households that appear in the multiple-cell sampling groups to produce the correct group totals. The second procedure is to expand on a cell-by-cell basis and refactor each undercounted cell, so that total row and column values are preserved over

the region, at the expense of achieving correct population totals in each county. A good illustration of the differences is shown in Tables 2, 3, and 4. Table 2 shows the estimated current household distribution in Monroe County, as estimated by SEMCOG. Table 3 shows the distribution obtained under the first method of expanding according to the sampling scheme. In Monroe, there were several empty cells in the non-car-owning households, as is shown by the zero entries.

Table 2

Estimated Distribution of Households in Monroe County

AUTOS		One person 1	Two persons 2	Three persons 3	Four persons 4	Five+ persons 5	Row Total
Zero autos	0	1630	380	252	70	33	2365
One auto	1	5949	4322	1807	983	1002	14063
Two autos	2	1297	8144	4259	4448	2803	20951
Three+ autos	3+	287	2057	3068	3575	3064	12051
Column Total		9163	14903	9386	9076	6902	49430

Table 3

Expansion Based on Sampling Scheme for Monroe County

Vehicle		One person 1	Two persons 2	Three persons 3	Four persons 4	Five+ persons 5+	Total
	0	1183	1183	0	0	0	2366
	1	5919	4322	1807	1489	496	14033
	2	807	7201	4259	5146	2105	19518
	3+	807	3000	3068	3734	2905	13514
Total		8716	15706	9134	10369	5506	49431

It can be seen that the population estimate for the county is correct in Table 3 (with rounding errors having produced one extra household. However, the row and column totals are not correct for the county, because of the combined cells in the sampling scheme. In the two non-zero cells of the non-car-owning households, equal samples were obtained and these produce

equal estimates of household numbers, although the actual population shows a preponderance of one-person households and non-zero numbers for the remaining cells that decline with increasing household size. Similarly, the sample contained equal numbers of households in the 1-person multi-car cells, yielding equal estimates of households in these two cells, while the actual population distribution shows declining numbers of one-person households with increasing numbers of vehicles. Because of sample distributions compared to incidence in individual cells, several of the other combined cells show different distributions from the estimated population.

Table 4 shows the results of expanding the sample for Monroe County on the basis of all cells, irrespective of the sampling scheme. Table 4 is the result after factoring all counties to produce correct cell totals for the region.

Table 4
Cell-By-Cell Expansion of the Monroe County Sample

Vehicles	One person 1	Two persons 2	Three persons 3	Four persons 4	Five+ persons 5+	Total
0	1630	382	0	0	0	2012
1	5949	4322	1833	983	1002	14089
2	1297	8144	4259	4448	2803	20951
3+	300	2057	3068	3575	3064	12064
Total	9176	14905	9160	9006	6869	49116

In contrast to Table 3, this expansion method produces almost the exact cell values of the estimated distribution, and provides row and column totals that are very close. Small discrepancies occur in those cells that were factored to reproduce regional totals, e.g., one-person households with 3+ cars, and three-person households with one car. The total population is too low in this table, because of the zeros in the sample for the three larger household-size groups with no cars. The fact that the zero samples in these cells cannot be expanded creates a shortfall of 355 households, of which 41 are added back by overestimates in other cells, leaving a net shortfall of 314 households, or 0.64%.

Overall, the cell-by-cell method produces more satisfactory results, if the concern is with reproducing distributions of households correctly, rather than exact county population totals. Applying this method, only Livingston County has more than a one percent discrepancy in population total and shows an actual total of 4.14% undercount, resulting from there being six

empty cells in the sample distribution. These cells are all non-car-owning households except one-person households, one-person households with 3 or more cars, and three-person households with one car. In this case, because of the missing cells, even the total county population is not replicated by expansion against the sampling scheme. The reason for this is the zero sample in the 3-person, 1-car households, which is an empty solo cell. In other words, there ended up being no sample in one cell in this county where multiple-cell sampling was not part of the design. The shortfall for this cell cannot be made up by overcompensating on another cell. For this county, the comparisons are shown in Tables 5, 6, and 7.

Table 5

Estimated Distribution of Households for Livingston County

VEHICLES	One person 1	Two persons 2	Three persons 3	Four persons 4	Five+ persons 5	Row Total
Zero autos 0	655	230	96	152	96	1229
One auto 1	5102	2754	889	589	346	9680
Two autos 2	906	8013	3394	4496	2745	19554
Three+ autos 3+	296	2183	3936	4373	2978	13766
Column Total	6959	13180	8315	9610	6165	44229

Table 6

Expansion of Livingston County Sample by Sampling Scheme

Vehicle	One person 1	Two persons 2	Three persons 3	Four persons 4	Five+ persons 5+	Total
0	1229	0	0	0	0	1229
1	5370	2754	0	312	623	9059
2	934	6062	3394	5310	1931	17631
3+	0	4134	3936	4656	2695	15421
Total	7533	12950	7330	10278	5249	43340

Comparing Tables 5 and 6, it can be seen that the column totals are distinctly different between the expanded data and the estimated true distribution. The row totals are also in error, although by somewhat smaller amounts. Only three cells of Table 6 show matching values to Table 5, although relative magnitudes of most pairs of cells that were jointly sampled are in reasonable agreement.

Table 7

Expansion of Livingston County Sample on a Cell-By-Cell Basis

Vehicles	One person 1	Two persons 2	Three persons 3	Four persons 4	Five+ persons 5+	Total
0	655	0	0	0	0	655
1	5102	2754	0	589	346	8791
2	906	8013	3394	4496	2745	19554
3+	0	2183	3936	4373	2978	13470
Total	6663	12950	7330	9458	6069	42470

Table 7 also shows discrepancies on most row and column totals, although there is closer agreement between Tables 7 and 5 on most totals. However, the major contrast is that thirteen of the cells in Table 7 are identical in value to Table 5, compared to the three of Table 6. Table 6 has a 2.0% shortfall of total population, while Table 7 has a 4.1% shortfall. The major source of this problem is the 889 households in the 3-person, 1-car households, which cannot be expanded nor compensated in the factoring. These households are the 2.0% deficit of Table 6 and are 2.0% of the 4.1% in Table 7.

On balance, the cell-by-cell expansion seems to be superior to expansion by the sampling scheme, particularly where analysis will concentrate on using the households by household size and vehicle ownership. It is therefore the recommended basis for the sampling factors and these factors are used for the remainder of this report. A complete set of the expansion factors is provided in Appendix A of this Technical Memorandum.

Adjusting Expanded Survey Data

THEORY AND RATIONALE FOR ADJUSTING EXPANDED DATA

As seen in the preceding section, expansion of the sample data does not guarantee replication of the original distributions of households, particularly where the sampling design allowed certain cells of a distribution to be empty on the characteristics used for sampling. It should be clear that, if the distributions of the characteristics used for sampling cannot be replicated accurately, there is considerable reason to suppose that other variables of interest will have distributions that are different from the expected population. The discrepancies in the distributions will arise for two reasons. First, even when a cell total on the sampling characteristics is represented correctly, there is likely to be a mismatch on other characteristics of the households in that cell, simply because no control of the distribution of households was made in the sampling process. Second, when the cell total is incorrect on the characteristics used for sampling, there is an even greater likelihood that the underlying distributions of other characteristics of the households in the sample will not match the distributions in the population.

A numerical mismatch between expanded survey data and actual data is an expected and normal occurrence. Even if the distribution of the sample were to match very closely that of the population, numerical mismatches would be certain to occur, simply because the sample cannot be expanded exactly and precisely into every cell of the distribution. For example, if the expansion factor for a particular cell is 236, then only multiples of 236 can be generated in that cell of the expanded data. An exact numerical match will occur, therefore, only when the original distribution contains a number that is an exact multiple of 236, which is highly unlikely to occur. Therefore, the requirement for determining if adjustment of expanded data is necessary is to perform statistical tests of significance between the expanded data and the expected sample distributions. The most stringent test of match between expanded and expected distributions is obtained if the expanded survey data are cross-tabulated by the original sampling variables and by the criterion variable against which adjustment might be needed. In other words, if sampling was performed by household size and vehicle availability, and income is a criterion variable against which adjustment is to be assessed, then the most stringent requirement is that a match is obtained by cross-tabulating vehicle availability and household size within each income category.

To determine if adjustment of the expanded survey data is necessary, a statistical test is needed between the expected and expanded distributions. The most obvious candidate test is the chi-

square (χ^2) test for significant differences between the "observed" (expanded data) and expected distributions. The χ^2 statistic has one serious disadvantage, however. The statistic is affected by the numeric size of the numbers used in the distribution, although these numbers do not affect the degrees of freedom of the test. For example, the χ^2 statistic will take different values for a difference between 0.9 and 1.0, 9 and 10, 900 and 1,000, etc., even though these represent the same percentage error. Two options exist for handling this. The first is to standardize all distributions to percentage values, so that the test is for a significant *percentage* difference between the distributions. The second is to use a non-parametric test, such as the Kolmogorov-Smirnov test. Non-parametric statistics are unaffected by the order of magnitude of the values in the distributions being compared and provide a better test in the case of such numbers as are dealt with in county population distributions. In this application, both tests are used and a decision to adjust is based on both tests showing a statistically-significant difference, i.e., the χ^2 test statistic, based on percentages, and the Kolmogorov-Smirnov test must both show a statistically-significant difference.

The Kolmogorov-Smirnov test is based on cumulative distributions of the observed and expected data. There are two possible ways to cumulate values in the data, when a natural order for cumulation does not exist. Values can be cumulated either across the rows of a two-way distribution or down the columns. Both are valid and the two methods will not yield the same values for the Kolmogorov-Smirnov statistic. Therefore, both cumulative procedures are used and, if either one yields a statistically-significant result, and the χ^2 statistic is also significant, then the distribution is considered to be significantly different. The Kolmogorov Smirnov test is given by:

$$D = \max |F(x) - S_n(x)| = k/\sqrt{n}$$

where:

D	=	test statistic value
$F(x)$	=	cumulative expected (theoretical) distribution function of x
$S_n(x)$	=	sample cumulative distribution function based on n observations
k	=	the Kolmogorov-Smirnov numerator for the chosen level of significance

Values of k are available in certain statistics texts. At 0.01 significance, k is equal to 1.63, and is 1.36 for 0.05 significance.

Once a need for adjustment is determined, the procedure is to calculate adjustment factors through iterative row and column balancing. For example, assume that the sampling scheme was by household size and vehicle ownership, and the criterion variable is income quartile. The columns of a table will be the household sizes and the rows are vehicle ownership levels. A table is produced for each county and each income quartile. Initially, the columns of each table are adjusted to have the correct totals, by multiplying the cells in each column by the ratio of the expected total to the observed total. This will have the effect of creating a mismatch between

the row totals. At the second iteration, the row totals are similarly adjusted by multiplying through the row by the ratio of the expected row total to the current row total. The two steps of column and row adjustment are repeated in sequence, until the adjusted totals are no more than a criterion percentage in error, e.g., no more than 10% in error. This would be determined when the ratios for multiplication are all equal to or less than 1.10 for a 10% error criterion.

ADJUSTING THE *TRAVELCOUNT* DATA

Initially, data were intended to be expanded first by urban/rural classifications and then by the remaining variables listed in this section of the report. However, because of geocoding, the initial factoring started with income, and urban/rural was dealt with at the last step.

Income

The first step in testing the need for income adjustments was to perform the statistical tests, as described in the preceding section. The results of the statistical tests are shown in Table 8. As the Table shows, the two tests are frequently not in agreement on significance, which is not surprising because the Chi-Square test is parametric and tests for individual differences between cells, while the Kolmogorov-Smirnov is non-parametric and tests for differences in the cumulative distributions.

Table 8 shows that only a restricted number of income quartiles by county need adjustment for the distributions to be not statistically different from the expected distributions. Specifically, adjustments are required only in Washtenaw, Wayne (both in Detroit and in the remainder of the county), Macomb, and Oakland counties. A total of eight of the 32 income distributions are targeted for adjustment. However, Applying factoring only to these cells results in severe imbalances in county totals and totals by household size and vehicles. Therefore, although theoretically there is no need to readjust all of the remaining cells, a full adjustment procedure was applied. This adjustment was performed by finding the ratio of the cell value in the estimated distribution provided by SEMCOG to the value obtained by cross-tabulating the expanded sample data from the survey.

Each cell of each table received a separate adjustment factor in this process, resulting in 640 (eight county subdivisions times five household-size groups times four vehicle-ownership groups times four income quartiles, or $8 \times 5 \times 4 \times 4$) distinct adjustment factors (less those for any rows of the tables that do not exist in the sample data, e.g., certain zero-car-owning households in specific income quartiles). In addition, the survey data contain a number of households with missing income. Adjustments to take these into account and not violate county control totals was done by assuming that the missing data would be distributed by income quartile identically to those households that answered the income question. Based on this, the adjustment factors for

Table 8

Results of Statistical Tests of Significance for Income

County	Income Quartile	Chi-Square	Kolmogorov-Smirnov		Adjustment Required
			By Column	By Row	
Monroe	1	<0.00%	>20.00%	>20.00%	No
	2	<0.00%	>20.00%	>20.00%	No
	3	0.87%	>20.00%	>20.00%	No
	4	9.75%	>20.00%	>20.00%	No
Washtenaw	1	1.60%	>20.00%	20.00%	No
	2	85.97%	>20.00%	>20.00%	No
	3	0.58%	5.00%	5.00%	Yes
	4	40.99%	>20.00%	15.00%	No
Detroit	1	61.13%	1.00%	10.00%	No
	2	86.80%	10.00%	10.00%	No
	3	63.42%	>20.00%	>20.00%	No
	4	0.00%	1.00%	1.00%	Yes
Out-Wayne	1	79.52%	>20.00%	>20.00%	No
	2	73.16%	5.00%	1.00%	Yes
	3	55.36%	5.00%	1.00%	Yes
	4	38.01%	1.00%	1.00%	Yes
Macomb	1	67.00%	>20.00%	>20.00%	No
	2	35.36%	>20.00%	>20.00%	No
	3	29.24%	1.00%	1.00%	Yes
	4	50.49%	10.00%	10.00%	Yes
Oakland	1	9.29%	>20.00%	20.00%	No
	2	19.80%	5.00%	1.00%	Yes
	3	93.93%	20.00%	>20.00%	No
	4	96.15%	>20.00%	15.00%	No
Livingston	1	0.00%	>20.00%	>20.00%	No
	2	0.03%	>20.00%	>20.00%	No
	3	0.06%	20.00%	>20.00%	No
	4	3.88%	>20.00%	>20.00%	No
St. Clair	1	0.29%	>20.00%	>20.00%	No
	2	0.02%	>20.00%	>20.00%	No
	3	0.00%	20.00%	>20.00%	No
	4	0.00%	>20.00%	>20.00%	No

all cells where income was measured were reduced by the fraction of missing households, and average factors were applied to the households with missing income.

Dwelling Units

Given the determination that selective adjustment would provide ill-conditioned tables, the subsequent adjustment procedures were automatically undertaken without statistical tests of significant differences between the estimated and expanded samples. The second variable for which adjustments were computed was that of dwelling type, for which there were two groups only – single family and other. Adjustment was performed using first a set of cross tabulations by county, household size, vehicle ownership, and dwelling type, using the adjusted expansion factors from the income adjustments. In effect, this process leads to estimating the marginal adjustments required to bring dwelling-unit distributions into line, following the adjustments for income.

This process resulted in generating a new set of 320 expansion factors (8 county subdivisions times five household-size groups times four vehicle-ownership groups times two dwelling-type groups). In this instance, there were no missing data, so expansion proceeded by the simple computation of ratios of the estimated distribution to the survey distribution, as obtained following income adjustment. This procedure, of course, will no longer maintain precise fit to the income distributions, which could be achieved only through one of two processes. Either the estimated data from SEMCOG would need to be provided as four-way cross-tabulations by county (Vehicle ownership by household size by income by dwelling type) which would result in a formidable number of 64 cross-tabulation tables each containing 20 cells and generating a potential for 1280 adjustment factors, or a series of row and column balancing procedures would need to be applied alternately to income and dwelling type, to average the effects of the two. Neither of these complex processes were deemed necessary to use.

Workers

The next variable to be used for expansion was that of the number of workers in the household, for which there are four categories, representing zero, one, two, and three or more workers. The procedure applied was identical to that described for dwelling type, again with no missing data present in the survey data. Because there are four categories of workers per household, this process generated another 640 adjustment factors. Adjustments were computed based on the prior expansion and adjustment for both income and dwelling type.

Life-Cycle Stage

There are five life-cycle stages defined in the data, and once again no missing data on this variable in the sample data. The same procedure was again applied to this variable, working on cross-tabulations generated from the sample data expanded and adjusted for each of income,

dwelling type, and workers. This procedure generated a further 800 adjustment factors, which are applied as a product with the previously expanded and adjusted factors.

Final Adjusted, Expanded Data

Once these four variables had been used for adjustment purposes, a final adjustment was required in order to reestablish correct county totals. This occurs because each of the stages of adjustment is not constrained to produce the correct total numbers of households by county, nor for the region as a whole. This results from the presence of zeros in a few cells of each set of cross-tabulations. If every cell contained at least one sample observation, then county totals would be maintained throughout the process. However, if a cell turns up empty for, say, a specific life-cycle group in a particular county for a specific vehicle ownership and household size, then the resulting table will not balance out to the county total. Because a sample could not be reasonably controlled to this fine level of detail, there are sporadic zero cells throughout the cross-tabulations.

Therefore, as the final step in the process, the county totals are reapplied by adjusting county-by-county to produce the exact county populations. The resulting factors are again multiplied by the compound expansion and adjustment factors determined through the prior steps. At this point, some comparisons were made between the data immediately following expansion only and the data following application of the entire series of adjustments. It was noted that the majority of differences between the estimated distributions and the distributions after applying all expansion and adjustment factors were smaller than the differences obtained after applying expansion only. This was checked only on the cross-tabulations with income, which, being the first adjustment to have been made, will exhibit the biggest deviations from an exact distribution. For example, for the Detroit area, the differences in total numbers of households in each income quartile dropped to about one-half to one-third of their values prior to adjustment. There are, of course, considerable variations on a cell-by-cell basis, but the adjusted data are generally closer to the estimated distributions than the data after expansion alone.

Also, comparisons were made between the county-by-county results after all adjustments and the expected distributions. These showed again that there is reasonable correspondence between the final results and the input estimated distributions. Monroe county has the worst results, primarily because of some cells that are empty in the sample data. For this county, row and column totals for vehicle ownership and household size range from 2% to 42% in error, the latter occurring for households with each of four and five or more persons, where the four-person households are overestimated and five-person are underestimated. This is not readily corrected, because of the sample design that combined these two household size groups for all car ownership levels and therefore forces the two groups to compensate each other. However, if the two groups are combined, as they were for sampling purposes, the combined error is 2%. For the remainder, the average error is about 13%. In most other counties, row and column totals are generally in error by less than 10%.

Urban/Rural

Because of delays in geocoding, this was tackled as an adjustment variable only after all the other variables had been used. However, it was found that a small number of households had insufficient data to allow geocoding to a traffic analysis zone, with the result that, following geocoding, the sample size had changed. Therefore, all of the prior steps were repeated with the reduced sample size, and with urban/rural used as the first adjustment variable. In this process, the exact same procedure was used as for the preceding steps, in which cross-tabulations were generated by vehicles, household size, urban/rural status, and county, and adjustment factors calculated to match the distribution provided by SEMCOG. This was performed with new, revised expansion factors, based on the new smaller sample. Following this, each of the remaining steps were performed in order, adjusting for income, dwelling units, workers, and life-cycle stage. The final step of rebalancing to county totals was then performed. Appendix A contains the resulting factors from this final step.

Conclusions

A set of expansion factors was computed for the sample data, based on the distributions provided by SEMCOG from updated census data, compared against the survey data. Expansion factors were computed by county and within county by vehicle-ownership and household-size groups. A series of adjustments were performed on the expanded data with the purpose of bringing distributions on other underlying variables, not used in the sampling, more into conformity with the expected distributions based on census data. Generally, these adjustments, applied in a composite process, provide results that are slightly to significantly better approximations to the census distributions than can be obtained from the simple expansion of the survey data.

Revisions can be made to the existing adjustments, if new information is obtained on the estimated distributions, simply by substituting into the appropriate computations the new distribution data. Similarly, additional adjustment factors can be computed by continuing the process described in this document for other variables. However, it is necessary to keep in mind that the more adjustments that are made, the more likely it is that deviations will begin to occur in specific cells of the data. In addition, the value of applying a very large number of adjusted expansion factors is clearly an issue. Currently, this process has resulted in approximately 160 separate adjustment factors for each county, vehicle-ownership group, and household-size group, or a total of 25,600 potential adjustment factors. (With a sample of 7,000 households, many of these will not be used, because they represent combinations of values that do not exist in the sample, and often do not exist in the population.) However, the potential for every observation

ADJUSTED EXPANSION FACTORS

Income	County	Vehicle Group	House-hold Size Group	Dwelling Type Group	Workers Group	Life Cycle	Expansion Factor	Final Factor
4.00	1	3	1	1	0	5	211.7891	4.5429
2.00	8	2	1	1	0	5	95.2500	10.0796
1.00	7	3	5	2	1	2	270.7273	10.6748
4.00	8	1	3	1	2	1	91.4106	11.9205
3.00	8	2	1	1	0	5	95.2500	13.1848
2.00	4	3	5	1	1	2	267.4151	13.4380
4.00	3	3	2	1	1	2	258.0000	13.9383
4.00	8	1	4	1	2	1	113.6667	14.0141
4.00	5	3	1	1	1	4	99.9728	14.1614
4.00	1	1	4	1	3	1	97.2027	14.5061
1.00	1	3	4	1	2	2	350.7000	15.2174
4.00	2	3	1	1	0	4	94.7888	15.3780
3.00	3	3	2	1	1	2	258.0000	15.5771
1.00	1	3	4	1	0	1	350.7000	15.8849
2.00	6	1	4	1	1	4	156.6250	18.5093
3.00	8	1	3	1	1	1	91.4106	18.9427
4.00	8	1	4	2	1	1	113.6667	19.1520
2.00	2	3	1	2	0	4	94.7888	19.2500
2.00	6	2	2	1	1	2	345.0741	19.5253
4.00	1	1	4	1	3	2	97.2027	20.4647
.00	8	2	1	1	0	5	95.2500	20.9539
4.00	2	1	4	1	2	1	149.7059	21.2559
1.00	1	3	2	2	0	2	319.3846	21.4453
4.00	1	1	3	1	2	2	69.3113	21.5235
4.00	2	1	2	1	1	4	177.4977	22.0811
2.00	1	1	4	2	3	1	97.2027	22.5781
1.00	3	0	3	2	1	1	451.9405	22.6508
4.00	1	1	2	1	2	2	239.6335	22.6552
3.00	2	3	1	2	1	4	94.7888	22.8324
4.00	8	1	3	1	2	2	91.4106	23.0147
4.00	8	1	5	1	1	1	168.6667	23.3033
2.00	8	1	3	1	1	1	91.4106	23.5723
2.00	1	1	3	1	3	2	69.3113	23.7260
2.00	1	1	4	1	3	2	97.2027	24.1401
2.00	1	1	3	1	2	2	69.3113	24.5138
1.00	4	3	4	1	0	1	190.0333	24.5797
4.00	2	1	4	1	0	1	149.7059	24.7854
4.00	2	1	2	1	1	2	177.4977	24.8686
4.00	1	1	3	1	1	2	69.3113	25.0181
.00	8	1	3	1	2	1	91.4106	25.1179
4.00	8	0	2	1	2	4	132.3737	25.4198
3.00	6	1	5	2	1	1	170.0000	25.4463
4.00	2	1	3	1	2	2	214.5873	25.4742
3.00	6	3	1	1	1	4	67.1420	25.5832
2.00	4	3	5	1	0	2	267.4151	25.7372
4.00	1	0	2	1	2	4	272.6745	25.9143
4.00	4	3	4	1	1	2	190.0333	26.8853
2.00	6	3	2	1	2	4	104.4211	26.9402
2.00	1	1	3	1	2	1	69.3113	27.0815
2.00	5	3	3	1	1	2	98.9677	27.1227
4.00	7	1	2	1	2	4	211.8462	27.2818
3.00	4	3	4	1	0	4	190.0333	27.5528
3.00	5	3	4	1	1	2	198.6111	27.5608
4.00	5	3	3	1	1	2	98.9677	27.9717
1.00	1	1	3	1	2	1	69.3113	28.2058
3.00	6	1	5	1	1	1	170.0000	28.2394
4.00	2	1	2	2	1	4	177.4977	28.3574
4.00	4	3	2	1	0	4	262.1379	28.4323
2.00	1	1	3	1	1	2	69.3113	28.4939
.00	1	1	3	1	2	2	69.3113	28.5555
4.00	2	1	3	1	2	4	214.5873	29.1903
4.00	1	0	2	1	1	2	272.6745	29.3263
3.00	6	3	3	2	1	2	98.0323	29.3290
4.00	2	1	5	1	1	1	203.8276	29.4270
1.00	1	1	3	1	1	2	69.3113	29.6769
2.00	8	2	1	2	1	5	95.2500	29.7443
4.00	1	1	2	1	1	2	239.6335	29.7528
4.00	6	3	3	1	2	2	98.0323	29.9650
3.00	5	3	1	1	1	4	99.9728	30.1862
4.00	2	1	2	1	2	4	177.4977	30.4750
.00	5	0	2	1	1	4	76.4379	30.6141
3.00	1	1	4	1	3	1	97.2027	30.8092
3.00	5	3	3	2	1	4	98.9677	30.8895
4.00	6	2	1	1	1	4	95.2500	31.0000

4.00	8	2	5	1	2	1	157.3200	31.2777
4.00	2	1	2	1	0	4	177.4977	31.2972
2.00	8	2	1	1	1	4	95.2500	31.3954
2.00	1	1	3	1	1	1	69.3113	31.4785
.00	1	1	3	1	2	1	69.3113	31.5465
4.00	7	1	5	1	2	1	173.0000	31.8885
4.00	8	1	3	1	3	4	91.4106	32.0442
4.00	4	3	1	2	1	4	127.6076	32.0609
4.00	2	1	4	1	1	1	149.7059	32.7404
1.00	1	1	3	1	1	1	69.3113	32.7854
4.00	1	2	1	2	1	4	266.9583	33.1372
.00	1	1	3	1	1	2	69.3113	33.1918
2.00	2	0	4	2	1	1	253.4849	33.3848
4.00	4	1	2	1	2	4	193.6812	33.5407
1.00	3	3	1	2	0	5	96.4895	33.6487
4.00	8	1	1	1	1	4	141.1364	33.6591
4.00	5	1	3	1	3	2	203.6419	34.1437
.00	2	3	1	2	1	4	94.7888	34.2626
4.00	1	2	1	1	1	4	266.9583	34.3799
4.00	8	3	4	1	3	2	142.1842	34.6713
.00	3	3	1	2	0	5	96.4895	35.2083
1.00	8	1	3	1	1	1	91.4106	35.8871
4.00	2	1	3	1	0	1	214.5873	36.1452
3.00	8	1	3	1	2	2	91.4106	36.5721
.00	1	1	3	1	1	1	69.3113	36.6685
4.00	8	0	2	2	2	3	132.3737	36.8042
4.00	6	1	3	2	2	1	176.9047	36.8956
1.00	5	0	2	2	0	2	76.4379	36.9311
2.00	1	0	2	1	1	4	272.6745	37.0451
1.00	3	3	1	1	0	4	96.4895	37.6557
1.00	3	3	4	1	0	2	247.9394	37.8837
4.00	2	3	1	1	1	4	94.7888	37.9447
2.00	4	3	4	1	1	2	190.0333	38.0658
4.00	2	1	3	2	3	4	214.5873	38.3644
3.00	1	1	3	1	2	2	69.3113	38.4440
1.00	8	2	5	1	1	1	157.3200	38.5751
4.00	3	3	4	1	1	2	247.9394	38.6980
2.00	4	3	4	2	1	2	190.0333	39.0804
4.00	2	1	2	2	2	4	177.4977	39.1373
2.00	1	3	4	1	0	2	350.7000	39.2901
4.00	4	1	2	2	1	2	193.6812	39.4395
4.00	3	3	5	2	3	2	283.9000	39.4900
4.00	6	3	1	1	1	4	67.1420	39.5687
4.00	8	1	1	2	1	4	141.1364	40.0080
3.00	3	3	1	1	0	4	96.4895	40.0725
2.00	6	2	1	1	0	4	95.8333	40.1491
2.00	1	0	2	1	2	4	272.6745	40.1889
4.00	2	1	2	2	0	4	177.4977	40.1932
4.00	1	1	3	1	0	1	69.3113	40.4711
2.00	1	3	2	1	1	2	319.3846	40.6236
3.00	8	2	1	1	1	4	95.2500	41.0673
.00	8	3	4	1	2	2	142.1842	41.0740
4.00	1	1	4	1	2	1	97.2027	41.1338
3.00	6	1	4	1	0	4	156.6250	41.2150
4.00	6	0	3	1	2	4	573.8605	41.3476
4.00	6	3	5	1	3	2	162.2667	41.3594
4.00	2	1	4	1	3	2	149.7059	41.3968
4.00	1	1	3	1	3	4	69.3113	41.6684
2.00	1	1	3	1	0	2	69.3113	41.7235
2.00	1	1	3	2	2	2	69.3113	42.0827
4.00	2	1	5	1	2	1	203.8276	42.1611
1.00	1	1	3	2	3	2	69.3113	42.4212
3.00	1	1	3	1	2	1	69.3113	42.4708
3.00	6	3	4	1	2	2	190.5000	42.6112
2.00	4	3	5	1	3	2	267.4151	42.9348
4.00	1	1	3	1	2	4	69.3113	43.0520
2.00	8	0	4	1	1	1	167.3000	43.2633
3.00	8	3	4	1	1	2	142.1842	43.3167
3.00	2	1	4	1	2	1	149.7059	43.3493
4.00	8	3	1	1	1	4	59.5657	43.4363
1.00	1	1	3	1	0	2	69.3113	43.4556
3.00	1	1	4	1	3	2	97.2027	43.4646
4.00	4	3	5	1	1	2	267.4151	43.5127
4.00	5	1	1	1	1	4	270.4091	43.5414
2.00	7	3	5	1	1	2	270.7273	43.7529
4.00	4				1	4	127.6076	43.7924

1.00	1	1	3	2	2	2	69.3113	43.8298
4.00	3	3	5	2	1	2	283.9000	44.1158
4.00	3	3	3	1	1	2	153.4579	44.3450
4.00	4	3	4	1	2	2	190.0333	44.5787
3.00	1	1	3	1	1	2	69.3113	44.6859
4.00	1	1	4	1	1	1	97.2027	44.9736
1.00	4	1	2	1	2	2	193.6812	45.0318
.00	6	3	3	1	3	2	98.0323	45.2765
2.00	1	0	2	1	1	2	272.6745	45.4803
2.00	8	1	3	1	3	2	91.4106	45.5104
2.00	6	3	5	1	2	2	162.2667	45.5950
4.00	4	3	4	1	3	2	190.0333	45.8781
.00	5	3	4	1	1	2	198.6111	46.0451
2.00	1	1	3	1	0	1	69.3113	46.0938
2.00	1	1	3	2	2	1	69.3113	46.4906
4.00	8	1	1	2	1	3	141.1364	46.5755
2.00	8	0	2	1	1	3	132.3737	46.7044
4.00	2	1	4	1	2	2	149.7059	46.7810
2.00	6	2	1	1	0	5	95.8333	46.8085
1.00	5	0	2	1	1	4	76.4379	46.8511
.00	4	3	2	1	0	4	262.1379	47.0690
4.00	4	3	4	2	3	2	190.0333	47.1008
1.00	4	0	3	1	0	2	157.8768	47.1991
4.00	8	3	3	1	3	4	100.3276	47.3875
4.00	1	1	2	1	2	4	239.6335	47.4123
2.00	1	1	3	1	3	4	69.3113	47.4574
3.00	1	0	3	2	2	1	338.8530	47.6113
4.00	6	2	1	2	1	4	95.8333	48.0062
1.00	1	1	3	1	0	1	69.3113	48.0074
.00	1	1	5	1	0	3	148.8818	48.3772
1.00	1	1	3	2	2	1	69.3113	48.4207
.00	8	1	3	1	1	2	91.4106	48.4945
3.00	1	0	3	1	1	1	338.8530	48.5098
2.00	1	1	4	1	2	1	97.2027	48.5214
4.00	4	1	2	1	2	3	193.6812	48.5843
.00	1	1	3	1	0	2	69.3113	48.6026
2.00	2	3	4	1	1	2	215.8899	48.8686
2.00	1	1	3	2	1	2	69.3113	48.9153
2.00	1	1	3	1	2	4	69.3113	49.0333
.00	3	3	4	1	1	2	247.9394	49.2474
1.00	2	3	2	1	0	5	239.5600	49.3322
3.00	1	1	3	1	1	1	69.3113	49.3665
2.00	3	1	2	1	0	2	175.2800	49.4176
4.00	6	3	4	1	2	2	190.5000	49.5510
4.00	1	3	3	1	2	2	242.5484	49.7149
4.00	6	1	2	1	2	4	161.0857	49.7433
4.00	5	3	4	1	3	2	198.6111	49.7547
2.00	2	0	2	1	1	4	249.3451	50.0808
3.00	4	3	4	1	1	2	190.0333	50.4399
4.00	3	2	1	1	0	5	179.2373	50.5455
4.00	5	2	4	1	1	1	202.1818	50.7616
4.00	5	3	5	1	3	2	218.8571	50.7827
4.00	3	2	3	1	0	4	141.5538	50.7830
2.00	3	3	3	1	1	2	153.4579	50.8170
3.00	8	1	3	1	3	4	91.4106	50.9209
1.00	1	1	3	2	1	2	69.3113	50.9461
2.00	8	3	3	1	2	4	100.3276	51.0375
1.00	1	1	3	1	2	4	69.3113	51.0689
4.00	2	1	2	1	1	5	177.4977	51.3371
4.00	5	2	3	1	1	2	137.3871	51.3891
2.00	4	1	2	1	1	2	193.6812	51.4014
2.00	6	1	5	2	1	1	170.0000	51.4629
4.00	3	1	2	1	1	2	175.2800	51.7048
4.00	4	1	2	1	1	4	193.6812	51.7574
4.00	1	3	3	2	2	2	242.5484	51.8116
4.00	4	1	3	1	3	4	168.2149	51.8504
2.00	1	0	3	1	1	1	338.8530	52.0435
3.00	3	3	1	1	0	3	96.4895	52.0983
4.00	2	3	4	1	1	2	215.8899	52.3961
2.00	8	3	1	1	0	4	59.5657	52.7367
4.00	2	2	4	1	3	2	244.5797	52.9707
3.00	6	3	3	1	1	2	98.0323	52.9870
2.00	1	1	4	1	1	1	97.2027	53.0508
2.00	2	1	3	1	2	1	214.5873	53.6647
.00	1	1	3	1	0	1	69.3113	53.6935
3.00	1	0	2	1	1	1	272.6745	54.0161

2.00	3	3	3	1	2	2	153.4579	66.3678
4.00	3	1	3	1	0	4	227.0897	66.3758
.00	1	1	3	1	1	4	69.3113	66.3914
3.00	2	1	4	1	1	1	149.7059	66.7710
4.00	4	2	3	1	3	4	192.4016	66.8573
4.00	2	1	2	1	2	3	177.4977	66.8860
3.00	2	2	1	1	0	5	192.7209	67.1103
4.00	3	2	3	1	3	4	141.5538	67.4559
2.00	3	3	1	1	0	5	96.4895	67.5246
4.00	8	2	4	1	2	2	151.7778	67.6145
4.00	8	2	4	1	1	2	151.7778	67.6145
4.00	3	0	1	2	1	4	424.9444	67.6222
2.00	1	0	3	1	0	1	338.8530	67.8409
2.00	3	1	2	1	1	2	175.2800	67.8799
4.00	3	1	2	1	2	4	175.2800	68.0004
2.00	2	3	3	1	1	1	128.9572	68.3402
4.00	7	3	4	1	3	2	230.1579	68.3838
4.00	7	3	4	1	2	2	230.1579	68.3838
4.00	3	1	2	2	1	2	175.2800	68.4463
2.00	1	1	4	1	2	2	97.2027	68.4524
2.00	5	2	3	1	2	2	137.3871	68.4555
2.00	5	2	3	1	0	2	137.3871	68.4555
4.00	4	1	3	1	2	4	168.2149	68.5206
4.00	2	3	4	1	3	2	215.8899	68.5502
2.00	2	0	2	1	0	5	249.3451	68.9600
2.00	4	3	5	1	1	1	267.4151	68.9774
2.00	4	1	3	1	1	4	168.2149	69.2688
1.00	8	1	3	1	1	2	91.4106	69.2865
2.00	2	2	1	1	0	5	192.7209	69.4012
2.00	2	3	3	1	1	4	128.9572	69.4104
1.00	4	1	2	1	1	2	193.6812	69.4897
.00	6	3	2	1	0	4	104.4211	69.5942
.00	6	3	2	1	2	4	104.4211	69.5942
2.00	5	2	3	2	1	2	137.3871	69.6672
4.00	1	0	5	1	2	1	279.5727	69.7345
2.00	1	0	4	1	1	1	235.5381	69.7866
3.00	2	3	1	1	1	4	94.7888	69.9351
2.00	1	1	4	2	1	1	97.2027	69.9994
2.00	6	3	3	1	2	2	98.0323	70.1621
3.00	4	3	1	1	1	4	127.6076	70.2984
2.00	8	1	3	2	2	1	91.4106	70.3233
2.00	8	1	3	2	1	1	91.4106	70.3233
4.00	2	3	4	2	3	2	215.8899	70.4600
2.00	1	0	2	2	2	4	272.6745	70.5151
4.00	2	1	3	2	2	4	214.5873	70.8057
4.00	6	2	3	1	1	1	155.0000	70.8286
4.00	6	2	3	1	2	1	155.0000	70.8286
4.00	2	1	2	1	2	5	177.4977	70.8526
.00	2	1	3	1	2	1	214.5873	71.0107
2.00	8	3	4	1	2	2	142.1842	71.2574
4.00	1	1	3	2	3	4	69.3113	71.5319
.00	3	3	3	1	2	2	153.4579	71.5933
4.00	5	2	3	2	2	4	137.3871	71.9214
4.00	4	3	3	1	3	2	135.4453	71.9276
4.00	2	1	4	1	1	2	149.7059	72.0568
4.00	8	3	3	1	2	2	100.3276	72.1322
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4.00	8	3	2	2	0	5	97.3095	72.2033
4.00	2	1	2	1	0	5	177.4977	72.7642
1.00	1	0	2	1	1	4	272.6745	72.8206
2.00	4	3	1	1	1	4	127.6076	72.8776
.00	3	2	3	1	0	4	141.5538	72.9519
4.00	2	3	3	1	1	1	128.9572	73.1235
2.00	2	1	4	1	2	1	149.7059	73.1710
4.00	1	1	3	1	0	4	69.3113	73.2763
3.00	1	3	3	1	1	2	242.5484	73.7269
1.00	1	1	4	2	2	1	97.2027	73.7417
.00	2	3	4	1	3	2	215.8899	73.9433
2.00	1	1	4	1	3	4	97.2027	74.0787
3.00	4	1	2	1	2	4	193.6812	74.1614
4.00	2	3	3	1	1	4	128.9572	74.2686
.00	2	2	1	1	0	5	192.7209	74.2965
3.00	1	1	3	1	3	4	69.3113	74.4256
4.00	2	2	4	1	1	2	244.5797	74.5501
1.00	1		3		0	2	69.3113	74.6000

2.00	2	1	2	1	1	4	177.4977	74.6481
3.00	2	3	4	1	3	2	215.8899	74.6826
2.00	1	1	4	1	1	2	97.2027	74.8422
.00	8	1	3	2	0	1	91.4106	74.9344
1.00	4	1	5	1	0	1	222.0714	75.0055
2.00	4	1	2	1	2	4	193.6812	75.0665
4.00	4	1	3	1	2	2	168.2149	75.0736
4.00	6	1	2	2	2	4	161.0857	75.8139
2.00	4	1	3	1	1	2	168.2149	75.8934
3.00	8	3	2	1	0	5	97.3095	75.9338
2.00	7	1	5	1	1	1	173.0000	76.0419
4.00	2	3	1	2	1	3	94.7888	76.2955
4.00	3	2	3	1	1	4	141.5538	76.5455
.00	2	2	4	1	0	2	244.5797	76.6066
2.00	3	1	2	1	0	4	175.2800	76.6314
3.00	4	0	4	1	3	2	169.8349	76.7780
4.00	8	3	3	1	3	3	100.3276	76.8561
3.00	1	1	3	1	2	4	69.3113	76.8969
3.00	5	1	2	1	1	4	227.4737	76.9247
1.00	2	3	4	1	3	2	215.8899	76.9420
2.00	1	1	4	1	0	1	97.2027	76.9434
4.00	3	1	3	1	1	2	227.0897	77.1219
3.00	2	1	2	1	1	4	177.4977	77.2414
2.00	8	2	5	1	1	1	157.3200	77.5898
2.00	8	3	3	1	2	2	100.3276	77.6881
2.00	8	3	3	1	1	2	100.3276	77.6881
4.00	8	2	2	1	2	4	178.3471	77.8243
4.00	8	2	2	1	1	4	178.3471	77.8243
4.00	8	2	2	1	0	4	178.3471	77.8243
2.00	4	3	2	1	0	5	262.1379	77.8650
1.00	6	3	1	1	0	5	67.1420	78.1010
1.00	1	0	4	2	1	1	235.5381	78.2896
2.00	4	2	5	1	3	1	304.6429	78.4375
4.00	3	1	5	1	2	1	243.8333	78.5007
4.00	8	2	3	1	2	2	126.4933	78.6025
4.00	8	2	3	1	1	2	126.4933	78.6025
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.00	4	2	3	1	0	4	192.4016	78.6268
2.00	6	1	2	1	2	4	161.0857	78.6312
2.00	6	1	2	1	0	4	161.0857	78.6312
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.00	4	1	2	1	2	4	193.6812	78.7494
1.00	1	1	4	1	2	2	97.2027	78.8435
4.00	3	3	1	1	1	3	96.4895	79.0245
4.00	4	1	1	1	1	3	316.0140	79.0816
2.00	1	1	3	2	0	1	69.3113	79.1289
.00	4	2	5	1	3	4	304.6429	79.3478
2.00	3	2	1	1	0	5	179.2373	79.7239
4.00	4	3	3	1	1	2	135.4453	79.7774
2.00	1	0	2	2	1	2	272.6745	79.7994
3.00	3	3	3	1	1	2	153.4579	79.8315
4.00	3	1	1	1	0	4	300.1344	79.9556
.00	1	0	3	1	1	1	338.8530	79.9915
4.00	8	3	2	1	2	3	97.3095	79.9919
2.00	6	1	2	1	0	2	161.0857	80.0081
4.00	3	1	2	1	1	4	175.2800	80.1781
2.00	1	3	5	1	3	2	356.5238	80.3429
.00	2	1	2	1	1	4	177.4977	80.6219
1.00	1	1	4	2	1	1	97.2027	80.6253
2.00	1	0	2	1	1	1	272.6745	80.7563
3.00	8	0	4	1	2	2	167.3000	80.9461
3.00	8	1	4	1	2	1	113.6667	81.0189
.00	3	3	4	1	3	2	247.9394	81.0833
4.00	2	3	4	1	2	2	215.8899	81.1343
1.00	1	0	3	2	2	1	338.8530	81.2541
2.00	4	2	3	1	2	1	192.4016	81.3920
4.00	3	2	3	1	1	1	141.5538	81.4124
3.00	6	2	2	1	1	1	345.0741	81.5467
.00	2	1	5	1	1	1	203.8276	81.5854
1.00	3	0	2	1	0	2	627.7630	81.6360
2.00	5	2	4	2	1	1	202.1818	81.9725
4.00	3	2	3	1	2	4	141.5538	82.2326
1.00	1	1	3	2	0	1	69.3113	82.4141
2.00	4	3	4	1	0	1	190.0333	82.6151
2.00	4	2	3	1	1	1	192.4016	82.7520
1.00	1	0	3	1	1	1	338.8530	82.7876

.00	4	2	3	1	3	4	192.4016	82.9114
2.00	3	1	5	1	0	1	243.8333	83.0382
2.00	3	0	1	1	1	4	424.9444	83.2566
4.00	8	2	3	2	2	1	126.4933	83.3319
2.00	4	2	3	2	0	1	192.4016	83.3485
4.00	4	1	2	2	2	3	193.6812	83.4309
2.00	1	1	3	1	0	4	69.3113	83.4566
3.00	4	3	4	1	2	2	190.0333	83.6348
.00	1	1	4	1	2	2	97.2027	83.7433
4.00	2	3	3	1	3	2	128.9572	83.8676
4.00	3	3	3	2	2	2	153.4579	84.0292
4.00	2	2	1	1	1	3	192.7209	84.0598
2.00	2	1	2	1	1	2	177.4977	84.0717
.00	2	1	3	1	2	2	214.5873	84.0899
2.00	1	1	3	2	2	4	69.3113	84.1751
2.00	5	1	2	1	1	4	227.4737	84.3004
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2.00	4	2	1	1	1	3	186.7407	84.3664
3.00	3	2	1	1	0	5	179.2373	84.4932
3.00	4	1	3	1	3	4	168.2149	84.6738
4.00	8	2	3	2	3	4	126.4933	84.7148
3.00	8	1	2	2	2	4	199.5208	84.8407
3.00	8	1	2	2	1	4	199.5208	84.8407
1.00	1	1	3	2	3	4	69.3113	84.8522
3.00	4	1	5	1	2	1	222.0714	84.9601
4.00	8	3	2	2	1	4	97.3095	85.2979
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2.00	2	1	4	1	0	1	149.7059	85.3209
4.00	8	2	4	1	2	1	151.7778	85.3823
4.00	8	2	4	1	1	1	151.7778	85.3823
2.00	1	0	1	1	1	4	465.6887	85.4068
4.00	2	2	3	1	2	1	208.2679	85.6001
4.00	1	1	2	2	1	4	239.6335	85.6321
2.00	8	2	4	1	1	2	151.7778	85.6708
2.00	8	2	4	1	2	2	151.7778	85.6708
.00	3	0	3	1	2	1	451.9405	85.6776
2.00	4	2	3	1	0	2	192.4016	85.7161
4.00	2	3	3	1	2	2	128.9572	85.8147
4.00	4	1	3	1	1	2	168.2149	85.8526
3.00	4	3	4	2	2	2	190.0333	85.8638
4.00	2	1	2	2	2	3	177.4977	85.8978
4.00	1	1	3	2	1	4	69.3113	85.9069
4.00	3	3	3	1	1	1	153.4579	85.9412
2.00	7	1	1	1	1	4	221.8261	86.0160
4.00	3	3	4	1	2	2	247.9394	86.0625
3.00	4	3	4	1	3	2	190.0333	86.0725
3.00	2	2	1	1	1	5	192.7209	86.1015
1.00	1	1	4	1	1	2	97.2027	86.2033
.00	3	1	2	1	1	2	175.2800	86.3205
1.00	4	1	2	1	0	2	193.6812	86.6796
.00	8	0	2	1	1	4	132.3737	86.8342
1.00	1	1	3	1	0	4	69.3113	86.9214
3.00	2	1	2	1	1	2	177.4977	86.9924
3.00	8	3	3	1	2	4	100.3276	87.0416
3.00	8	3	3	1	1	4	100.3276	87.0416
3.00	8	3	3	1	3	4	100.3276	87.0416
3.00	2	1	3	1	3	4	214.5873	87.0579
3.00	3	1	2	1	1	2	175.2800	87.1676
2.00	8	1	1	1	1	4	141.1364	87.2509
2.00	8	1	1	1	0	4	141.1364	87.2509
3.00	1	1	4	1	2	1	97.2027	87.3636
4.00	4	3	3	1	3	4	135.4453	87.3899
4.00	3	2	3	1	2	1	141.5538	87.4611
4.00	3	1	5	1	1	2	243.8333	87.4969
.00	2	3	4	1	2	2	215.8899	87.5175
1.00	1	1	3	2	2	4	69.3113	87.6697
.00	4	3	3	1	3	2	135.4453	87.6922
3.00	7	1	1	1	1	4	221.8261	87.7437
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4.00	3	2	3	2	3	4	141.5538	87.7775
2.00	4	1	2	2	1	2	193.6812	88.2685
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1.00	8	0	4	1	1	1	167.3000	88.6152
.00	1	1	4	1	0	1	97.2027	88.6235

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3.00	7	1	2	1	1	4	211.8462	89.0070
2.00	2	2	1	1	1	5	192.7209	89.0408
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.00	8	3	2	1	1	4	97.3095	89.2261
2.00	3	1	2	1	2	4	175.2800	89.2733
1.00	6	2	1	1	0	4	95.8333	89.2763
3.00	6	3	2	1	2	4	104.4211	89.3339
3.00	6	3	2	1	0	4	104.4211	89.3339
3.00	1	1	3	1	1	4	69.3113	89.3821
1.00	1	0	2	1	1	2	272.6745	89.4019
4.00	5	2	4	1	2	2	202.1818	89.5731
4.00	5	2	4	1	3	2	202.1818	89.5731
4.00	2	2	3	1	1	1	208.2679	89.6743
3.00	8	3	2	1	2	4	97.3095	89.7050
3.00	8	3	2	1	1	4	97.3095	89.7050
2.00	2	3	3	1	3	4	128.9572	89.8521
2.00	3	1	2	2	1	2	175.2800	89.8587
2.00	3	2	1	1	0	4	179.2373	89.9702
4.00	3	1	2	2	2	4	175.2800	90.0183
4.00	2	2	3	1	2	4	208.2679	90.1626
2.00	2	1	3	1	0	1	214.5873	90.1693
2.00	1	1	4	2	2	2	97.2027	90.3215
2.00	1	1	2	2	1	2	239.6335	90.4460
.00	7	1	2	1	1	4	211.8462	90.5043
2.00	2	3	3	1	2	1	128.9572	90.5205
4.00	4	1	1	1	0	5	316.0140	90.5474
.00	1	1	4	1	3	4	97.2027	90.6264
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2.00	5	1	3	2	1	2	203.6419	91.0204
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2.00	3	2	3	1	0	4	141.5538	91.3851
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4.00	4	1	4	1	1	2	211.5217	91.7829
2.00	6	0	4	1	2	1	285.9309	91.8836
2.00	2	3	3	1	2	4	128.9572	91.9380
2.00	4	3	3	1	3	4	135.4453	92.1257
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4.00	8	1	2	1	2	4	199.5208	92.1949
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.00	2	3	3	1	1	4	128.9572	92.2490
2.00	4	2	1	1	1	4	186.7407	92.5502
2.00	8	2	1	2	1	4	95.2500	92.6464
1.00	4	1	5	2	3	1	222.0714	93.0206
4.00	3	1	1	1	0	5	300.1344	93.0604
1.00	5	2	3	1	0	2	137.3871	93.0822
3.00	6	2	3	1	2	1	155.0000	93.1004
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.00	8	2	4	1	2	2	151.7778	93.4166
2.00	8	1	4	1	2	1	113.6667	93.4272
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4.00	2	2	4	1	2	2	244.5797	94.0223
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2.00	5	2	3	1	1	4	137.3871	94.1403
2.00	5	2	3	1	0	4	137.3871	94.1403
.00	6	3	3	1	0	5	98.0323	94.1491
4.00	2	2	3	1	1	4	208.2679	94.4539
4.00	3	2	1	1	1	4	179.2373	94.4896
4.00	1	0	5	1	1	1	279.5727	95.0140
4.00	4	2	3	1	2	1	192.4016	95.1195
1.00	6	3	4	1	1	1	190.5000	95.1878
3.00	2	1	4	1	2	2	149.7059	95.4054
4.00	8	2	2	1	2	3	178.3471	95.4208
3.00	1	1	4	1	1	1	97.2027	95.5188
4.00	8	1	3	2	1	4	91.4106	95.5977
3.00	4	3	3	1	0	4	135.4453	95.8130
4.00	2	3	3	1	0	1	128.9572	95.8423
2.00	2	1	2	2	1	4	177.4977	95.8662
2.00	1	3	5	1	1	2	356.5238	95.9656
4.00	2	1	5	2	2	1	203.8276	96.0112
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.00	5	2	3	1	1	2	137.3871	96.2068

2.00	5	3	3	1	2	4	98.9677	96.2921
4.00	3	3	5	1	3	2	283.9000	96.4270
4.00	3	1	3	1	3	4	227.0897	96.4415
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.00	3	2	3	1	3	4	141.5538	96.9033
4.00	4	3	3	1	1	4	135.4453	96.9271
1.00	6	2	4	1	1	2	221.7826	96.9732
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4.00	4	1	1	1	1	4	316.0140	97.1488
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.00	4	3	3	1	1	2	135.4453	97.2624
3.00	3	2	3	1	0	4	141.5538	97.4847
2.00	4	2	5	1	1	4	304.6429	98.3723
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.00	2	1	5	1	0	1	203.8276	98.3900
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3.00	8	1	2	1	2	4	199.5208	98.5961
3.00	8	1	2	1	1	4	199.5208	98.5961
4.00	3	2	3	1	3	2	141.5538	99.0180
4.00	4	3	4	1	1	4	190.0333	99.0622
3.00	2	1	2	2	1	4	177.4977	99.1966
3.00	3	3	4	1	1	2	247.9394	99.2356
4.00	5	3	3	1	2	4	98.9677	99.3065
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.00	8	2	3	1	1	1	126.4933	99.6687
1.00	4	1	3	1	0	4	168.2149	99.6808
2.00	1	0	1	1	0	4	465.6887	100.2277
2.00	3	2	1	2	0	5	179.2373	100.2518
3.00	3	3	1	2	1	4	96.4895	100.6732
3.00	8	1	1	1	1	4	141.1364	100.8067
4.00	7	2	3	1	2	4	188.5556	100.8338
4.00	7	1	2	1	0	5	211.8462	100.9921
4.00	1	0	4	1	2	1	235.5381	101.1299
1.00	2	3	2	1	1	3	239.5600	101.1849
.00	8	2	3	1	2	4	126.4933	101.3227
4.00	3	1	2	1	2	3	175.2800	101.3647
2.00	3	1	2	2	0	4	175.2800	101.4440
2.00	1	1	4	2	0	1	97.2027	101.5252
2.00	8	1	1	1	1	3	141.1364	101.5735
1.00	8	0	3	2	1	1	497.8189	101.8647
1.00	1	3	3	1	2	2	242.5484	101.8811
1.00	1	1	3	2	1	4	69.3113	101.9040
2.00	8	2	3	1	2	1	126.4933	102.0416
2.00	3	3	3	1	1	4	153.4579	102.0843
2.00	4	3	3	1	1	4	135.4453	102.1798
4.00	1	3	4	1	2	2	350.7000	102.2726
2.00	7	1	2	1	2	4	211.8462	102.3921
3.00	5	2	4	1	2	1	202.1818	102.5356
3.00	5	2	4	1	1	1	202.1818	102.5356
2.00	3	0	1	2	1	4	424.9444	102.5816
4.00	1	1	2	2	2	3	239.6335	102.5950
3.00	3	3	5	1	3	2	283.9000	102.6395
.00	7	3	4	1	2	2	230.1579	102.8857
.00	7	3	4	1	1	2	230.1579	102.8857
.00	7	3	4	1	3	2	230.1579	102.8857
2.00	5	2	3	1	1	5	137.3871	102.8950
4.00	8	3	2	2	2	3	97.3095	102.9350
4.00	4	3	3	1	2	2	135.4453	102.9478
.00	6	2	1	2	1	4	95.8333	102.9689
2.00	2	1	2	1	2	4	177.4977	103.0250
2.00	8	1	1	2	1	4	141.1364	103.7085
2.00	8	1	1	2	0	4	141.1364	103.7085
2.00	8	2	3	1	1	4	126.4933	103.7349
2.00	8	2	3	1	0	4	126.4933	103.7349
1.00	6	2	4	1	2	1	221.7826	103.9002
3.00	4	1	3	1	0	4	168.2149	103.9150
3.00	4	1	5	1	1	1	222.0714	103.9344
1.00	6	2	1	1	0	5	95.8333	104.0842
3.00	3	3	3	1	2	2	153.4579	104.2611
.00	1	0	3	1	0	1	338.8530	104.2722

2.00	1	1	2	1	2	4	239.6335	104.8017
2.00	6	1	1	2	0	5	178.3864	104.8638
2.00	1	0	4	1	2	1	235.5381	105.1400
2.00	3	1	2	1	1	4	175.2800	105.2606
2.00	2	1	2	1	0	4	177.4977	105.8046
2.00	6	1	1	1	1	5	178.3864	105.8048
2.00	6	1	1	1	0	5	178.3864	105.8048
3.00	1	1	2	1	1	2	239.6335	105.8243
4.00	3	2	3	2	1	1	141.5538	105.9385
.00	3	3	3	1	1	1	153.4579	106.2382
.00	4	3	3	1	3	4	135.4453	106.5434
.00	2	3	3	1	2	2	128.9572	106.5903
3.00	2	1	2	1	2	4	177.4977	106.6042
3.00	6	3	3	2	2	4	98.0323	106.6398
.00	5	1	2	1	0	4	227.4737	106.7223
2.00	2	1	3	1	0	2	214.5873	106.7771
1.00	8	0	1	1	1	3	263.5294	106.8306
4.00	3	2	3	2	2	4	141.5538	107.0058
1.00	8	1	3	2	0	1	91.4106	107.0623
4.00	3	2	5	1	1	1	321.6610	107.1793
3.00	4	1	2	1	2	3	193.6812	107.4243
4.00	8	2	2	1	0	5	178.3471	107.4646
4.00	8	2	2	1	1	5	178.3471	107.4646
4.00	7	2	5	2	2	1	343.1250	107.6040
4.00	3	3	5	1	1	2	283.9000	107.7225
3.00	4	2	3	1	3	4	192.4016	107.9051
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2.00	2	1	2	2	1	2	177.4977	107.9684
4.00	2	2	5	1	1	1	306.2836	107.9742
4.00	8	3	3	2	2	4	100.3276	108.0963
2.00	8	2	4	1	2	1	151.7778	108.1834
2.00	8	2	4	1	1	1	151.7778	108.1834
3.00	8	3	2	1	2	3	97.3095	108.2534
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4.00	4	1	1	1	1	5	316.0140	108.3634
2.00	2	1	4	1	3	4	149.7059	108.5071
2.00	4	3	3	1	2	2	135.4453	108.5267
.00	2	0	2	1	1	4	249.3451	108.6611
4.00	2	0	1	2	0	5	529.2857	108.6885
2.00	4	1	2	1	2	3	193.6812	108.7353
3.00	8	1	4	1	2	2	113.6667	108.8860
4.00	6	3	3	1	3	4	98.0323	108.9524
4.00	6	3	3	1	2	4	98.0323	108.9524
1.00	2	3	2	2	1	5	239.5600	109.0630
1.00	4	1	3	1	0	2	168.2149	109.2139
1.00	6	1	3	1	1	1	176.9047	109.3674
3.00	2	1	2	1	0	4	177.4977	109.4803
.00	3	3	4	1	2	2	247.9394	109.5239
4.00	2	2	1	2	1	4	192.7209	109.7765
2.00	1	0	2	1	0	4	272.6745	109.8706
.00	2	3	2	1	0	4	239.5600	109.9033
.00	3	2	3	1	1	4	141.5538	109.9608
4.00	6	3	2	1	2	4	104.4211	110.0735
.00	3	3	3	1	1	4	153.4579	110.1218
1.00	1	1	2	1	1	2	239.6335	110.3949
4.00	1	0	5	1	3	1	279.5727	110.3991
3.00	8	1	4	2	2	1	113.6667	110.7222
4.00	2	3	2	1	0	5	239.5600	110.7750
2.00	5	2	4	1	0	2	202.1818	111.2650
2.00	2	2	5	1	1	1	306.2836	111.4261
3.00	8	1	3	2	3	3	91.4106	111.6305
3.00	2	1	2	2	1	2	177.4977	111.7193
.00	3	3	5	1	3	2	283.9000	111.7364
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3.00	4	1	3	1	2	4	168.2149	111.8969
4.00	3	3	3	1	2	1	153.4579	112.2405
4.00	3	1	1	1	1	4	300.1344	112.2565
3.00	7	3	2	2	0	5	145.5333	112.2862
4.00	3	2	3	1	1	2	141.5538	112.3604
4.00	8	1	2	1	2	3	199.5208	112.3981
3.00	5	3	3	2	1	1	98.9677	112.4006
1.00	6	1	2	1	1	4	161.0857	112.5441
1.00	1	1	4	2	3	4	97.2027	112.5830
2.00	2	1	4	1	1	1	149.7059	112.7053
2.00	1	2	3	1	1	2	364.1837	112.8181
2.00	3	2	1	2	0	4	176.6578	112.8578

4.00	2	2	4	2	1	1	244.5797	113.1508
2.00	2	1	5	1	1	1	203.8276	113.4436
3.00	4	1	5	1	3	2	222.0714	113.5537
1.00	1	1	4	2	1	2	97.2027	113.7434
4.00	3	2	3	2	2	1	141.5538	113.8094
3.00	4	0	3	1	3	4	157.8768	113.8630
1.00	1	1	5	1	1	2	148.8818	114.0612
1.00	6	1	3	1	0	2	176.9047	114.1067
1.00	6	1	3	1	2	2	176.9047	114.1067
4.00	8	2	1	1	1	4	95.2500	114.2209
.00	2	1	2	1	0	4	177.4977	114.2719
3.00	4	1	2	1	1	4	193.6812	114.4403
3.00	3	1	2	1	2	4	175.2800	114.6399
3.00	3	3	5	1	1	2	283.9000	114.6628
3.00	6	3	5	1	2	2	162.2667	114.6817
1.00	1	0	3	1	2	2	338.8530	115.2400
4.00	2	1	1	1	0	5	281.9542	115.2633
3.00	3	1	2	2	1	2	175.2800	115.3917
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2.00	6	2	3	1	2	1	155.0000	115.7795
2.00	6	2	3	1	1	1	155.0000	115.7795
2.00	4	1	2	1	1	4	193.6812	115.8370
2.00	4	2	5	1	2	1	304.6429	115.9032
4.00	7	3	5	1	1	2	270.7273	115.9107
4.00	7	3	5	1	2	2	270.7273	115.9107
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2.00	5	1	3	2	1	1	203.6419	116.0251
4.00	8	3	3	1	1	1	100.3276	116.0619
1.00	8	2	1	1	1	5	95.2500	116.1244
2.00	8	3	2	1	2	5	97.3095	116.1787
2.00	8	3	5	1	1	2	221.1111	116.1853
2.00	8	3	5	1	3	2	221.1111	116.1853
2.00	8	3	5	1	2	2	221.1111	116.1853
4.00	3	3	3	1	2	4	153.4579	116.3435
2.00	1	2	3	1	1	1	364.1837	116.3527
2.00	8	3	3	2	2	4	100.3276	116.4222
.00	1	1	2	2	1	2	239.6335	116.4225
3.00	8	2	4	1	3	2	151.7778	116.4849
3.00	8	2	4	1	1	2	151.7778	116.4849
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2.00	3	1	3	1	0	4	227.0897	116.5803
1.00	1	1	4	2	0	1	97.2027	116.9368
.00	3	2	3	1	1	1	141.5538	116.9523
1.00	2	1	4	1	0	1	149.7059	117.0955
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1.00	2	1	5	1	1	1	203.8276	117.6428
4.00	1	1	2	1	0	5	239.6335	117.7120
2.00	2	3	2	1	0	5	239.5600	117.7907
4.00	3	1	3	1	2	4	227.0897	117.8091
.00	4	2	3	1	2	1	192.4016	117.9601
.00	8	2	4	1	1	1	151.7778	117.9646
4.00	7	2	4	1	2	2	204.3636	118.0270
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4.00	6	2	3	1	3	4	155.0000	118.0841
.00	4	3	3	1	1	4	135.4453	118.1709
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4.00	3	1	2	1	0	5	175.2800	118.2931
4.00	3	3	4	1	1	4	247.9394	118.3251
3.00	2	1	3	1	2	1	214.5873	118.4107
4.00	3	3	2	1	0	4	258.0000	118.4123
2.00	4	1	3	1	2	1	168.2149	118.4837
4.00	4	2	3	1	3	3	192.4016	118.7752
4.00	3	2	1	2	1	4	179.2373	118.8195
2.00	2	1	2	1	0	2	177.4977	119.1615
2.00	7	2	1	1	1	4	226.5000	119.3382
.00	2	3	3	1	3	4	128.9572	119.4167
2.00	4	3	5	1	3	4	267.4151	119.7423
3.00	8	1	1	2	1	4	141.1364	119.8213
2.00	3	1	4	1	1	1	243.9231	119.8223
2.00	8	1	5	1	1	3	168.6667	120.0549
3.00	8	1	2	1	2	3	199.5208	120.2020
1.00	1	1	2	1	0	2	239.6335	120.2718
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2.00	4	0	4	2	1	2	169.8349	120.5112

4.00	3	2	3	1	2	2	141.5538	120.7085
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2.00	4	0	1	1	0	5	414.6154	120.7576
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2.00	2	1	3	1	1	1	214.5873	121.4124
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2.00	6	1	2	2	1	2	161.0857	121.9407
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3.00	7	3	2	1	1	4	145.5333	122.4894
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3.00	1	1	4	1	2	2	97.2027	123.2496
.00	8	1	1	2	1	4	141.1364	123.2809
.00	8	2	2	1	2	4	178.3471	123.2886
.00	8	2	2	1	1	4	178.3471	123.2886
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.00	4	3	4	1	1	4	190.0333	123.6179
4.00	4	2	4	1	1	2	291.2614	123.6523
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4.00	7	1	1	1	1	4	221.8261	123.8318
3.00	4	3	3	1	1	2	135.4453	124.0997
2.00	4	3	1	1	1	5	127.6076	124.1141
2.00	2	3	3	2	3	2	128.9572	124.4081
3.00	4	3	2	1	0	4	262.1379	124.4635
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3.00	8	1	2	2	2	2	199.5208	124.9726
1.00	1	1	4	1	0	2	97.2027	125.0270
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4.00	4	3	3	1	2	4	135.4453	125.0784
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2.00	1	2	3	2	1	2	364.1837	125.4940
2.00	8	0	2	2	1	2	132.3737	125.5119
2.00	8	1	4	1	1	2	113.6667	125.5622
2.00	8	1	4	1	2	2	113.6667	125.5622
2.00	4	1	4	1	1	1	211.5217	125.6331
.00	3	2	3	1	2	1	141.5538	125.6416
3.00	4	3	3	1	0	1	135.4453	125.7372
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.00	8	2	3	1	2	2	126.4933	126.8795
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3.00	7	3	3	1	1	4	187.4286	127.1109
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4.00	8	3	5	2	3	2	221.1111	127.1473
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3.00	4	1	3	1	1	4	168.2149	127.9629
2.00	3	1	1	1	0	4	300.1344	128.1018
1.00	4	1	5	1	3	2	222.0714	128.4320
3.00	2	1	5	2	1	1	203.8276	128.5722
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.00	3	1	2	2	2	4	193.6812	128.9072

4.00	4	2	4	1	1	1	291.2614	129.2856
3.00	7	1	2	2	1	4	211.8462	129.3941
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3.00	6	1	1	2	1	5	178.3864	129.5535
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.00	7	1	1	1	1	4	221.8261	130.1672
2.00	2	1	3	2	2	1	214.5873	130.1722
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2.00	6	1	3	1	1	1	176.9047	132.2118
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2.00	2	1	2	2	2	4	177.4977	132.3091
.00	1	1	4	1	0	2	97.2027	132.7969
2.00	3	1	2	1	2	3	175.2800	133.0751
2.00	3	3	3	1	2	4	153.4579	133.3236
3.00	1	0	1	1	1	4	465.6887	133.4292
2.00	1	0	2	1	1	5	272.6745	133.5056
4.00	7	2	3	1	2	2	188.5556	133.6039
3.00	2	2	3	1	2	1	208.2679	133.6129
3.00	1	2	3	1	1	1	364.1837	133.6618
.00	3	1	2	1	1	4	175.2800	133.8563
2.00	4	3	3	1	1	1	135.4453	134.0925
2.00	3	2	3	1	0	2	141.5538	134.1434
4.00	3	1	2	2	2	3	175.2800	134.1857
4.00	5	2	5	1	2	2	311.4444	134.3269
2.00	8	1	2	2	2	4	199.5208	134.3732
2.00	4	2	3	1	2	4	192.4016	134.4289
1.00	4	1	3	1	1	2	168.2149	134.4880
1.00	1	2	3	1	1	2	364.1837	134.6218
3.00	1	1	4	1	1	2	97.2027	134.7546
4.00	4	2	4	1	2	1	291.2614	134.7765
1.00	8	1	4	2	3	3	113.6667	134.8772
.00	1	1	2	1	2	4	239.6335	134.9012
3.00	3	1	2	1	1	4	175.2800	135.1700
2.00	3	1	3	1	1	2	227.0897	135.4543
2.00	4	1	3	1	1	1	168.2149	135.4953
2.00	8	1	3	2	2	2	91.4106	135.7715
2.00	8	1	3	2	1	2	91.4106	135.7715
2.00	2	1	2	2	0	4	177.4977	135.8787
3.00	4	3	3	1	3	4	135.4453	135.9415
4.00	3	3	2	1	1	4	258.0000	135.9869
.00	2	2	3	1	2	1	208.2679	136.1706
4.00	1	1	2	2	1	1	239.6335	136.2806
1.00	3	1	4	1	1	1	243.9231	136.3307
3.00	2	3	3	1	1	1	128.9572	136.3461
.00	6	2	3	2	1	1	155.0000	136.4290
4.00	8	2	2	2	2	4	178.3471	136.4875
4.00	8	2	2	2	1	4	178.3471	136.4875
2.00	4	2	3	1	1	4	192.4016	136.6751
3.00	2	1	2	2	2	4	177.4977	136.9055
.00	2	3	2	1	0	5	239.5600	136.9109
2.00	1	1	5	1	3	2	148.8818	136.9888
1.00	1	1	5	1	2	2	148.8818	137.0100
1.00	6	2	1	2	0	4	95.8333	137.0498
3.00	2	2	4	1	0	2	244.5797	137.1389
2.00	8	3	2	1	2	4	97.3095	137.2486
2.00	2	0	4	1	0	2	253.4849	137.3543
4.00	2	3	2	1	1	4	239.5600	137.6183
2.00	1	1	2	1	1	4	239.6335	137.6349
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2.00	8	2	3	2	2	1	126.4933	137.7778

2.00	8	2	3	2	1	1	126.4933	137.7161
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.00	5	2	4	1	1	2	202.1818	137.9406
.00	5	2	4	1	2	2	202.1818	137.9406
2.00	6	1	3	1	2	2	176.9047	137.9410
4.00	3	3	5	1	2	2	283.9000	138.2760
1.00	2	0	4	2	1	1	253.4849	138.2887
1.00	8	0	2	1	0	4	132.3737	138.3809
3.00	5	1	3	1	2	4	203.6419	138.4731
3.00	2	3	3	1	1	4	128.9572	138.4813
3.00	1	1	4	1	0	1	97.2027	138.5379
.00	2	2	4	1	1	2	244.5797	138.5528
.00	3	3	3	1	2	1	153.4579	138.7487
1.00	1	2	3	1	1	1	364.1837	138.8394
2.00	8	1	3	2	0	3	91.4106	138.9132
1.00	2	1	2	1	1	4	177.4977	138.9593
4.00	4	3	5	1	3	2	267.4151	139.0245
2.00	3	1	2	2	1	4	175.2800	139.3430
4.00	5	2	3	1	2	1	137.3871	139.3458
4.00	5	2	3	1	1	1	137.3871	139.3458
3.00	8	1	1	2	1	3	141.1364	139.4906
4.00	6	2	5	1	2	2	235.9333	139.5582
4.00	6	2	5	1	1	2	235.9333	139.5582
.00	1	2	3	1	1	2	364.1837	139.8825
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.00	4	2	1	1	1	3	186.7407	140.1241
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.00	3	3	2	1	0	4	258.0000	140.4351
2.00	1	2	1	2	1	3	266.9583	140.4822
2.00	4	3	5	1	2	1	267.4151	140.5372
.00	8	1	2	2	0	4	199.5208	140.5704
3.00	2	1	2	2	0	4	177.4977	140.5992
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3.00	2	2	3	1	2	4	208.2679	140.7345
1.00	3	1	4	2	1	1	243.9231	140.8261
3.00	8	3	3	1	2	3	100.3276	141.1697
.00	2	1	3	1	0	2	214.5873	141.2905
4.00	3	1	1	1	1	3	300.1344	141.3837
2.00	2	1	1	1	0	5	281.9542	141.5519
2.00	2	3	1	2	0	5	94.7888	142.0841
2.00	5	0	2	1	0	1	76.4379	142.3198
.00	2	2	3	1	1	1	208.2679	142.6517
4.00	2	2	4	2	2	1	244.5797	142.7053
3.00	2	3	5	1	1	2	274.3651	142.7169
3.00	4	1	2	1	0	4	193.6812	142.7498
2.00	3	3	3	2	1	1	153.4579	142.8906
.00	3	2	3	2	1	4	141.5538	143.0873
3.00	3	2	3	1	0	2	141.5538	143.0970
4.00	8	3	4	1	2	1	142.1842	143.1262
4.00	8	3	4	1	1	1	142.1842	143.1262
4.00	8	3	4	1	3	1	142.1842	143.1262
4.00	2	2	4	2	3	4	244.5797	143.2244
.00	2	2	3	1	2	4	208.2679	143.4285
.00	8	1	1	2	1	3	141.1364	143.5181
2.00	1	0	1	1	0	5	465.6887	143.5525
2.00	2	1	3	1	1	2	214.5873	143.7748
4.00	6	3	3	1	2	1	98.0323	143.8002
4.00	6	3	3	1	1	1	98.0323	143.8002
.00	3	3	3	1	2	4	153.4579	143.8208
3.00	7	2	3	1	0	5	188.5556	143.9073
4.00	3	2	5	1	2	1	321.6610	144.1062
2.00	1	1	2	2	2	4	239.6335	144.1296
3.00	1	2	3	2	1	2	364.1837	144.1630
3.00	4	1	4	1	1	1	211.5217	144.2595
2.00	2	3	3	2	0	4	128.9572	144.3976
2.00	4	1	2	1	0	4	193.6812	144.4920
2.00	1	0	2	1	2	5	272.6745	144.8352
4.00	5	3	2	1	2	4	205.7000	144.9286
4.00	5	3	2	1	0	4	205.7000	144.9286
4.00	2	2	3	2	2	1	208.2679	145.0137
2.00	5	1	1	1	0	4	270.4091	145.0137
2.00	2	2	4	2	3	2	244.5797	145.1615
2.00	4	2	3	2	3	4	192.4016	145.1618
2.00	2	3	1	1	1	4	94.7888	145.4875
3.00	1	2	2	1	2	2	239.6335	145.5359

2.00	4	2	5	1	3	2	304.6429	145.5923
4.00	2	2	4	1	2	1	244.5797	145.6257
2.00	5	3	2	1	0	5	205.7000	145.7499
2.00	1	2	1	1	1	3	266.9583	145.7508
2.00	4	3	3	2	0	1	135.4453	145.8028
2.00	6	3	3	1	3	5	98.0323	145.8968
1.00	1	1	5	1	1	1	148.8818	145.9739
2.00	1	0	4	2	2	1	235.5381	146.0000
2.00	2	1	1	1	0	4	281.9542	146.0312
4.00	2	2	5	1	2	1	306.2836	146.0422
2.00	1	1	4	1	3	3	97.2027	146.0445
4.00	4	3	2	1	1	4	262.1379	146.1142
4.00	2	2	4	1	3	4	244.5797	146.1554
.00	8	3	3	1	2	1	100.3276	146.2520
2.00	2	3	2	1	1	4	239.5600	146.3341
2.00	3	2	3	1	1	1	141.5538	146.5034
3.00	3	2	3	1	1	4	141.5538	146.9393
3.00	2	1	4	1	1	2	149.7059	146.9530
3.00	2	1	1	1	0	5	281.9542	147.0278
3.00	8	2	4	1	2	1	151.7778	147.0948
3.00	8	2	4	1	1	1	151.7778	147.0948
3.00	4	3	1	2	0	4	127.6076	147.1063
3.00	3	3	5	1	2	2	283.9000	147.1848
2.00	8	0	1	2	1	3	263.5294	147.3577
3.00	2	2	3	1	1	4	208.2679	147.4328
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2.00	2	2	4	1	3	2	244.5797	148.1321
4.00	4	0	4	1	2	2	169.8349	148.6026
3.00	1	2	3	2	1	1	364.1837	148.6795
3.00	4	1	1	1	1	3	316.0140	148.7642
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1.00	2	1	4	1	3	4	149.7059	148.9165
2.00	3	2	1	1	1	4	179.2373	149.0356
2.00	3	1	1	1	0	5	300.1344	149.0978
1.00	2	2	1	1	0	5	192.7209	149.1599
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4.00	4	3	3	2	3	4	135.4453	149.5320
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1.00	1	2	3	2	1	2	364.1837	149.7474
2.00	1	1	2	1	0	4	239.6335	149.9489
2.00	8	2	3	1	1	5	126.4933	150.1750
.00	2	2	3	1	1	4	208.2679	150.2550
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3.00	4	3	3	1	1	4	135.4453	150.7773
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2.00	1	0	3	1	3	4	338.8530	151.0653
1.00	3	1	2	2	0	2	175.2800	151.1135
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1.00	1	1	2	2	1	2	239.6335	151.8217
4.00	2	2	3	2	1	1	208.2679	151.9156
3.00	3	3	2	1	1	4	258.0000	151.9751
2.00	8	1	1	1	0	5	141.1364	152.2424
2.00	8	1	1	1	1	5	141.1364	152.2424
.00	4	3	3	1	2	4	135.4453	152.4922
.00	2	0	2	1	1	5	249.3451	152.5220
4.00	2	3	3	2	3	4	128.9572	152.5963
3.00	4	1	1	1	0	4	316.0140	152.7050
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2.00	8	1	2	1	2	4	199.5208	156.1593
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1.00	4	1	2	1	1	4	193.6812	156.6003
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3.00	6	2	4	1	2	2	221.7826	157.4022
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3.00	2	2	1	1	1	4	192.7209	157.5549
3.00	3	1	4	1	3	2	243.9231	157.5835
3.00	3	2	3	1	2	4	141.5538	157.8565
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4.00	8	1	2	2	0	5	199.5208	158.3773
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3.00	2	3	4	1	1	4	215.8899	159.0626
2.00	8	2	4	2	2	1	151.7778	159.0957
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1.00	1	3	5	1	3	1	356.5238	159.2841
4.00	4	2	3	1	1	4	192.4016	159.7265
4.00	1	3	3	1	3	4	242.5484	159.9355
3.00	4	3	3	1	2	2	135.4453	160.1429
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2.00	5	1	1	1	0	5	270.4091	160.2268
.00	3	3	5	1	2	2	283.9000	160.2296
3.00	3	1	3	1	1	2	227.0897	160.2560
3.00	3	3	3	1	1	4	153.4579	160.3702
.00	2	1	3	1	1	1	214.5873	160.6564
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1.00	5	1	2	1	1	4	227.4737	160.6806
.00	3	2	1	1	1	4	179.2373	160.8019
3.00	8	2	3	1	2	1	126.4933	161.0035
2.00	2	1	4	1	2	2	149.7059	161.0385
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1.00	8	1	1	1	0	4	141.1364	161.3018
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4.00	6	2	3	1	2	2	155.0000	161.4324
4.00	3	2	4	1	2	2	282.1022	161.4541
4.00	1	1	2	2	0	5	239.6335	161.8846
4.00	4	0	3	1	2	2	157.8768	161.9686
2.00	7	1	1	1	0	5	221.8261	162.0212
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2.00	2	2	1	1	1	4	192.7209	162.9335

3.00	3	3	4	1	3	2	247.9394	163.3861
3.00	2	1	4	2	1	1	149.7059	163.4452
2.00	6	1	4	1	2	1	156.6250	163.6624
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3.00	8	2	3	1	1	4	126.4933	163.6753
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2.00	8	1	2	2	1	3	199.5208	163.8191
2.00	8	1	2	2	2	3	199.5208	163.8191
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2.00	2	1	2	1	1	3	177.4977	163.8361
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3.00	4	3	3	2	0	4	135.4453	163.9447
4.00	4	3	3	1	2	1	135.4453	164.1428
4.00	4	3	4	1	2	4	190.0333	164.2560
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2.00	2	1	3	1	1	4	214.5873	164.7482
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.00	1	0	4	1	0	1	235.5381	165.0455
3.00	7	1	1	1	1	3	221.8261	165.3826
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1.00	3	0	3	2	0	1	451.9405	165.4525
2.00	8	3	2	1	2	3	97.3095	165.6277
4.00	7	2	4	1	1	1	204.3636	165.6343
4.00	7	2	4	1	2	1	204.3636	165.6343
.00	2	3	5	1	1	2	274.3651	165.8711
2.00	1	1	5	1	1	1	148.8818	165.9786
1.00	2	0	4	1	0	1	253.4849	166.2174
1.00	8	3	3	1	3	4	100.3276	166.4332
4.00	1	3	3	1	2	4	242.5484	166.5442
2.00	4	2	1	1	0	5	186.7407	166.7266
4.00	8	2	2	2	2	3	178.3471	167.3481
3.00	5	3	2	1	1	4	205.7000	167.3653
1.00	2	1	3	1	0	1	214.5873	167.5200
2.00	4	1	2	1	1	3	193.6812	167.7922
3.00	3	2	3	1	2	1	141.5538	167.8933
4.00	2	1	1	2	0	5	281.9542	168.0197
.00	3	1	1	1	0	4	300.1344	168.2007
2.00	2	3	2	2	0	5	239.5600	168.2660
1.00	2	1	4	1	2	4	149.7059	168.2851
3.00	1	1	2	1	2	4	239.6335	168.6355
3.00	6	2	4	1	2	1	221.7826	168.6459
3.00	6	2	4	1	1	1	221.7826	168.6459
4.00	3	2	4	1	2	1	282.1022	168.7998
4.00	3	3	3	2	2	4	153.4579	168.8029
2.00	6	1	1	2	1	3	178.3864	168.8380
4.00	4	3	4	1	3	4	190.0333	169.0437
3.00	8	1	2	2	0	5	199.5208	169.3736
4.00	4	2	3	2	3	4	192.4016	169.6447
3.00	5	2	3	1	1	2	137.3871	170.0539
1.00	5	1	2	2	1	2	227.4737	170.2433
.00	8	2	2	1	0	5	178.3471	170.2446
.00	8	2	2	1	1	5	178.3471	170.2446
3.00	4	1	1	1	0	5	316.0140	170.3329
4.00	1	2	3	1	1	2	364.1837	171.2170
3.00	8	2	4	2	1	2	151.7778	171.3040
1.00	6	1	2	2	1	4	161.0857	171.5290
1.00	6	1	2	2	0	4	161.0857	171.5290
2.00	4	1	4	1	2	1	211.5217	171.6136
2.00	3	1	3	2	1	2	227.0897	171.6813
3.00	3	1	1	1	0	4	300.1344	171.7180
4.00	2	2	3	1	2	2	208.2679	171.8389
3.00	2	0	4	1	2	2	253.4849	172.0105
.00	1	3	2	1	0	5	319.3846	172.0337
3.00	1	0	2	1	2	3	272.6745	172.2768
1.00	3	2	3	1	1	1	141.5538	172.4407
2.00	4	1	2	1	1	1	193.6812	172.6111
4.00	4	2	3	1	3	1	304.6429	173.1171

.00	3	2	3	1	2	2	141.5538	173.4029
2.00	2	1	2	1	1	5	177.4977	173.5523
1.00	3	1	5	1	0	2	243.8333	173.5624
1.00	3	2	1	1	0	5	179.2373	173.7778
4.00	4	2	2	1	0	4	428.9915	173.8268
4.00	3	1	1	2	0	5	300.1344	174.1718
2.00	1	0	1	2	1	4	465.6887	174.2682
1.00	4	1	2	2	2	4	193.6812	174.2700
.00	2	2	1	1	1	4	192.7209	174.4262
3.00	2	3	1	1	0	3	94.7888	174.5565
2.00	3	0	1	1	0	5	424.9444	174.7342
.00	2	2	4	1	2	2	244.5797	174.7422
4.00	2	2	2	1	1	4	450.8375	175.2779
2.00	8	2	3	2	2	2	126.4933	175.3144
2.00	8	2	3	2	1	2	126.4933	175.3144
1.00	1	1	5	1	2	1	148.8818	175.3435
2.00	2	0	2	2	0	5	249.3451	175.5654
3.00	1	3	3	1	3	4	242.5484	176.1071
4.00	3	3	2	1	2	4	258.0000	176.1586
2.00	3	1	2	2	2	3	175.2800	176.1636
3.00	2	2	4	1	3	2	244.5797	176.2370
.00	6	2	3	1	2	4	155.0000	176.3287
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4.00	1	2	3	1	1	1	364.1837	176.5812
2.00	8	3	2	2	2	4	97.3095	176.6139
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1.00	3	1	2	1	0	4	175.2800	177.0145
.00	1	1	2	1	1	4	239.6335	177.1641
3.00	1	1	4	2	1	2	97.2027	177.8059
4.00	1	1	4	1	2	4	97.2027	178.0772
2.00	2	3	4	1	3	4	215.8899	178.1552
2.00	3	2	3	1	3	2	141.5538	178.1851
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4.00	3	1	3	1	1	1	227.0897	178.7229
3.00	8	3	4	1	1	1	142.1842	178.8152
3.00	8	3	4	1	2	1	142.1842	178.8152
3.00	3	1	2	2	1	4	175.2800	178.9367
2.00	2	1	4	2	2	1	149.7059	179.1115
3.00	2	3	3	1	3	4	128.9572	179.2646
3.00	2	1	2	1	1	5	177.4977	179.5816
2.00	3	1	1	1	1	4	300.1344	179.8531
4.00	2	2	3	1	1	2	208.2679	180.0176
3.00	2	3	3	1	2	1	128.9572	180.5981
.00	7	3	3	1	2	4	187.4286	180.6942
2.00	1	0	4	1	0	3	235.5381	180.7300
2.00	4	2	5	1	1	1	304.6429	180.8394
3.00	5	2	4	1	2	2	202.1818	180.9330
2.00	8	1	1	2	0	5	141.1364	180.9590
.00	8	1	1	1	0	5	141.1364	180.9744
1.00	3	1	3	1	0	4	227.0897	181.4035
3.00	2	3	3	1	0	4	128.9572	181.5060
1.00	7	3	2	1	0	5	145.5333	182.2740
4.00	2	2	2	1	0	4	450.8375	182.3266
2.00	8	2	2	1	0	5	178.3471	182.3463
2.00	8	2	2	1	1	5	178.3471	182.3463
3.00	4	1	1	1	1	4	316.0140	182.7511
3.00	3	3	1	1	1	3	96.4895	182.8569
2.00	2	2	2	1	0	1	450.8375	182.8696
2.00	2	1	1	1	1	5	281.9542	182.9627
3.00	2	3	3	1	2	4	128.9572	183.4263
4.00	3	3	3	1	3	4	153.4579	183.4460
1.00	1	0	3	2	1	1	338.8530	183.8094
4.00	8	1	2	1	0	5	199.5208	184.0553
3.00	2	1	5	2	2	1	203.8276	184.2102
3.00	4	1	2	2	2	3	193.6812	184.4732
4.00	6	1	1	1	1	4	178.3864	184.8086
2.00	5	1	3	1	2	4	203.6419	184.8991
1.00	8	0	1	2	0	3	263.5294	184.9065
1.00	8	0	1	2	1	3	263.5294	184.9065
3.00	8	2	5	1	2	1	157.3200	185.2925
3.00	8	2	5	1	1	1	157.3200	185.2925
2.00	5	2	3	1	1	1	137.3871	185.6228
4.00	1	3	4	1	3	2	350.7000	186.4070
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3.00	1	3	4	1	1	2	350.7000	186.8535

3.00	2	3	5	1	2	2	274.3651	186.9801
1.00	6	2	4	2	1	1	221.7826	187.0593
2.00	3	2	1	2	1	4	179.2373	187.4104
1.00	8	2	3	2	1	1	126.4933	187.6372
1.00	8	2	3	2	2	1	126.4933	187.6372
2.00	2	1	4	1	0	2	149.7059	187.7786
1.00	8	1	1	1	0	3	141.1364	187.7803
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.00	2	1	1	1	0	5	281.9542	188.0728
4.00	6	2	5	1	1	1	235.9333	188.3918
4.00	6	2	5	1	2	1	235.9333	188.3918
4.00	8	2	2	2	1	5	178.3471	188.4704
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4.00	2	1	1	1	1	3	281.9542	188.5444
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2.00	1	2	3	2	2	1	364.1837	188.8148
2.00	8	3	3	2	3	3	100.3276	188.8211
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3.00	1	2	3	1	2	2	364.1837	189.0713
2.00	1	1	2	2	1	4	239.6335	189.2838
.00	1	3	3	1	3	4	242.5484	189.6421
4.00	7	3	3	1	3	4	187.4286	189.6919
4.00	7	3	3	1	1	4	187.4286	189.6919
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.00	2	1	3	1	1	2	214.5873	190.2470
1.00	1	3	5	1	1	1	356.5238	190.2571
2.00	3	2	3	2	1	1	141.5538	190.6386
4.00	2	3	4	1	3	4	215.8899	191.0150
4.00	3	3	3	1	1	5	153.4579	191.0184
1.00	4	2	3	1	1	1	192.4016	191.2198
2.00	3	2	5	1	1	1	321.6610	191.3814
1.00	8	1	1	2	1	4	141.1364	191.7273
1.00	8	1	1	2	0	4	141.1364	191.7273
4.00	3	2	4	1	1	2	282.1022	191.8217
3.00	6	3	3	1	2	4	98.0323	192.6598
2.00	1	1	1	1	0	4	525.7030	192.7154
.00	1	1	2	1	0	4	239.6335	193.0148
2.00	6	2	3	1	2	4	155.0000	193.0253
2.00	3	3	3	2	2	4	153.4579	193.4393
1.00	2	3	3	1	1	4	128.9572	193.4611
1.00	4	2	5	2	1	4	304.6429	193.6048
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.00	3	1	3	2	1	2	227.0897	193.7945
3.00	1	3	5	1	2	2	356.5238	193.9964
1.00	2	2	4	1	0	2	244.5797	194.0120
.00	2	1	1	1	0	4	281.9542	194.0243
3.00	1	0	5	1	2	1	279.5727	194.1326
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1.00	4	1	3	1	0	1	168.2149	194.9836
3.00	1	2	3	1	2	1	364.1837	194.9948
.00	4	1	4	1	2	1	211.5217	195.1274
3.00	5	3	4	1	2	1	198.6111	195.3012
1.00	4	1	2	1	0	4	193.6812	195.3392
3.00	5	3	3	1	3	4	98.9677	195.7311
.00	3	1	1	1	0	5	300.1344	195.7690
1.00	5	1	1	1	1	4	270.4091	195.8170
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2.00	6	1	2	1	0	5	161.0857	196.0079
3.00	2	1	1	1	1	4	281.9542	196.0544
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.00	3	1	2	1	0	5	175.2800	197.4888
3.00	3	1	2	1	1	1	153.4579	197.8142

3.00	4	3	3	1	1	1	135.4453	197.8680
2.00	8	1	2	2	1	2	199.5208	197.9353
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4.00	4	3	2	1	2	3	262.1379	198.7347
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3.00	3	1	2	1	0	5	175.2800	199.4269
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.00	4	3	3	1	2	1	135.4453	200.1184
3.00	4	3	5	1	2	2	267.4151	200.1515
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4.00	3	2	4	1	1	1	282.1022	200.5490
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.00	4	1	4	1	1	2	211.5217	201.4147
2.00	4	2	2	1	0	4	428.9915	202.0065
3.00	3	3	3	1	2	1	153.4579	202.0595
2.00	3	2	3	1	1	2	141.5538	202.1951
4.00	5	2	2	1	0	5	339.3333	202.9948
3.00	3	1	3	2	1	2	227.0897	203.1161
3.00	7	2	1	1	1	4	226.5000	203.1639
3.00	4	1	3	1	0	1	168.2149	203.2660
3.00	3	2	3	2	1	1	141.5538	203.3631
3.00	4	1	4	1	1	2	211.5217	203.4065
.00	2	2	5	1	2	1	306.2836	203.5750
.00	1	2	3	1	2	2	364.1837	204.0700
4.00	1	2	4	1	2	2	730.2222	204.4335
1.00	8	2	3	1	0	5	126.4933	204.6124
.00	1	0	1	1	1	4	465.6887	204.6125
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3.00	6	3	2	2	2	4	104.4211	204.8510
3.00	8	2	3	1	2	2	126.4933	204.9595
4.00	8	3	5	1	3	2	221.1111	205.2148
4.00	8	3	5	1	2	2	221.1111	205.2148
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3.00	3	2	3	2	2	4	141.5538	205.4120
.00	1	2	1	1	1	4	266.9583	205.4191
4.00	7	2	3	1	1	1	188.5556	205.5410
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2.00	3	1	2	2	0	5	175.2800	205.5837
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1.00	3	1	2	1	2	4	175.2800	206.2166
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2.00	3	1	4	1	2	1	243.9231	206.9156
1.00	1	2	4	1	2	2	730.2222	207.1593
2.00	1	3	3	1	3	4	242.5484	207.2804
2.00	1	0	2	2	2	3	272.6745	207.3093
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3.00	2	3	5	1	1	1	274.3651	207.5845
2.00	3	1	2	2	1	3	175.2800	207.7114
3.00	2	3	4	1	3	4	215.8899	208.1029
2.00	5	1	3	1	1	1	203.6419	208.2478
4.00	4	2	4	1	3	2	291.2614	208.4255
2.00	2	2	4	1	1	2	244.5797	208.4788
.00	4	1	2	2	1	4	193.6812	208.6793
1.00	4	2	5	1	1	1	304.6429	208.7023
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4.00	3	2	2	1	0	4	488.1858	209.2661
2.00	3	1	1	1	1	5	300.1344	209.3312
3.00	3	3	3	1	2	4	153.4579	209.4459
2.00	2	3	5	1	1	1	274.3651	209.8892
2.00	4	2	3	2	1	1	192.4016	209.9760
2.00	1	1	4	1	2	4	97.2027	210.0597
2.00	8	0	2	2	0	5	132.3737	210.0960

4.00	3	1	1	2	1	4	300.1344	210.0992
2.00	3	3	3	1	3	4	153.4579	210.2196
2.00	8	0	1	1	0	5	263.5294	210.3123
3.00	1	2	3	2	2	2	364.1837	210.3146
2.00	2	1	2	2	1	3	177.4977	210.4052
3.00	6	1	1	1	1	3	178.3864	210.4622
1.00	3	1	3	1	1	2	227.0897	210.7722
2.00	2	3	4	1	2	4	215.8899	210.8601
.00	4	3	4	1	3	4	190.0333	210.9464
.00	3	2	5	1	2	1	321.6610	211.3203
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3.00	8	3	3	1	1	1	100.3276	213.1830
3.00	4	2	2	1	0	4	428.9915	213.2211
2.00	3	1	2	1	1	5	175.2800	213.3184
4.00	8	3	3	1	1	5	100.3276	213.7341
4.00	4	3	3	2	2	4	135.4453	214.0206
3.00	2	1	1	2	0	5	281.9542	214.3229
2.00	4	1	1	1	1	3	316.0140	214.4188
4.00	4	1	2	2	0	5	193.6812	214.4279
.00	2	2	4	1	1	1	244.5797	214.5966
2.00	4	2	5	1	2	2	304.6429	215.1344
.00	4	2	2	1	0	4	428.9915	215.1635
2.00	3	0	1	2	0	5	424.9444	215.2924
2.00	4	1	2	1	0	1	193.6812	215.3106
2.00	2	0	1	1	0	5	529.2857	215.4154
1.00	2	0	2	1	0	5	249.3451	215.5185
.00	4	2	5	1	2	1	304.6429	215.5394
3.00	3	2	3	1	1	2	141.5538	215.6909
2.00	8	0	1	2	1	4	263.5294	215.8414
2.00	8	0	1	2	0	4	263.5294	215.8414
2.00	1	3	3	1	2	4	242.5484	215.8454
2.00	4	2	3	1	1	2	192.4016	215.9407
1.00	1	0	2	1	0	4	272.6745	215.9756
2.00	6	1	4	2	1	2	156.6250	216.0016
3.00	8	2	4	2	1	1	151.7778	216.3193
1.00	5	1	1	1	0	5	270.4091	216.3597
3.00	2	2	1	1	1	3	192.7209	216.4855
2.00	1	1	2	1	1	3	239.6335	216.5601
1.00	5	1	3	2	1	2	203.6419	217.1808
1.00	5	1	3	2	2	2	203.6419	217.1808
2.00	3	2	3	1	2	2	141.5538	217.2177
3.00	8	2	3	2	2	1	126.4933	217.2916
.00	2	3	5	1	2	2	274.3651	217.3154
2.00	4	2	3	2	0	2	192.4016	217.4972
3.00	2	1	2	2	1	3	177.4977	217.7148
1.00	1	1	3	1	2	5	69.3113	217.9471
.00	5	1	1	1	1	3	270.4091	218.2042
3.00	3	2	3	2	2	1	141.5538	218.4725
1.00	3	2	1	2	0	5	179.2373	218.5233
3.00	4	1	3	1	2	1	168.2149	218.8792
2.00	5	1	4	2	2	1	327.6667	218.8842
2.00	1	1	2	1	1	1	239.6335	219.0413
2.00	1	0	5	1	1	2	279.5727	219.6025
3.00	1	1	1	1	0	4	525.7030	219.8552
4.00	5	2	1	1	0	4	432.3333	219.8809
2.00	4	1	1	1	0	4	316.0140	220.0989
1.00	3	1	4	1	1	2	243.9231	220.4752
3.00	4	2	1	1	0	5	186.7407	220.8180
1.00	2	1	4	1	2	2	149.7059	221.0113
3.00	2	1	1	2	0	4	281.9542	221.1050
4.00	8	3	5	2	2	1	221.1111	221.2783
3.00	1	1	2	1	1	4	239.6335	221.4670
1.00	2	1	2	1	0	2	177.4977	221.8000

1.00	1	0	1	1	1	4	465.6887	221.8533
2.00	2	2	3	1	2	1	208.2679	222.5552
1.00	2	2	5	1	1	1	306.2836	222.6412
1.00	8	1	1	2	0	3	141.1364	223.2002
1.00	8	1	1	2	1	3	141.1364	223.2002
4.00	4	3	5	1	1	1	267.4151	223.3515
1.00	2	0	4	2	0	1	253.4849	223.4738
2.00	2	2	1	1	1	3	192.7209	223.8758
.00	3	1	2	2	2	3	175.2800	224.0212
2.00	4	1	2	1	1	5	193.6812	224.0413
4.00	2	1	1	2	1	4	281.9542	224.0460
2.00	6	2	5	1	3	2	235.9333	224.1502
2.00	6	2	5	1	0	2	235.9333	224.1502
2.00	6	2	5	1	2	2	235.9333	224.1502
4.00	1	3	3	1	1	4	242.5484	224.3041
1.00	2	0	4	1	2	2	253.4849	224.3615
1.00	3	2	3	2	1	1	141.5538	224.3898
3.00	3	3	3	2	1	1	153.4579	224.4753
2.00	5	2	2	1	0	5	339.3333	224.8063
4.00	7	0	1	1	1	4	327.5000	224.8551
1.00	1	0	5	1	2	2	279.5727	225.1776
1.00	6	1	2	1	1	1	161.0857	225.2401
1.00	1	2	3	2	2	1	364.1837	225.3058
2.00	6	0	1	1	0	5	456.1667	225.4320
1.00	2	1	3	1	1	1	214.5873	225.5648
3.00	4	3	2	1	0	5	262.1379	225.7378
4.00	2	3	4	1	2	4	215.8899	226.0806
3.00	2	2	3	2	2	1	208.2679	226.3513
2.00	3	1	1	1	1	3	300.1344	226.5196
4.00	4	2	1	1	1	3	186.7407	226.7312
.00	3	3	3	1	3	4	153.4579	226.7711
2.00	1	1	2	2	2	3	239.6335	226.7792
3.00	7	3	3	2	1	4	187.4286	226.9480
2.00	4	1	3	2	1	4	168.2149	227.0568
3.00	6	3	4	1	3	4	190.5000	227.2220
3.00	2	2	5	1	1	1	306.2836	227.3262
4.00	2	2	2	1	1	5	450.8375	228.7411
2.00	1	1	4	1	1	4	97.2027	229.6682
2.00	8	1	2	1	1	2	199.5208	230.0269
4.00	6	2	2	1	2	4	345.0741	230.3111
1.00	4	1	4	1	3	2	211.5217	230.6820
1.00	6	0	2	2	0	4	751.3041	230.8575
1.00	1	1	2	1	1	4	239.6335	231.0323
2.00	3	1	5	1	3	4	243.8333	231.0345
.00	1	0	3	2	0	1	338.8530	231.5107
2.00	2	1	1	1	1	3	281.9542	231.5465
2.00	8	2	2	2	2	4	178.3471	231.5925
2.00	8	2	2	2	0	4	178.3471	231.5925
3.00	3	2	3	1	2	2	141.5538	231.7163
3.00	1	1	2	2	2	4	239.6335	231.9177
2.00	3	1	3	2	3	3	227.0897	232.0522
2.00	2	2	5	1	3	1	306.2836	232.0920
2.00	2	1	2	1	0	3	177.4977	232.2179
4.00	3	1	4	2	1	1	243.9231	232.3631
1.00	6	2	2	1	0	4	345.0741	232.5839
1.00	6	2	2	1	1	4	345.0741	232.5839
4.00	2	2	2	2	1	4	450.8375	232.5885
2.00	2	3	3	1	3	3	128.9572	232.6048
3.00	4	3	3	2	3	4	135.4453	232.6082
3.00	3	3	3	2	1	4	153.4579	232.6812
2.00	2	2	3	1	1	1	208.2679	233.1478
.00	2	3	2	1	2	4	239.5600	233.4355
4.00	2	3	1	1	1	3	94.7888	233.6913
3.00	5	2	3	1	3	4	137.3871	233.8589
3.00	5	2	3	1	2	4	137.3871	233.8589
2.00	6	3	5	1	1	1	162.2667	233.9456
3.00	6	1	2	1	0	4	161.0857	234.0194
3.00	6	1	2	1	1	4	161.0857	234.0194
2.00	4	0	1	2	1	4	414.6154	234.0986
1.00	3	1	2	2	0	4	175.2800	234.3301
2.00	2	2	3	1	2	4	208.2679	234.4174
2.00	6	1	1	2	1	4	178.3864	234.5289
4.00	2	3	5	1	1	1	274.3651	234.7881
4.00	4	3	3	1	1	5	135.4453	234.8996
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.00	4	1	2	1	1	5	193.6812	235.0333

3.00	5	2	4	2	0	2	202.1818	235.2178
3.00	7	3	3	1	2	1	187.4286	235.3594
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1.00	3	1	4	1	2	1	243.9231	235.4232
4.00	1	2	2	2	2	4	711.9730	235.6068
2.00	2	1	2	1	1	1	177.4977	235.8509
.00	3	3	3	1	1	5	153.4579	236.1319
.00	3	1	1	1	1	4	300.1344	236.1514
4.00	3	2	1	1	1	3	179.2373	236.5762
2.00	6	1	1	1	1	4	178.3864	236.6337
3.00	2	2	3	2	1	1	208.2679	237.1246
.00	3	1	4	1	1	2	243.9231	237.1485
4.00	4	3	2	1	2	4	262.1379	237.8098
4.00	2	2	2	1	0	5	450.8375	237.9398
2.00	6	2	2	1	1	4	345.0741	238.0386
2.00	6	2	2	1	2	4	345.0741	238.0386
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1.00	3	1	3	2	0	2	227.0897	238.3038
3.00	2	2	3	1	3	4	208.2679	238.3923
2.00	1	1	2	1	1	5	239.6335	238.8266
1.00	8	2	3	2	2	2	126.4933	238.8646
3.00	4	1	1	2	1	3	316.0140	239.2169
2.00	4	3	4	1	3	4	190.0333	239.3425
2.00	1	0	2	1	0	1	272.6745	239.5120
1.00	1	0	3	2	0	1	338.8530	239.6031
.00	2	2	1	1	1	3	192.7209	239.6671
2.00	3	1	1	2	0	4	300.1344	239.7553
1.00	4	1	3	1	1	1	168.2149	240.1064
.00	4	1	1	1	0	4	316.0140	240.1158
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2.00	2	2	3	1	0	4	208.2679	240.2772
1.00	1	0	3	1	3	4	338.8530	240.3053
3.00	2	1	1	1	1	3	281.9542	240.5039
.00	2	1	2	2	1	5	177.4977	240.7198
3.00	3	2	5	1	1	1	321.6610	240.7523
1.00	3	2	3	2	2	1	141.5538	241.0615
3.00	3	1	1	1	1	4	300.1344	241.0897
1.00	4	0	4	1	1	1	169.8349	241.1069
4.00	4	2	3	2	2	1	192.4016	241.3575
1.00	2	1	3	2	2	1	214.5873	241.8390
.00	4	3	2	1	1	4	262.1379	241.8887
1.00	1	1	4	1	2	4	97.2027	241.9469
2.00	4	1	4	1	2	2	211.5217	241.9759
.00	3	2	4	1	2	2	282.1022	242.2641
4.00	5	2	2	1	1	4	339.3333	242.3401
4.00	5	2	2	1	0	4	339.3333	242.3401
4.00	5	2	2	1	2	4	339.3333	242.3401
4.00	8	3	4	1	1	4	142.1842	242.5384
4.00	8	3	4	1	3	4	142.1842	242.5384
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2.00	2	2	2	2	0	1	450.8375	242.6625
1.00	3	1	2	1	1	4	175.2800	243.1464
2.00	1	1	3	1	1	5	69.3113	243.2354
3.00	3	2	5	2	1	1	321.6610	243.3453
3.00	8	2	2	1	2	3	178.3471	243.7960
3.00	8	2	2	1	1	3	178.3471	243.7960
3.00	2	1	2	1	1	1	177.4977	244.0445
4.00	3	1	1	2	1	5	300.1344	244.5347
3.00	3	1	3	1	2	4	227.0897	244.8023
1.00	6	1	2	1	2	3	161.0857	245.3007
2.00	4	1	1	1	0	5	316.0140	245.5065
3.00	4	1	1	2	0	4	316.0140	245.5538
2.00	2	2	3	1	1	4	208.2679	245.5746
2.00	2	0	1	1	0	4	529.2857	245.8470
2.00	2	1	2	1	0	5	177.4977	245.9894
2.00	1	1	1	1	1	4	525.7030	246.0141
2.00	7	2	5	1	2	1	343.1250	246.2179
3.00	2	3	4	1	2	4	215.8899	246.3055
4.00	2	2	2	1	2	4	450.8375	246.5597
1.00	3	2	1	2	0	4	179.2373	246.6084
2.00	3	3	1	1	1	3	96.4895	246.8133
3.00	1	3	3	1	1	4	242.5484	246.9841
.00	3	3	4	1	3	4	247.9394	247.9243
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4.00	4	2	3	1	2	2	192.4016	248.2136
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2.00	4	1	3	2	1	2	168.2149	248.7716
4.00	2	3	3	1	3	3	128.9572	248.8854
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4.00	3	3	3	1	2	5	153.4579	249.4729
3.00	2	2	3	2	1	4	208.2679	249.7633
4.00	1	2	3	1	2	2	364.1837	249.7828
.00	2	1	1	1	1	4	281.9542	250.7858
3.00	3	1	4	1	2	1	243.9231	250.9611
4.00	6	2	4	1	2	2	221.7826	251.5092
1.00	1	1	2	1	0	4	239.6335	251.7025
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.00	5	2	2	1	1	3	339.3333	253.8053
3.00	6	3	3	1	2	1	98.0323	254.2808
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3.00	2	1	2	1	0	5	177.4977	254.5352
2.00	4	2	1	2	1	3	186.7407	254.7627
2.00	1	0	3	1	1	4	338.8530	255.1103
2.00	4	0	2	1	0	4	654.9521	255.1213
.00	6	1	2	1	0	5	161.0857	255.1852
3.00	4	3	3	1	2	1	135.4453	255.3364
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3.00	5	2	3	1	1	5	137.3871	255.6067
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1.00	2	3	3	1	2	4	128.9572	256.2502
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2.00	3	0	4	1	1	1	876.0437	256.4788
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1.00	3	3	4	2	1	1	247.9394	257.6541
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2.00	5	1	2	1	0	5	227.4737	257.6999
1.00	2	1	4	1	0	2	149.7059	257.7098
3.00	4	2	3	1	1	4	192.4016	257.7924
4.00	3	2	2	1	2	4	488.1858	258.1810
2.00	3	1	5	1	1	1	243.8333	258.4963
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1.00	2	1	4	1	1	4	149.7059	259.2096
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2.00	1	1	2	1	0	5	239.6335	260.1942
1.00	1	0	1	1	0	4	465.6887	260.3521
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2.00	2	1	1	2	0	3	281.9542	261.1321
2.00	6	1	2	2	2	3	161.0857	261.2076
.00	3	1	2	2	0	5	175.2800	261.4337
1.00	1	1	5	1	0	2	148.8818	261.6131
1.00	1	0	2	1	1	5	272.6745	262.4356
2.00	4	1	4	2	0	1	211.5217	262.7093
2.00	2	2	4	1	2	2	244.5797	262.9325
.00	8	3	5	1	3	2	221.1111	263.0808
4.00	3	3	4	1	2	4	247.9394	263.1490
2.00	4	1	1	1	1	4	316.0140	263.4054
2.00	6	2	3	1	3	2	155.0000	263.8843
2.00	6	2	3	1	1	2	155.0000	263.8843
1.00	8	0	1	1	1	5	263.5294	263.9028
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4.00	6	3	4	1	3	4	190.5000	264.2286
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1.00	3	3	3	1	0	4	153.4579	264.3737
3.00	1	0	5	1	1	1	279.5727	264.5078
1.00	1	1	4	1	1	4	97.2027	264.5320
4.00	3	1	1	2	3	3	220.1334	264.6137

4.00	4	3	2	1	1	5	262.1379	265.0054
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2.00	1	3	2	1	1	5	319.3846	265.1870
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3.00	1	1	2	1	2	3	239.6335	265.3377
.00	5	2	3	2	2	1	137.3871	265.4901
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.00	2	1	2	1	0	5	177.4977	265.6752
.00	1	3	3	1	1	4	242.5484	265.9665
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2.00	2	1	1	2	1	5	281.9542	266.7052
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1.00	7	1	1	1	0	4	221.8261	267.6284
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.00	4	1	1	1	0	5	316.0140	267.8342
3.00	2	2	3	1	2	2	208.2679	268.2227
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2.00	5	2	2	1	1	4	339.3333	268.3791
2.00	5	2	2	1	2	4	339.3333	268.3791
2.00	5	2	2	1	0	4	339.3333	268.3791
2.00	3	2	4	1	2	2	282.1022	268.7505
1.00	4	1	2	2	1	4	193.6812	268.9203
4.00	6	2	4	1	1	1	221.7826	269.4751
4.00	2	3	2	2	2	4	239.5600	269.8090
3.00	2	1	3	1	0	4	214.5873	269.9714
1.00	1	1	5	2	1	1	148.8818	270.5338
.00	2	2	4	1	2	1	244.5797	270.6483
.00	4	2	4	1	2	2	291.2614	270.7063
1.00	8	0	1	2	0	4	263.5294	270.8407
4.00	2	3	5	1	2	4	274.3651	270.8590
.00	4	2	4	1	1	1	291.2614	271.5079
2.00	2	3	4	1	1	1	215.8899	271.5643
3.00	2	3	5	1	2	1	274.3651	271.9661
3.00	1	1	5	1	1	2	148.8818	272.7988
1.00	3	1	2	2	2	4	175.2800	272.9875
3.00	4	2	5	1	2	1	304.6429	273.2086
.00	2	2	3	1	2	2	208.2679	273.3571
3.00	6	2	3	2	2	2	155.0000	273.7159
3.00	4	3	1	1	1	3	127.6076	273.7265
3.00	4	1	1	2	0	5	316.0140	273.9000
4.00	3	1	2	1	1	1	175.2800	273.9660
.00	2	1	1	2	0	5	281.9542	274.1542
3.00	8	2	2	1	1	5	178.3471	274.5675
4.00	2	1	1	2	1	3	281.9542	274.8417
2.00	2	1	1	2	1	4	281.9542	275.1450
.00	3	0	1	2	1	4	424.9444	275.8679
3.00	4	1	2	1	0	5	193.6812	276.0938
3.00	8	2	3	2	2	2	126.4933	276.6150
4.00	1	3	5	1	2	2	356.5238	276.9507
.00	3	2	2	1	0	4	488.1858	277.4540
3.00	4	1	4	1	2	2	211.5217	277.8514
1.00	1	0	2	2	1	1	272.6745	278.5328
.00	1	1	2	1	1	3	239.6335	278.7571
3.00	2	0	1	2	1	3	529.2857	278.7684
2.00	3	1	1	2	0	5	300.1344	279.0514
4.00	4	2	2	1	2	4	428.9915	279.4322
2.00	4	1	2	1	0	5	193.6812	279.4634
2.00	4	2	1	2	1	4	186.7407	279.4756
1.00	1	0	5	1	1	1	279.5727	279.4958
2.00	3	1	3	1	0	1	227.0897	280.0160
.00	2	2	3	1	0	2	208.2679	280.1903
1.00	6	1	2	1	0	5	161.0857	280.5442
3.00	1	1	1	1	1	4	525.7030	280.6598
3.00	3	2	3	2	1	2	141.5538	280.6695
2.00	3	2	4	1	2	1	282.1022	280.9779
3.00	2	2	3	1	1	2	208.2679	280.9888
1.00	8	1	1	1	0	5	141.1364	281.4525
4.00	1	3	2	1	2	3	319.3846	281.8403
2.00	3	3	3	1	0	5	153.4579	282.2332
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2.00	3	2	3	2	2	2	141.5538	282.5538

3.00	2	2	1	2	1	4	192.7209	282.7154
2.00	4	1	3	2	1	3	168.2149	282.8174
.00	2	1	1	2	0	4	281.9542	282.8297
1.00	1	3	5	1	2	1	356.5238	282.9140
4.00	3	1	3	1	2	1	227.0897	282.9675
.00	4	2	4	1	2	1	291.2614	283.0391
3.00	2	3	5	1	3	2	274.3651	283.7145
3.00	4	0	1	1	1	4	414.6154	283.7267
2.00	4	3	1	1	1	3	127.6076	283.7696
2.00	8	2	2	2	1	3	178.3471	283.9568
2.00	8	2	2	2	2	3	178.3471	283.9568
3.00	1	2	4	1	2	2	730.2222	284.5343
3.00	4	1	2	2	1	3	193.6812	284.6652
1.00	2	1	2	2	0	2	177.4977	284.8734
4.00	3	3	4	1	1	1	247.9394	284.9896
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.00	2	2	3	1	1	2	208.2679	286.3676
.00	5	2	1	1	0	5	432.3333	286.4411
3.00	2	3	3	2	2	1	128.9572	286.6477
2.00	2	0	2	2	1	1	249.3451	286.7617
3.00	2	1	3	2	2	1	214.5873	287.2235
.00	4	1	1	1	1	4	316.0140	287.3608
4.00	4	3	3	1	3	3	135.4453	287.7920
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2.00	4	1	1	2	0	3	316.0140	288.1042
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3.00	1	1	5	1	3	2	148.8818	288.1461
3.00	3	1	5	1	1	1	243.8333	289.8490
4.00	3	2	2	1	1	4	488.1858	290.2941
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2.00	4	1	4	2	2	2	211.5217	291.1662
4.00	2	3	4	1	1	1	215.8899	291.1666
1.00	2	1	1	1	0	5	281.9542	291.3076
2.00	3	1	3	1	0	5	227.0897	291.4088
3.00	1	2	1	1	1	3	266.9583	291.7342
3.00	6	1	1	1	1	4	178.3864	292.3480
2.00	2	2	1	2	1	4	192.7209	292.3667
.00	2	2	2	1	1	4	450.8375	292.6709
3.00	4	1	2	2	1	1	193.6812	292.8406
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.00	4	1	2	1	0	5	193.6812	293.1744
1.00	8	2	2	1	1	5	178.3471	293.2146
3.00	4	1	1	2	1	4	316.0140	293.8688
1.00	4	1	1	1	0	3	316.0140	293.8699
2.00	8	3	4	1	2	1	142.1842	294.1569
3.00	2	0	5	1	3	4	550.2689	294.1870
2.00	2	1	3	2	1	1	214.5873	294.5048
2.00	4	1	2	2	1	1	193.6812	296.4146
2.00	7	2	3	1	1	4	188.5556	296.8947
.00	3	1	1	1	1	3	300.1344	297.4256
2.00	1	1	5	1	0	2	148.8818	297.4653
4.00	3	2	1	2	1	3	179.2373	297.4915
2.00	7	2	2	1	0	4	364.2273	297.7376
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2.00	1	1	2	2	1	3	239.6335	297.8265
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2.00	6	1	2	2	0	5	161.0857	298.7366
3.00	3	3	2	1	0	5	258.0000	299.1233
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.00	4	2	3	2	2	1	192.4016	299.3134
2.00	4	2	2	1	0	5	428.9915	299.4125
2.00	5	2	2	2	2	3	339.3333	299.8552
2.00	4	3	2	1	2	3	262.1379	300.0834
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.00	3	2	4	1	1	1	282.1022	300.9264
2.00	3	2	2	1	0	4	488.1858	300.9831
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3.00	3	2	3	2	2	2	141.5538	301.5226
2.00	6	2	5	1	1	1	235.9333	302.5838
2.00	6	2	5	1	2	1	235.9333	302.5838
2.00	2	1	2	2	1	1	177.4977	302.8896
4.00	4	3	3	1	2	5	135.4453	303.1234
2.00	4	3	3	1	3	3	135.4453	303.3880
3.00	2	0	2	2	1	4	249.3451	303.5277
3.00	6	2	4	2	2	1	221.7826	303.6258
3.00	3	1	1	1	1	3	300.1344	303.6453
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2.00	1	1	3	2	2	3	69.3113	304.0334
1.00	3	0	1	1	0	4	424.9444	304.1657
.00	2	2	2	1	0	4	450.8375	304.4405
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4.00	2	2	3	2	1	2	208.2679	304.9646
2.00	7	3	5	1	2	1	270.7273	305.4151
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1.00	2	1	3	1	1	4	214.5873	306.0757
3.00	2	2	4	2	2	2	244.5797	306.5452
1.00	3	1	1	1	0	4	300.1344	306.6209
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.00	1	1	2	1	1	5	239.6335	307.4186
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4.00	2	3	5	1	2	1	274.3651	307.6069
2.00	1	1	5	2	1	1	148.8818	307.6085
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3.00	4	3	4	1	2	4	190.0333	308.1630
3.00	4	2	5	1	0	1	304.6429	309.3094
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1.00	6	0	1	1	0	5	456.1667	310.8310
2.00	8	1	2	1	0	5	199.5208	311.7521
.00	6	2	2	1	2	4	345.0741	311.7600
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.00	2	3	4	1	1	1	215.8899	314.0739
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3.00	4	2	2	1	0	5	428.9915	316.0346
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.00	3	3	2	1	0	5	258.0000	317.4341
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4.00	2	3	3	1	1	5	128.9572	325.2594
2.00	5	1	1	2	1	4	270.4091	325.5154
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.00	5	1	2	1	0	5	227.4737	326.2419
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.00	3	1	2	1	0	1	175.2800	332.9820
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4.00	1	3	4	1	2	1	350.7000	335.1584
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2.00	1	3	3	1	0	4	242.5484	339.9724
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4.00	6	2	2	2	2	4	345.0741	347.2597
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2.00	1	1	1	1	0	5	525.7030	348.3030
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.00	6	1	1	1	1	4	178.3864	348.8262
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.00	2	1	1	2	1	5	281.9542	354.3576
4.00	1	1	1	1	1	4	525.7030	354.8881
2.00	1	1	3	1	0	5	69.3113	356.1681
.00	1	0	1	1	0	3	465.6887	356.1685
1.00	7	0	1	1	0	5	327.5000	356.3953
1.00	3	1	1	1	0	5	300.1344	356.8764
4.00	8	3	5	1	1	1	221.1111	357.1417
4.00	8	3	5	1	3	1	221.1111	357.1417
4.00	8	3	5	1	2	1	221.1111	357.1417
4.00	1	1	5	1	1	1	148.8818	357.7434
2.00	1	1	2	2	0	5	239.6335	357.8347
1.00	4	1	3	2	0	2	168.2149	357.9930
1.00	1	3	5	1	0	1	356.5238	358.4373
1.00	3	1	2	1	0	5	175.2800	358.7330
2.00	3	1	2	1	1	1	175.2800	359.6720
4.00	8	1	2	2	1	1	199.5208	360.2514
1.00	4	1	1	1	0	4	316.0140	361.0080
4.00	5	3	3	1	1	1	98.9677	361.3670
.00	1	3	1	1	1	3	211.7891	362.3728
.00	3	3	4	1	1	1	247.9394	362.6803
4.00	4	2	2	1	1	4	428.9915	362.9764
3.00	2	1	3	1	1	4	214.5873	363.5151
1.00	1	1	2	1	1	3	239.6335	363.5153
2.00	2	0	1	2	0	4	529.2857	363.5834
.00	3	3	2	1	1	5	258.0000	364.5472
3.00	1	1	2	2	2	3	239.6335	364.9084
3.00	4	3	3	1	1	5	135.4453	365.4038
.00	2	1	1	2	1	4	281.9542	365.5711
3.00	2	3	2	2	1	4	239.5600	366.1549
.00	7	1	1	2	1	4	221.8261	366.3392
.00	3	1	1	2	0	5	300.1344	366.4012
2.00	4	2	4	1	2	1	291.2614	367.3653
1.00	1	1	2	1	1	1	239.6335	367.6801
3.00	1	1	5	1	3	1	148.8818	368.7653
3.00	6	3	4	1	2	1	190.5000	369.3701
2.00	1	1	5	2	2	1	148.8818	369.4985
3.00	4	2	1	2	1	4	186.7407	370.1463
1.00	1	1	3	1	0	5	69.3113	370.9548
2.00	3	2	2	1	2	4	488.1858	371.3364
3.00	2	2	3	1	2	5	208.2679	371.4324
2.00	1	3	1	2	1	4	211.7891	372.4154
1.00	1	0	1	1	0	5	465.6887	372.8929
2.00	3	2	1	1	1	3	179.2373	373.1444
3.00	3	1	1	2	0	5	300.1344	374.0633
1.00	3	0	1	2	0	4	424.9444	374.7666
1.00	1	0	2	2	1	3	272.6745	375.6359
1.00	1	2	1	2	1	3	266.9583	375.8797
.00	4	1	1	2	1	3	316.0140	376.1485
1.00	2	1	1	1	1	5	281.9542	376.5293
3.00	6	2	5	1	1	1	235.9333	376.6765
1.00	1	1	1	1	1	1	340.2840	376.6803

2.00	2	2	3	2	2	1	208.2679	377.0269
1.00	4	1	2	1	0	5	193.6812	377.8073
4.00	1	1	5	1	3	1	148.8818	377.8695
.00	2	2	3	1	2	5	208.2679	378.5425
1.00	2	1	4	2	1	1	149.7059	378.6289
1.00	1	0	2	2	0	4	272.6745	378.9494
2.00	7	1	2	1	0	5	211.8462	379.0359
1.00	1	1	2	2	2	3	239.6335	380.6690
2.00	1	1	5	1	0	1	148.8818	380.6918
4.00	2	3	4	1	3	1	215.8899	380.9357
3.00	1	1	3	1	1	5	69.3113	381.4565
3.00	7	2	3	1	1	1	188.5556	383.2609
4.00	1	3	2	1	1	4	319.3846	383.9417
3.00	2	2	4	1	1	1	244.5797	384.1645
.00	1	1	5	2	1	1	148.8818	384.6204
.00	3	2	2	1	1	4	488.1858	384.8845
.00	2	3	2	1	2	3	239.5600	385.4056
4.00	3	2	5	1	1	2	321.6610	385.9284
.00	4	1	1	2	0	4	316.0140	386.1129
3.00	5	2	2	1	1	5	339.3333	386.4090
4.00	4	3	5	1	3	4	267.4151	387.7304
.00	2	2	3	1	0	5	208.2679	388.0051
2.00	4	1	3	2	2	1	168.2149	388.3785
1.00	2	1	1	1	1	4	281.9542	388.4444
4.00	3	1	4	1	2	1	243.9231	388.4483
3.00	2	2	1	2	1	3	192.7209	388.4601
3.00	1	2	3	1	1	4	364.1837	390.6300
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1.00	4	3	5	2	1	1	267.4151	390.8341
2.00	3	1	1	2	1	5	300.1344	391.7842
.00	1	0	3	1	1	4	338.8530	392.1076
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3.00	8	2	3	2	3	3	126.4933	393.3736
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4.00	4	3	4	1	1	1	190.0333	393.5871
.00	4	3	2	1	2	4	262.1379	393.6886
4.00	3	3	5	1	3	1	283.9000	394.4366
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2.00	4	1	1	2	0	5	316.0140	394.7813
3.00	3	2	1	1	1	3	179.2373	395.4669
2.00	1	0	2	1	0	5	272.6745	395.9589
3.00	4	2	3	2	1	1	192.4016	396.0504
.00	2	2	3	1	1	5	208.2679	396.5594
2.00	5	1	1	2	1	3	270.4091	396.5665
1.00	1	0	4	2	1	2	235.5381	397.2983
.00	2	2	2	1	0	5	450.8375	397.3008
3.00	1	1	1	1	0	5	525.7030	397.3539
2.00	3	1	3	2	1	1	227.0897	397.8558
4.00	4	2	5	1	1	1	304.6429	399.1255
3.00	3	2	4	1	2	2	282.1022	400.2773
1.00	1	1	2	1	0	1	239.6335	400.5760
3.00	4	2	3	1	2	2	192.4016	400.6070
1.00	1	1	2	1	1	5	239.6335	400.8916
2.00	2	2	1	2	1	3	192.7209	401.7212
1.00	1	1	1	1	1	4	525.7030	402.6330
1.00	4	1	1	1	0	5	316.0140	402.6819
.00	4	1	2	2	1	5	193.6812	403.6085
4.00	2	2	2	2	1	3	450.8375	404.0969
2.00	1	1	1	2	1	4	525.7030	404.1113
2.00	1	3	4	1	2	1	350.7000	404.2224
.00	2	0	1	1	0	5	529.2857	405.0999
1.00	3	2	2	1	0	4	488.1858	405.1884
2.00	3	1	5	1	1	2	243.8333	405.6709
1.00	1	0	3	1	1	4	338.8530	405.8137
1.00	2	1	3	2	0	1	214.5873	406.3458
1.00	3	1	2	2	2	3	175.2800	406.9285
2.00	2	2	4	1	2	1	244.5797	407.2411
3.00	4	2	3	1	1	2	192.4016	407.3008
2.00	2	2	2	1	1	5	450.8375	407.4472
1.00	1	0	2	2	2	3	272.6745	407.5135
2.00	2	0	3	2	1	1	760.2131	408.3185
2.00	2	2	4	1	3	4	244.5797	408.7223
1.00	8	1	2	2	1	2	199.5208	410.9854
4.00	2	3	5	1	3	4	274.3651	410.9884
.00	4	3	5	1	3	4	267.4151	411.5976
.00	2	2	2	1	2	4	450.8375	411.6938

1.00	8	1	4	2	0	2	113.6667	412.4155
2.00	2	2	2	2	1	4	450.8375	414.3005
3.00	2	2	2	1	1	4	450.8375	414.5545
1.00	2	1	2	2	1	5	177.4977	414.9027
.00	6	2	2	1	1	5	345.0741	415.5490
2.00	2	3	5	1	3	1	274.3651	417.2499
2.00	3	2	2	1	1	4	488.1858	417.5241
3.00	2	0	2	2	0	5	249.3451	417.9504
3.00	3	2	4	1	2	1	282.1022	418.4887
3.00	1	1	2	1	0	5	239.6335	418.6761
4.00	2	2	5	2	2	1	306.2836	419.3215
3.00	1	1	5	1	2	1	148.8818	419.3669
1.00	4	3	2	1	1	4	262.1379	419.4934
2.00	2	3	4	1	2	1	215.8899	420.5122
.00	1	0	2	2	0	2	272.6745	421.0473
.00	3	2	2	1	2	3	488.1858	421.0990
2.00	4	2	2	1	1	4	428.9915	421.8199
2.00	1	0	5	1	0	1	279.5727	422.1425
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3.00	3	2	2	1	2	4	488.1858	422.5534
1.00	3	1	3	2	2	2	227.0897	422.9605
3.00	2	3	2	1	1	3	239.5600	423.1851
2.00	4	1	1	2	1	4	316.0140	423.5631
2.00	2	2	2	1	0	5	450.8375	423.8325
2.00	2	0	2	1	2	4	249.3451	423.9438
2.00	3	1	1	2	1	3	300.1344	423.9541
1.00	2	1	1	2	0	5	281.9542	424.6399
4.00	3	3	2	1	2	3	258.0000	425.0889
3.00	1	2	4	1	2	1	730.2222	425.8427
3.00	4	2	5	1	1	1	304.6429	426.2772
3.00	8	2	2	2	2	3	178.3471	427.5673
3.00	8	2	2	2	1	3	178.3471	427.5673
1.00	6	1	2	2	0	5	161.0857	427.5787
4.00	2	2	2	1	2	3	450.8375	428.3701
4.00	1	3	3	2	2	1	242.5484	428.8131
4.00	6	3	4	1	2	1	190.5000	429.5276
4.00	6	3	4	1	1	1	190.5000	429.5276
4.00	1	1	5	1	2	1	148.8818	429.7204
1.00	3	1	1	1	1	4	300.1344	430.4914
.00	4	1	1	2	0	5	316.0140	430.6847
4.00	2	3	3	1	2	5	128.9572	430.8246
1.00	1	0	4	1	2	2	235.5381	431.0498
2.00	1	0	5	2	2	1	279.5727	431.9682
1.00	4	1	1	1	1	4	316.0140	432.0397
2.00	2	3	4	2	2	1	215.8899	432.2280
1.00	1	2	2	1	0	4	711.9730	433.0777
1.00	1	2	1	1	1	4	266.9583	433.6305
4.00	4	1	4	1	3	4	211.5217	435.4167
.00	1	1	1	2	0	4	525.7030	435.8322
1.00	1	1	2	1	0	5	239.6335	436.7589
.00	4	2	4	1	3	2	291.2614	437.7066
1.00	2	1	2	1	1	1	177.4977	439.0426
2.00	2	2	2	1	2	4	450.8375	439.1867
4.00	3	3	5	1	1	1	283.9000	440.6411
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3.00	2	1	5	1	1	2	203.8276	442.7646
2.00	4	1	3	2	1	1	168.2149	444.1412
4.00	5	3	4	1	3	4	198.6111	445.1455
3.00	4	2	2	1	1	4	428.9915	445.2376
1.00	6	1	1	1	0	4	178.3864	445.4922
2.00	2	2	3	1	2	2	208.2679	446.7708
3.00	3	3	3	1	2	5	153.4579	449.1104
.00	4	2	2	1	1	4	428.9915	449.2936
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.00	3	0	2	2	0	2	627.7630	451.6771
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1.00	4	1	3	1	0	5	168.2149	453.0418
3.00	1	3	3	1	2	1	242.5484	453.0640
.00	7	2	2	1	1	4	364.2273	453.9171
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2.00	7	1	1	2	1	5	221.8261	455.9881
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2.00	7	1	1	2	1	3	221.8261	456.2836
4.00	3	2	2	1	0	5	488.1858	456.5398
1.00	8	2	2	2	2	3	178.3471	456.6053
1.00	8	0	1	2	0	5	263.5294	456.7731
2.00	3	2	2	1	2	3	488.1858	456.8097
.00	3	3	5	1	3	1	283.9000	457.0597
1.00	4	0	1	1	0	5	414.6154	457.4711
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2.00	7	2	4	2	2	1	204.3636	458.0689
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4.00	1	3	4	2	2	1	350.7000	460.6579
3.00	1	1	1	2	1	4	525.7030	461.0215
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3.00	3	1	2	1	1	1	175.2800	461.8712
.00	4	1	1	2	1	4	316.0140	462.0841
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2.00	1	0	5	1	0	2	279.5727	463.3924
3.00	5	2	5	1	2	2	311.4444	463.8916
1.00	1	0	2	2	0	2	272.6745	465.2364
4.00	2	3	5	1	3	1	274.3651	466.7478
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4.00	2	1	5	1	3	2	203.8276	468.6878
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.00	3	0	1	1	0	5	424.9444	469.9046
1.00	1	0	2	1	0	1	272.6745	470.8154
2.00	7	3	2	1	1	4	145.5333	472.2694
2.00	4	1	1	2	1	5	316.0140	472.4582
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.00	3	2	2	1	1	3	488.1858	473.4763
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3.00	3	2	2	1	1	4	488.1858	475.1116
2.00	6	1	4	1	1	2	156.6250	475.4223
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2.00	3	1	2	2	1	1	175.2800	476.1304
2.00	5	3	4	1	3	1	198.6111	476.4386
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3.00	4	2	2	1	2	3	428.9915	481.5672
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4.00	6	2	4	2	2	1	221.7826	485.1563
2.00	1	3	5	2	3	1	356.5238	485.1648
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1.00	3	1	3	1	1	1	227.0897	488.4453
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.00	4	3	4	1	1	1	190.0333	491.1499
1.00	5	1	2	1	0	5	227.4737	491.1884
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3.00	3	2	1	2	1	3	179.2373	497.2946
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2.00	8	3	5	1	3	4	221.1111	498.4096

1.00	2	2	2	1	0	4	450.8375	498.9499
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3.00	3	3	4	1	3	4	247.9394	499.5777
1.00	4	1	2	2	0	1	193.6812	499.8524
1.00	1	1	2	2	1	3	239.6335	499.9282
4.00	8	2	5	1	1	2	157.3200	502.2517
.00	4	1	2	2	0	5	193.6812	503.4508
1.00	7	1	1	1	0	5	221.8261	504.1091
3.00	4	3	5	1	1	1	267.4151	504.2513
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.00	3	3	5	1	1	1	283.9000	510.5999
.00	7	3	4	1	2	4	230.1579	513.0562
4.00	3	3	5	1	3	4	283.9000	515.6905
1.00	1	1	1	2	0	4	525.7030	518.0920
4.00	3	2	5	1	2	2	321.6610	518.8940
3.00	3	2	2	1	2	3	488.1858	519.8158
3.00	1	0	4	1	0	1	235.5381	522.2750
4.00	3	3	4	2	2	4	247.9394	523.8378
2.00	3	3	2	1	0	5	258.0000	524.2716
3.00	3	1	1	2	1	5	300.1344	525.1795
1.00	1	0	3	1	0	4	338.8530	528.9948
2.00	6	2	4	1	1	2	221.7826	530.2473
1.00	1	0	1	2	0	4	465.6887	531.2351
3.00	4	2	4	1	2	2	291.2614	531.4470
2.00	4	1	5	1	0	2	222.0714	531.5796
3.00	4	2	4	1	1	1	291.2614	533.0207
2.00	1	0	4	1	2	2	235.5381	533.5568
3.00	1	1	5	2	3	2	148.8818	534.0218
3.00	4	3	2	1	1	3	262.1379	534.5234
1.00	1	2	2	1	1	4	711.9730	535.1458
1.00	5	1	1	2	0	3	270.4091	535.4974
1.00	5	2	5	1	1	1	311.4444	536.2411
.00	1	3	4	1	3	1	350.7000	536.8780
4.00	1	2	4	1	3	2	730.2222	537.1895
1.00	2	1	1	2	0	3	281.9542	537.3985
2.00	4	2	4	2	1	2	291.2614	537.4811
2.00	7	3	3	1	2	1	187.4286	538.8807
2.00	3	0	5	1	0	1	1307.7141	539.4197
1.00	2	1	2	2	2	3	177.4977	540.5673
3.00	2	2	2	1	1	5	450.8375	541.0016
1.00	3	1	1	1	1	3	300.1344	542.1911
2.00	2	2	2	1	1	3	450.8375	542.4398
.00	2	2	2	2	2	4	450.8375	546.3054
1.00	2	1	3	2	1	1	214.5873	547.1425
1.00	2	0	2	2	0	5	249.3451	548.6886
3.00	2	2	2	2	1	4	450.8375	550.1014
2.00	7	1	2	2	1	5	211.8462	551.0242
2.00	1	1	5	2	0	2	148.8818	551.2931
1.00	3	1	3	2	0	1	227.0897	552.2471
3.00	4	2	4	1	2	1	291.2614	555.6586
.00	1	1	1	2	1	4	525.7030	556.3688
4.00	7	3	2	1	2	3	145.5333	556.5164
2.00	4	3	4	1	1	1	190.0333	557.2649
2.00	4	2	4	2	2	2	291.2614	560.3085
2.00	4	2	4	2	1	1	291.2614	561.9677
1.00	3	2	2	1	1	4	488.1858	562.0777
3.00	2	2	2	1	0	5	450.8375	562.7577
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.00	1	2	2	1	0	4	711.9730	564.3246
1.00	4	1	1	2	1	3	316.0140	565.5297
1.00	2	0	1	2	1	4	529.2857	565.5986
4.00	3	3	5	1	2	1	283.9000	565.6208
.00	3	2	5	1	1	2	321.6610	565.9333
1.00	2	1	1	2	1	4	281.9542	566.2364
2.00	4	2	4	1	3	2	291.2614	568.1131
2.00	6	2	4	1	1	1	221.7826	568.1242
3.00	3	1	1	2	1	3	300.1344	568.3025
4.00	2	2	2	2	2	3	450.8375	568.4344
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2.00	1	2	1	1	0	5	266.9583	570.0208

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1.00	3	1	1	2	0	4	300.1344	573.8717
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.00	3	0	1	2	0	5	424.9444	578.9757
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.00	1	0	5	1	2	4	279.5727	606.8980
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1.00	1	0	5	1	2	2	203.8276	634.3656
3.00	4	2	2	1	0	3	272.6745	634.9527
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3.00	3	1	5	1	2	2	243.8333	640.4593
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2.00	1	0	5	2	1	2	279.5727	646.0728
1.00	8	1	2	1	0	5	199.5208	647.3104
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1.00	4	1	1	2	0	5	316.0140	647.5235
1.00	1	0	1	2	1	5	465.6887	648.3576
2.00	3	3	4	1	1	1	247.9394	650.4686
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4.00	4	3	4	1	2	1	190.0333	652.6103
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.00	3	3	5	1	2	1	283.9000	655.4222
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4.00	3	2	3	1	1	5	141.5538	658.9627
3.00	4	2	2	1	1	5	428.9915	659.9276
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4.00	4	3	4	2	2	1	190.0333	670.0035
2.00	4	2	2	2	0	5	428.9915	670.9277
1.00	1	0	1	2	1	3	465.6887	671.4592
3.00	3	3	4	1	2	4	247.9394	671.4592

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1.00	4	1	3	2	2	1	168.2149	688.2315
3.00	1	3	5	1	3	1	356.5238	690.8633
1.00	2	0	1	2	0	5	529.2857	693.5626
1.00	2	1	1	2	1	3	281.9542	694.6137
1.00	3	0	1	2	0	5	424.9444	701.1236
.00	1	0	1	2	0	5	465.6887	701.7399
.00	1	0	2	1	0	5	272.6745	704.4182
2.00	7	3	4	1	2	1	230.1579	707.8954
4.00	2	0	5	1	2	2	550.2689	707.9398
3.00	4	2	2	2	0	5	428.9915	708.1748
1.00	1	0	4	1	0	2	235.5381	711.3820
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3.00	5	3	3	1	2	1	98.9677	712.2474
2.00	3	2	4	1	3	2	282.1022	712.5998
4.00	4	3	5	1	3	1	267.4151	713.6154
.00	2	2	2	1	2	3	450.8375	715.2725
3.00	2	2	2	2	1	5	450.8375	717.8930
2.00	1	3	3	1	1	1	242.5484	718.2054
2.00	2	2	2	2	1	3	450.8375	719.8013
3.00	2	2	2	1	1	3	450.8375	720.2425
2.00	1	2	2	1	2	3	711.9730	721.2246
1.00	3	1	1	2	0	3	300.1344	722.7744
2.00	1	2	2	1	1	4	711.9730	725.8552
3.00	3	3	4	1	1	1	247.9394	730.8158
2.00	3	0	3	1	1	2	451.9405	731.7788
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1.00	4	2	2	1	2	4	428.9915	738.0378
3.00	4	3	4	1	1	1	190.0333	738.4144
3.00	3	1	3	2	2	1	227.0897	745.2523
.00	3	2	2	1	2	5	488.1858	746.7861
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2.00	1	3	3	2	1	1	242.5484	748.4950
2.00	4	0	1	2	1	3	414.6154	750.7886
4.00	1	2	3	1	2	4	364.1837	752.8670
1.00	7	1	1	2	0	4	221.8261	753.2062
1.00	4	0	2	1	0	4	654.9521	754.0688
1.00	1	0	3	2	0	2	338.8530	754.4891
2.00	2	2	3	2	2	2	208.2679	756.8665
1.00	1	0	1	2	0	5	465.6887	760.8688
3.00	2	2	2	1	2	5	450.8375	761.0153
1.00	1	1	1	1	0	3	525.7030	765.1362
3.00	4	2	2	2	2	4	428.9915	768.0610
4.00	3	2	4	2	2	2	282.1022	768.8641
4.00	2	2	5	1	1	2	306.2836	769.0445
1.00	1	2	4	1	0	1	730.2222	769.1339
3.00	2	2	2	2	2	4	450.8375	773.8158
3.00	1	3	5	1	3	4	356.5238	774.1819
1.00	4	1	1	2	1	5	316.0140	774.9298
.00	4	2	2	2	2	4	428.9915	775.0579
3.00	1	0	5	2	1	1	279.5727	778.1847
1.00	1	0	2	1	0	5	272.6745	778.3473
1.00	4	0	1	2	0	5	414.6154	783.7441
2.00	3	2	3	1	0	5	141.5538	786.7137
.00	1	1	1	2	0	5	525.7030	787.6984
3.00	1	3	5	2	1	1	356.5238	787.8104
1.00	1	0	1	2	0	3	465.6887	787.9793
3.00	4	2	5	1	1	2	304.6429	791.2372
1.00	2	0	1	2	0	4	529.2857	791.5418
2.00	2	2	3	2	1	2	208.2679	792.8898
2.00	2	2	5	1	1	2	306.2836	793.6307
4.00	3	2	5	1	3	2	321.6610	795.7189
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1.00	2	1	2	2	0	1	177.4977	799.1706
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1.00	4	3	3	1	2	5	135.4453	802.6334
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3.00	1	0	5	1	1	4	279.5727	817.9483
1.00	4	0	2	1	1	5	654.9521	818.1399
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Factors

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.00	1	1	1	1	1	1	3	525.7030	821.6648
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1.00	2	2	2	1	1	3	3	450.8375	833.3572
3.00	3	2	3	1	0	5	5	141.5538	839.2240
2.00	1	2	4	1	2	1	1	730.2222	842.5065
3.00	3	3	2	2	2	4	4	258.0000	843.9182
2.00	4	2	3	1	1	5	5	192.4016	848.9478
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2.00	3	3	4	2	3	4	4	247.9394	885.1493
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.00	1	2	2	2	2	3	3	711.9730	990.0204
4.00	3	2	2	2	2	3	3	488.1858	999.2431
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3.00	1	2	4	1	2	2	2	321.6610	1178.1236
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4.00	3	2	2	2	0	5	488.1858	1436.3417
2.00	3	2	2	2	2	3	488.1858	1437.1910
2.00	3	3	4	1	2	1	247.9394	1446.6096
.00	2	2	5	1	2	2	306.2836	1449.9597
4.00	3	2	4	1	2	4	282.1022	1486.9663
4.00	3	0	2	1	1	5	627.7630	1504.2685
1.00	1	2	5	2	1	1	1007.2143	1505.3871
.00	1	2	5	1	2	1	1007.2143	1525.4306
1.00	5	1	5	1	1	1	1002.0000	1540.2963
3.00	1	2	5	1	2	1	1007.2143	1568.8186
2.00	1	2	4	1	1	2	730.2222	1584.3039
4.00	2	2	5	1	3	2	306.2836	1601.8605
1.00	1	1	1	2	1	3	525.7030	1604.4391
2.00	3	2	2	2	1	3	488.1858	1615.9521
3.00	2	2	5	1	1	2	306.2836	1619.1268
3.00	3	3	4	1	2	1	247.9394	1625.2976
3.00	3	2	2	2	2	3	488.1858	1635.4172
2.00	2	3	2	1	1	2	239.5600	1637.6108
2.00	2	2	5	1	3	2	306.2836	1653.0718
1.00	1	0	5	2	0	1	279.5727	1735.1266
2.00	1	2	2	1	0	5	711.9730	1829.0934
3.00	3	2	2	2	1	3	488.1858	1838.8342
3.00	1	2	5	1	1	2	1007.2143	1883.5202
1.00	3	2	2	2	2	3	488.1858	1934.7700
2.00	2	1	5	2	1	2	203.8276	2025.9315
3.00	3	3	2	2	2	3	258.0000	2036.4618
1.00	1	1	5	1	3	4	148.8818	2054.6630
2.00	5	2	5	1	2	1	311.4444	2157.2634
3.00	2	2	5	1	2	2	306.2836	2189.9756
4.00	1	2	3	1	3	4	364.1837	2448.7280
2.00	1	2	2	2	0	5	711.9730	2613.5100
2.00	2	0	5	1	1	2	550.2689	2749.4408
4.00	1	2	5	1	3	1	1007.2143	2935.2532
3.00	8	2	5	1	2	2	157.3200	2975.3911
1.00	8	2	2	2	2	2	178.3471	3045.9376
3.00	2	2	5	1	3	2	306.2836	3372.5169
2.00	8	1	5	1	1	2	168.6667	3919.0640
1.00	1	2	2	2	0	1	711.9730	4088.3322

APPENDIX D: LIST OF COMMUNITIES BY COUNTY IN URBANIZED AREAS

1 = Detroit Urbanized Area

Wayne County

Allen Park	City
Brownstown	Twp
Canton	Twp
Dearborn	City
Dearborn Heights	City
Detroit	City
Ecorse	City
Flat Rock	City
Gibraltar	City
Grosse Ile	Twp
Grosse Pointe	City
Grosse Pointe Farms	City
Grosse Pointe Park	City
Grosse Pointe Shores	Vil
Grosse Pointe Woods	City
Hamtramck	City
Harper Woods	City
Highland Park	City
Huron	Twp
Inkster	City
Lincoln Park	City
Livonia	City
Melvindale	City
Northville	City
Northville	Twp
Plymouth	City
Plymouth	Twp
Redford	Twp
River Rouge	City
Riverview	City
Rockwood	City
Romulus	City
Southgate	City
Taylor	City
Trenton	City
Van Buren	Twp
Wayne	City
Westland	City
Woodhaven	City
Wyandotte	City

Oakland County

Auburn Hills	City
Berkley	City
Beverly Hills	Vil
Bingham Farms	Vil
Birmingham	City
Bloomfield	Twp
Bloomfield Hills	City
Clarkston	City
Clawson	City
Commerce	Twp
Farmington	City
Farmington Hills	City
Ferndale	City
Franklin	Vil
Hazel Park	City
Highland	Twp
Huntington Woods	City
Independence	Twp
Keego Harbor	City
Lake Angelus	City
Lare Orion	Vil
Lathrup Village	City
Lyon	Twp
Madison Heights	City
Northville	City
Novi	City
Oak Park	City
Oakland	Twp
Orchard Lake Village	City
Orion	Twp
Oxford	Vil
Oxford	Twp
Pleasant Ridge	City
Pontiac	City
Rochester	City
Rochester Hills	City
Royal Oak	Twp
Royal Oak	City
Southfield	Twp
Springfield	Twp
Sylvan Lake	City
Troy	City
Walled Lake	City
Waterford	Twp

West Bloomfield	Tw
White Lake	Tw
Wixom	City
Wolverine Lake	Vil

St. Clair County

Ira	Tw
Clay	Tw

Monroe County

South Rockford	Vil
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2 = Ann Arbor Urbanized Area

Wayne County

Belleville	City
Van Buren	Tw

Washtenaw County

Ann Arbor	City
Ann Arbor	Tw
Barton Hills	Vil
Dexter	Vil
Lodi	Tw
Pittsfield	Tw
Saline	City
Saline	Tw
Scio	Tw
Superior	Tw
York	Tw
Ypsilanti	City
Ypsilanti	Tw

3 = Port Huron Urbanized Area

St. Clair County

Burtchville	Tw
Clyde	Tw
Fort Gratiot	Tw
Kimball	Tw
Marysville	City
Port Huron	City

Port Huron
St. Clair
St. Clair

Twp
City
Twp