Knoxville Regional
Transportation Planning Organization

2008 East Tennessee Household Travel Survey

Final Report

October 10, 2008

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The Knoxville Regional Transportation Planning Organization (TPO) is federally mandated to provide comprehensive transportation planning in Knox County and the urbanized areas of Blount, Sevier, and Loudon Counties. TPO members are Knoxville, Knox County, Farragut, Alcoa, Maryville, Lenoir City, Blount County, Loudon County, Sevier County, the East Tennessee Development District, and the State of Tennessee.

The report was prepared on behalf of the Knoxville Regional Transportation Planning Organization.
The project was funded in part by the Tennessee Department of Transportation.
NuStats is solely responsible for its findings and conclusions,
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1. Introduction

1.1 Introduction

This report presents findings from the 2008 East Tennessee Household Travel Survey, which was a comprehensive study of travel behavior in Knox, Blount, Anderson, Jefferson, Loudon, Roane, Sevier, and Union counties. The purpose of the survey was to collect weekday travel characteristics of households in the eight-county region during a 24-hour timeframe. The data will be used by the Knoxville Regional Transportation Planning Organization and local agencies to update transportation and air quality models and to identify transportation needs in the region.

The Household Travel Survey was conducted by NuStats, a survey research firm that designed, executed, and analyzed the survey data. NuStats operated under a subcontract with Bernardin-Lochmueller and Associates.

1.2 Study Sample

The 2008 Household Travel Survey collected data from a total sample of 1,400 households using a computer-assisted telephone interviewing (CATI) system between February and May 2008. The survey was based on a random sample of households in Knox, Blount, Anderson, Jefferson, Loudon, Roane, Sevier, and Union counties. A socioeconomic stratification was used to define the sample of households to ensure that the study captured the diversity of the population according to specific factors affecting travel behavior in the eight-county region. The stratification scheme was based on two household characteristics:

- Household Size – Total number of persons in the household (1, 2, 3, 4+ persons), and
- Employment Status – Total number of employed household members.

Households were contacted by telephone or by mail and recruited to participate in the study. Demographic interviews were conducted to collect the following data about the households and their members: household size, number of vehicles, household income, dwelling type, age, gender, drivers' license, work status and address, school status and address.

Following the demographic interviews, 1,959 households agreed to complete 24-hour travel logs for each member. Participants recorded travel destination locations, travel mode, trip duration, persons traveling, and destination activity. A complete list of data items collected during the survey is in Appendix D. After data were processed, it was determined that 1,400 households (71% of recruited households) provided complete data. The travel behavior data reported herein are based upon these households.

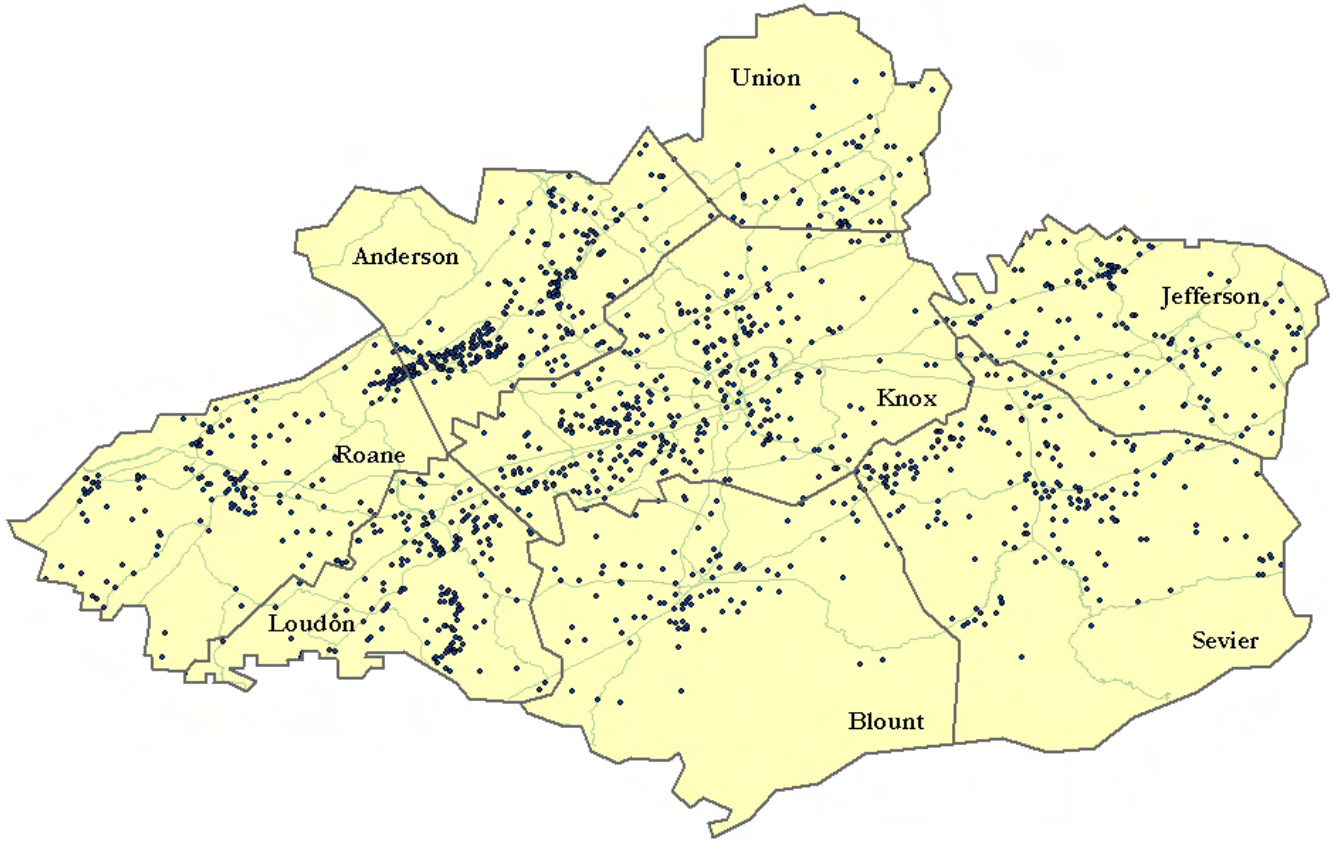
1.3 Study Area

The study area was comprised of eight counties in Tennessee: Knox, Blount, Anderson, Jefferson, Loudon, Roane, Sevier, and Union Counties. According to 2000 Census data, this area includes a total of 319,910 households. Figure 1.1 shows the locations of the 1,400 surveyed households.

1.4 Previous Survey

The previous travel study was conducted by NuStats in 2000 and surveyed 1,538 households from Knox and Blount counties only. The survey's structure and purpose were similar to those of this study. For a comparison of results from the two studies, please refer to Chapter 9. Additionally, 22 panel households participated in both the 2001 and 2008 studies and are analyzed in Chapter 10.

Figure 1.1:
Locations of Surveyed Households



2. Summary Findings

This chapter provides an overview of the basic findings of the study, including travel-related and demographic statistics.

2.1 Key Findings

This section presents an overview of the key findings of the 2008 Household Travel Survey. Each of these findings is supported by detailed data analyses presented in later sections of the report.

Trip Rates

- Households surveyed in the 2008 Household Travel Survey reported making an average of 8.58 trips, with an average of 3.64 trips per person.
- Trip rates for the East Tennessee study area were higher than those found in the 2000 Travel Behavior Survey (8.21 per household and 3.84 per person).
- Trip rates were highest in Roane County with 9.12 trips per household and 3.90 trips per person; Trip rates were lowest in Union County with 7.78 trips per household and 2.90 trips per person.
- Households reported an average of 2.36 persons per household and 2.29 vehicles per household.
- Certain demographic characteristics were positively associated with higher rates of travel. These were household income, number of vehicles, number of workers in household and number of students. Of these, the number of students had the greatest impact on trip rates.
- Households reported an average of 1.17 workers per household. Households with no workers reported making 6.06 trips, while those with three or more workers reported making 12.88 trips.
- Households reported an average of 0.51 students per household. Households with no students reported 6.29 trips, while those with three or more students reported 22.02 trips.
- The presence of children in the household increased trip making. Households with children reported making 13.38 trips, whereas older households with no children reported 6.48 trips. Retired households and young households without children reported the fewest trips – 5.82 and 5.48 trips per household, respectively.
- On average, females made more trips than males. The female trip rate was 3.76, while males averaged 3.50 trips.
- Persons aged 35 to 44 years had the highest person trip rate (4.05 trips) among all age categories. Persons under 5 years and between 13 and 17 years had the lowest trip rates, averaging 2.66 trips and 3.16 trips respectively.
- Most households (69.5%) reported making between one and ten trips within a 24-hour period. Only 1.4% reported making zero trips, while 6.0% of surveyed households made more than 20 trips per day.

Travel Mode and Travel Purpose

- Nearly three-fourths (72%) of trips were made by an auto driver, and 24% were made by an auto passenger. Transit comprised less than one tenth of a percent of all trips, school bus accounted for two percent, and non-motorized (walk or bike) accounted for less than two percent combined.
- The largest percentage of total trips ended at "home" (33.3%); working at non-home locations was the second most frequent reason for travel (13.1%), followed by personal business (10.0%).

- Nearly all of work trips were made via auto (97%).
- Average vehicle occupancy for trips in the 2008 Household Travel Behavior Survey was 1.70 persons per vehicle.
- The average number of non-motorized trips was 2.16 trips per household.
- Among trips by non-motorized modes, the most frequent purpose reported was social/recreational (12.8%).

Trip Duration and Peak Travel Periods

- The average trip lasted 19.5 minutes.
- On average, auto trips took just under 20 minutes per trip. Walk trips had the shortest average travel time at approximately 12 minutes per trip
- The highest frequency of vehicle trips started between 7 a.m. and 8 a.m. and 3 p.m. and 7 p.m. The heaviest trip making occurred between 7 a.m. and 8 a.m. and accounted for more than 10% of all vehicle trips.

Vehicle Characteristics

- The average age of all vehicles was seven years. Union County recorded the oldest vehicles, with an average of eight years.
- Ford was the most popular vehicle make (18%); Chevrolet was the second most popular make (15%) and Toyota was third (12%).
- The most popular vehicle models were Ford F-150 (4%), Toyota Camry (3%), and Dodge Ram Pickup (2%).

2.2 Summary Data

Table 2.1 presents the total number of persons, vehicles, workers and trips per household in the Inner (Knox and Blount) and Outer (Anderson, Jefferson, Loudon, Roane, Sevier, and Union) counties, as well as the standard error for each measure.

Table 2.1:
Summary Data by County

Type	Inner	Outer
Persons per household	2.35 +/- 0.06	2.36 +/- 0.04
Vehicles per household	2.23 +/- 0.06	2.31 +/- 0.04
Workers per household	1.22 +/- 0.05	1.15 +/- 0.03
Licensed drivers per household	1.90 +/- 0.04	1.88 +/- 0.02
Daily vehicle trips per household*	8.50 +/- 0.30	8.12 +/- 0.22
Vehicle driver trips per household	6.65 +/- 0.21	6.00 +/- 0.13
Vehicle passenger trips per household	1.86 +/- 0.15	2.11 +/- 0.12
Public transit (bus) trips per household**	2.0***	0.0
Non-motorized trips per household**	2.10 +/- 0.29	2.19 +/- 0.22

** Includes trips made by a personal vehicle (car, van, truck, motorcycle).*
*** Average includes only those households making at least one public transit or non-motorized trip.*
****Only two trips were made by public transit.*

3. Travel Behavior

This chapter presents detailed analyses of weekday travel behavior by the household sample characteristics, such as county, vehicle ownership, household size, housing type, etc.

3.1 Overall Trip Rates

A trip rate is the average number of trips taken by either a household or person. The mean number of trips reported per person was 3.64 trips, while the mean number of trips reported by household was 8.58. The average number of vehicle trips for the eight-county area was 8.23 trips.

Table 3.1:
Study-Wide Trip Rates

Type	Trip Rate
Person	3.64
Household	8.58

Base: 3,301 persons / 1,400 households.

The average household trip rate varied among the eight counties in the study area, as shown in Table 3.2. The highest trip rate occurred in Roane County, where households traveled an average of 9.12 trips per day. In contrast, households in Union County traveled an average of 7.78 trips per day.

Table 3.2:
Household Trip Rates by County

County	Percent	Trip Rate
Knox	22.4%	8.82
Blount	6.3%	8.95
Anderson	19.4%	8.52
Jefferson	9.3%	8.15
Loudon	11.6%	8.70
Roane	12.2%	9.12
Sevier	14.3%	8.10
Union	4.5%	7.78
Total	100.0%	8.58

Base: 1,400 households.

3.2 Household Trip Rates

Table 3.3 presents the mean household trip rates by household income in 2007. The table shows a general trend of an increase in trip rate with an increase in household income. Households in the lowest income category (less than $10,000) traveled an average of 5.41 trips, while households making between $75,000 and $175,000 traveled more than twice that rate.

Table 3.3:
Household Trip Rates by Household Income

Income	Percent	Trip Rate
Less than $10,000	4.0%	5.41
$10,000 to less than $25,000	13.5%	5.55
$25,000 to less than $35,000	10.8%	6.81
$35,000 to less than $45,000	10.3%	7.75
$45,000 to less than $50,000	6.4%	8.00
$50,000 to less than $75,000	18.0%	9.05
$75,000 to less than $100,000	18.2%	11.16
$100,000 to less than $125,000	8.0%	10.73
$125,000 to less than $150,000	4.3%	11.42
$150,000 to less than $175,000	2.1%	11.07*
$175,000 or more	4.3%	8.84
Total	100.0%	8.58

*Base: 1,274 households reporting income. *Sample size is less than 30.*

There is also a clear trend in household trip rates when compared to the number of household vehicles. Table 3.4 shows that as the number of household vehicles increases, the trip rate increases also. Households in the study area that own two vehicles traveled more than three times as much as households with no vehicles.

Table 3.4:
Household Trip Rates by Household Vehicles

Number of HH Vehicles	Percent	Trip Rate
Zero	1.6%	2.82*
One	23.2%	5.02
Two	40.2%	8.96
Three+	35.0%	10.76
Total	100.0%	8.58
Vehicles per household	2.29	

*Base: 1,400 households. *Sample size is less than 30.*

Table 3.5 presents the average trip rate of households based on the number of household members. As expected, there is a clear positive relationship between these two variables: as the household size increases, so does the trip rate. Households with four or more members made more than twice as many trips as two-person households.

Table 3.5:
Household Trip Rates by Household Size

Household Size	Percent	Trip Rate
One Person	26.2%	3.96
Two Persons	38.2%	7.34
Three Persons	17.4%	10.03
Four+ Persons	18.1%	16.46
Total	100.0%	8.58
Persons per household	2.36	

Base: 1,400 Households.

As presented in the previous two tables, average household trip rates varied according to household size and the number of vehicles available. Table 3.6 presents the trip rates and standard deviations by household size and household vehicles. The standard deviation is a measure of how widely the trip values are dispersed. Therefore, a relatively small standard deviation indicates that households with the same characteristics (household size and household vehicles) made about the same number of trips.

Table 3.6:
Household Trip Rates/Standard Deviations by Household Size and Household Vehicles

Number HH Vehicles	Household Size				Total
	One-Person	Two-Person	Three-Person	Four + Persons	
Zero	2.40/1.64*	7.00/4.24*	0.00/0.00*	0.00/0.00*	2.82/2.26
One	3.98/2.50	7.35/4.54	8.38/4.69*	16.13/10.87*	5.02/4.11
Two	4.15/3.32	7.04/4.19	10.44/6.07	16.56/8.94	8.96/6.83
Three+	4.45/2.43	7.89/4.19	9.96/5.60	16.41/8.59	10.76/7.21
Total	3.96/2.65	7.34/4.23	10.03/5.72	16.46/8.77	8.58/6.79

*Base: 1,400 households. *Sample size is less than 30.*

Table 3.7 presents household trip rates by residence type. Of the households reporting residence type, 86.3% are living in a single-family home detached from any other house. These households reported making an average of nine trips on their assigned travel day, about 0.5 trips above the average. Respondents living in multi-family housing, such as apartments or condos (6.2% of all households), reported the lowest trip rate, 5.3. Respondents living in either mobile homes (5.2%) or single-family homes attached to one or more houses (2.2%) reported making an average of 6.74 and 6.58 trips during their assigned travel day, respectively. Households living in multi-family housing had fewer people per household (1.4 people) than those living in any type of single-family home (2.4 people).

Table 3.7:
Household Trip Rates by Residence Type

Residence Type	Percent	Trip Rate
Single-family detached from any other house	86.3%	8.98
Single-family attached to one or more houses (duplex, row house, townhouse)	2.2%	6.58
Mobile home	5.2%	6.74
Building with two or more apartments or condo units	6.2%	5.26
Total	100.0%	8.58

Base: 1,398 households reporting residence type.

The relationship between the numbers of employed household members, either full-time or part-time, and the trip rate is shown in Table 3.8. The household trip rates clearly increase as the number of household workers increased. Zero-worker households reported making an average of 6.06 trips, while households with three or more workers traveled more than twice that amount, 12.88 trips.

Table 3.8:
Household Trip Rates by Number of Household Workers

Workers	Percent	Trip Rate
No Workers	27.9%	6.06
One Worker	35.0%	7.74
Two Workers	30.8%	10.95
Three + Workers	6.3%	12.88
Total	100.0%	8.58
Workers per Household	1.17	

Base: 1,400 households.

The presence of students in the household has an even greater effect on household trip rates than did number of workers. As seen in Table 3.9, households with three or more students made an average of 22.02 trips on the assigned travel day, whereas households with no students averaged 6.29 trips per day.

Table 3.9:
Household Trip Rates by Number of Students

Students	Percent	Trip Rate
No Students	69.4%	6.29
One Student	16.0%	10.88
Two Students	10.4%	14.92
Three+ Students	4.2%	22.02
Total	100.0%	8.58
Students per household	0.51	

Base: 1,400 households.

The "lifecycle" stage of households also has a clear association with trip rates. The lifecycle variable is created to look at complex relationships among age, employment, and presence of children. Households are divided into the following five lifecycle categories:

Table 3.10:
Lifecycle Stages of Households

Category	Age	Employed	Children
Not Employed, Not Retired*	N/A	Not Working	N/A
Younger Household** w/o Children	18-35	Working	No
Older Household w/o Children	36+	Working	No
Household with Children	18+	Working	Yes
Retired	N/A	Retired	No

**These households can include roommates as well as married couples and are typically comprised of students.*
***These households can include roommates as well as married couples.*

Table 3.11 presents household trip rates by lifecycle category. The presence of children increased trip rates by 100% over households without children. Households comprised of young persons (under the age of 36) without children reported the lowest trip rate, 5.48. Surprisingly, the highest trip rate among households without children occurred in the unemployed group, which reported 6.73 trips per day.

Table 3.11:
Household Trip Rates by Lifecycle

Lifecycle	Percent	Trip Rate
Not Employed, Not Retired	7.2%	6.73
Younger Household w/o Children	2.2%	5.48
Older Household w/o Children	37.4%	6.48
Household with Children	32.4%	13.38
Retired Household	20.7%	5.82
Total	100.0%	8.58

Base: 1,400 households.

3.3 Person Trip Rates

Table 3.12 presents person trip rates by gender. As with the 2000 Survey data, females reported a higher trip rate, 3.76, than males, 3.50.

Table 3.12:
Person Trip Rates by Gender

Gender	Percent	Trip Rate
Female	52.7%	3.76
Male	47.3%	3.50
Total	100.0%	3.64

Base: 3,295 persons reporting gender.

The average person trip rate by age is shown in Table 3.13. Persons between the ages of 35 and 44 traveled the most, 4.05 trips during their assigned travel day. After this category, the person trip rate declines steadily to 3.64 trips for persons 65 years and older. The youngest age group, persons under 5 years old, traveled the least, 2.66 trips.

Table 3.13:
Person Trip Rates by Age

Age	2008 Survey	2000 Census	Trip Rate
Under 5 years	3.9%	6%	2.66
5 to 12 years old	8.8%	9%	3.42
13 to 17 years old	6.6%	8%	3.16
18 to 24 years old	4.5%	12%	3.26
25 to 34 years old	6.8%	17%	3.17
35 to 44 years old	11.3%	16%	4.05
45 to 54 years old	19.3%	11%	3.88
55 to 64 years old	18.7%	9%	3.83
65 years and older	20.2%	13%	3.64
Total	100.0%	100%	3.64

Base: 3,265 persons reporting age.

Table 3.14 presents person trip rates by age for those with a valid driver's license. As in Table 3.13, people between the ages of 35 and 44 made the highest number of trips. People between the ages of 18 and 34 had the lowest trip rates.

Table 3.14:
Trip Rates for Persons with a Valid Driver's License

Age	Percent	Trip Rate
16 to 17 years old	73.2%	3.72
18 to 24 years old	93.2%	3.28
25 to 34 years old	95.5%	3.21
35 to 44 years old	98.4%	4.09
45 to 54 years old	98.4%	3.90
55 to 64 years old	97.9%	3.88
65 and older	94.2%	3.76
All Ages 16 and above	95.7%	3.79

Base: 2,621 persons reporting DL status, ages 16 and up.

Table 3.15 presents person trip rates by employment status for all persons 16 years and older, while Table 3.16 shows person trip rates by the number of paying jobs for all persons employed at least part-time. Employed respondents traveled more during their assigned travel day than those not employed. Of respondents 16 years and older who are employed, those with two jobs traveled the most (4.46 trips) compared to those with one or three different jobs.

Table 3.15:
Person Trip Rates by Employment Status

Employment Status	Percent	Trip Rate
Yes	59.2%	3.87
No	40.8%	3.55
Total	100.0%	3.74

Base: 2,758 persons reporting employment status, ages 16 and up.

Table 3.16:
Person Trip Rates by Number of Paying Jobs

Number of Jobs	Percent	Trip Rate
One	96.0%	3.85
Two	3.7%	4.46
Three	0.3%	3.40*
Total	100.0%	3.87

*Base: 1,633 employed persons, ages 16 and up. *Sample size is less than 30.*

Nearly 22% of all persons reported being enrolled in some type of school, either part-time or full-time. Overall, as shown in Table 3.17, non-students traveled slightly more than students during their travel day. Table 3.18 presents person trip rates by the type of school attended. Persons enrolled in graduate school reported making more trips on average than those in any other type of school. Elementary, middle, and high school students traveled the least during their travel day.

Table 3.17:
Person Trip Rates by Student Status

Student Status	Percent	Trip Rate
Yes	21.6%	3.40
No	78.4%	3.71
Total	100.0%	3.64

Base: 3,299 persons reporting student status.

Table 3.18:
Person Trip Rates by Type of School Attended

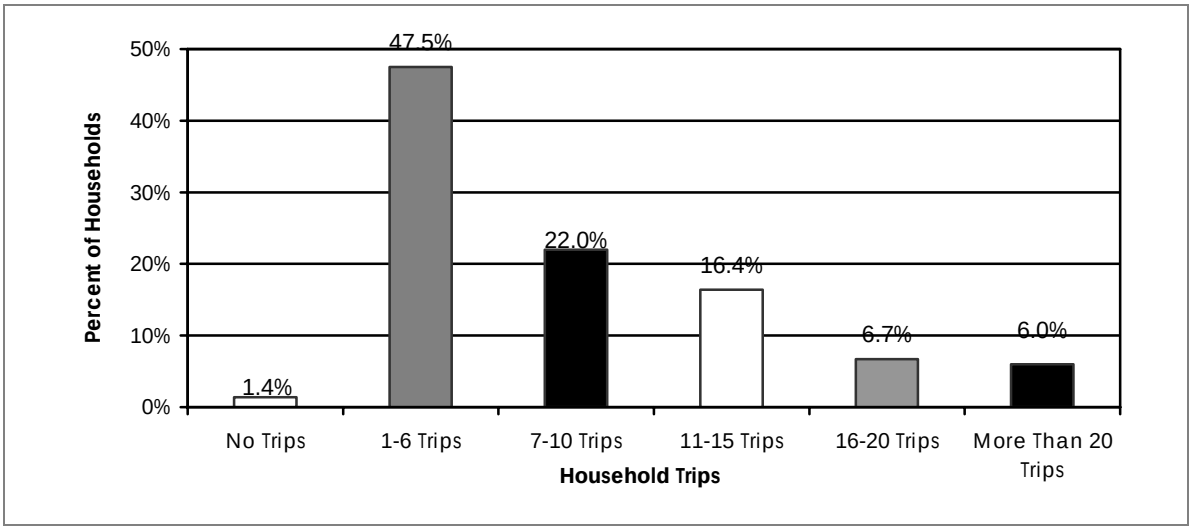
Type	Percent	Trip Rate
Daycare/Preschool	8.8%	3.45
Elementary/Middle School	49.5%	3.32
High School	25.9%	3.30
College/University	13.3%	3.59
Trade/Vocational	0.8%	3.83*
Graduate School	1.7%	5.08*
Total	100.0%	3.40

*Base: 707 persons enrolled in school and reporting type of school. *Sample size is less than 30.*

3.4 Rates of Travel and Non-Travel

The distribution of the number of household trips for the 1,400 completed surveys is presented in Figure 3.19. Nearly half of all households (47.5%) reported making between one and six trips. Six percent of households made over twenty trips during their assigned travel day, while 6.7% made between 16 and 20 trips.

Figure 3.19:
Distribution of Household Trips



As shown in the preceding figure, only 1.4% of all households reported zero trips during their travel day. There was a focused effort during data collection to minimize these cases because a large percentage of zero-trip households can have a profound impact on the overall trip rate. A rigorous quality check was performed to ensure that households not traveling had valid reasons. The following two tables examine characteristics of persons not making trips. Table 3.20 presents the age of persons reporting no trips. Nearly half of respondents who did not travel (46.8%) are above the age of 55, while only 6.7% are between the ages of 13 and 24.

Table 3.20:
Age of Zero Trip Persons

Age	Percent
0 to 12 years old	12.5%
13 to 17 years old	2.5%
18 to 24 years old	4.2%
25 to 34 years old	9.1%
35 to 44 years old	9.1%
45 to 54 years old	15.8%
55 to 64 years old	18.8%
65 and older	28.0%
Total	100.0%

Base: 361 persons reporting age and zero trips.

Table 3.21 presents the reasons why those making zero trips did not travel. Of all zero-trip persons, 15.4% reported they were personally sick, while 3.8% were taking care of someone else who was sick. Over half (54.8%) reported some other reason that they did not travel.

Table 3.21:
Zero Trip Persons: Reason for Not Traveling

Reason	Percent
Personally sick	15.4%
Caretaking sick kids	3.0%
Caretaking sick other	0.8%
Home-bound elderly or disabled	9.4%
Worked at home for pay	5.5%
Worked around home (not for pay)	6.3%
Out of area	4.7%
Other reason	54.8%
Total	100.0%

Base: 363 persons reporting zero trips.

4. Trip Characteristics

This chapter presents characteristics of 12,012 individual trips recorded during the household travel survey.

4.1 Total Trips

In total, 12,012 trips were reported by 3,301 persons from 1,400 households. Table 4.1 presents the number of total trips made by households residing in each of the eight counties included in the study.

Table 4.1:
Total Trips by County

County	Frequency	Percent
Knox	2,761	23.0%
Blount	788	6.6%
Anderson	2,318	19.3%
Jefferson	1,059	8.8%
Loudon	1,418	11.8%
Roane	1,559	13.0%
Sevier	1,619	13.5%
Union	490	4.1%
Total	12,012	100.0%

Base: 12,012 trips.

Table 4.2 compares the counties where the households and places of work are located for employed respondents. Overall, 41.0% of employed survey participants reported their work location to be in Knox County, while only 1.7% reported working in Union County. In fact, the only respondents who worked in Union County were also residents there. For all counties except Union County, the majority of workers do not cross county lines to get to work.

Table 4.2:
Cross-County Travel for Work

County Lives In	County Works In							
	Knox	Blount	Anderson	Jefferson	Loudon	Roane	Sevier	Union
Knox	83.7%	5.9%	6.9%	0.0%	1.6%	1.3%	0.5%	0.0%
Blount	33.0%	60.6%	0.9%	0.0%	3.7%	0.9%	0.9%	0.0%
Anderson	28.5%	1.1%	64.4%	0.0%	0.0%	6.0%	0.0%	0.0%
Jefferson	25.2%	0.8%	0.0%	67.5%	0.0%	0.8%	5.7%	0.0%
Loudon	28.3%	6.9%	5.5%	0.0%	53.1%	5.5%	0.7%	0.0%
Roane	17.8%	1.6%	23.6%	0.0%	4.7%	52.4%	0.0%	0.0%
Sevier	22.9%	3.6%	0.4%	1.6%	0.0%	0.0%	71.5%	0.0%
Union	57.7%	0.0%	2.8%	1.4%	0.0%	1.4%	0.0%	36.6%
Total	41.0%	7.4%	17.2%	5.7%	6.2%	8.6%	12.4%	1.7%

Base: 1,551 geocoded work locations.

Table 4.3 represents the counties where respondents traveled to for major shopping trips (for clothing, furniture, appliances, automobiles, large grocery trips) versus their home county. Nearly half of all shopping trips (47.2%) were done in Knox County, while 19.5% and 12.4% of all trips were in Anderson and Blount Counties, respectively.

Table 4.3:
Cross-County Travel for Non-Incidental Shopping

County Lives In	County Works In							
	Knox	Blount	Anderson	Jefferson	Loudon	Roane	Sevier	Union
Knox	97.6%	0.0%	1.2%	0.0%	0.0%	0.0%	1.2%	0.0%
Blount	36.1%	58.3%	0.0%	0.0%	0.0%	0.0%	5.6%	0.0%
Anderson	23.8%	0.0%	72.6%	0.0%	0.0%	3.6%	0.0%	0.0%
Jefferson	13.6%	0.0%	0.0%	63.6%	0.0%	0.0%	22.7%	0.0%
Loudon	40.6%	30.4%	0.0%	0.0%	29.0%	0.0%	0.0%	0.0%
Roane	35.1%	0.0%	32.4%	0.0%	5.4%	27.0%	0.0%	0.0%
Sevier	35.0%	12.5%	0.0%	0.0%	0.0%	0.0%	52.5%	0.0%
Union	88.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.1%
Total	47.2%	12.4%	19.5%	3.7%	5.8%	3.4%	7.7%	0.3%

Base: 379 geocoded shopping locations.

An overwhelming majority of trips (96%) were made in a private vehicle (either as auto driver or auto passenger). Trips using public transportation (including school buses) comprised less than 3% of all trips, as were trips made by non-motorized means. Table 4.4 shows the distribution of all travel modes.

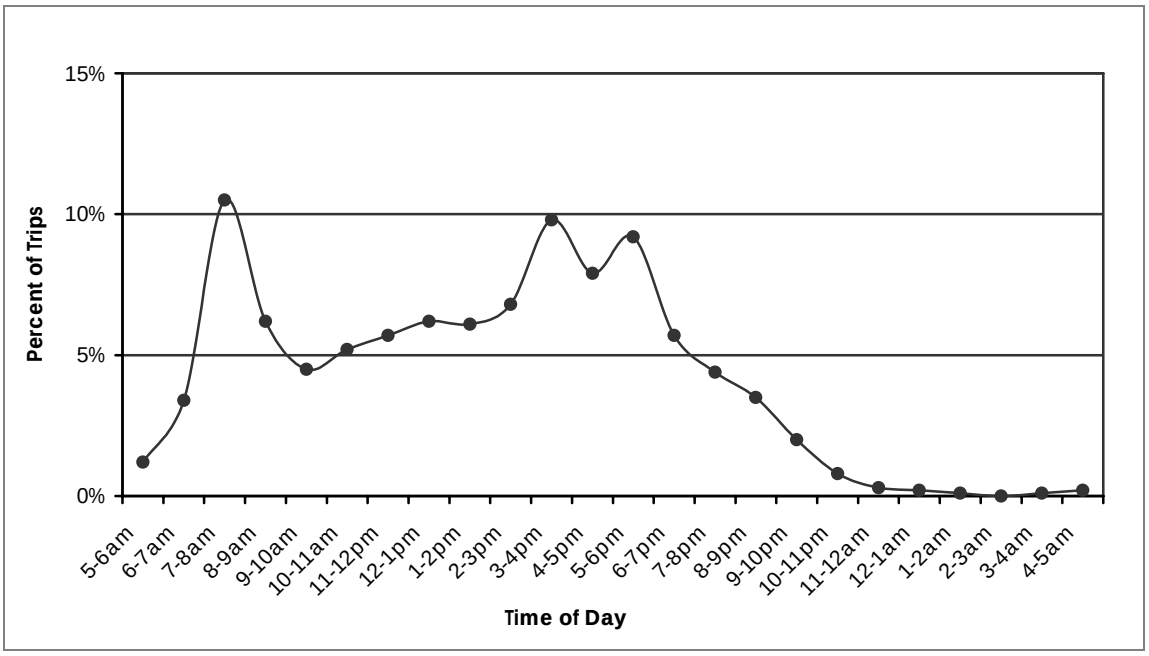
Table 4.4:
Travel Mode

Travel Mode	Percent
Auto Driver	72.1%
Auto Passenger	23.8%
Transit – Public Bus	<0.1%
Transit – School Bus	2.0%
Motorcycle/Moped	0.1%
Taxi/Shuttle Bus	0.1%
Walk	1.8%
Bike	<0.1%
Total	100%

Base: 12,012 trips.

The hour when the highest percentage of overall trips took place was between 7:00 a.m. and 8:00 a.m. The afternoon peak of travel, between 3:00 p.m. and 6:00 p.m., included 26.9% of all reported trips. Figure 4.5 shows the hour-by-hour distribution of the departure time of all trips reported throughout the day.

Figure 4.5:
Time of Day of Travel



4.2 Trip Purpose

The primary trip activity is defined as the main reason a person was traveling from one place to another. For instance, if a person was traveling to their home to eat, sleep, watch television, etc., they would record "Personal activities at home" as the primary trip activity. However, if a person were traveling to their home to pick-up a passenger, then that person would record "Pick up/drop off passenger" as their primary activity.

Approximately one-third of all trip purposes (33.3%) were recorded as "personal activities at home," as presented in Table 4.6. Work accounted for the next most frequent reason for travel (13.1%), followed by personal business and incidental shopping (10.0% and 9.9%, respectively). Comparing the trip purposes for residents of Inner Counties (Knox and Blount) with Outer Counties (Anderson, Jefferson, Loudon, Roane, Sevier, and Union), there are only slight differences. Inner County respondents did more incidental shopping and personal business, while Outer County respondents reported more social/recreational trips.

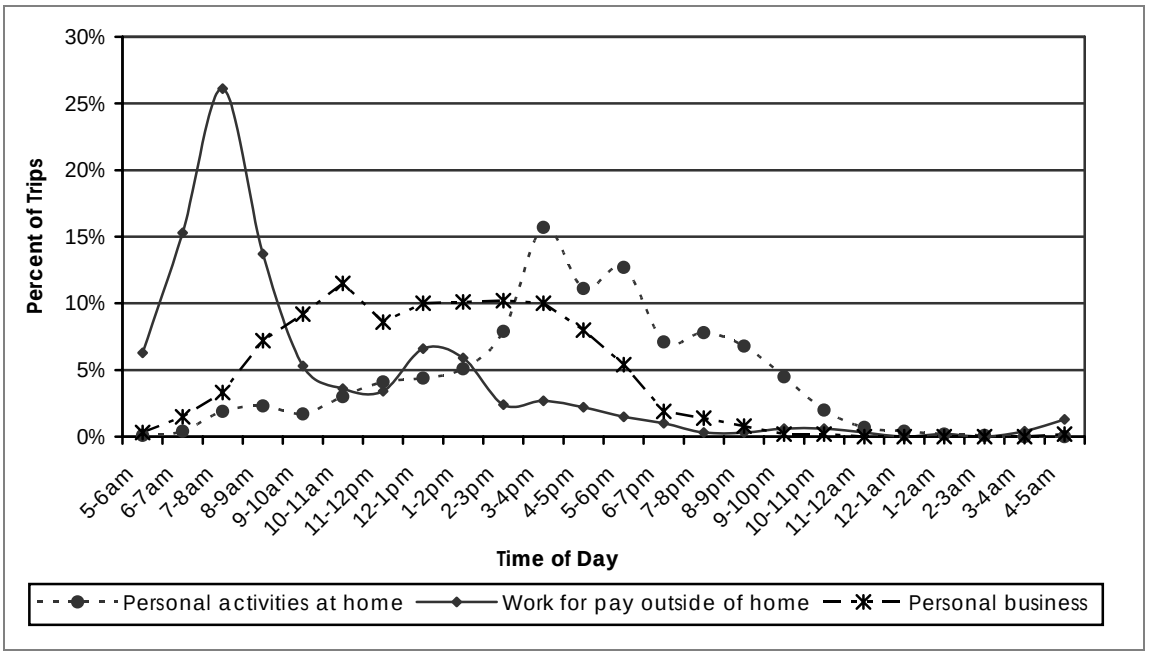
Table 4.6:
Primary Trip Purpose by County

Purpose	Inner	Outer	Total
Personal activities at home	33.3%	33.2%	33.3%
Work at home (for pay)	0.3%	0.2%	0.3%
Work for pay (other than at home)	13.2%	13.0%	13.1%
Volunteer work	0.5%	0.2%	0.3%
School: post-high school	0.6%	0.3%	0.4%
School: elementary – high school	4.1%	4.3%	4.3%
Shopping (incidental)	10.3%	9.8%	9.9%
Shopping (major)	3.3%	3.3%	3.3%
Personal business	10.5%	9.8%	10.0%
Medical/dental	2.3%	2.2%	2.2%
Eat meal outside of home	5.3%	5.9%	5.7%
Social/recreational	7.0%	7.9%	7.6%
Civic activities	0.7%	0.3%	0.4%
Church activities	1.3%	1.7%	1.5%
Pick up/drop off passenger at work	0.9%	0.9%	0.9%
Pick up/drop off passenger at school	3.4%	4.2%	3.9%
Pick up/drop off passenger at other	2.3%	2.1%	2.1%
Change mode of transportation	0.2%	0.4%	0.3%
Loop trip	0.5%	0.3%	0.4%
Total	100.0%	100.0%	100.0%

Base: 12,012 trips (not including place of origin).

Figure 4.7 compares the start times for trips with the three most common trip purposes. Over 25% of all "work for pay" trips were made between 7:00 a.m. and 8:00 a.m. Trips with a primary purpose of "personal activities at home" peaked in the afternoon between 3:00 p.m. and 5:00 p.m., while "personal business" trips had a much smoother distribution from the morning to the early afternoon.

Figure 4.7:
Time of Day of Travel by Trip Purpose



4.3 Trip Segment Type

All household members were asked to record all places to which they traveled for a 24-hour period in a personal travel log. Respondents were to record, among other things, the exact address, the reason for travel, and departure and arrival times anytime they changed location. This information was used to calculate types of trips taken.

Trip segment type is defined as a combination of origin and destination pairs as follows:

- Home-based Work – trips having a combination of home and work as either origin or destination
- Home-based School – trips having a combination of home and school as either origin or destination
- Home-based Other – trips having a combination of home and non-work/non-school as either origin or destination
- Non-home-based – trips not starting or ending at home.

Trip segment type is reported as unlinked trips, meaning that each stop was considered a destination regardless of trip purpose importance. Table 4.8 presents trip segment types for all trips. Most trips reported (44.4%) were home to/from "other" place (Home-based other). Other places are all non-work and non-school locations, such as stores, restaurants, a friend's home, doctor's offices, etc.

Table 4.8:
Trip Segment Type

Segment Type	Percent
Home-based Work	15.6%
Home-based School	7.4%
Home-based Other	44.4%
Non-home-based	32.6%
Total	100.0%

Base: 12,012 trips.

There were virtually no differences observed between trip segment types in Inner and Outer Counties. There were slightly more home-based school trips recorded by residents of the Inner Counties, whereas residents of the Outer Counties recorded slightly more incidences of non-home-based trips.

Figure 4.9:
Trip Segment Type by County

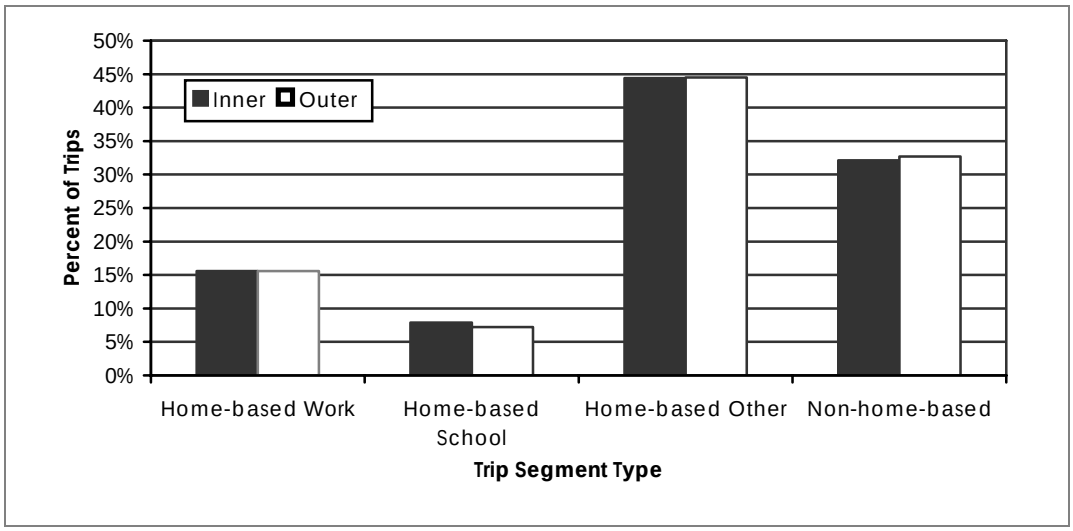
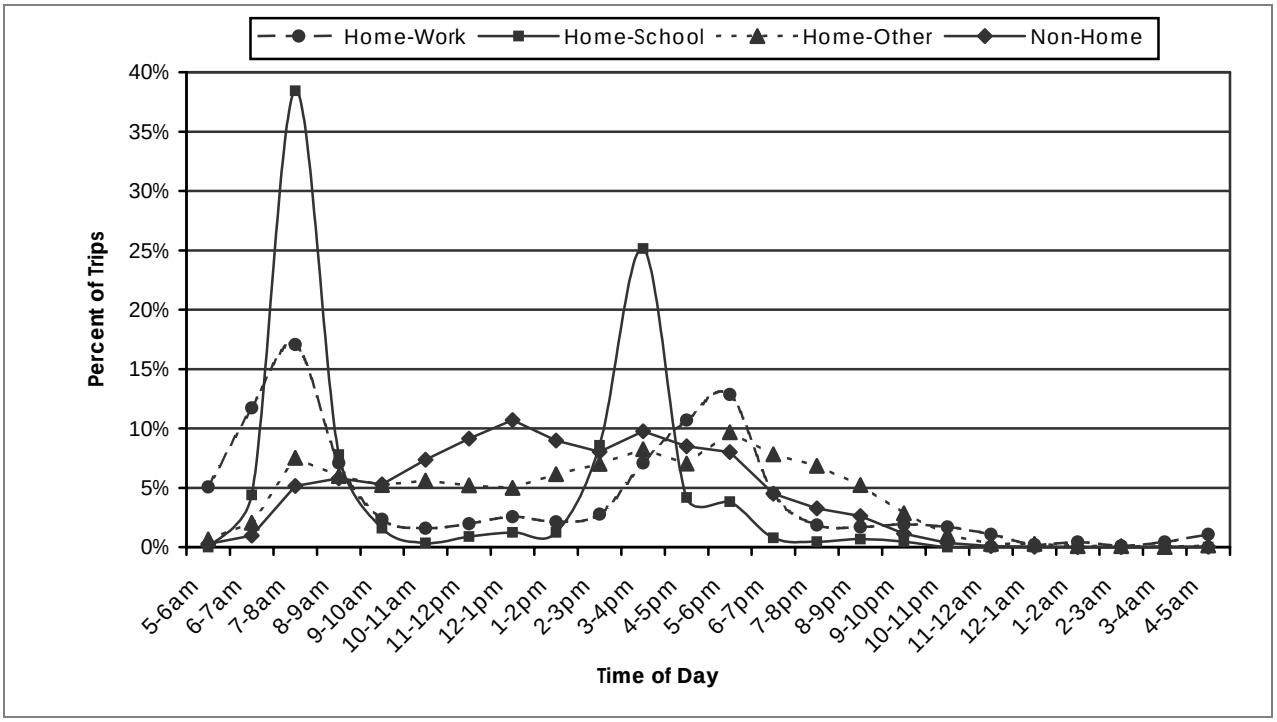


Figure 4.10 presents the time of day distribution for each trip segment type. Home-based school trips exhibit the most noticeable morning and afternoon peak patterns, occurring between 7:00 a.m. and 8:00 a.m. and 3:00 p.m. and 4:00 p.m. Home-based work trips also peak twice during the day, while the frequencies of home-based other and non-home trips remain fairly consistent throughout the middle of the day.

Figure 4.10:
Trip Segment by Time of Day



5. Mode Choice

This chapter presents trip characteristics for each of the three primary mode types: 1) Personal vehicle; 2) Public transit; and 3) Non-motorized. Selected demographic characteristics of mode users are also examined.

5.1 Travel Mode

The most popular mode of travel in the Knoxville Urban Area was the personal vehicle, with 72% of all trips made by auto drivers and 24% made by auto passengers. Two percent (2%) of all trips were made via the school bus. Public transit, which includes public and private bus service and taxi service, accounted for less than 1% of all trips. Non-motorized modes, including walking and biking, accounted for just over 2% of all trips made. Figure 5.1 presents the distribution of travel modes among all trips.

Figure 5.1:
Travel Mode

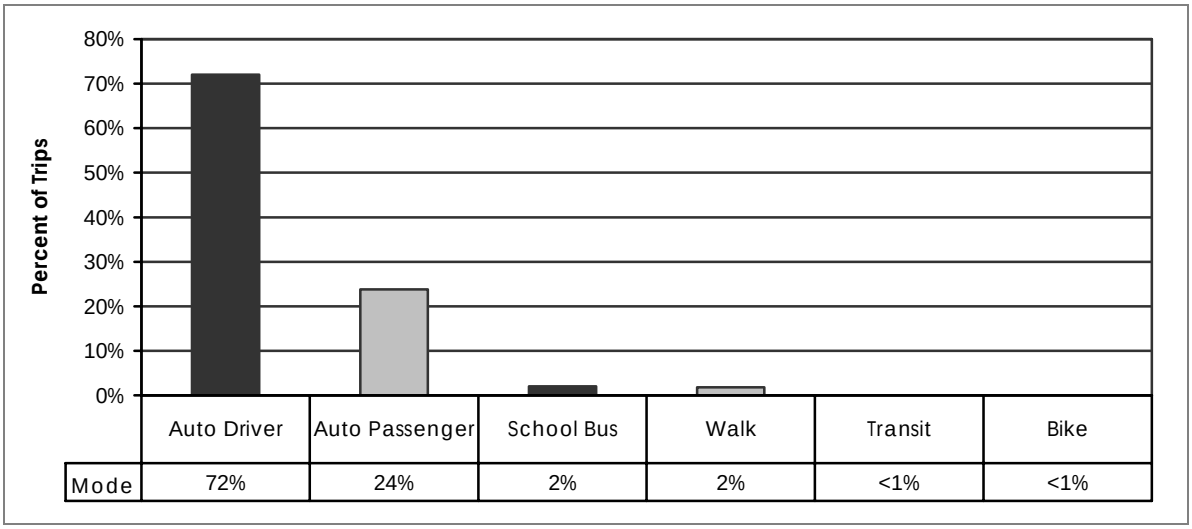


Table 5.2 presents travel mode by trip purpose, or the percentage of all trips made by a particular mode for each trip purpose. Overall, auto driver was reported as the most common travel mode for all trip purposes with the exception of school (elementary through high school), loop trips, and change mode of transportation. For trips to school, 67.8% of respondents were an auto passenger, while 17.9% traveled on a school bus. Non-motorized modes (walk and bike) were used most for loop trips, while public transit was used hardly at all across all trip purposes.

Table 5.3 presents an alternate method of presenting the relationship between mode choice and trip purpose. This table shows the distribution of travel mode by unlinked trip segment type. Again, the automobile emerged as the most popular of modes for all trip segment types, with the exception of home-based school trips, where auto passenger and school bus were the most used modes.

Table 5.2:
Travel Mode by Trip Purpose (Travel To)

Travel To:	Travel Mode							
	Auto Driver	Auto Passenger	Public Transit	School Bus	Motor-cycle	Taxi/ Shuttle	Walk	Bike
Personal activities at home	71.4%	23.9%	0.0%	3.2%	0.1%	0.1%	1.3%	0.1%
Work at home (for pay)	87.1%	3.2%	0.0%	0.0%	0.0%	0.0%	9.7%	0.0%
Work for pay (other than at home)	94.1%	4.3%	0.1%	0.1%	0.2%	0.0%	1.3%	0.0%
Volunteer work	83.8%	16.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
School: post-high school	97.7%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%
School: elementary – high school	13.3%	67.8%	0.0%	17.9%	0.0%	0.0%	1.0%	0.0%
Shopping (incidental)	74.8%	23.8%	0.1%	0.0%	0.1%	0.1%	1.1%	0.0%
Shopping (major)	70.7%	28.3%	0.0%	0.0%	0.0%	0.3%	0.8%	0.0%
Personal business	79.4%	18.5%	0.0%	0.2%	0.0%	0.4%	1.5%	0.0%
Medical/dental	64.2%	35.1%	0.0%	0.0%	0.0%	0.4%	0.4%	0.0%
Eat meal outside of home	66.7%	30.5%	0.0%	0.0%	0.4%	0.0%	2.3%	0.0%
Social/recreational	62.6%	32.3%	0.0%	1.4%	0.3%	0.2%	2.9%	0.1%
Civic activities	72.5%	25.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Church activities	60.5%	35.7%	0.0%	0.0%	0.0%	0.0%	3.8%	0.0%
Pick up/drop off passenger at work	73.1%	26.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pick up/drop off passenger at school	80.0%	18.5%	0.0%	0.6%	0.0%	0.0%	0.4%	0.0%
Pick up/drop off passenger at other	79.6%	19.6%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
Change mode of transportation	21.4%	45.2%	0.0%	14.3%	0.0%	2.4%	9.5%	0.0%
Loop trip	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	93.5%	2.2%
Overall	72.0%	23.8%	<0.1%	2.0%	0.1%	0.1%	1.8%	0.1%

Base: 12,012 trips.

Table 5.3:
Travel Mode by Trip Segment Type

Trip Segment Type	Travel Mode							
	Auto Driver	Auto Passenger	Public Transit	School Bus	Motor-cycle	Taxi/ Shuttle	Walk	Bike
Home-based Work	95.8%	3.4%	0.0%	0.0%	0.2%	0.0%	0.6%	0.1%
Home-based School	18.5%	56.6%	0.0%	23.3%	0.0%	0.1%	1.5%	0.0%
Home-based Other	71.2%	26.2%	0.0%	0.1%	0.1%	0.1%	2.2%	0.1%
Non-home-based	74.0%	22.9%	0.1%	0.8%	0.2%	0.2%	1.9%	0.0%
Overall	72.0%	23.8%	<0.1%	2.0%	0.1%	0.1%	1.8%	0.1%

Base: 12,012 trips.

As Table 5.4 shows, there is direct correlation between automobile ownership and the percentage of trips made by automobile. As the number of vehicles owned by a household increased, the percentage of trips made by an automobile increased. Conversely, as vehicle ownership increased, the use of other modes decreased. A similar relationship is seen in Table 5.5, where travel by automobile accounted for a higher percentage of trips made by those with a valid driver's license than it did for those who were unlicensed.

Table 5.4:
Travel Mode by Vehicle Ownership

Number HH Vehicles	Travel Mode								
	Auto Driver	Auto Passenger	Public Transit	School Bus	Motor-cycle	Taxi/ Shuttle	Walk	Bike	Total
Zero	1.6%	67.7%	0.0%	3.2%	0.0%	6.5%	21.0%	0.0%	100.0%
One	78.3%	17.6%	0.1%	1.3%	0.0%	0.0%	2.7%	0.0%	100.0%
Two	67.9%	27.6%	0.0%	2.4%	0.1%	0.1%	1.9%	0.1%	100.0%
Three+	75.0%	21.6%	0.0%	2.0%	0.2%	0.1%	1.1%	0.0%	100.0%
Overall	72.0%	23.8%	<0.1%	2.0%	0.1%	0.1%	1.8%	0.1%	100.0%

Base: 12,012 trips.

Table 5.5:
Travel Mode by Driver's License Status

Has a Valid Driver's License	Travel Mode								
	Auto Driver	Auto Passenger	Public Bus	School Bus	Motorcycle/ Moped	Taxi/ Shuttle	Walk	Bike	Total
Yes	86.0%	12.1%	<0.1%	0.2%	0.2%	<0.1%	1.5%	<0.1%	100.0%
No	0.0%	80.9%	0.0%	9.8%	0.0%	1.6%	7.7%	0.0%	100.0%
Overall	84.0%	12.0%	<0.1%	0.4%	0.2%	0.1%	3.3%	<0.1%	100.0%

Base: 10,031 trips taken by persons aged 16 years or above.

5.2 Vehicle Trips

The overall vehicle trip rate[1] for the entire study area was 8.42. Roane County households made slightly more vehicle trips than other counties (8.95), compared with the county with the fewest average household vehicle trips, Union County (7.44).

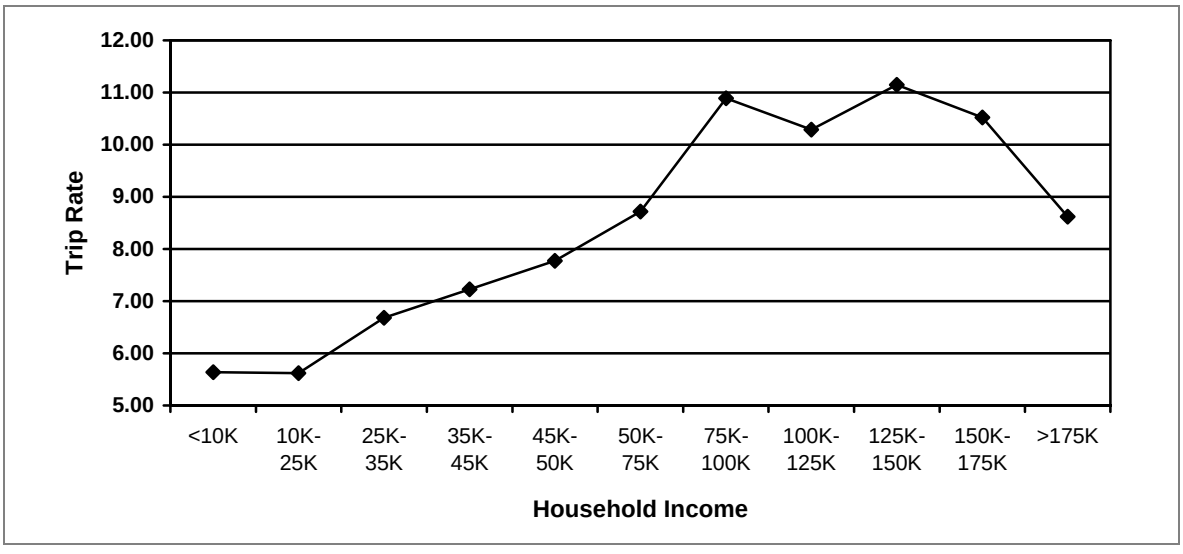
Table 5.6:
Household Vehicle Trip Rates by County

County	Trip Rate
Anderson	8.34
Blount	8.73
Jefferson	7.99
Knox	8.63
Loudon	8.57
Roane	8.95
Sevier	8.08
Union	7.44
Total	8.42

Base: 1,400 households.

Figure 5.7 shows that as household income increased, generally so did the average number of household vehicle trips.

Figure 5.7:
Household Vehicle Trip Rates by Household Income



[1] The average number of trips a household made using a personal vehicle.

Table 5.8 presents the distribution of trip purposes for all vehicle trips. "Personal activities at home" was the top trip purpose at 42.4%, and "personal business" was second at 8.7%.

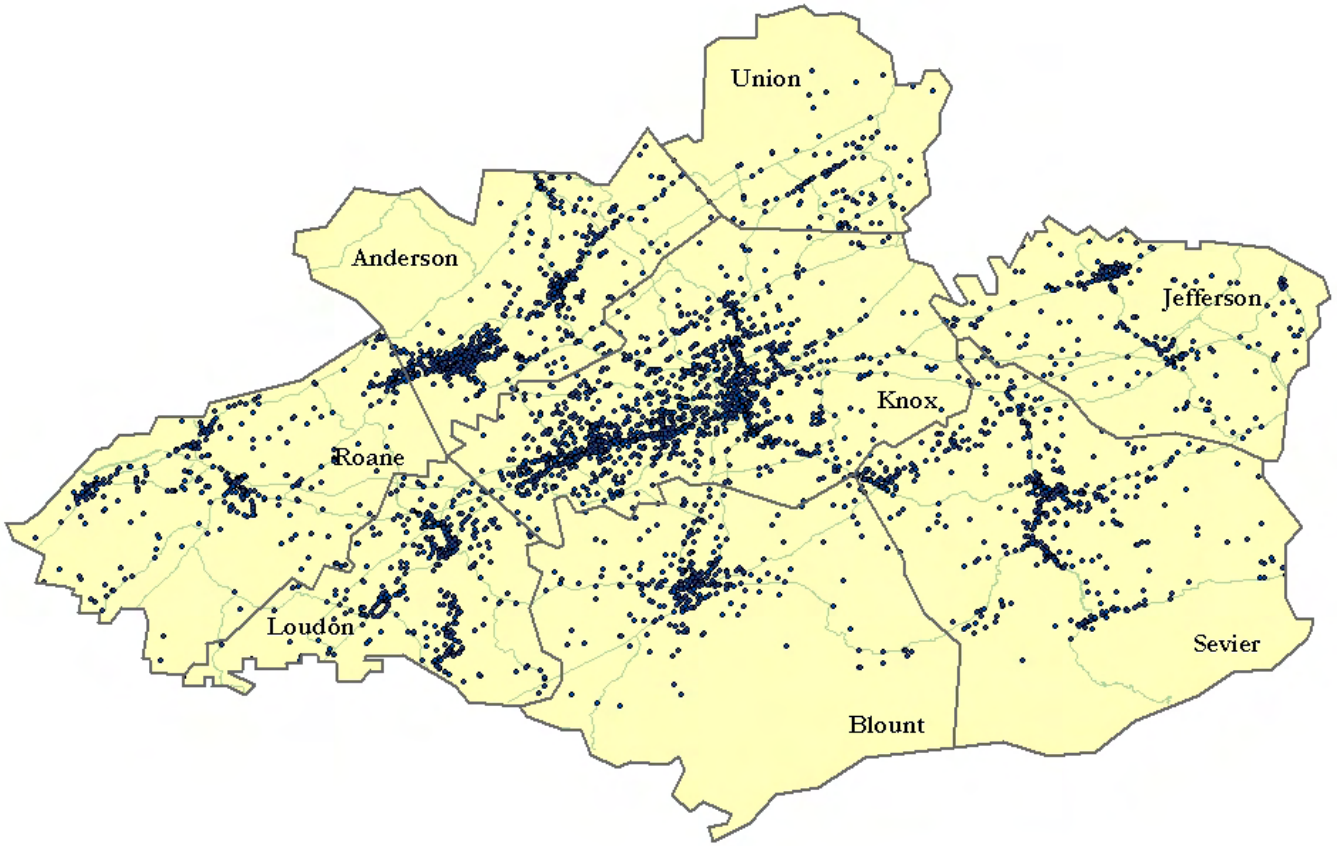
Figure 5.9 on page 29 presents the locations of all vehicle trip destinations.

Table 5.8:
Vehicle Trips by Purpose (Travel To)

Travel To:	Percent
Personal activities at home	42.4%
Work at home	0.3%
Work	9.0%
Volunteer	0.3%
School – university	0.2%
School – grade	4.1%
Shopping – incidental	8.6%
Shopping – major	2.6%
Personal business	8.7%
Medical/dental	1.6%
Eat meal outside of home	5.1%
Social/recreational	7.1%
Civic activities	0.3%
Church activities	1.5%
Pick up/drop off at work	1.0%
Pick up/drop off at school	4.4%
Pick up/drop off at other place	2.3%
Change mode of transportation	0.3%
Loop trip	0.2%
Total	100.0%

Base: 194,542 auto driver, auto passenger, & motorcycle trips.

Figure 5.9:
Map of Destinations for Vehicle Driver Trips



5.3 Public Transit Trips

The survey results found that from the 1,400 households that completed the study, only twice did a respondent record public transit as the travel mode. Because of this, no further analysis will be done for this mode.

5.4 Non-Motorized Trips

Out of the 101 households that recorded making at least one non-motorized trip on their assigned travel day, these households reported an average of 2.33 non-motorized trips. Households in Anderson County reported making the most trips on average by biking or walking (2.5). Households in Sevier County reported making the least non-motorized trips on average (1.67). Considering all households in the study, the overall average number of non-motorized trips reported was 0.16 per day. When only considering the households that recorded making at least one non-motorized trip on their assigned travel day, the region as a whole averaged 2.16 non-motorized trips per household.

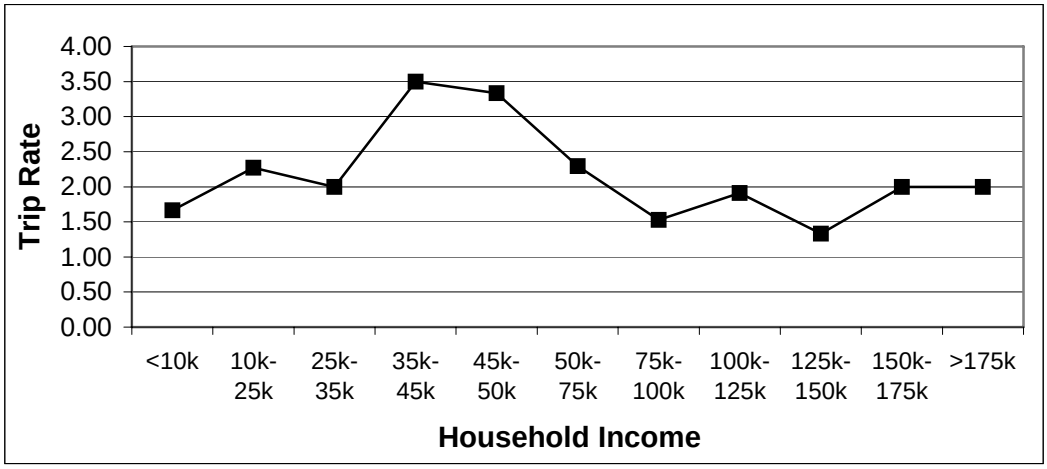
Table 5.10:
Household Non-Motorized Trip Rates by County

County	Trip Rate
Anderson	2.50*
Blount	1.86*
Jefferson	2.33*
Knox	2.17*
Loudon	1.89*
Roane	2.33*
Sevier	1.67*
Union	2.33*
Total	2.16

*Base: 101 households reporting at least one non-motorized trip. *Sample size is less than 30.*

As Figure 5.11 shows, the frequency of non-motorized trips did not have a strong association with either an increase or decrease in household income. Households making an income of $35,000 to $75,000 a year reported a higher average of non-motorized trips than other income categories.

Figure 5.11:
Household Non-Motorized Trip Rates by Household Income



Other than personal activities at home (23.9%), the top reason for bike or walk trips was social/recreational (12.8%) and work (9.2%) purposes, followed closely by personal business (8.3%).

Table 5.12:
Non-Motorized Trips by Purpose (Travel To)

Travel To:	Percent
Personal activities at home	23.9%
Work at home	1.4%
Work	9.2%
Volunteer	0.0%
School – university	0.5%
School – grade	2.3%
Shopping – incidental	6.0%
Shopping – major	1.4%
Personal business	8.3%
Medical/dental	0.5%
Eat meal outside of home	7.3%
Social/recreational	12.8%
Civic activities	0.0%
Church activities	3.2%
Pick up/drop off at work	0.0%
Pick up/drop off at school	0.9%
Pick up/drop off at other place	0.5%
Change mode of transportation	1.8%
Loop trip	20.2%
Total	*100.0%*

Base: 218 walk & bike trips.

Thirty-four percent of people who reported making at least one non-motorized trip on the assigned travel day were 65 years and older. People between the ages of 18 and 24 years made the least amount of non-motorized trips and comprise only 4% of the total. As seen in Figure 5.14, females reported slightly more non-motorized trips.

Table 5.13:
Age of Persons Making Non-Motorized Trips

Age	Percent
5 to 12 years old	5%
13 to 17 years old	15%
18 to 24 years old	4%
25 to 34 years old	6%
35 to 44 years old	5%
45 to 54 years old	19%
55 to 64 years old	29%
65 years and older	34%
Total	100%

Base: 205 persons reporting age and making at least one non-motorized trip.

Figure 5.14:
Non-Motorized Trips by Gender

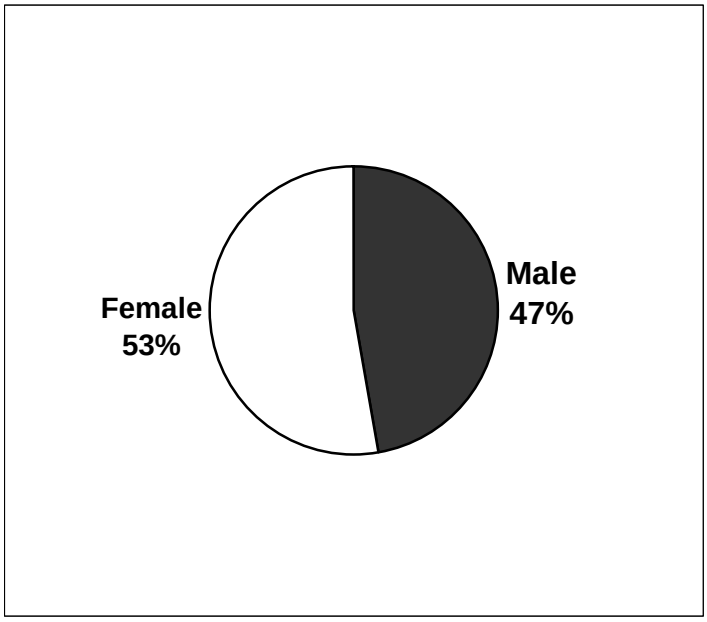


Figure 5.15 on page 33 presents the destinations of all non-motorized trips.

Figure 5.15:
Map of destinations for Non-Motorized Trips

6. Vehicle Information

This chapter presents general vehicle characteristics, including occupancy levels, vehicle age, and popular vehicle makes and models.

6.1 Vehicle Occupancy

As presented in Table 6.1, the average vehicle occupancy for personal vehicles per trip was 1.70 persons. Of all trip purposes, trips to grade school had the highest vehicle occupancy, with two and a half persons per vehicle (2.50). Trips to college/university locations had the lowest average vehicle occupancy, with 1.02 persons per vehicle.

Table 6.2 shows a similar pattern. Home-based school trips had the highest average vehicle occupancy, while home-based work trips had the lowest.

Table 6.1: Average Vehicle Occupancy by Trip Purpose (Travel To)

Travel To:	Occupancy
School – grade	2.50
Pick up/drop off at work	2.29
Church activities	2.26
Pick up/drop off at school	2.22
Change mode of transportation	2.11
Pick up/drop off at other place	2.10
Loop trip	2.00
Social/recreational	1.99
Eat meals outside of home	1.90
Civic activities	1.78
Medical/dental	1.76
Shopping – major	1.70
Personal activities at home	1.69
Shopping – incidental	1.62
Personal business	1.51
Volunteer	1.41
Work (other than at home)	1.13
Work at home	1.11
School - university	1.02
Overall	1.70

Base: 11,522 vehicle trips.

Table 6.2: Average Vehicle Occupancy by Trip Segment Type

Segment Type	Occupancy
Home-based School	2.39
Non-home-based	1.70
Home-based Other	1.69
Home-based Work	1.11
Overall	1.70

Base: 11,522 vehicle trips.

6.2 Vehicle Age

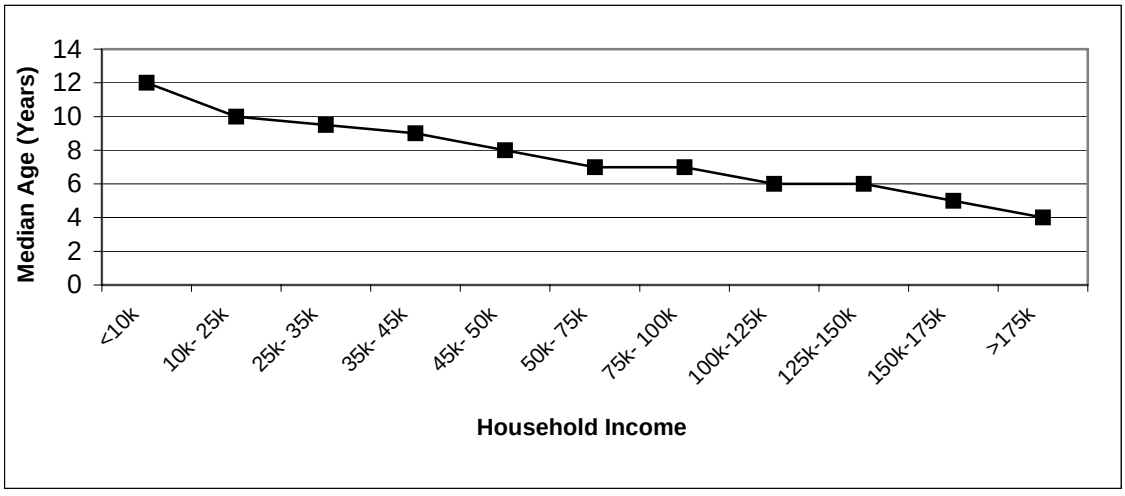
The median age of all vehicles reported in the survey was seven years, as presented in Table 6.3. Automobiles in Union County were slightly older, with a median age of nine years. As Figure 6.4 shows, households with a higher income generally had newer automobiles.

Table 6.3: Median Vehicle Age by County

County	Age (Years)
Anderson	8.0
Blount	7.0
Jefferson	7.0
Knox	7.0
Loudon	7.0
Roane	8.0
Sevier	7.0
Union	9.0
Overall	7.0

Base: 3,161 vehicles reporting model year.

Figure 6.4: Median Vehicle Age by Household Income



6.3 Vehicle Makes and Models

Ford was the most popular vehicle make in the eight-county study area, with nearly one in every five and a half automobiles manufactured by Ford. Chevrolet was the second most popular make, with 15% of the automobile share. Toyota was the third most popular at 12%.

The most popular vehicle model was the Ford F-150 at 4% of all vehicles, while the Toyota Camry, the most popular vehicle in the 2000 study, is second at 3% of the overall vehicles.

Table 6.5:
Top 10 Vehicle Makes

Vehicle Make	Percent
Ford	18%
Chevrolet	15%
Toyota	12%
Dodge	8%
Honda	7%
Nissan	6%
Buick	3%
GMC	3%
Jeep	3%
Chrysler	2%

Base: 3,189 vehicles reporting make.

Table 6.6:
Top 10 Vehicle Models

Vehicle Make	Percent
Ford F-150	4%
Toyota Camry	3%
Dodge Ram Pickup	2%
Chevrolet Silverado	2%
Ford Ranger	2%
Honda Accord	2%
Dodge Caravan	2%
Ford Taurus	2%
Toyota Tacoma	2%
Ford Explorer	1%

Base: 3,100 vehicles reporting model.

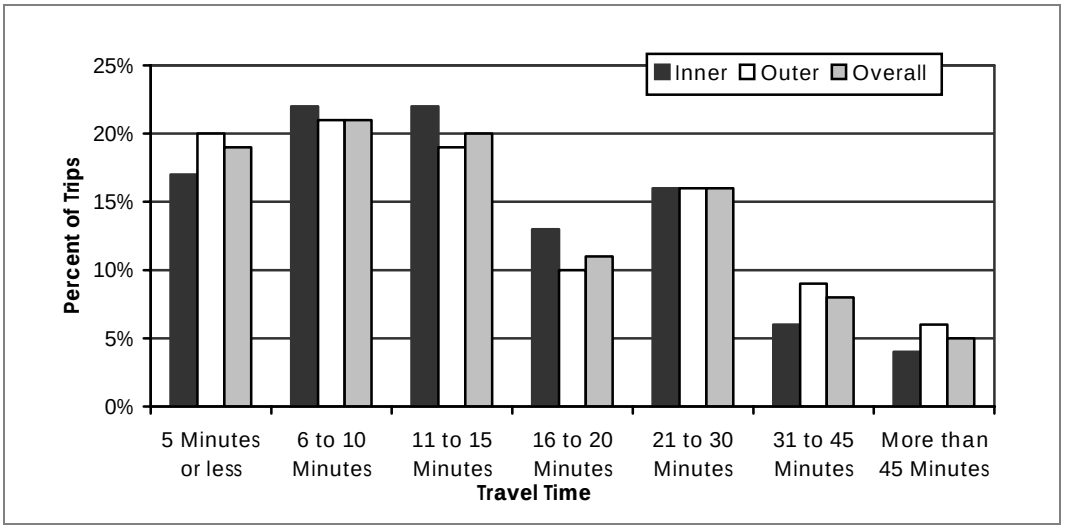
7. Travel Times

This chapter examines general characteristics of travel times and selected trip characteristics that impact trip duration.

7.1 Travel Time

On average, trips lasted 19.5 minutes from origin to destination. The travel times in the Inner and Outer Counties, as well as the overall mean travel time, are presented in Figure 7.1. Sixty percent of all trips had a travel time of 15 minutes or less, while 13% took more than 30 minutes. The average trip time experienced by households in the Inner and Outer Counties only differed by .01 minutes, yet Figure 7.1 does show that the Outer Counties had more variation in their trip times. Outer County households took more trips under five minutes, as well as more trips over 30 minutes.

Figure 7.1:
Travel Time (in Minutes) by County



As Table 7.2 indicates, trips to change mode of transportation had the highest average travel time at over 42 minutes per trip. Loop trips and trips to school (college or university) also averaged over 30 minutes. The shortest trips made were picking up/dropping off at school and incidental shopping trips, each taking under 15 minutes.

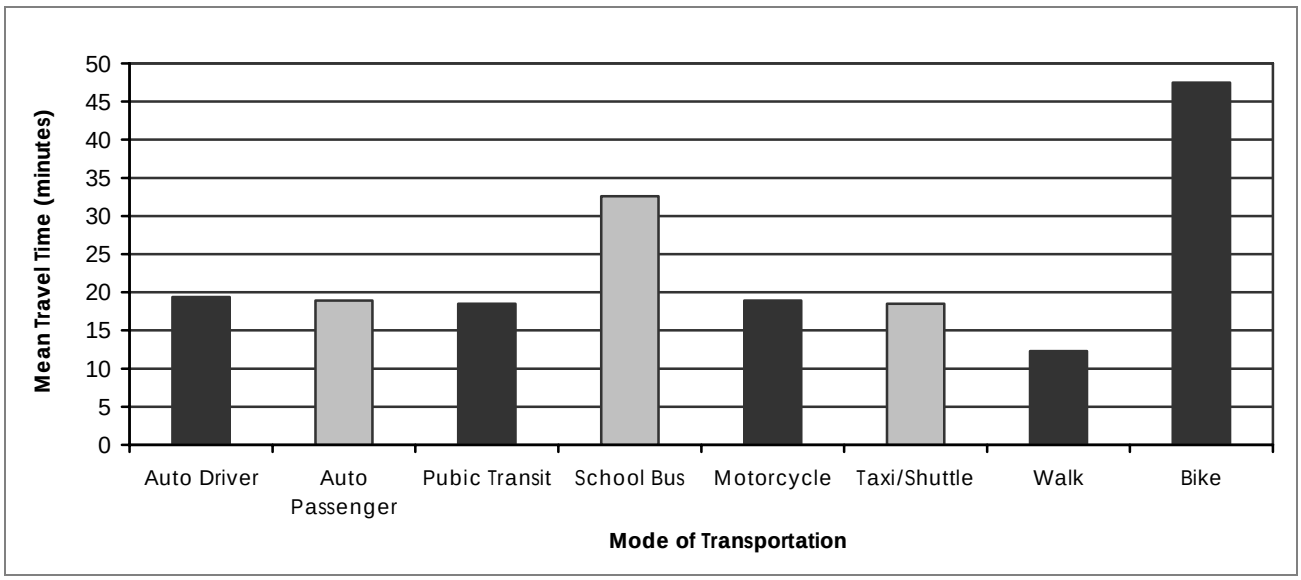
Table 7.2:
Mean Travel Time (in Minutes) by Primary Trip Purpose

Travel To:	Travel Time
Change mode of transportation	42.3
Loop trip	34.7
School - University	30.8
Medical/dental	27.9
Social/recreational	24.1
Work for pay (other than at home)	22.3
Civic activities	22.3
Personal activities at home	20.7
Pick up/drop off passenger at other	18.1
Volunteer work	17.9
School - grade	17.9
Church activities	17.2
Shopping (major)	16.9
Personal business	16.6
Eat meal outside of home	16.6
Work at home (for pay)	16.1
Pick up/drop off passenger at work	15.2
Shopping (incidental)	14.7
Pick up/drop off passenger at school	13.4
Overall	19.5

Base: 12,012 trips.

Trips taken by bike had the highest average travel time at over 45 minutes per trip. However, because there were so few cases of bike trips (four total), there is nothing conclusive about the results. On average, auto trips took just under 20 minutes per trip. Walk trips had the shortest average travel time at approximately 12 minutes per trip. Figure 7.3 presents mean travel time by mode.

Figure 7.3:
Mean Travel Time (in Minutes) by Travel Mode



7.2 Trip Start Times

Vehicle trip data show three distinguishable trip start time peaks: 1) Morning Peak occurring between 7:00 a.m. and 8:00 a.m.; 2) End of School Day Peak occurring between 3:00 p.m. and 4:00 p.m.; and 3) Evening Peak occurring between 5:00 p.m. and 6:00 p.m. There are clear similarities between this distribution and the overall trips by time of day shown in Figure 4.5, due to the fact that the majority of trips were made by auto modes, and therefore these trips contribute the most to the overall distribution.

Figure 7.4:
Vehicle Trips by Time of Day

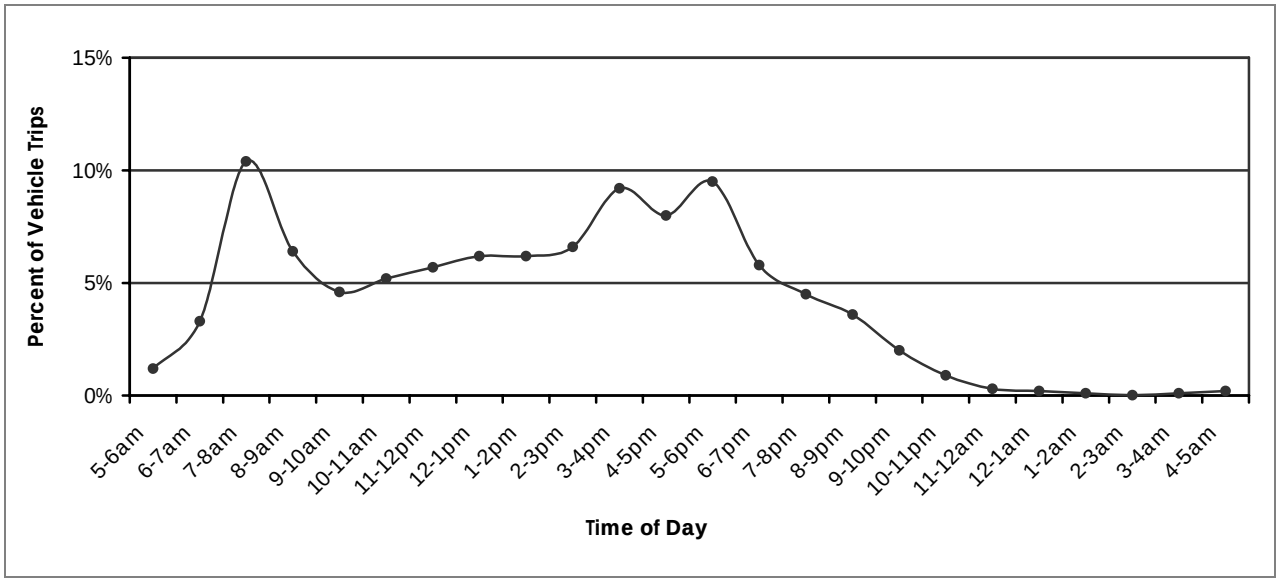
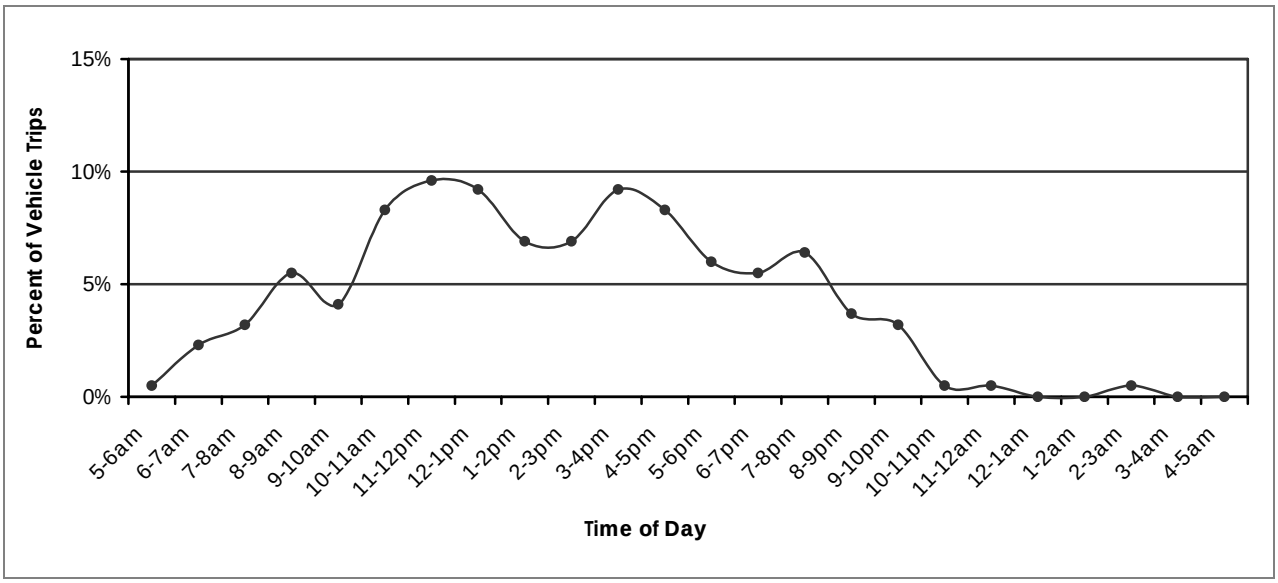


Figure 7.5 presents the distribution of start times for all non-motorized trips. The two most pronounced peaks occur between 10:00 a.m. and 1:00 p.m. and between 3:00 p.m. and 5:00 p.m. There are also two smaller peaks between 8:00 a.m. and 9:00 a.m. and between 7:00 p.m. and 8:00 p.m.

Figure 7.5:
Non-Motorized Trips by Time of Day



8. University of Tennessee

This chapter compares selected demographics and travel behavior characteristics of persons of households making trips to the University of Tennessee (UT) Area. For the purposes of analysis in this section, the UT Area is defined as the area confined by Grand Avenue to the North, World's Fair Park to the East, Neyland Drive to the South, and Alcoa Highway to the West.

Figure 8.1:
UT Area Trip Locations

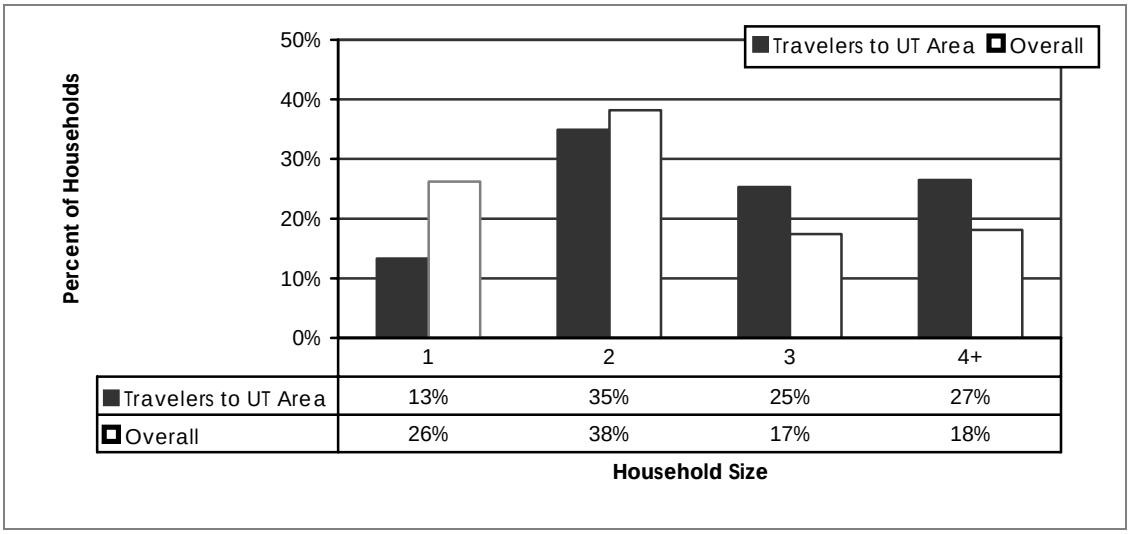
8.1 Household Characteristics

Out of the 1,400 completed households in the entire study, 83 (5.9%) reported at least one trip to the University of Tennessee area, as defined above. One of the households is located within the area. The geographic distribution of all households traveling to the UT area is shown in Figure 8.2.

The average size of households reporting at least one trip to the UT area is 2.77, compared to the overall survey average of 2.36. Figure 8.3 presents the overall distribution of household size for both groups of households. In the overall study, a greater percentage of one- and two-person households are found, while the three-person and greater households are more common in the UT area group.

Figure 8.2:
Locations of Households Traveling to UT Area

Figure 8.3:
Household Size Comparison



The households traveling to the UT area also had a greater number of vehicles per household, when compared to all surveyed households. Table 8.4 presents the distribution of the number of household vehicles. The average number of vehicles for households traveling to the UT area is 2.69, while overall the average is 2.29. Over half of households traveling to the UT area own three or more vehicles.

Table 8.4:
Household Vehicles Comparison

Number of Vehicles per Household	Travelers to UT Area	Overall
Zero	1.2%	1.6%
One	13.3%	23.2%
Two	34.9%	40.2%
Three+	50.6%	35.0%
Total	100.0%	100.0%
Vehicles per Household	2.69	2.29

UT Area Base: 83 households.

When compared to all households, a higher percentage of households with persons that traveled to the UT Area resided in a single-family house detached from any other house. Households with persons that traveled to the UT Area also displayed comparable household income levels. Table 8.5 presents a comparison of residence type, while Table 8.6 presents a comparison of household income.

Table 8.5:
Residence Type Comparison

Residence Type	Travelers to UT Area	Overall
Single-Family House Detached from Any Other House	96.4%	86.3%
Singe-Family Attached to One or More Houses (Duplex, Townhouse)	1.2%	2.2%
Mobile Home	1.2%	5.2%
Building with Two or More Apartments	1.2%	6.2%
Total	100.0%	100.0%

UT Area Base: 83 households.

Table 8.6:
Household Income Comparison

Income	Travelers to UT Area	Overall
Less than $10,000	2.6%	4.0%
$10,000 to less than $25,000	5.2%	13.5%
$25,000 to less than $35,000	1.3%	10.8%
$35,000 to less than $45,000	7.8%	10.3%
$45,000 to less than $50,000	2.6%	6.4%
$50,000 to less than $75,000	20.8%	18.0%
$75,000 to less than $100,000	22.1%	18.2%
$100,000 to less than $125,000	16.9%	8.0%
$125,000 to less than $150,000	9.1%	4.3%
$150,000 to less than $175,000	2.6%	2.1%
$175,000 or more	9.1%	4.3%
Total	100.0%	100.0%

UT Area Base: 83 households.

8.2 Person Characteristics

Persons traveling to the UT Area were more frequently college-age when compared to the full study, with 13.0% between the ages of 18 and 24 years, compared to 4.5% overall. Very few respondents under the age of 18 traveled to UT during their travel day. Table 8.7 compares age for persons traveling to the UT Area with all surveyed persons.

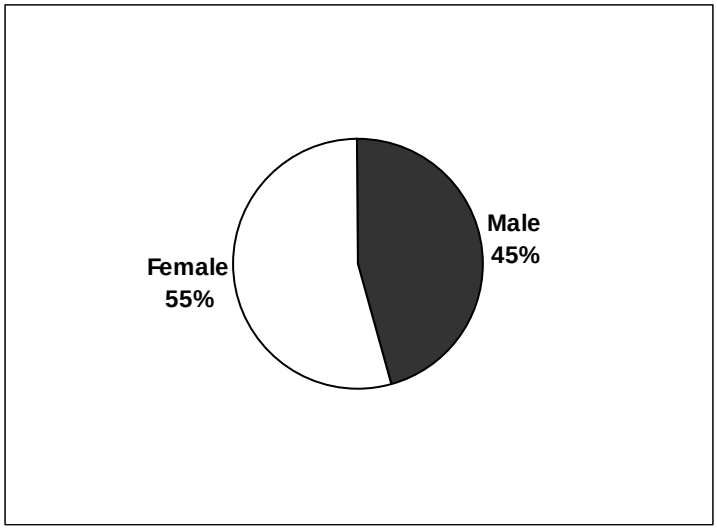
Table 8.7:
Age Comparison

Age	Travelers to UT Area	Overall
Under 5 years	1.9%	3.9%
5 years to 12 years old	1.9%	8.8%
13 years to 17 years old	1.9%	6.6%
18 years to 24 years old	13.0%	4.5%
25 years to 34 years old	9.3%	6.8%
35 years to 44 years old	13.0%	11.3%
45 years to 54 years old	25.0%	19.3%
55 years to 64 years old	21.3%	18.7%
65 years and older	13.0%	20.2%
Total	100.0%	100.0%

UT Area Base: 108 persons reporting age.

Figure 8.8 presents the gender distribution for persons traveling to the UT area during the assigned travel day. Females comprised 55% of persons making trips to the UT Area.

Figure 8.8:
Gender Comparison



Tables 8.9 and 8.10 present a comparison of employment status and student status between persons traveling to the UT Area and all persons in the travel behavior survey. As Table 8.9 indicates, a larger percentage of UT Area patrons (74.5%), age 16 and older, were employed, compared to all persons (16 and older) in the survey (59.2%). Only one in four persons who traveled to the UT area (25.5%) were unemployed, while two in five were unemployed (40.8%) in the overall study. Table 8.10 shows that 25.5% of persons making at least one trip to the UT Area were students, compared with 21.6% of persons in the entire study area. Students attending a four-year college or university made up 13.6% of the UT Area patrons, compared to 1.5% of the overall survey.

Table 8.9: Employment Status Comparison

Employment Status	Travelers to UT Area	Overall
Full-Time (30+ hours/week)	62.3%	47.2%
Part-Time (<30 hours/week)	12.3%	12.0%
Not employed	25.5%	40.8%
Total	100.0%	100.0%

UT Area Base: 106 persons over the age of 16.

Table 8.10: Student Status Comparison

Student Status	Travelers to UT Area	Overall
Daycare	1.8%	0.9%
Nursery School/Preschool	0.0%	1.0%
Kindergarten to Grade 8	0.9%	10.6%
Grade 9 to 12	1.8%	5.5%
Technical/Vocation School	0.0%	0.2%
2-Year College (Community College)	3.6%	1.3%
4-Year College or University	13.6%	1.5%
Graduate School/Professional	3.6%	0.4%
Student Total	25.5%	21.6%
Non-Students	74.5%	78.4%
Total	100.0%	100.0%

UT Area Base: 110 persons.

8.3 Travel Behavior Characteristics

Compared to the entire study area, trip rates were higher for those that traveled to the UT Area. Persons traveling to the UT Area made 4.35 trips during their assigned travel day, compared to an overall rate of 3.64 trips per day. Households with members traveling to the UT Area made, on average, 2.08 more trips per day.

Table 8.11:
Trip Rates Comparison

Type	Travelers to UT Area	Overall
Person	4.35	3.64
Household	10.66	8.58

UT Area Base: 479 total trips by UT Area patrons.

Mode choice was less diverse in the UT Area when compared to the entire study area. Table 8.12 compares the travel mode distribution for trips to the UT Area with all trips reported in the study. A higher percentage of trips to the UT Area were made by walking, 4.5%, compared to 1.8% of overall trips.

Table 8.12:
Total Trips by Mode Comparison

Travel Mode	Travelers to UT Area	Overall
Auto Driver	79.7%	72.0%
Auto Passenger	15.8%	23.8%
Transit – Public Bus	0.0%	<0.1%
Transit – School Bus	0.0%	2.0%
Motorcycle/Moped	0.0%	0.1%
Taxi/Shuttle Bus	0.0%	0.1%
Walk	4.5%	1.8%
Bike	0.0%	<0.1%
Total	100.0%	100.0%

UT Area Base: 133 trips to UT Area.

Table 8.13 compares the primary trip purpose between the two areas. A much higher proportion of trips made in the UT Area were for work and college/university purposes. Almost half of all trips to the UT Area (42.1%) were made for work, while work trips comprised of only 13.1% of trips in the overall study. Compared to the overall study, more trips were also made in the UT Area for medical/dental visits, as well as eating a meal outside of home.

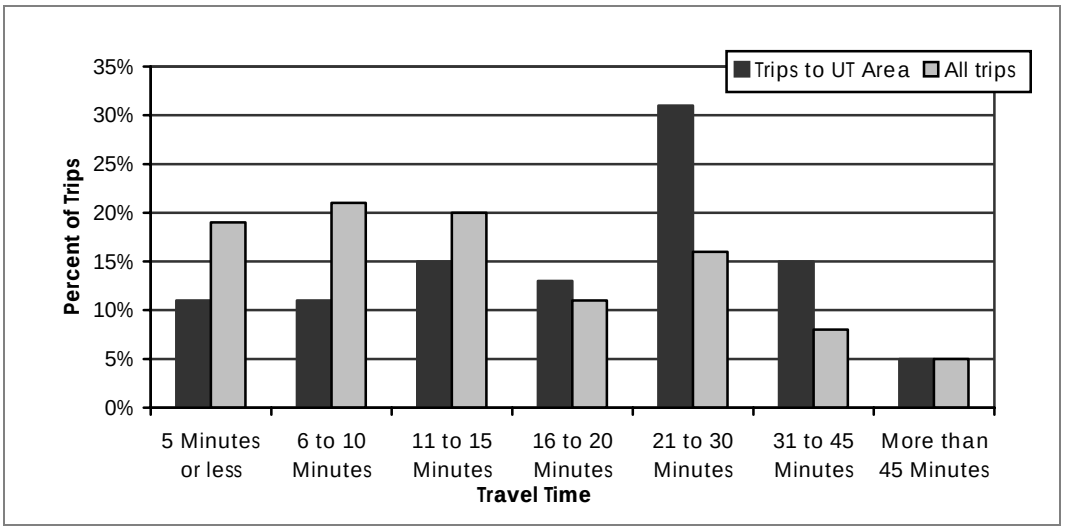
Table 8.13:
Primary Trip Purpose Comparison

Travel To:	Travelers to UT Area	Overall
Personal activities at home	2.3%	33.3%
Work at home	0.0%	0.3%
Work	42.1%	13.1%
Volunteer	0.8%	0.3%
School – university	11.3%	0.4%
School – grade	1.5%	4.3%
Shopping – incidental	3.0%	9.9%
Shopping – major	0.0%	3.3%
Personal business	8.3%	10.0%
Medical/dental	9.0%	2.2%
Eat meal outside of home	9.0%	5.7%
Social/recreational	3.0%	7.6%
Civic activities	0.0%	0.4%
Church activities	0.0%	1.5%
Pick up/drop off at work	3.8%	0.9%
Pick up/drop off at school	3.8%	3.9%
Pick up/drop off at other place	2.3%	2.1%
Change mode of transportation	0.0%	0.3%
Loop trip	0.0%	0.4%
Total	100.0%	100.0%

UT Area Base: 133 trips to UT Area.

The mean travel time for trips in the UT Area was 24.1 minutes, nearly five minutes longer than the average trip for the entire study area (19.5 minutes). Figure 8.14 presents a comparison of travel times, which clearly shows that trips lasting more than 15 minutes were more common to the UT Area, while shorter trips were more common overall.

Figure 8.14:
Trip Duration (in Minutes) Comparison



UT Area Base: 133 trips.

9. Comparison with 2000 Survey

This chapter will compare the results from the 2000 Knoxville Household Travel Behavior Study with results in Knox and Blount Counties from the current study. Besides only being conducted in two counties instead of eight, the previous survey also only included travel information for persons five years and older. Also, the 2000 data were weighted to better represent the demographic characteristics of the region, while the current data were not. Therefore, this chapter will compare the unweighted as well as the weighted data from the 2000 study with the unweighted data from the 2008 study in Knox and Blount Counties only. For the trip-related data, only travel reported by respondents older than four years will be considered. Refer to Appendix I for a detailed explanation on comparing and combining the two datasets.

9.1 Summary Data

An overall summary of the two surveys is presented in Table 9.1. The number of persons per household decreased from 2.42 in 2000 (2.43 weighted) to 2.35 in 2008. The number of vehicles, household workers, and licensed drivers per household all increased in 2008. There is also a noticeable increase in the number of vehicle trips per household and a corresponding decline in the number of non-motorized trips per household.

Table 9.1:
Summary Data by Survey

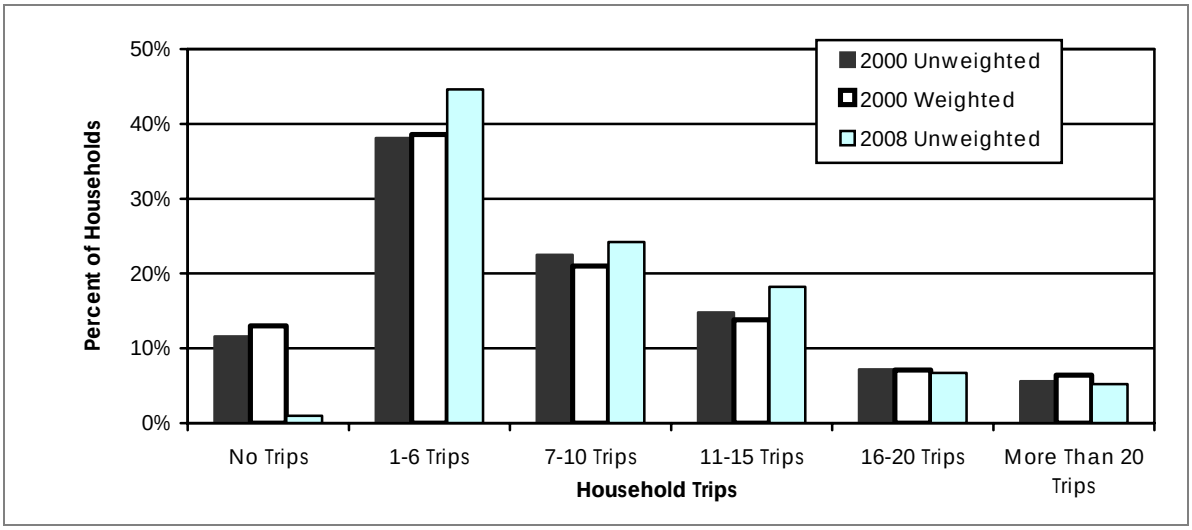
Type	2000 Unweighted Data	2000 Weighted Data	2008 Unweighted Data
Persons per household	2.42	2.43	2.35
Vehicles per household	1.98	1.82	2.23
Workers per household	1.09	1.15	1.22
Licensed drivers per household	1.80	1.80	1.90
Daily vehicle trips per household*	7.83	7.71	8.38
Vehicle driver trips per household	5.97	6.00	6.63
Vehicle passenger trips per household	1.68	1.71	1.73
Public transit (bus) trips per household**	1.90	1.96	2.00***
Non-motorized trips per household**	2.33	2.36	2.10

** Includes trips made by a personal vehicle (car, van, truck, motorcycle).*
*** Average includes only those households making at least one public transit or non-motorized trip.*
****Only one household reported a public transit trip in 2008.*

9.2 Trip Rates

First, the levels of immobility (at the household and person level) are presented to give more understanding to the overall trip rates from the two surveys. Figure 9.2 shows the distribution of the number of household trips made by households in the 2000 survey (unweighted and weighted) compared to the 2008 survey. As apparent in the graph, the percentage of households with zero trips is much smaller in 2008, 1.0% compared to 11.6% unweighted and 13.0% weighted in 2000.

Figure 9.2:
Distribution of Household Trips



The immobility rate is the proportion of either persons or households that recorded zero trips and has a strong impact to the overall trip rates. As shown in Table 9.3, both immobility rates were lower in 2008 than in 2000. However, the household rate showed the biggest change, decreasing from 11.6% unweighted (13.0% weighted) to 1.0% unweighted. The person rate also decreased to 9.7%, yet this is still large enough to influence the overall person trip rate.

Table 9.3:
Immobility Rates Comparison

Immobility Rate	% Making Zero Trips		
	2000 Unweighted	2000 Weighted	2008 Unweighted
Person	17.3%	15.8%	9.7%
Household	11.6%	13.0%	1.0%

Base: 1,538 households in 2000; 401 households in 2008.

The trip rates of the two studies are summarized in Table 9.4. As expected, the person rate in the 2008 survey, 3.80 trips, is higher than the unweighted 2000 rate, 3.51 trips, and comparable to the 2000 weighted rate, 3.84 trips. Despite the decrease in average household size in 2008, the household trip rate is higher because of the higher person rate and extremely low household immobility rate.

Table 9.4:
Trip Rates Comparison

Trip Rate	2000 Unweighted	2000 Weighted	2008 Unweighted
Person	3.51	3.84	3.80
Household	8.10	8.21	8.72

Base: 1,538 households in 2000; 401 households in 2008.

Table 9.5 compares the household trip rates by income category for both surveys, as well as the distribution of income level.

Table 9.5:
Household Trip Rates by Household Income Comparison

Income	2000 Unweighted Data		2000 Weighted Data		2008 Unweighted Data	
	Percent	Trip Rate	Percent	Trip Rate	Percent	Trip Rate
Less than $10,000	12.2%	4.74	13.6%	5.10	2.8%*	7.10
$10,000 to less than $25,000	33.3%	6.88	34.8%	6.99	10.8%	6.67
$25,000 to less than $35,000	20.8%	8.19	19.7%	8.44	10.2%	5.57
$35,000 to less than $45,000	10.5%	10.04	10.2%	10.63	9.7%	7.03
$45,000 to less than $50,000	3.3%	9.00	3.3%	9.50	6.9%	8.64
$50,000 to less than $75,000	11.0%	10.51	10.1%	11.09	19.3%	9.17
$75,000 to less than $100,000	4.8%	12.47	4.5%	12.92	20.7%	10.03
$100,000 to less than $125,000	2.3%	13.53	2.1%	14.33	7.7%*	11.18
$125,000 to less than $150,000	0.7%*	13.56	0.6%*	13.99	3.6%*	15.15
$150,000 to less than $175,000	0.6%*	14.75	0.7%*	14.88	2.8%*	10.40
$175,000 or more	0.5%*	13.71	0.5%*	15.31	5.5%*	9.70
Total	100.0%	8.10	100.0%	8.21	100.0%	8.72

Base: 1,305 households in 2000; 362 households in 2008 reporting income.
**Sample size is less than 30.*

9.3 Trip Characteristics

Before analyzing Table 9.6, which presents the distribution of primary trip purpose for both surveys, it is important to note that in the 2008 study, there were four options added that did not appear in the 2000 study. The added trip purposes were volunteer activities, pick up/drop off someone at some other place, change mode of transportation, and loop trip. In 2008, the combined frequency of all four of these purposes makes up less than 3% of the overall distribution.

In 2008, there were fewer trips made to work and to pick up/drop off someone else at work, yet there were more trips made to pick up/drop off someone else at school. While there were more trips made for personal business and incidental shopping in 2008, there were less made for shopping for major purposes.

Table 9.6:
Primary Trip Purpose Distribution Comparison

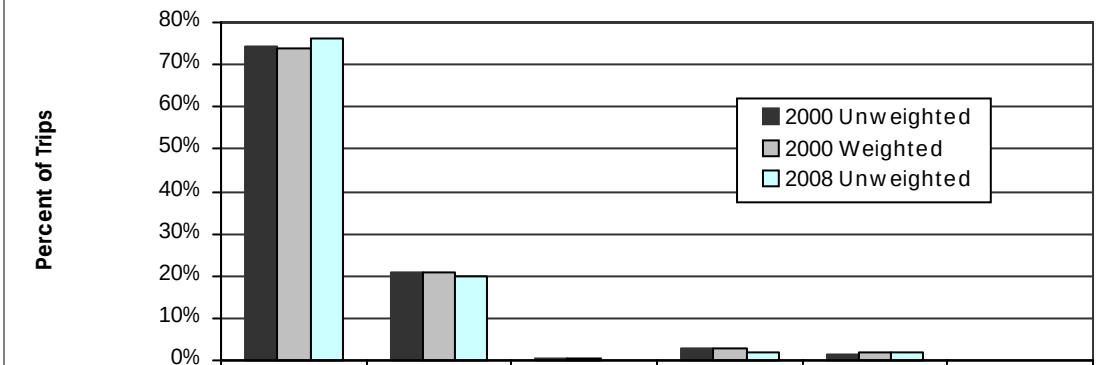
Primary Trip Purpose	2000 Unweighted	2000 Weighted	2008 Unweighted
Personal activities at home	46.8%	33.0%	46.2%
Work at home	0.5%	0.6%	0.4%
Work	12.3%	15.7%	11.0%
Volunteer	N/A	N/A	0.4%
School – university	0.8%	1.5%	0.5%
School – grade	3.6%	4.8%	3.1%
Shopping – incidental	6.3%	7.6%	8.1%
Shopping – major	2.9%	3.3%	2.6%
Personal business	6.6%	7.8%	8.6%
Medical/dental	1.7%	1.9%	1.9%
Eat meal outside of home	4.3%	5.4%	4.2%
Social/recreational	5.6%	7.0%	5.7%
Civic activities	0.6%	0.7%	0.6%
Church activities	1.2%	1.5%	1.0%
Pick up/drop off at work	6.6%	9.0%	0.7%
Pick up/drop off at school	<0.1%	<0.1%	2.6%
Pick up/drop off at other place	N/A	N/A	1.8%
Change mode of transportation	N/A	N/A	0.2%
Loop trip	N/A	N/A	0.4%
Total	100.0%	100.0%	100.0%

Base: 16,009 places in 2000; 4,418 places in 2008.

Figure 9.7 presents the mode distribution between the two studies and shows that the vast majority of trips in both studies were made by auto. From the 2000 survey to the 2008 survey, there was an increase in auto driver trips and a slight decrease in auto passenger and school bus trips.

The distribution of trip segment type is presented in Figure 9.8 (refer to Section 4.3 for the definition of the trip segments). There were slightly more home-based work and home-based other trips in 2008, yet slightly fewer home-based school and non-home-based trips.

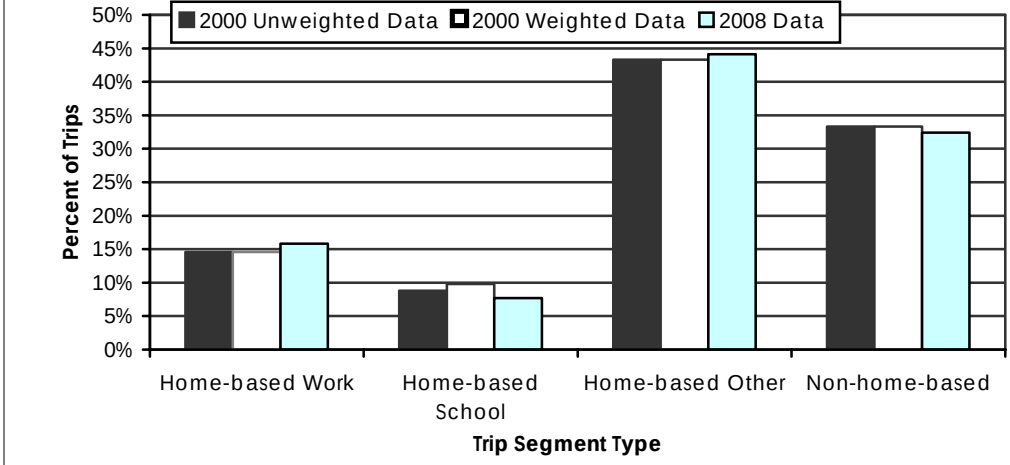
Figure 9.7:
Mode Comparison



	Auto Driver	Auto Passenger	Public Transit	Schoolbus	Walk	Bike
2000 Unweighted	74.2%	20.9%	0.3%	2.8%	1.6%	0.0%
2000 Weighted	74.0%	20.7%	0.4%	2.9%	2.0%	0.1%
2008 Unweighted	76.1%	19.8%	0.1%	1.9%	1.8%	0.0%

Base: 12,460 trips in 2000; 3,497 trips in 2008.

Figure 9.8:
Trip Segment Type by Survey



A comparison of mode by trip segment type is presented in Table 9.9. In 2008, there was a decrease in the number of respondents driving for home-based work trips and a corresponding increase in auto passenger trips. The comparison also shows that fewer students took the school bus or walked for their home-based school trips and instead used a personal vehicle mode in 2008.

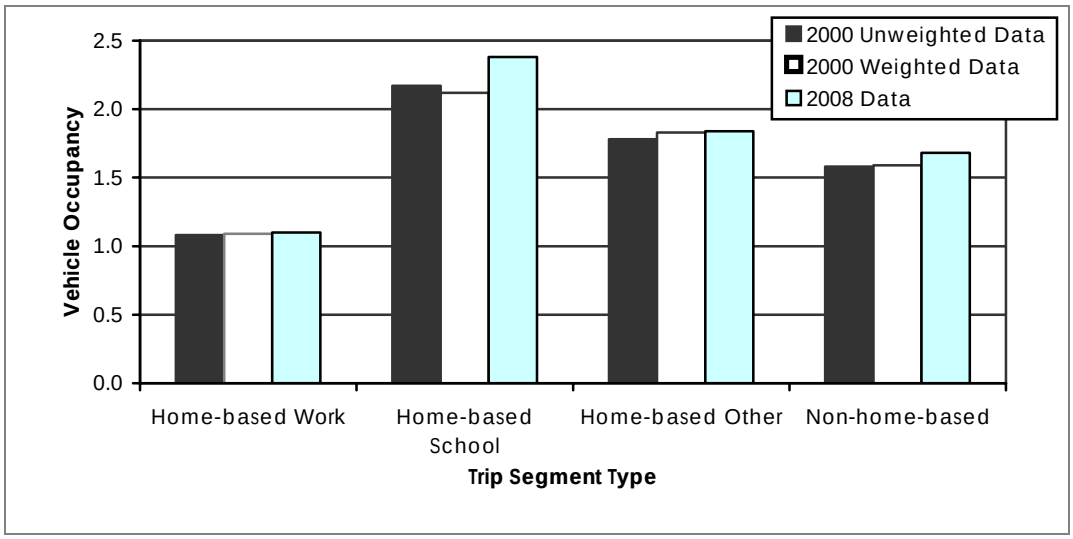
Table 9.9:
Travel Mode by Trip Segment Type

Trip Segment Type	2000 Unweighted					
	Auto Driver	Auto Passenger	Public Transit	School Bus	Walk	Bike
Home-based Work	93.8%	4.7%	0.6%	0.0%	0.9%	0.0%
Home-based School	19.6%	46.8%	0.5%	27.2%	5.7%	0.2%
Home-based Other	75.7%	22.9%	0.3%	0.1%	1.0%	0.1%
Non-home-based	78.2%	18.7%	0.2%	1.2%	1.6%	0.1%
Overall	74.2%	20.9%	0.3%	2.8%	<0.1%	<0.1%
Trip Segment Type	**2000 Weighted**					
	Auto Driver	Auto Passenger	Public Transit	School Bus	Walk	Bike
Home-based Work	93.1%	4.9%	1.0%	0.0%	1.0%	0.0%
Home-based School	22.9%	44.2%	0.8%	25.0%	7.0%	0.2%
Home-based Other	75.5%	22.7%	0.3%	0.1%	1.2%	0.1%
Non-home-based	78.5%	18.2%	0.2%	1.2%	1.8%	0.1%
Overall	74.0%	20.7%	0.4%	2.9%	2.0%	0.1%
Trip Segment Type	**2008 Unweighted**					
	Auto Driver	Auto Passenger	Public Transit	School Bus	Walk	Bike
Home-based Work	92.5%	6.2%	0.0%	0.0%	1.0%	0.3%
Home-based School	26.2%	56.0%	0.0%	15.1%	2.7%	0.0%
Home-based Other	78.5%	18.3%	0.1%	0.8%	2.4%	0.0%
Non-home-based	80.5%	17.0%	0.2%	0.3%	2.0%	0.0%
Overall	76.1%	19.8%	0.1%	1.9%	1.8%	<0.1%

Base: 12,460 trips in 2000; 3,497 trips in 2008.

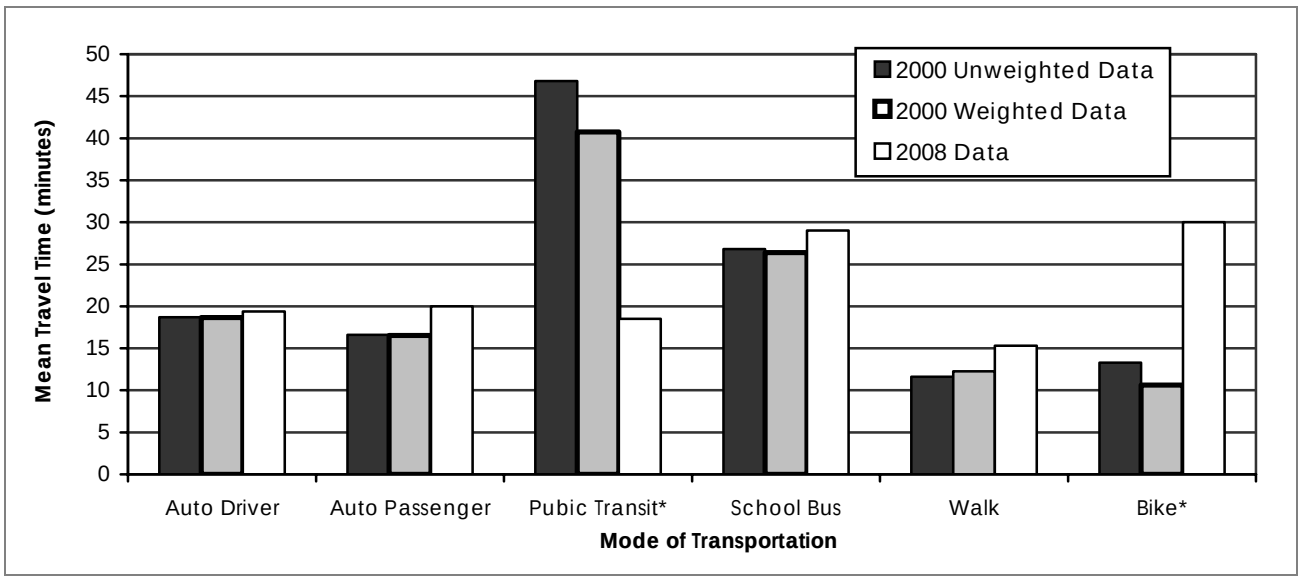
Figure 9.10 compares the average vehicle occupancy reported based on trip segment type. The total number of passengers, including the respondent, riding in personal vehicles increased for all trip segments in the 2008 survey. The most noticeable change was seen in home-based school trips, where the average occupancy rose from 2.12 passengers in 2000 (2.17 passengers in the unweighted data) to 2.38 passengers in 2008.

Figure 9.10:
Average Vehicle Occupancy by Trip Segment Type



The average travel time for all trips in 2000 was 18.55 minutes unweighted (18.49 minutes weighted) and increased to 19.66 minutes in 2008. A comparison of travel time by each mode is presented in Figure 9.11. For each mode, with the exception of public transit (which was only used twice in the 2008 data), the mean travel time increased from the previous survey. The smallest change occurred in trips made by auto driver, which lasted on average just under 20 minutes for both studies.

Figure 9.11:
Mean Travel Time (in Minutes) by Travel Mode Comparison



**In 2008, there were only two public transit and one bike trip reported.*

10. Panel Sample Comparison

This chapter will compare the unweighted results from the 22 households that completed both the 2000 Knoxville Household Travel Behavior Study and the current study. Eight households had a different number of members in the previous study, and 13 households had a different number of vehicles. However, the location of each household did not change between surveys. Figure 10.2 shows the location of all 22 panel households.

10.1 Summary Data

An overall summary of the two surveys is presented in Table 10.1. The number of persons per household decreased from 2.41 in 2000 to 2.14 in 2008. The number of vehicles and licensed drivers also decreased in 2008, yet the number of household workers remained the same. Similar to the overall survey comparison made in Chapter 9, the average number of vehicle trips increased in 2008.

Table 10.1:
Summary Data by Survey

Type	2000 Survey	2008 Survey
Persons per household	2.41	2.14
Vehicles per household	2.41	1.95
Workers per household	0.82	0.82
Licensed drivers per household	2.00	1.77
Daily vehicle trips per household*	7.91	8.59
Vehicle driver trips per household	6.55	6.58
Vehicle passenger trips per household	1.36	4.00
Public transit (bus) trips per household**	0.00	0.00
Non-motorized trips per household***	2.00	1.00

** Includes trips made by a personal vehicle (car, van, truck, motorcycle)*
*** No transit trips were reported in either survey*
****Only one non-motorized trip was reported in each study.*

Figure 10.2:
Panel Households

10.2 Trip Characteristics

The households that completed both studies traveled more on average in 2008 than in 2000. As presented in Table 10.2, the mean household trip rate increased from 8.18 to 8.82 trips, and the mean person trip rate increased from 3.40 to 4.13 trips.

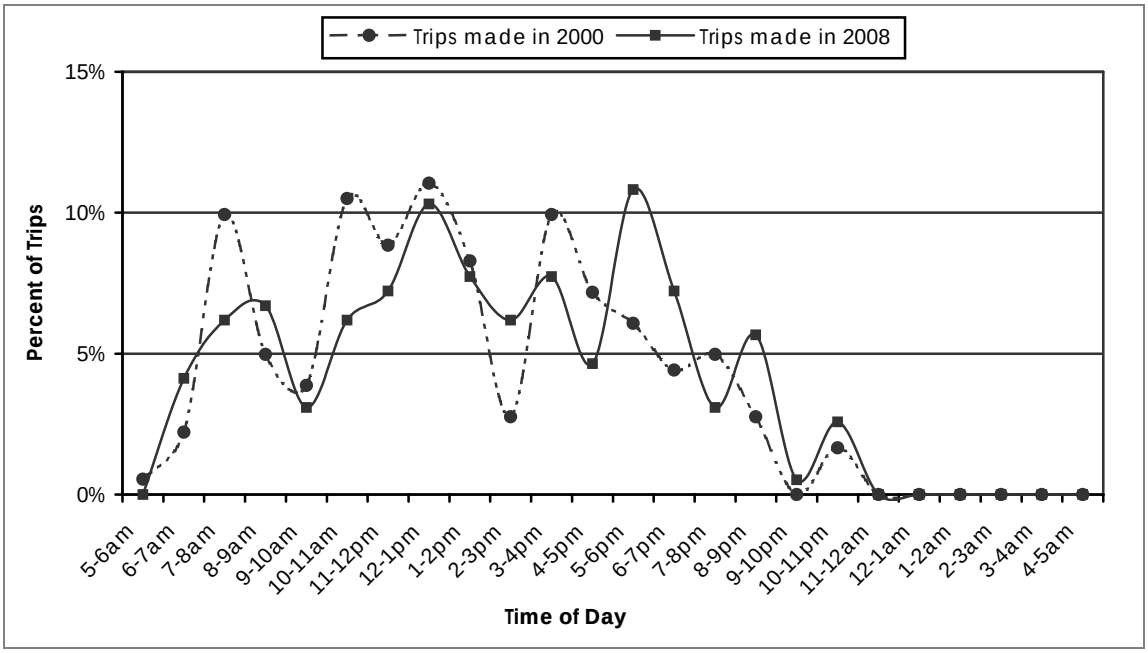
Table 10.2:
Trip Rates Comparison

Type	Trip Rate 2000	Trip Rate 2008
Person	3.40	4.13
Household	8.18	8.82

Base: Trips taken by 22 households.

Figure 10.3 shows the time of day during which the households traveled in both 2000 and 2008. One aspect remained consistent between the two studies: there were no trips taken past 1:00 a.m. However, in 2000, there were much more defined travel peaks between 7:00 a.m. and 8:00 a.m., as well as between 4:00 p.m. and 5:00 p.m. In comparison, there is only a slight morning peak in the travel times from 2008. In the current study, the two most prominent travel peaks occurred between noon and 1:00 p.m. and 6:00 p.m. and 7:00 p.m.

Figure 10.3:
Time of Day Comparison



Base: Trips taken by 22 households.

The average travel time reported for these households also increased from 17.8 minutes in 2000 to 19.0 minutes in 2008. There were also differences in the average travel time for different trip purposes, as presented in Table 10.4. In 2000, the travel time was higher than in 2008 for work, eating a meal outside of home, and social/recreational trips, yet it was lower for home, school, and civic trips. There was not much difference reported in the travel times for work at home, personal business, or church trips.

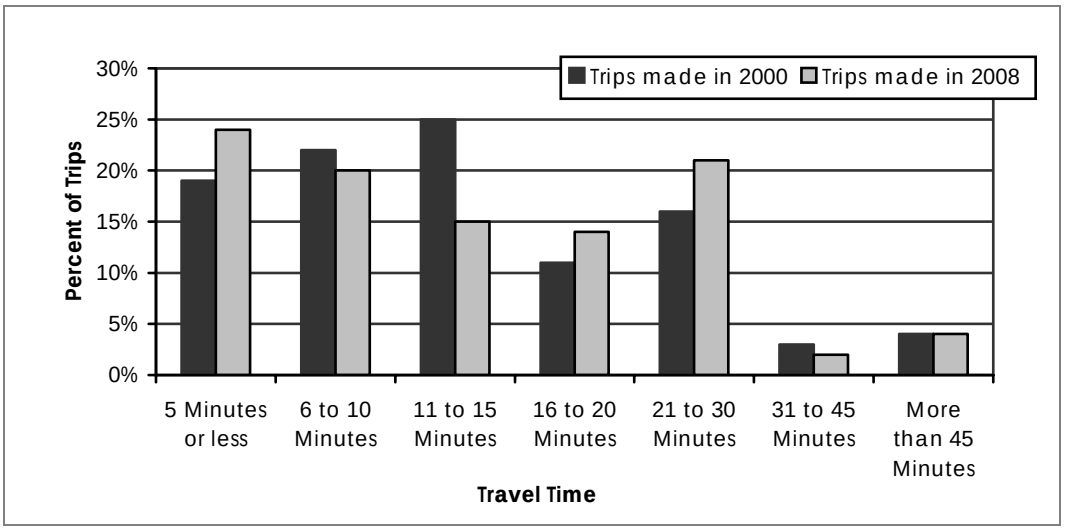
The increase in travel time from trips made in 2000 to trips made in 2008 is also apparent in Figure 10.5. Interestingly, for the 2008 trips, the highest percentage of reported trips was under six minutes long, yet there were also more trips lasting between 16 and 30 minutes than in the previous survey. Roughly one in four of the trips made by these households in 2000 were between 11 and 15 minutes long.

Table 10.4:
Mean Travel Time (in Minutes) by Primary Trip Purpose

Travel To:	Travel Time 2000	Travel Time 2008
Personal activities at home	16.9	23.2
Work at home (for pay)	15.0	14.75
Work for pay (other than at home)	27.6	19.9
School: day care – high school	19.4	24.8
Shopping (incidental)	14.2	14.4
Shopping (major)	7.75	12.2
Personal business	14.9	14.2
Medical/dental	12.4	18.0
Eat meal outside of home	18.8	10.6
Social/recreational	24.9	17.4
Civic activities	15.0	53.3
Church activities	21.7	20.0
Overall	17.8	19.0

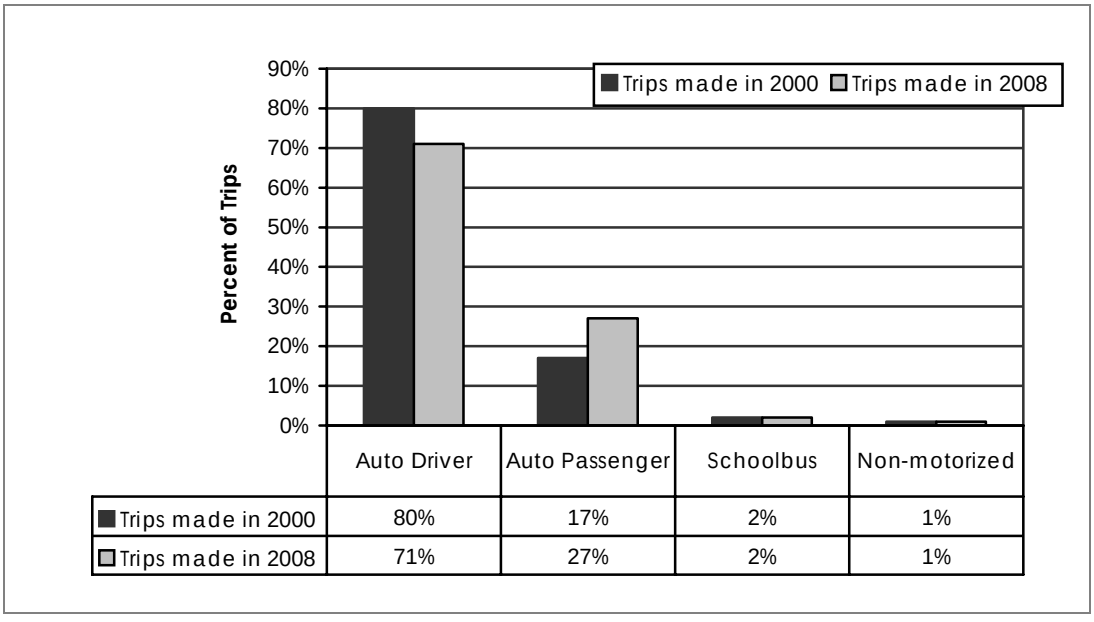
Base: Trips taken by 22 households.

Figure 10.5:
Travel Time (in Minutes) Comparison



There was very little change in travel mode for these households from the 2000 study to the 2008 study, as Figure 10.6 shows. Use of transit and non-motorized modes remained very low, while the auto modes dominated. There was a slight decrease in auto driver and an increase in auto passenger reported trips in 2008.

Figure 10.6:
Mode Comparison



Base: Trips taken by 22 households. Transit trips include public transit and school buses.

Appendix A: Survey Design

Sample Design

Sample Universe

The sample universe for the 2008 Household Travel Behavior Survey was defined as all households residing in eight counties in Tennessee: Knox, Blount, Anderson, Union, Jefferson, Sevier, Loudon, and Roane. According to 2000 Census data, there were 319,910 households distributed across the counties as shown in Table A-1.

Table A-1: Counties in the Study Area

County	Total Households	% of Total Households in Study Area
Knox	157,755	49.3%
Blount	42,830	13.4%
Anderson	29,770	9.3%
Jefferson	17,190	5.4%
Loudon	15,945	5.0%
Roane	21,220	6.6%
Sevier	28,485	8.9%
Union	6,715	2.1%
Total	319,910	100.0%

Sample Size

The survey employed a probability sample to select households for participation. A disproportionate stratified sampling process was used to distribute the required 1,400 surveys among individual stratum in order to maximize statistical reliability. The sample was stratified by household size and employment status of household members. A complete presentation of the sample design is in Appendix B.

Sample Frame Generation

A sampling frame is the list of elements from which a sample is selected. Properly drawn samples provide information appropriate for describing the population of elements that comprise the sampling frame. The sampling frame for the 2008 Household Travel Survey was DSF address-based and listed sample. For the DSF address-based frame, a sample of all the addresses available in the defined area are drawn, then a name and phone number are attached to all addresses possible. Those that end up with a name and phone number are the "matched" sample, while those that remain as only an address are "unmatched."

Another frame was used towards the end of data collection to target households in the sample strata that were under-performing, specifically larger households. For this purpose, a listed sample was ordered, where every record has a name, phone number, and address. The home addresses of sample records were geocoded and mapped for visual inspection prior to use to ensure proper coverage of the

study area. Also, all sample records were run through duplication checks, both by the sample provider and NuStats. Any records with identical address and surname information or phone numbers were removed prior to dialing.

Sample Preparation

Since households were selected by stratification cell until a pre-determined quota was reached, the selection procedure was executed in replicates to maintain the randomness of the selection process. A replicate is a systematically selected subsample of a sample that is geographically representative of the entire sample. The main benefit of using replicated samples is that the interviewers do not need to contact the entire sample in order to ensure proper representation of the survey area.

At the beginning of the recruitment interview, screening questions were asked of each household in order to obtain the number of persons in the household and the number of persons who were employed. This allowed a precise allocation of sample into appropriate household size and employment status stratum. A running account, based on the stratification cell each household falls into, was kept of the households that agreed to participate. A simultaneous account was kept of the households that completed their travel diaries. Once quota for a particular stratum was reached, within an allowed margin of error, subsequent households falling into that cell were disqualified for participation.

Data Collection: Procedures & Participation Rates

The survey conformed to standard procedures for conducting a household travel survey. Data collection procedures included the following nine stages:

1) Geocode Home Addresses,
2) Advance Mailing ("unmatched" sample),
3) Recruitment Telephone Interview,
4) Geocode Habitual Addresses,
5) Respondent Packet Mailing,
6) Reminder Call,
7) Data Retrieval Telephone Interview,
8) Geocode Trip-ends, and
9) Data Edit Checks & Cleaning.

Geocode Home Addresses

Once the sample was prepared and replicated, all households addresses were geocoded to ensure proper location in the desired sample frame. Following the recruitment telephone interview, any households that reported a change in address were geocoded again. This process ensured that a 100% match rate was obtained for surveyed households.

Advance Mailing

"Unmatched" households were mailed a packet containing an advance letter and household recruitment questionnaire, which can be seen in full in Appendix E. The advance letter provided a brief introduction to the study and the sponsor, written in simple language, and focused on explaining the relevance of the survey to individuals' daily lives. The letter also included a toll-free number to obtain additional information. The household recruitment questionnaire was a simplified version of the CATI recruitment interview and allowed the respondent to complete and mail back the survey to NuStats with a phone

number to schedule an assigned travel date. In this way, "unmatched" sample was recruited without ever dialing them directly.

Recruitment Telephone Interview

The recruitment interview was administered using a computer-assisted telephone interviewing (CATI) program. During recruitment, each household was contacted to secure participation in the study. If the household agreed, household-level demographic information was collected including income, household size, vehicle ownership, and other household characteristics. In addition, demographic characteristics were obtained for each member of the household such as age, gender, employment, and school status (see Appendix E for the recruitment questionnaire).

Collecting this information in the first interview had several advantages. First, since the household size and employment status were known at the start of the survey effort, NuStats was able to minimize over-sampling or inefficient survey fielding by stopping the survey process at that point for any household in quota cells that were full. Second, by collecting this level of information in the first call, NuStats had a unique opportunity to collect information on potential non-response and non-contacts in later stages of the survey, as well as monitor any potential non-response bias.

In addition to securing the household's participation in the study, the recruitment call is used to assign a travel day. This allowed the respondent to focus on completing the travel log from this point on in the survey process, thereby reducing the perception of the "burden" of the survey.

Because work and school addresses were collected during recruitment, this allowed an attempt to geocode these addresses prior to the retrieval interview. If the address was insufficient for geocoding, it was corrected at the time of travel data retrieval. Since these addresses typically form the substance of the respondent's travel, it also helped to reduce the retrieval interview length, which averaged 20.0 minutes.

Table A-5 presents the final call outcomes of all recruitment call attempts. The response rate for the Recruitment Interview stage was 30%. This was calculated using the CASRO formula, which divides the number of recruited households (1,959) by the sum of all eligible sample and a portion of unknown sample that is expected to be eligible (6,592). The portion of unknown sample assigned to the denominator of the response rate was calculated by determining the ratio of overall known eligible units (37%) to ineligible units (63%) and then multiplying the total unknown (9,286) by the percentage of eligible (37%).

An eligible sample piece was a telephone attempt made to a household identified as qualifying for inclusion in the survey. An ineligible sample piece was a telephone attempt made to a non-qualifying household (over quota) or to businesses, bad numbers (disconnects), and computer and fax lines. Those telephone attempts resulting in no answer, busy, etc. were considered as unknown sample because no definitive determination could be made as to the qualifying status of the telephone number. When calculating the response rate, the assumption was made that had unknown sample been contacted, the proportion of those units that would have qualified for the study would have been consistent with the occurring ratio of known eligible to ineligible sample.

Table A-5:
Recruitment Call Outcomes

Call Outcome	Frequency
Eligible Units	
Recruited	1,959
Partial completes	11
Refused to participate	1,181

Call Outcome	Frequency
Subtotal Eligible	3,151
Ineligible Units	
Disconnected number	2,627
Business/Government	101
Computer/Fax line	273
Language barrier	100
Out of area/Over quota	2,252
Subtotal Ineligible	5,353
Eligibility Unknown Units	
No answer	1,213
Call back	136
Answering machine	2,037
Caller I.D.	16
Busy	78
No screener completed	5,806
Subtotal Eligibility Unknown	9,286
Total	17,790

Geocode Habitual Addresses

Following the completion of the recruitment telephone interview, all habitual addresses were geocoded. This included home, work, and school addresses. Geocoding habitual addresses early in the data collection process afforded the opportunity to clarify ungeocodable addresses during subsequent interviews. The processes used to geocode all addresses in the study is further detailed below.

Respondent Mailing Packet

The day following recruitment, demographic information was processed into the master data set, and packets were assembled for each recruited household. These packets included a cover letter, travel log, example of a completed travel log, and a postage-paid envelope to return the completed logs after the retrieval interview (see Appendix G). Travel days were scheduled 7 to 10 days after recruitment to allow for sufficient time for packets to reach the households using first class mail.

Reminder Call

The night prior to the start of the assigned travel period, reminder calls were made to the households. This reminder call served three key purposes:

1. Confirm that the household received the packet and answer any questions respondents might have about using the log to track their travel.
2. Schedule an appointment to conduct the retrieval interview.
3. Increase the likelihood that the household will follow through with recording their travel by reiterating the importance of the study and the household's commitment to participate.

For those instances where an answering machine was reached, the interviewers left brief messages that referenced a toll-free number for respondents to call if they had questions.

Data Retrieval Telephone Interview

The day after the assigned travel period or at the appointed time, telephone calls were made to retrieve the travel data recorded by each eligible household member in his/her travel log. The interviews were guided using CATI programs of the retrieval instrument (see Appendix H). The average retrieval interview length was 25.7 minutes.

Table A-6 presents call outcomes for all retrieval interviews. The retrieval rate is 72%. This was calculated by dividing the completed retrieval calls (1,400) by the number of eligible retrieval sample (1,959), which are all completed recruits.

Table A-6:
Retrieval Call Outcomes

Call Outcome	Frequency
Eligible Units	
Completed	1,400
Disconnected number	30
Pending (no answer, call backs, etc.)	221
Refused to participate	308
Total	1,959

The overall response rate for the study is 22%. This was calculated by multiplying the CASRO response rate from recruitment and the retrieval rate together (30% * 72% = 22%). Although response rates are declining in the survey research field, this response rate was within the industry's acceptable range for household travel surveys. An overall response rate of 20-22% is average. The response rate calculation used a formula prescribed by the American Association for Public Opinion Research (AAPOR).

Processing

Data processing took place throughout the study, beginning with the creation of the advance notification mailout, continuing with the release of sample for recruitment, processing recruitment data for the respondent mailout, appending the retrieval data to the master tables, and performing quality control on the data. A master control file tracked the progress of each household through the various survey stages with codes to allow for immediate identification of problem cases that were not progressing according to schedule as well as for confirmation that cleared cases moved along as appropriate.

Geocode Trip-ends

All trip-ends were geocoded promptly following travel data retrieval. This quick turnaround allowed for clarification interviews with respondents providing unmatchable addresses. Table A-7 presents the final geocode match rates (matched to a specific address) for all location types.

Table A-7:
Geocode Match Rates

Location Type	Match Rate
Home	100.0%
Work	95.0%
School	96.3%
Trip-ends	92.8%

Three methods were used to geocode the home, work, school, and trip-ends reported as part of this effort: manual (traditional) geocoding, pre-geocoded look-up lists that were then referenced during the CATI interview, and real-time, online geocoding using the PTV e-CATI function. Each of these is described in more detail below. All three methods relied on Navteq based coverage files.

Traditional Geocoding

The traditional geocoding process consisted of four steps:

(1) On a daily basis, addresses obtained from recruitment (work, school, and updated home location) and retrieval (trip ends) were pulled from the master data tables. As the data were pulled, a field containing concatenated address data was created. This table was sorted by the technician during the session to best perform the geocoding procedure.

(2) Interactive (manual) geocoding was performed on all addresses in the files using ArcView software. Addresses for which latitude/longitude coordinates could be identified received a status (AV_STATUS) of "M" for matched. If the location was outside the study area, it received a status of "O" for out of area. If the technician was unable to code the location, it received a status of "U" for unmatched.

(3) After addresses were geocoded, ArcView calculated and assigned longitude and latitude coordinates for the matched cases in decimal degrees to five decimal places. Additional geography variables (city, county, state, and tract) were added at this time.

(4) Unmatched cases were researched further in an attempt to match them to a geographic location through manual address research efforts (using the Internet and other resources available to the technician).

Pre-Geocoded Lists

To simplify the address collection process, the geocoding team created pre-geocoded lists of points of interest in the region. These lists included the Navteq Points of Interest table as well as bus stops and other prominent points of interest in the study area. These lists were loaded into the CATI, where the interviewer could reference them as needed during address collection (either work/school locations during recruitment or trip-ends during retrieval). As the study progressed, the list of geocoded trip-ends was also loaded into the CATI as an additional point of interest file.

PTV e-CATI

A third option for geocoding was for the interviewer to geocode a specific address as the respondent reported it. Figure M-1 shows the interviewer screen, displaying a map of the location. In this geocoding approach, the interviewer entered the location details (name of place, address, city, state, and zip) and submitted the address to the e-CATI server. The interviewer then verified that the location was correct by reporting back to the respondent the cross streets and other landmarks. The lists of locations or addresses included a percent probability of a correct match to assist the interviewer in selecting the most accurate address. For addresses that could not be matched, or were matched at anything less than a 90% probability, the interviewer obtained cross-streets, landmarks, and any other details about the location and sent the address to the technician for traditional geocoding.

Data Edit Checks & Cleaning

Routine and customized edit checks (Data Quality Checks) and data cleaning were performed on master data files. Routine checks included such items as:

- Data range checks (are there data outside the expected range?)
- Checks for missing data (this is done by a combination of queries and direct data viewing of the internal delivery files and minimizes processing problems).
- Checks for proper data skips.
- Checks to ensure the deliverable files include the data items on the matrix and that variables are properly named.
- Checks for high frequency of item non-responses (checked throughout various stages of data).

Appendix B: Sample Design

Survey Objectives

The purpose of the Knoxville Household Travel Survey is to collect sufficient data on the travel behavior of households to provide inputs for an update of the regional travel model. The planning area includes Knox, Blount, Anderson, Jefferson, Loudon, Roane, Sevier, and Union Counties.

Survey Population

The universe for the survey is defined as households in the eight-county region of Tennessee, including Knox, Blount, Anderson, Jefferson, Loudon, Roane, Sevier, and Union Counties. According to 2000 Census, the study area was comprised of 319,910 households.

Table B-1:
Counties in the Study Area

County	Total Households	% of Total Households
Knox	157,755	49.3%
Blount	42,830	13.4%
Anderson	29,770	9.3%
Jefferson	17,190	5.4%
Loudon	15,945	5.0%
Roane	21,220	6.6%
Sevier	28,485	8.9%
Union	6,715	2.1%
Total	319,910	100.0%

**Source: Census 2000.*

Sample Size

The survey will result in a sample of 1,400 randomly sampled households, including 1,000 completed surveys from Anderson, Jefferson, Loudon, Roane, Sevier, and Union Counties, as well as 400 completed surveys from Knox and Blount Counties.

Sample Type

The Knoxville Household Travel Survey will use a probability sample to select households for inclusion in the survey. The major requirements for a probability sample are that the relative probability (or chance) that any given household in the universe will be included in the sample is known and that once the sampling procedures have been determined, selection of specific households to be included in the sample will be left entirely to chance. The type of probability sample that will be used is stratified sampling, in which the sample elements will be drawn disproportionate to population.

Sample Size Determination

Household size and employment status of members in the household were used to stratify households to be surveyed in the Knoxville Household Travel Survey. The target number of surveyed households in each category (i.e., cell) was determined based on the distribution of households in the population. The sample size computation for each category was accomplished as follows.

1) The Census 2000 data of the urban area's household distribution by household size and employment status were used to determine the distribution of overall sample in each cell. Table B-2 presents this distribution.

Table B-2:
Distribution of Sample in Study Area by Stratification Variables

Strata	Total Households	% Within Study Area
1-person worker	42,570	13.3%
1-person non-worker	43,090	13.5%
2 persons with at least one worker	80,220	25.1%
2 person non-worker	35,310	11.0%
3 persons	55,770	17.4%
4+ persons	62,950	19.7%
Total	319,910	100.0%

**Source: Census 2000.*

2) The distribution of surveys was further stratified by geography: 1,000 surveys were to come from the Outer Counties (Anderson, Jefferson, Loudon, Roane, Sevier, and Union), while 400 needed to come from the Inner Counties (Knox and Blount). Table B-3 presents the breakdown of surveys between these two geographic areas.

Table B-3:
Distribution of Surveys in Study Area by Stratification and Geography Variables

Strata	Inner Counties		Outer Counties		Total # of Surveys	Total % of Surveys
	# of Surveys	% of Surveys	# of Surveys	% of Surveys		
1-person worker	61	15.2%	125	12.5%	186	13.3%
1-person non-worker	53	13.3%	136	13.6%	189	13.5%
2 persons with at least one worker	100	25.2%	251	25.0%	351	25.1%
2 person non-worker	41	10.1%	114	11.4%	155	11.0%
3 persons	68	16.9%	176	17.6%	244	17.4%
4+ persons	77	19.3%	198	19.8%	275	19.7%
Totals	400	100.0%	1,000	100.0%	1,400	100.0%

Sample Results

The actual completed survey counts are compared with the target distribution in Tables B-4 and B-5. For each of the six stratification categories, the number of completed surveys was within 10% of the target number.

Table B-4:
Completed Surveys by Stratification Variables

Strata	Target	Actual	% of Target
1-person worker	186	170	91.4%
1-person non-worker	189	197	104.2%
2 persons with at least one worker	351	369	105.1%
2 person non-worker	155	166	107.1%
3 persons	244	244	100.0%
4+ persons	275	254	92.4%
Total	1,400	1,400	100.0%

Table B-5:
Completed Surveys by Stratification and Geography Variables

Strata	Inner Counties			Outer Counties		
	Target	Actual	% of Target	Target	Actual	% of Target
1-person worker	61	56	91.8%	125	114	91.2%
1-person non-worker	53	50	94.3%	136	147	108.1%
2 persons with at least one worker	101	103	103.0%	250	266	106.0%
2 person non-worker	41	46	112.2%	114	120	105.3%
3 persons	68	70	102.9%	176	174	98.9%
4+ persons	77	76	98.7%	198	178	89.9%
Totals	400	401	100.0%	1,000	999	100.0%

Appendix C: Travel Day Characteristics

Figure C-1:
Distribution of Travel Days by Day of Week

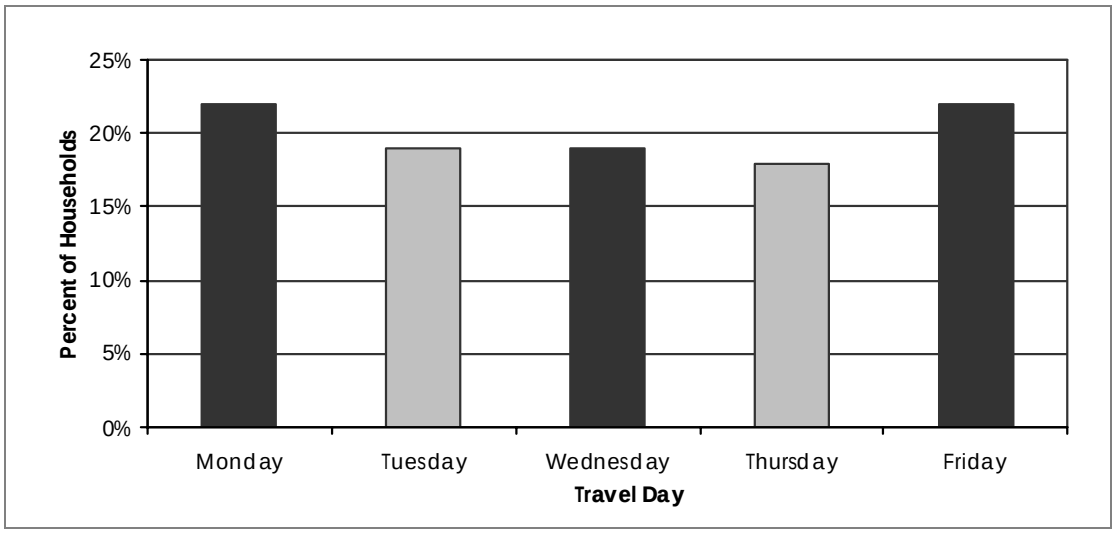


Figure C-2:
Distribution of Travel Days by Month

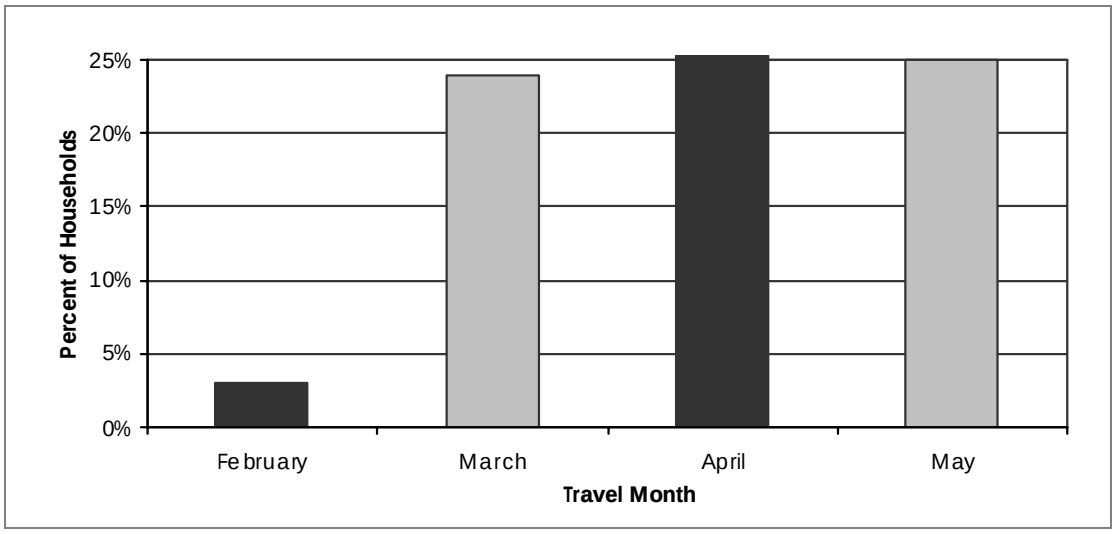


Table C-3:
Assigned Travel Days

Travel Day	Frequency
Thursday, February 7	20
Friday, February 8	17
Monday, March 17	54
Tuesday, March 18	42
Wednesday, March 19	24
Thursday, March 20	26
Tuesday, March 25	65
Wednesday, March 26	55
Thursday, March 27	15
Friday, March 28	20
Monday, March 31	34
Tuesday, April 1	21
Wednesday, April 2	26
Thursday, April 3	13
Friday, April 4	32
Monday, April 7	54
Tuesday, April 8	21
Wednesday, April 9	17
Thursday, April 10	57
Friday, April 11	75
Monday, April 14	33
Tuesday, April 15	16
Wednesday, April 16	43
Thursday, April 17	9
Friday, April 18	32
Monday, April 21	40
Tuesday, April 22	29
Wednesday, April 23	18
Thursday, April 24	41
Friday, April 25	23
Monday, April 28	22
Tuesday, April 29	13
Wednesday, April 30	40
Thursday, May 1	21
Friday, May 2	39
Monday, May 5	66
Tuesday, May 6	40
Wednesday, May 7	33
Thursday, May 8	50
Friday, May 9	16
Monday, May 12	4
Tuesday, May 13	21
Wednesday, May 14	7
Thursday, May 15	2
Friday, May 16	54

Appendix D: Data Items Matrix

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
HOUSEHOLD ITEMS (TABLE)												
H-1	H-1	SAMPN	SAMPLE NUMBER	REC	SAMPN	Y	Y	N	7		SAMPLE NUMBER	
H-2		PROJ	RECRUIT PROGRAM	REC	PROJ	N	Y	C	8			
H-3		RESCHED	RESCHEDULE			N	Y	N	1	1=RESCHEDULE		
H-4	H-2	HHADDR	HABITUAL ADDRESS LOCNUM			Y	N	N	7			
H-5	H-3	LANG	LANGUAGE	REC	LANG	Y	Y	N	1	1= ENGLISH 2= SPANISH	WAS THIS INTERVIEW CONDUCTED IN ENGLISH OR SPANISH?	
H-6		QUEST	QUEST NUMBER	REC	QUEST	N	Y	C	5			
H-7		RECDATE	DATE OF RECRUITMENT	REC	S_DAT	N	Y	T	12			
H-8		RECDISP	RECRUIT DISPOSITION	REC	S_RES	N	Y	C	2			
H-9	H-4	STYPE	SAMPLE TYPE	REC	STYPE	Y	Y	N	1		SAMPLE TYPE	
H-10	H-5	STRATA	STRATA	REC	STRAT	Y	Y	N	2			
H-11		FNAME	FIRST NAME	REC	RESPF	N	Y	C	30		FIRST NAME	
H-12		LNAME	LAST NAME	REC	RESPL	N	Y	C	30		LAST NAME	
H-13		ADLTS	Advanced letter	REC	ADLTS	N	Y	N	2	1= Letter sent 2= Letter not sent 3= DK/RF	Do you remember receiving a letter about this study?	
H-14		PHONE	IMPORTED PHONE NUMBER	REC	PHONE	N	Y	C	12		IMPORTED PHONE NUMBER	
H-15	H-6	ADVLT	Advanced letter	REC	ADVLT	Y	Y	N	1	1= Yes 2= No 9= DK/RF	Do you remember receiving a letter about this study?	ADVLTS=1

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
H-16	H-7	HCNTY	Household county	REC	HCNTY	Y	Y	N	5	47001 ANDERSON 47009 BLOUNT 47089 JEFFERSON 47093 KNOX 47105 LOUDON 47145 ROANE 47155 SEVIER 47179 UNION 99997 =OTHER, SPECIFY 99998= DK/RF	In which county do you live?	
H-17		O_HCNTY	Household county - other	REC	O_HCNTY	N	Y	C	30		In which county do you live? Other	IF HCNTY=99997
H-18	H-8	HHSIZ	Household size	REC	HHSIZ	Y	Y	N	2	01= ONE 02= TWO 03= THREE 04= FOUR 05= FIVE 06= SIX 07= SEVEN 08= EIGHT OR MORE 98= DK 99= RF	How many people, including yourself, live in your home?	
H-19	H-9	HHVEH	Household vehicle	REC	HHVEH	Y	Y	N	2	00= NONE 01= ONE 02= TWO 03= THREE 04= FOUR 05= FIVE 06= SIX 07= SEVEN 08= EIGHT OR MORE 98= DK 99= RF	And how many motor vehicles are owned, leased, or available for regular use by the people who currently live in your household? Please be sure to include motorcycles, mopeds, and RVs.	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
H-20		TPO1A	Traffic conditions on major roads rating	REC	TPO1A	Y	Y	N	1	1 POOR 2 3 4 VERY GOOD	Please rate each of the following aspects of the transportation system in your community today, on a scale of 1 to 4 with 1 being poor and 4 being "very good." (Traffic conditions on major roads)	
H-21		TPO1B	Transit services rating	REC	TPO1B	Y	Y	N	1	1 POOR 2 3 4 VERY GOOD	Please rate each of the following aspects of the transportation system in your community today, on a scale of 1 to 4 with 1 being poor and 4 being "very good." (Transit services)	
H-22		TPO1C	Sidewalks and crosswalks rating	REC	TPO1C	Y	Y	N	1	1 POOR234 VERY GOOD	Please rate each of the following aspects of the transportation system in your community today, on a scale of 1 to 4 with 1 being poor and 4 being "very good." (Sidewalks and crosswalks)	
H-23		TPO1D	Bike lanes and wide shoulders rating	REC	TPO1D	Y	Y	N	1	1 POOR 2 3 4 VERY GOOD	Please rate each of the following aspects of the transportation system in your community today, on a scale of 1 to 4 with 1 being poor and 4 being "very good." (Bike lanes and wide shoulders)	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
H-24		TPO1E	Greenways and bicycle/pedestrian paths rating	REC	TPO1E	Y	Y	N	1	1 POOR 2 3 4 VERY GOOD	Please rate each of the following aspects of the transportation system in your community today, on a scale of 1 to 4 with 1 being poor and 4 being "very good." (Greenways and bicycle/ pedestrian paths)	
H-25		TPO1F	Traffic safety and control on major roads rating	REC	TPO1F	Y	Y	N	1	1 POOR 2 3 4 VERY GOOD	Please rate each of the following aspects of the transportation system in your community today, on a scale of 1 to 4 with 1 being poor and 4 being "very good." (Traffic safety and control on major roads)	
H-26		TPO1G	Overall rating for transportation systems rating	REC	TPO1G	Y	Y	N	1	1 POOR 2 3 4 VERY GOOD	Please rate each of the following aspects of the transportation system in your community today, on a scale of 1 to 4 with 1 being poor and 4 being "very good." (Overall rating for transportation systems)	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
H-27		TPO2	Future funding	REC	TPO2	Y	Y	N	1	1 Use tolls to fund new projects 2 Increase the fuel tax 3 Leave taxes at the level they are now 4 Charge new development for transportation improvements 5 Increase sales tax to fund projects 6 increase property tax to fund projects 7 Other PLEASE SPECIFY	How do you think future transportation projects should be funded?	
H-28		O_TPO2	Other, specify	REC	O_TPO2	Y	Y	N	30		Other, specify	
H-29	H-10	RESTY	Description of home	REC	RESTY	Y	Y	N	2	1= One-family house detached from any other house 2= One-family house attached to one or more houses [DUPLEX, ROW HOUSE, TOWNHOUSE] 3= Mobile Home 4= Building with 2 or more apartments [CONDO, APARTMENT, ETC] 97= Or something else? SPECIFY 99= RF	Which best describes your home?	
H-30	H-11	O_RESTY	Description of home-OTHER	REC	O_RESTY	Y	Y	C	30		Which best describes your home?	IF RESTY=97

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
H-31	H-12	OWN	Home ownership	REC	OWN	Y	Y	N	2	1= Owned by you or someone in this household 2= Rented to you for cash rent 3= Occupied by you without payment of cash rent 97= Or something else? SPECIFY 99= DK/RF	Is your home owned or rented?	
H-32	H-13	O_OWN	Home ownership-other	REC	O_OWN	Y	Y	C	30		Is your home owned or rented?	IF OWN=97
H-33	H-14	INCOM	Household income	REC	INCOM	Y	Y	N	2	1= Less than $10,000 2= $10,000 - $24,999 3= $25,000 - $34,999 4= $35,000 - $44,999 5= $45,000 to $49,999 6= $50,000 to $74,999 7= $75,000 to $99,999 8= $100,000 to $124,999 9= $125,000 to $149,999 10= $150,000 to $174,999 11= More than $175,000 99= RF	Household income	
H-34	H-15	ASSN	TRAVEL DAY	REC	ASSN	Y	Y	N	3	SEE "ASSN" CODE LIST	Day of recorded travel	
H-35	H-16	DAY	Day of the week of travel day	TRAVEL TABLE	DAY	Y	Y	N	1	1=Monday 2=Tuesday 3=Wednesday 4=Thursday 5=Friday		
H-36	H-17	HTRIPS	Number of Household Trips on Travel Date	PPROC	HTRIPD1	Y	N	N	2	Sum of trips per household	Calculated summary	
H-37	H-18	HHLIC	Number of Licensed Drivers	PPROC	NLICENS	Y	N	N	2	Sum of licensed drivers per household	Calculated summary	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
H-38	H-19	HHWRK	Number of HH Workers (Full-time and Part-time)	PPROC	NWORK	Y	N	N	2	Sum of workers per household	Calculated summary	
H-39	H-20	HHSTU	Number of HH Students	PPROC	NSTUD	Y	N	N	2	Sum of students per household	Calculated summary	
H-40	H-21	VEHTRIPS	Vehicle Trips	PPROC		Y	Y	N	2	Sum of vehicle trips per household	Post-processed summary variable	
H-41	H-22	AGE_HH	Age of Head of Household	PPROC		Y	Y	N	3	Age of main respondent in person file	Post-processed summary variable	
H-42	H-23	LIFECYCL	Lifecycle	PPROC		Y	Y	N	2	1=Young HH No Children 2=Older HH No Children 3=HH with children 4=Retired 5=Not working, not retired	Post-processed summary variable	
VEHICLE FILE												
V-1	V-1	SAMPN	SAMPLE NUMBER	REC	VSAMP	Y	Y	N	7		VEHICLE SAMPLE NUMBER	
V-2	V-2	VEHNO	Vehicle number	REC	VEHNO	Y	Y	N	2		VEHICLE NUMBER	
V-3	V-3	YEAR	Year of vehicle	REC	YEAR	Y	Y	N	4	9998= DK 9999= RF	What is the year of your vehicle? RANGE: 1900 - 2006	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
V-4	V-4	MAKE	Vehicle make	REC	MAKE	Y	Y	N	2	11 ACURA 12 AUDI 13 BMW 14 BUICK 15 CADILLAC 16 CHEVROLET 17 CHRYSLER 18 DAEWOO 19 DODGE 20 FORD 21 GEO 22 GMC 23 HARLEY DAVIDSON 24 HONDA 25 HUMMER 26 HYUNDAI 27 INFINITI 28 ISUZU 29 JAGUAR 30 JEEP 31 KAWASAKI 32 KIA 33 LEXUS 34 LINCOLN 35 MAZDA 36 MERCEDES 37 MERCURY 38 MITSUBISHI 39 NISSAN 40 OLDSMOBILE 41 PLYMOUTH 42 PONTIAC 43 PORSCHE 44 RANGE ROVER 45 SAAB 46 SATURN 47 SCION 48 SUBARU 49 SUZUKI 50 TOYOTA 51 VOLKSWAGEN 52 VOLVO 53 YAMAHA 97 OTHER, SPECIFY 98 DON'T KNOW 99 REFUSED	What is the make of your vehicle?	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
V-5	V-5	O_MAKE	Other make	REC	O_MAKE	Y	Y	C	30		What is the make of your vehicle? Other	IF MAKE=97
V-6	V-6	MODEL	Vehicle model	REC	MODEL	Y	Y	C	30		What is the model?	
V-7	V-7	BODY	Body type	REC	BODY	Y	Y	N	2	1= Car/Station wagon 2= Van (any type) 3= SUV 4= Pickup Truck 5= Other type of truck 6= RV 7= Motorcycle 97= OTHER, SPECIFY 99= RF	And is this a/an?	
V-8	V-8	O_BODY	Other, body type	REC	O_BODY	Y	Y	C	30		What is the body type? - Other	IF BODY=97
V-9	V-9	FUEL	Fuel Type	REC	FUEL	Y	Y	N	1	1= Gasoline 2= Diesel 3= Hybrid 7= Other, SPECIFY 8= DK 9= RF	What type of fuel does this vehicle use?	
V-10	V-10	O_FUEL	Fuel Type, other	REC	O_FUEL	Y	Y	C	30		What type of fuel does this vehicle use? Other	
V-11	V-11	VOWN	Vehicle Ownership	REC	VOWN	Y	Y	N	1	1= Owned 2= Leased 3= Provided by an employer 4= Borrowed from a friend or relative 7= Other, specify 8= DK 9= RF	Is this vehicle…?	
V-12	V-12	O_VOWN	Vehicle Ownership, other	REC	O_VOWN	Y	Y	C	30		Is this vehicle…? Other	
PERSON FILE												
P-1	P-1	SAMPN	SAMPLE NUMBER	REC	PSAMP	Y	N	N	7		PERSON SAMPLE NUMBER	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
P-2	P-2	PERNO	PERSON NUMBER	REC	PERNO	Y	Y	N	2		PERSON NUMBER	
P-3		FNAME	FIRST NAME	REC	FNAME	N	Y	C	30		What is this person's first name?	
P-4	P-3	WADD	Work address (unique identifier to location file)	PPROC		Y	Y	N	7	Number linking RECTYPE=2 to Location File		
P-5	P-4	SADD	School address (unique identifier to location file)	PPROC		Y	Y	N	7	Number linking RECTYPE=2 to Location File		
P-6	P-5	RELAT	Relation to respondent	REC	RELAT	Y	Y	N	1	0= Reference Person 1= Spouse/Partner 2= Child 3= Parent 4= Grandparent 5= Grandchild 6= Other relative 7=Not related 9= Refused	How is this person related to you?	
P-7	P-6	GEND	Gender	REC	GEND	Y	Y	N	1	1= Male 2= Female 9= RF	What is this person's gender?	
P-8	P-7	AGE	Age	REC	AGE	Y	Y	N	2	98= 98 years old or older 99= DK/RF	What is this person's age?	
P-9	P-8	AGEB	Age if refused	REC	AGEB	Y	Y	N	1	1= UNDER 16 2= AGE 16-64 3=Over 64 9= DK/RF	Can you tell me if NAME is at least 16 years of age?	IF AGE=99 OR 98
P-10	P-9	HISP	Hispanic or Latino	REC	HISP	Y	Y	N	1	1= YES 2= NO 9= RF	Are you Hispanic or Latino?	
P-11	P-10	RACE	Ethnicity or race	REC	RACE	Y	Y	N	2	1= White 2= Black or African American 3= Asian 4= American Indian or Alaska Native 97= or some other race? SPECIFY 99= REFUSED	And what is your race?	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
P-12	P-11	O_RACE	Ethnicity or race, other	REC	O_RACE	Y	Y	C	30		And what is your race? OTHER	IF RACE = 97
P-13	P-12	DISAB	Disabled	REC	DISAB	Y	Y	N	1	1= YES 2= NO 9= DK/RF	Does NAME have any type of disability that affects your ability to travel?	
P-14	P-13	DTYPE	What type of disability	REC	TDISA	Y	Y	N	1	1= Blind/visually impaired 2= Transferable wheelchair 3= Non-transferable wheelchair 4= Deaf/hearing impaired 5= Mentally disabled 6= Cane/walker 7= Other, specify 8= DK 9= RF	What type of disability is that?	IF DISAB=1
P-15	P-14	O_DTYPE	What type of disability - Other	REC	O_TDISA	Y	Y	C	30		What type of disability is that? OTHER	IF DTYPE=7
P-16	P-15	LIC	Valid license	REC	LIC	Y	Y	N	1	1= YES 2= NO 9= DK/RF	Does NAME have a valid driver's license?	AGE>15
P-17	P-16	EMPLY	Employed?	REC	EMPLY	Y	Y	N	1	1= EMPLOYED FULL-TIME (30+ HOURS/WEEK) 2= EMPLOYED PART-TIME (<30 HOURS /WEEK 3= NOT EMPLOYED 9= DK/RF	Are you employed, either full-time or part-time?	AGE>15
P-18	P-17	VOL	Volunteered employment?	REC	VOLUN	Y	Y	N	1	1= YES 2= NO 9= DK/RF	Does NAME do any type of volunteer work on a regular basis?	IF EMPLY>2
P-19	P-18	WORKS	DOES THIS PERSON WORK?	REC		Y	Y	N	1	1= YES 2= NO	Calculated variable	IF EMPLY<3

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
P-20	P-19	WKSTAT	Employment status	REC	PRIMA	Y	Y	N	1	1= Retired 2= Disabled/On disability status 3= Homemaker 4= Unemployed but looking for work 5= Unemployed and not looking for work, or 6= a Student? 7= OTHER (specify) 9= REFUSED	Which of the following best describes NAME's status?	IF EMPLY>2 OR VOLUN>1
P-21	P-20	O_WKSTAT	Employment status	REC	O_PRIMA	Y	Y	C	30		Which of the following best describes NAME's status?	IF WKSTAT=7
P-22	P-21	JOBS	How many jobs	REC	JOBS	Y	Y	N	1		How many jobs does NAME have? Please include all paid and volunteer positions that he/she works on a regular basis.	IF EMPLY<3 OR VOLUN = 1
P-23	P-22	WLOC	Work location	REC	WLOC	Y	Y	N	1	1 HOME 2 ADDRESS GIVEN – ENTER BELOW 3 VARIES – ENTER MOST RECENT LOCATION BELOW 4 NO SET WORK LOCATION – ENTER WHERE WORKED LAST WEEK 8 DON'T KNOW 9 REFUSED	At what location does this person normally [work/volunteer]?	
P-24	P-23	WNAME	Workplace/Volunteer Location Name	REC	WNAME	Y	Y	C	70		What is the name of this person's [employer/volunteer location]?	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
P-25	P-24	WMODE	Work mode	REC	WMODE	Y	Y	N	2	1= Drive alone 2= Shared ride, 2-person carpool 3= Shared ride, 3+person carpool 4= Vanpool 5= Transit - walk access 6= Transit - drive access 7= Walk 8= Bike 9= Work at home 97= Other, specify 99= DK/RF	How does this person normally get to work/their volunteer activity?	IF EMPLY 1 OR 2 AND WLOC=2
P-26	P-25	O_WMODE	Other, work mode	REC	O_WMODE	Y	Y	C	30		How does this person normally get to work/their volunteer activity?	IF WMODE=97
P-27	P-26	WDAYS	Days at work	REC	WDAYS	Y	Y	N	1	97= Varies week to week 99-DK/RF	How many days a week do you typically go to work at this address?	
P-28	P-27	WHOME	Telecommute to work	REC	WHOME	Y	Y	N	1	1= YES 2= NO 9= DK/RF	On average, how many days per week do you work at this location?	IF EMPLY 1 OR 2 AND WLOC=2
P-29	P-28	OFTEN	How often	REC	HOWOF	Y	Y	N	1	1= Almost every day, 2= Once a week or more, 3= One a month or more 4= A few times a year, or 5= Once a year 9= DK/RF	About how often do you/does NAME work at home instead of traveling to your/his/her usual workplace?	IF WHOME=1
P-30	P-29	POLICY	Telecommuting policy	REC	TPOLI	Y	Y	N	1	1= YES 2= NO 8= DK 9= RF	Does your employer have a formal telecommuting policy for working from home?	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
P-31	P-30	EDUCA	Level of education completed	REC	EDUCA	Y	Y	N	2	1= Not a high school graduate, 12 grade or less 2= High school graduate (high school diploma or GED) 3= Some college credit but no degree 4= Associate or technical school degree 5= Bachelor's or undergraduate degree 6= Graduate degree 97= OTHER, SPECIFY 99= DK/RF	What is the highest degree or level of school you've completed?	
P-32	P-31	O_EDUCA	Level of education completed, other	REC	O_EDUCA	Y	Y	C	30		What is the highest degree or level of school you've completed? Other	IF EDUCA=97
P-33	P-32	STUDE	Student	REC	STUDE	Y	Y	N	1	1= YES – FULL TIME 2= YES – PART TIME 3= NO 9= DK/RF	Is this person currently enrolled in any type of school, including [if age<6 daycare], technical school, or university?	
P-34	P-33	SCHOL	School grade level attends	REC	SCHOL	Y	Y	N	2	1= DAYCARE 2= NURSERY SCHOOL, PRE-SCHOOL 3= KINDERGARTEN TO GRADE 8 4= GRADE 9 TO 12 5= TECHNICAL/ VOCATION SCHOOL 6= 2-YEAR COLLEGE (COMMUNITY COLLEGE) 7= 4-YEAR COLLEGE OR UNIVERSITY 8= GRADUATE SCHOOL/PROFESSIONAL 97= OTHER, SPECIFY 99= DK/RF	What school grade or level does this person attend?	IFSTUDE<3

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
P-35	P-34	O_SCHOL	School grade level attends. Other	REC	O_SCHOL	Y	Y	C	30		What school grade or level does this person attend? Other	If SCHOL=97
P-36	P-35	SLOC	School location	REC	SLOC	Y	Y	N	1	1= HOME 2= ADDRESS OBTAINED – OBTAIN NAME FIRST 9= DK/RF	Where is the school located?	If STUDE<3
P-37	P-36	SNAME	SCHOOL NAME	REC	SNAME	Y	Y	C	70		SCHOOL NAME	If STUDE<3
P-38	P-37	SMODE	School mode	REC	SMODE	Y	Y	N	2	1= Drive alone 2= Shared ride, 2-person carpool 3= Shared ride, 3+ person carpool 4= School bus 5= Transit - walk access 6= Transit - drive access 7= Walked 8= Bike 9= School at home 97= Other, specify 99= DK/RF	How does this person normally get to school?	If STUDE<3 AND SLOC=2
P-39	P-38	O_SMODE	School mode, other	REC	O_SMODE	Y	Y	C	30		How does this person normally get to school?- Other	IF SMODE=97
P-40	P-39	PTRIPS	Person Trips	PPROC		Y	N	N	2	Calculated summary	Sum of trips per person	
LOC FILE												
L-1		LOCTYPE				N	Y	N	1	1= Home 2= Work 3= School 5= Trip ends 6= Out state/Out of Area(OBTAIN CITYAND STATE)	Pulls from master LOC	
L-2	L-1	LOCNO	Location number			Y	Y	N	7	Unique Location Reference Number		

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
L-3		REFERENCE				N	Y	N	8			
L-4		VERIFIED				N	Y	N	8			
L-5		ORIGLOCNO				N	Y	N	8			
L-6		DUPLOCNO				N	Y	N	4			
L-7		GCSTAT				N	Y	C	1			
L-8		GISCOUNT				N	Y	N	2			
L-9		GCTYPE				N	Y	C	30			
L-10		GCDATE				N	Y	T	12			
L-11		GCREV				N	Y	N	2			
L-12		GCERR				N	Y	N	2			
L-13		GCNOTE				N	Y	C	255			
L-14		SAMPN				N	Y	N	7			
L-15		PERSNO				N	Y	N	2			
L-16		DAYNO				N	Y	N	4			
L-17		PLACENO				N	Y	N	4			
L-18		LINENO				N	Y	N	4			
L-19		COMPANY				N	Y	C	50			
L-20	L-2	ADDRESS				Y	Y	C	60			
L-21		GEOADDRESS				N	Y	C	80			
L-22		COVER				N	Y	C	80			
L-23		SUITE				N	Y	C	8			
L-24		CCODE				N	Y	C	50			
L-25	L-3	ZIP	Zip code			Y	Y	C	5		What is the zip code of that place?	
L-26		CO_LEN				N	Y	C	50			

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
L-27		ADD_LEN				N	Y	C	50			
L-28		TOTAL_LEN				N	Y	C	50			
L-29		NADDR_LEN				N	Y	C	50			
L-30		FIPSCODE				N	Y	C	5			
L-31		STATECODE				N	Y	N	8			
L-32	L-4	TRACT				Y	Y	N	4			
L-33	L-5	AV_CITY				Y	Y	C	24			
L-34	L-6	AV_STATE				Y	Y	C	2			
L-35	L-7	AV_ZIP				Y	Y	C	10			
L-36	L-8	GCCITY				Y	Y	C	50			
L-37		RETRIEVAL DATA FLAG				N	Y	N	1			
L-38		DELETE				N	Y	C	2			
L-39		CHANGE				N	Y	C	2			
L-40		ADD				N	Y	C	2			
L-41		CONV100				N	Y	N	8			
L-42	L-9	NAME	Name of place			Y	Y	C	60		What is the name of the location to where you went?	
L-43	L-10	CITY	Place city			Y	Y	C	24		In what city is the place located?	
L-44	L-11	XSTREET	Place xstreets			Y	Y	C	90		What is the nearest cross street or streets to that place?	
L-45	L-12	LANDMARK	Nearest Landmark			Y	Y	C	90		What is the nearest major landmark?	
L-46	L-13	COUNTY	Place County			Y	Y	C	50		In what county is that place located?	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
L-47	L-14	STATE	State			Y	Y	C	2		Which state is that in? (asked for non-ID counties)	
L-48	L-15	XCORD	Longitude of place			Y	Y	D	17.5			
L-49	L-16	YCORD	Latitude of place			Y	Y	D	17.5			
L-50	L-17	AV_STATUS	Arcview Status			Y	Y	C	1	M=Matched U=Unmatched C=Cursor Match O=Out of Area Y=Match to City Centroid Z=Match to Zip Code Centroid		
L-51	L-18	AV_ADD	Arcview Address			Y	Y	C	50			
L-52	L-19	AV_ZONE	Arcview Zip Code			Y	Y	N	5			
L-53		AV_SIDE	Arcview Side			N	Y	C	1			
L-54		AV_SCORE	Arcview Score			N	Y	N	3			
L-55		QC_FLAG	Quality Control Flag			N	Y	N	1	1=Given City matches geocoded city and Given Zip matches geocoded zip code 2=Given Zip matches geocoded zip code 3=Given city matches geocoded city 4=Point Verified Visually (or verified unmatched, out of area)		
L-56	L-20	GCCNTY	GEOCODED COUNTY			Y	Y	C	20			
L-57	L-21	GCZIP	Geocoded Zip code			Y	Y	N	5			
L-58	L-22	FIPS	GEOCODED FIPS			Y	Y	C	5			
L-59		TRAVT	Location is traveled to			N	Y	N	1	1=Yes		
L-60		TAZ	TAZ			N	Y	N	3			

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
PLACE FILE												
T-1	T-1	SAMPN	HH ID Number	RET	TSAM1	Y	Y	N	7			
T-2	T-2	PERNO	Person ID Number	RET	PERNO	Y	Y	N	2			
T-3	T-3	PLANO	Trip Number	RET	PLANO	Y	Y	N	2			
T-4		FNAME	Persons name	RET	FNAME	N	Y	C	30		What is the first name of the person?	
T-5	P-40	INTRV	ARE YOU INTERVIEWING THIS PERSON?	RET	INTRA	Y	Y	N	1	1= YES 2= NO		
T-6	P-41	PROXY	WHICH PERSON SERVED AS PROXY?	RET	PROXY	Y	Y	N	2			INTRV=2
T-7	P-42	TYPDY	In general, would you say that <ASSN> was a typical day for you?	RET	TYPDY	Y	Y	N	1	1= YES 2= NO 8= DK	In general, would you say that <ASSN> was a typical day for you?	
T-8	P-43	O_TYPDY	Reason for not being a typical day	RET	WHYNO	Y	Y	C	60		If no, why was <ASSN> not a typical day for you?	IF TYPDY=2
T-9	P-44	TYPPL	Was most of your travel for this day planned in advance or did you change your travel plans as the day progressed?	RET	TYPPL	Y	Y	N	1	1= YES 2= NO 8= DK	Was most of your travel for this day planned in advance or did you change your travel plans as the day progressed?	
T-10	P-45	O_TYPPL	If changed plans, what happened that caused the change in plans?	RET	WHATH	Y	Y	C	60		IF CHANGED PLANS: What happened that caused the change in plans?	IF TYPPL=2

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
T-11	P-46	DIARY	Now I'd like to talk about the trips [this person] recorded in the travel log we sent. Did [NAME] complete the travel log?	RET	CMPLG	Y	Y	N	1	1= YES [COMPLETED] 2= NO [NOT COMPLETED] 3= DID NOT RECEIVE MATERIALS 8= DON'T KNOW 9= REFUSED	Now I'd like to talk about the trips [this person] recorded in the travel log we sent. Did [NAME] complete the travel log?	
T-12	T-4	LOCNO	Location Reference #	RET	LOCNO	Y	Y	N	7	Unique Location Reference Number		
T-13		TOTPL	Total places	RET	TOTPL	N	Y	N	2		How many places did <YOU> visit over the course of the [FIRST] travel day?	
T-14	T-5	PTYPE	Place type	RET	PTYPE	Y	Y	N	1	1= Home 2= Work 3= School 4= Previously entered place 5= NEW PLACE-IN AREA 7= NEW PLACE-OUT OF STATE	[IFPLACE 1]Okay, where were you at 3am on [ASSN]? OTHERWISE: Where did you go next?	
T-15		PLNAME		RET	PLNAM	N	Y	C	30			
T-16		GOSAM	Go to someone else's work or school location?	RET	GOSAM	N	Y	N	1	1= YES 2= NO 8= DK	Did <YOU> go to someone else's work or school location?	
T-17		ROWNO		RET		N	Y	N	2			
T-18		PEHAD		RET		N	Y	N	3			
T-19		ADDR	Street Address	RET	ADDR	N	Y	C	40		What is the street address there?	
T-20		CITY	City	RET	CITY	N	Y	C	25			
T-21		PLCNTY	Place County	RET	PLCTY	N	Y	C	30			
T-22		STATE	State	RET	STATE	N	Y	C	2			
T-23		PLZIP		RET	PLZIP	N	Y	N	5	99999=DK/RF	And the zip code at that location?	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
T-24		XSTRT	Cross streets closest to that location	RET	XSTRT	N	Y	C	40		Can you tell me the name of cross streets closest to that location?	
T-25		LAND	Nearby Landmark	RET	LAND	N	Y	C	30		Can you tell me a nearby landmark that can be found easily on a map?	
T-26	T-6	TPURP	Primary Trip purpose	RET	TPUR1	Y	Y	N	2	1= Personal activities at home 2= Work at home (for pay 3= Work for pay (other than at home) 4= Volunteer work (regularly scheduled) 5= School - Junior college, college/univ., vocational 6= School - Daycare, kindergarten, elementary, middle, high 7= Shopping - incidental 8= Shopping - major 9= Personal business 10= Medical/dental 11= Eat meal outside of home 12= Social/recreational 13= Civic activities 14= Church activities 15= Pick-up/drop off passenger at work 16= Pick-up/drop off passenger at school 17= Pick-up/drop off passenger at other place 18= Change mode of transportation 19= Loop trip 97= Other, specify	What was the MAIN purpose of your trip? [ONE RESPONSE ONLY]	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
T-27	T-7	O_TPURP	Other Primary Trip purpose	RET	O_TPUR1	Y	Y	C	60		What was the main purpose of your trip? Other	IF TPURP=97
T-28	T-8	TPUR2	Other activities	RET	TPUR2_01	Y	Y	N	2	0= No other activities 1= Personal activities at home 2= Work at home (for pay 3= Work for pay (other than at home) 4= Volunteer work (regularly scheduled) 5= School - Junior college, college/univ., vocational 6= School - Daycare, kindergarten, elementary, middle, high 7= Shopping - incidental 8= Shopping - major 9= Personal business 10= Medical/dental 11= Eat meal outside of home 12= Social/recreational 13= Civic activities 14= Church activities 15= Pick-up/drop off passenger at work 16= Pick-up/drop off passenger at school 17= Pick-up/drop off passenger at other place 18= Change mode of transportation 19= Loop trip 97= Other, specify	And what other activities did <YOU > do there?	

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
T-29	T-9	TPUR3	Other activities	RET	TPUR2_02	Y	Y	N	2	0= No other activities 1= Personal activities at home 2= Work at home (for pay 3= Work for pay (other than at home) 4= Volunteer work (regularly scheduled) 5= School - Junior college, college/univ., vocational 6= School - Daycare, kindergarten, elementary, middle, high 7= Shopping - incidental 8= Shopping - major 9= Personal business 10= Medical/dental 11= Eat meal outside of home 12= Social/ recreational 13= Civic activities 14= Church activities 15= Pick-up/drop off passenger at work 16= Pick-up/drop off passenger at school 17= Pick-up/drop off passenger at other place 18= Change mode of transportation 19= Loop trip 97= Other, specify		

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
T-30	T-10	TPUR4	Other activities	RET	TPUR2_03	Y	Y	N	2	0= No other activities 1= Personal activities at home 2= Work at home (for pay 3= Work for pay (other than at home) 4= Volunteer work (regularly scheduled) 5= School - Junior college, college/univ., vocational 6= School - Daycare, kindergarten, elementary, middle, high 7= Shopping - incidental 8= Shopping - major 9= Personal business 10= Medical/dental 11= Eat meal outside of home 12= Social/recreational 13= Civic activities 14= Church activities 15= Pick-up/drop off passenger at work 16= Pick-up/drop off passenger at school 17= Pick-up/drop off passenger at other place 18= Change mode of transportation 19= Loop trip 97= Other, specify		
T-31	T-11	O_TPUR2	Other activities	RET	O_TPUR2	Y	Y	C	50		And what other activities did <YOU > do there? Other	IF TPUR2 OR TPUR3 OR TPUR4=97

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
T-32	T-12	MODE	Mode of trip	RET	MODE	Y	Y	N	2	1= Auto/Van/Truck - driver 2= Auto/Van/Truck – passenger 3= Transit - Public bus (KAT, KTRANS, SUNTIME, DIAL-A-RIDE, CAC, or ETHRA) 4= Transit - School bus 5= Motorcycle/ moped 6= Taxi/shuttle bus 7= Walk 8= Bike 97= Other, specify	How did you get there?	
T-33	T-13	O_MODE	Other mode type	RET	O_MODE	Y	Y	C	30		How did you get there? Other	IF MODE=97
T-34	T-14	PARTY	Number of people traveling with you	RET	PARTY	N	Y	N	2	1= 01 2= 02 3= 03 4= 04 5= 05 6= 06 7= 07 8= 8 OR MORE 99= REFUSED	How many others traveled with<YOU2 >? NOT INCLUDING THE RESPONDENT	
T-35	T-15	HHMEM	Number of household members on trip	RET	WAHHM	Y	Y	N	2	1= 01 2= 02 3= 03 4= 04 5= 05 6= 06 7= 07 8= 8 OR MORE 99= REFUSED	Of these, how many were household members?	IF PARTY>0

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
T-36	T-16	PERTP	Person(s) on trip	RET	PERTP	Y	Y	C	16	01= 01 02= 02 03= 03 04= 04 05= 05 06= 06 07= 07 08= 08 10= MORE THAN 8 PEOPLE 99= REFUSED	Who were the household members?	IF HHMEM>0
T-37	T-17	NONHH	Non hh members	RET	NONHH	Y	Y	N	2	COMPUTED NON HH MEMBERS		
T-38	T-18	VHTNO	Vehicle Number	RET	VHTNO	Y	Y	N	2	1= 01 2= 02 3= 03 4= 04 5= 05 6= 06 7= 07 8= 08 97= NON HH VEHICLE 99= REFUSED	Which vehicle did<YOU >use?	If MODE=1 or 2
T-39	T-19	PRKTY	Park	RET	PARK	Y	Y	N	1	1= Didn't park 2= Parking lot 3= Parking garage 4= Street 5= Driveway/garage 7= Other, specify 8= DK 9= RF	Where did you park?	If MODE=1 or 2
T-40	T-20	O_PRKTY	Park	RET	O_PARK	Y	Y	C	30		Where did you park? OTHER	IF PARK=7
T-41	T-21	PAYPR	Paid to park	RET	PFEEW	Y	Y	N	1	1= YES 2= NO 9= DK/RF	Did you pay to park?	If PARK>1
T-42	T-22	DISTN	Distance to Destination	RET	HOWF	Y	Y	N	3	98=DK/RF	How far did you walk/bike?	If PARK>1 or MODE= Public Bus, Walk, or Bike

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
T-43	T-23	WBUNT	Distance to Destination UNITS	RET	HOWFU	Y	Y	N	1	1= blocks 2= miles 3= minutes 7=Other (specify) 9=DK/RF	How far did you walk/bike? Units	If PARK>1 or MODE= Public Bus, Walk, or Bike
T-44	T-24	O_WBUNT	Distance to Destination UNITS, Other	RET	O_HOWFU	Y	Y	C	30		How far did you walk from where you parked to your destination? Units Other	IF WKUNT=7
T-45	T-25	CARVL	Personal auto available when using transit?	RET	EXPTL	Y	Y	N	1	1= YES 2= NO 9= DK/RF	Did you have a personal automobile available to you when you made this trip by bus?	If MODE= Public transit
T-46	T-26	ARR_HR	Arrival hour	RET	ARRTM	Y	Y	C	2	Military time (0-23)	What time did you arrive at place X?	
T-47	T-27	ARR_MIN	Arrival minute	RET	ARRTM	Y	Y	C	2	0-59	What time did you arrive at place X?	
T-48	T-28	DEP_HR	Departure hour	RET	DEPTM	Y	Y	C	2	Military time (0-23)	What time did you depart from place X?	
T-49	T-29	DEP_MIN	Departure minute	RET	DEPTM	Y	Y	C	2		What time did you depart from place X?	
T-50	T-30	TRPDUR	Trip Duration	RET	TRDUR	Y	Y	N	4	Calculated (Arrival Time-Departure of Previous Place)		
T-51	T-31	ACTDUR	Activity Duration	RET	ACTDUR	Y	Y	N	4	Calculated (Arrival Time-Departure Time)		

ITEM #	DELIV ITEM #	VAR NAME	Variable Description	PROGRAM	IZU NAME	DELIV	PROCESSING	DATA TYPE	WIDTH	VALUES	ACTUAL QUESTION	CONDITIONS
T-52		LASTR	Any additional trips?	RET	LASTR	N	Y	N	1	1= YES, YOU WILL BACK UP TO DEPARTURE TIME 2= NO	Did you NAME make any additional trips after you were settled in for the evening, such as to run a quick errand, grocery shopping, video, rental, grab a bite to eat, or to pick up or drop off another person?	
T-53	P-47	NOGO	Reason, for no trips	RET	NOGO	Y	Y	N	1	1= PERSONALLY SICK 2= CARETAKING SICK KIDS 3= CARETAKING SICK OTHER 4= HOMEBOUND ELDERLY OR DISABLED 5= WORKED AT HOME FOR PAY 6= WORKED AROUND HOME(NOT FOR PAY) 7= OUT OF AREA 97= OTHER, SPECIFY	Why didn't you make any trips on [Travel day]?	
T-54	P-48	O_NOGO	Reason, for no trips, Other	RET	O_NOGO	Y	Y	C	60		Why didn't you make any trips on [Travel day]? Other	NOGO=97
T-55	V-51	CNTV	Reason why not	RET	CNTV1-8	Y	Y	N	1	1= YES 2= NO 9= DK/RF	Did anyone drive [Vehicle number] on [Travel day]?	
T-56	V-52	O_CNTV	Reason why not	RET	O_CNTV1-8	Y	Y	C	60		IF NO, WHY NOT?	IF CNTV=7

Appendix E: Advance Mailing Packet

Advance Letter

- Matched Sample
- Unmatched Sample

Study Brochure

Household Questionnaire

Survey Sponsored by:

KNOXVILLE REGIONAL TPO TRANSPORTATION PLANNING ORGANIZATION

400 Main Street, Suite 403
Knoxville, TN 37902
www.knoxtrans.org

"<<FIRST>> <<LAST>>" or "
<<CITY>> Travel Survey Household" or
"<<LAST>> Household"
<<ADDRESS>>
<<CITY>>, <<ST>> <<ZIP>>

DATE
<SAMPN> - <REP>

"Dear <<FIRST>>" or "<<Dear <<CITY>> Travel Survey Household" or "Dear <<LAST>> Household",

Local transportation planners need your help! Your household has been selected to participate in the **East Tennessee Household Travel Survey**, sponsored by the Knoxville Regional Transportation Planning Organization (TPO). The survey information will be used to make important transportation decisions. These decisions not only include projects such as building new roads, making improvements on existing roads, but also decisions that could enhance air quality, access to jobs, and the quality of life here in eastern Tennessee.

What are we asking of you?

- **First, participate in a 10-minute telephone interview**. In the next few days, you'll receive a phone call between 5 and 9 p.m. to confirm your participation. An interviewer from NuStats, a nationally recognized survey research firm, will call to answer any of your questions and also to ask some additional questions about your household and vehicles. You may also begin the process by calling 1-877-261-4621.

- **Next, record your travel for 24 hours.** After the phone call, you will receive travel logs in the mail for each person in your household. Each person should record all the places they visit, or stops they make, whether around town or out of town, on an assigned day.

- **Finally, provide your travel information in a follow-up phone call.** An interviewer will call after your travel day to collect the information from each person's travel log.

Confidentiality is critical to the success of our survey. We want you to feel secure in responding to our questions and in giving us your travel information. All information will be held in strict confidence. If you want to find out more about this survey, visit the survey Web site at ***www.nustats.com/ETTS*** or call Mike Conger, the project representative for TPO, at (865) 215-3813 or e-mail Mike.Conger@knoxtrans.org.

Thank you – your participation will really make a difference!

Jeffrey Welch, TPO *Director*

Project is funded in part by the Tennessee Department of Transportation

TDOT

Survey Sponsored by:

KNOXVILLE REGIONAL TPO TRANSPORTATION PLANNING ORGANIZATION

400 Main Street, Suite 403
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"<<LAST>> Household"
<<ADDRESS>>
<<CITY>>, <<ST>> <<ZIP>>

DATE
<SAMPN> - <REP>

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What are we asking of you?

- **First, fill-out the enclosed Household Questionnaire, including a phone number where we can best reach you, and return it postage-paid to us.** You can also call us toll-free at 1-877-261-4621 to complete the survey by phone or go on-line to enter your information: ***http://surveys.nustats.com/ETTS/index.html.*** **Enter PIN#: <<PIN>>**
- **Next, participate in a 10 minute telephone interview**, in which we will answer your questions and also ask you some additional questions about your household and vehicles.
- **Then, record your travel for 24 hours.** After the phone call, you will receive travel logs in the mail for each person in your household. Each person should record all the places they visit, or stops they make, whether around town or out of town, on an assigned day.
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Thank you – your participation will really make a difference!

Jeffrey Welch, TPO *Director*

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TDOT

WHY PARTICIPATE?

The Knoxville Regional Transportation Organization (TPO) is putting together a new plan for guiding future growth and transportation investment in the Eastern Tennessee region. To make sure this plan best meets the needs of the region, we're asking for your help. If you and your household members can tell us about your daily transportation habits by participating in our Travel Survey, it will help us plan future transportation improvements that will best serve your needs.

Making sure that your transportation needs are met is a top priority for TPO. It's important that everyone's travel habits are included as we develop transportation solutions for the future:

- Whether you travel a lot or a little.
- Whether you travel by car, bus, or simply by biking or walking.

To successfully plan for the future of transportation in the region, our survey needs to include travel details from households of all types, including yours. We ask for your help so that transportation projects will truly reflect the needs of all regional residents.

FREQUENTLY ASKED QUESTIONS

WHAT IS THE TRAVEL SURVEY?

- Collects information on travel patterns – when, where, how and why.
- Results will be used to show travel patterns throughout the region.
- Provides information necessary to determine future transportation investments and priorities.

WHY IS MY PARTICIPATION SO IMPORTANT?

- We need to understand changes in travel behavior since our last survey was done.

WHY DO YOU NEED DETAILED PERSONAL INFORMATION?

- Your information, combined with that of other participating households, will be used to provide a general profile of everyone in the area.
- Personal characteristics are good predictors of household travel patterns. With this information, we can help identify where future transportation investment is needed.

WANT MORE INFORMATION ABOUT HOW TO GET STARTED?

Julie Paasche, NuStats
toll-free 1-800-447-8287, ext. 2241
email: jpaasche@nustats.com

WANT MORE INFORMATION ABOUT TPO OR THE SURVEY?

Mike Conger: 865-215-3813
email: Mike.Conger@knoxtrans.org
visit: www.knoxtrans.org/about/history.htm

East Tennessee Travel Survey

Help keep the region moving!

Help Eastern Tennessee Prepare for its Future Transportation Needs!

Find out how to participate inside.

Survey conducted by NuStats on behalf of:

KNOXVILLE REGIONAL TPO TRANSPORTATION PLANNING ORGANIZATION

Project is funded in part by the Tennessee Department of Transportation

TDOT

WHY THIS SURVEY?

The design, construction, and maintenance of roads, bikeways, sidewalks, and public transit cost taxpayers a lot of money.

The TRAVEL SURVEY collects data about where people in the region travel for work, school, recreation, shopping, and other purposes to help define transportation needs. The results are used to plan transportation improvements, and other projects that affect mobility, access to jobs, air quality, and quality of life.

HOW WAS YOUR HOUSEHOLD SELECTED?

A small number of households in the eastern Tennessee region were randomly selected. Because government surveys are exempt from Do-Not-Call lists, everyone in your area had an equal chance of being selected to participate in our study.

CONFIDENTIALITY

All information your household provides will be kept strictly confidential.

Your name and personal information will be separated from your responses for analysis.

HOW DO YOU PARTICIPATE? FOLLOW THESE 3 EASY STEPS . . .

1 COMPLETE AND RETURN THE HOUSEHOLD QUESTIONNAIRE.

This questionnaire begins the survey process by gathering general information about your household and asking for a phone number where we can best reach you to complete the interview. Once you complete the questionnaire, you can either mail it back, call us toll-free (877-261-4621) to provide the information or, enter the information online at the web address provided on the questionnaire and on the enclosed letter.

2 PARTICIPATE IN A SHORT TELEPHONE INTERVIEW.

Once we receive your completed household questionnaire, an interviewer from NuStats, a nationally recognized survey research firm, will call to ask some additional questions to ensure that our survey represents different types of households in the eastern Tennessee region. Such information includes the number of people in your household, their ages, where they work or go to school, and the number and types of vehicles. The interviewer will be happy to answer any questions that you have about the survey.

3 RECORD YOUR TRAVEL FOR 24-HOURS.

Next, all persons in your household will receive personalized travel logs in the mail. Everyone should use the logs to record their activities, the places they visit, and stops they make, whether around town or out of town for 24 hours on the assigned travel day.

4 PROVIDE YOUR TRAVEL INFORMATION IN A FOLLOW-UP PHONE CALL.

An interviewer will call after your travel day to collect information from each person in the household. The interviewer will want to speak directly with each person age 16 and older, so a specific appointment (day and time) will be set. If the logs were used to record all the information, this interview is quick!

To plan for future transportation needs, transportation planners rely on the information YOU provide about your actual travel habits. Your household's information can only be used for planning and decision-making if everyone in the household participates.

Household Questionnaire

This questionnaire begins the survey process by gathering general information about your household and asking for a phone number where we can best reach you to complete the interview and schedule your travel day.

When you complete the questionnaire, you can either mail it back, call us toll-free (877-261-4621) to provide the information or, enter the information online at the web address provided in the enclosed letter and on the label below.

Thank you for your participation!

Questions begin on the other side

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 5478 AUSTIN TX

POSTAGE WILL BE PAID BY ADDRESSEE

EAST TENNESSEE TRAVEL SURVEY
206 WILD BASIN RD STE A300
AUSTIN TX 78746-9907

Thank You!

Your participation can help make a difference
for the future of transportation in the region.

1. Which best describes your home?

- ❑1 One-family house, detached from any other house
- ❑2 One-family house, attached to one or more houses *(duplex, rowhouse, townhouse)*
- ❑3 Mobile home
- ❑4 Building with 2 or more apartments *(condo, apartment, etc.)*
- ❑97 Other *(specify)*: _____

2. Is this home . . . ?

- ❑1 Owned by you or someone in household
- ❑2 Rented for cash rent
- ❑3 Occupied without payment of cash rent
- ❑97 Other *(specify)*: _____

3. Who is the best person in your household for us to contact?

First Name: _____

Last Name: _____

4. What is the best phone number to reach you?

(_____) _____ - _____ ❑1 Cell ❑2 Landline

5. What is the best time of day to reach you at this number?

_____ **am / pm**

6. Do you have an email account that you check daily, where we can contact you?

- ❑1 Yes: _____ @ _____
- ❑2 No

7. What types of telephone service does your household have? *(Check all that apply)*

- ❑1 Standard land-based telephone service
- ❑2 Wireless cellular or satellite service
- ❑97 Other: *(specify)* _____
- ❑98 Don't Know

8. How many people, including yourself, live in your home? *(DO NOT INCLUDE college students living away from home, household members on active military duty, or anyone who lives somewhere else most of the time.)*

Total #: ☐

9. How many motor vehicles are owned, leased, or available for regular use by the people who currently live in your household? *(Include motorcycles, mopeds, and RVs but exclude any vehicles in non-working condition.)*

Total #: ☐

Thank You! Please fold with the business reply showing, seal with tape and drop in any public mailbox.

Appendix F: CATI Recruitment Interview

2008 East Tennessee Travel Survey
Recruitment Interview, Version 4

All Travel Days (Mon through Fri) for All Household Members
20% +/- 3% for each day of the week Monday through Friday
Black out dates: Good Friday and Easter Monday
Also need to schedule around Spring Break which will vary by school

Notes:

- Items in ALL CAPS are programmer/interviewer notes or response codes that are not read to the respondent.
- Items appearing in caps with brackets such as [CTFIP] denote merge fields where the actual information to be read may vary across respondents.
- Items in upper and lower case (unless otherwise noted) are read to the respondent verbatim.
- The numbering of the choice sets may sometimes not be continuous. This is because we use standard codes for response categories of "other – specify", don't know, and refused.
- The completed recruitment interviews will be tracked by the same categories as identified for retrieval, with goals set assuming 70% of each respondent type will complete the retrieval process.

INTRODUCTION

INT03-Hi – my name is _____ and I'm calling on behalf of the Tennessee Department of Transportation and the Knoxville Transportation Planning Organization. We're interviewing families in your area about their travel. The information collected through this study will benefit [CTFIP] county by helping transportation planners more accurately identify transportation needs.

May I speak with [NAME - IF LISTED SAMPLE] or an adult who lives in this household? (NAME PRESENT)
May I speak with an adult who lives in this household? (NO NAME PRESENT)

ADULT ON PHONE: We're conducting the East Tennessee Travel Survey to understand why and how people travel as part of planning for future transportation needs. [You may have received a letter in the mail with information about this study.] The study is purely a research effort, your participation is voluntary, and your answers will be completely confidential.

Screeners

INT06-First I have some brief questions about your household.

NO/RF: May I call back at a more convenient time? IF YES, SET A CALLBACK

STILL NO: Is there someone else in the household who might be willing to answer these few questions for me now? It is very important for transportation planning in the region that we get travel information from households like yours.

S1 Do you reside in [CTFIP] county?

IF NO: (S1A)In which county do you live?

TERMINATE IF NOT IN STUDY AREA

HHSIZ- How many people, including yourself, live in your home?
ENTER NUMBER
98…DON'T KNOW – TERMINATE WITH BELOW TEXT

99…REFUSED – TERMINATE(INT13) "Thank you but without this information, your household will not be eligible to participate in this study." PAUSE AND GIVE FINAL OPPORTUNITY FOR RESPONDENT TO ANSWER BEFORE TERMINATING

NOTE TO INTERVIEWER: INCLUDE IN THIS NUMBER ALL PERSONS WHO SLEEP THERE AT LEAST 3 NIGHTS PER WEEK. INCLUDE FOSTER CHILDREN, ROOMERS, HOUSEMATES, PEOPLE LIVING HERE MOST OF THE TIME WHILE WORKING, EVEN IF THEY HAVE ANOTHER PLACE TO LIVE, HOUSEHOLD MEMBERS ON ACTIVE DUTY.

DO NOT INCLUDE COLLEGE STUDENTS LIVING AWAY WHILE ATTENDING COLLEGE OR PEOPLE WHO LIVE AT ANOTHER PLACE MOST OF THE TIME.

S3 [IF HHSIZE<3] Of those [X] household members how many are currently employed full or part time?
ENTER NUMBER

98…DON'T KNOW-TERMINATE(INT16)- Thank you but without this information, your household will not be eligible to participate in this study.

99…REFUSED-TERMINATE(INT16)- Thank you but without this information, your household will not be eligible to participate in this study.

NOTE TO PROGRAMMER: CHECK QUOTA FOR 1 – 2 PERSON HOUSEHOLDS WITH NO WORKERS.

HHVEH- How many vehicles are owned, leased, or available for regular use by the people who currently live in your household? Please be sure to include motorcycles, mopeds, and RVs. INTERVIEWER NOTE: THE NUMBER OF TRIPS MADE BY A HOUSEHOLD IS OFTEN DIRECTLY RELATED TO THE NUMBER OF VEHICLES.

ENTER NUMBER
98…DON'T KNOW – TERMINATE WITH BELOW TEXT
99…REFUSED – TERMINATE "Thank you but without this information, your household will not be eligible to participate in this study." PAUSE AND GIVE FINAL OPPORTUNITY FOR RESPONDENT TO ANSWER BEFORE TERMINATING

TPO1A – TPO1G-Please rate each of the following aspects of the transportation system in your community today, on a scale of 1 to 4 with 1 being poor and 4 being "very good."

a. Traffic conditions on major roads
b. Transit services
c. Sidewalks and crosswalks
d. Bike lanes and wide shoulders
e. Greenways and bicycle/pedestrian paths
f. Traffic safety and control on major roads
g. Overall rating for transportation system

TPO2-How do you think future transportation projects should be funded?

SELECT ALL THAT APPLY

Use tolls to fund new projects	1
Increase the fuel tax	2
Leave taxes at the level they are now	3
Charge new development for transportation improvements	4
Increase sales tax to fund projects	5
Increase property tax to fund projects	6
Other PLEASE SPECIFY	7

BHISP-Are you Hispanic, Latino, or Spanish?

1-YES
2-NO
9-RF

BRACE-I'm going to read a list of race categories. <IF BHISP=1>, then "in addition Hispanic, Latino, or Spanish, Please choose the category you consider yourself to be:

SELECT ALL THAT APPLY

White	01	
African American/Black	02	
Asian	03	
American Indian/Alaska native	04	
OTHER (SPECIFY)	97	O
DK/RF	08	X

AB75 And to make sure your household properly represents others in the region, can you tell me if your total household income for 2007 was above or below $75,000? INTERVIEWER NOTE: HOUSEHOLD INCOME NOT ONLY ALLOWS US TO VERIFY THAT WE ARE INCLUDING ALL TYPES OF HOUSEHOLDS FROM THE REGION, BUT ALSO HAS BEEN FOUND TO BE RELATED TO THE TYPES OF TRIPS HOUSEHOLDS MAKE.

B75 [IF BELOW $75,000]
1 Less than $10,000
2 $10,000 but less than $25,000
3 $25,000 but less than $35,000
4 $35,000 but less than $45,000
5 $45,000 but less than $50,000
6 $50,000 but less than $75,000
99 RF

A75 [IF ABOVE $75,000]
7 $75,000 but less than $100,000
8 $100,000 but less than $125,000
9 $125,000 but less than $150,000
10 $150,000 but less than $175,000
11 $175,000 or more
99 REFUSED

IF REFUSED: I appreciate your concerns about providing this information, but I only need to properly identify your household as belonging to one of the following categories: READ APPROPRIATE RANGES

1 Less than $10,000
2 $10,000 but less than $25,000
3 $25,000 but less than $35,000
4 $35,000 but less than $45,000
5 $45,000 but less than $50,000
6 $50,000 but less than $75,000
7 $75,000 but less than $100,000
8 $100,000 but less than $125,000
9 $125,000 but less than $150,000
10 $150,000 but less than $175,000
11 $175,000 or more

Recruit

INT05-This study will collect data to help local transportation planners understand why, when, and where people travel in the East Tennessee Region. To do this, we're asking people to record their travel for a 24-hour period. If you could help us with this study, we'd ask you some questions about your household today to make sure that all regional households are represented. Then we ask for some details about each person in your household in order to prepare personalized logs, which we'd mail to you. After you record your travel, we call back to collect your information. Everything asked is for research purposes only and will be held in strict confidence.

IF BRACE=02 OR INCOM<3 OR HHSIZ<4- **We are offering 5$ for each family member in your household in appreciation of your efforts, but only IF EVERYONE in your family completes a travel log. If all of your travel information is completed before May 28th and confirmed for EVERYONE in your family, we will mail you the 5$ incentive for each household member.**

IF BRACE=02 OR INCOM<3 OR HHSIZ>3-**We are offering 10$ for each family member in your household in appreciation of your efforts, but only IF EVERYONE in your family completes a travel log. If all of your travel information is completed before May 28th and confirmed for EVERYONE in your family, we will mail you the 10$ incentive for each household member.**

VEHICLE ROSTER

ZERO VEHICLE HOUSEHOLDS SKIP TO P1

Start Vehicle Roster

CARS- You said that you had {U}<HHVEH>{/U} vehicles in your household. I have a few questions about each of these vehicles.

Let's start with the vehicle that is driven the most.

INTERVIEWER NOTE: THESE DETAILS ABOUT THE HOUSEHOLD VEHICLES HELP TO MONITOR AIR QUALITY ISSUES.

MAKEX- What make is Vechile#<VEHNO>

MODLX- What is the model name or number for that vehicle?
IF YOU DON'T FIND IT IN THE TABLE, SELECT 997.

YEAR- What year is that vehicle?
RANGE: 1900 - 2008

BODY-Is this a/an
1 Car or station wagon
2 Van (ANY TYPE)
3 SUV
4 Pick-up Truck
5 Other kind of truck
6 RV
7 Motorcycle,
97 Or something else (SPECIFY)?
99 REFUSED

FUEL-What type of fuel does this vehicle use?
1 Gasoline
2 Diesel
3 Electric/Hybrid
7 Or something else, SPECIFY
8 DK
9 RF

VOWN-Is this vehicle …. (READ LIST)
1 Owned
2 Leased
3 Provided by an employer, or
4 Borrowed from a friend or relative?
8 DK
9 RF

PERSON ROSTER

(IF HHSIZ==1)PEOP1- You indicated that there is {u}<HHSIZ>{/u} person in your household. Now I need to get some information about you.

(IF HHSIZ>1)PEOPL-Now I need to get some information about each household member. Earlier you indicated that there were<HHSIZ>persons in your household. First I need the names for each person in the household.

FNAME-
[IF HHSIZE=1]- What is your first name?

[IF HHSIZE=2] What is the first name of the other person living in your home?

[IF HHSIZE>2] Excluding you, what's the first name of the oldest person?
What's the name of the next oldest person in the household? [EXCLUDING REFERENCE PERSON]

What's the first name of the next oldest person? [EXCLUDING REFERENCE PERSON]

BEGIN SERIES OF QUESTIONS WITH REFERENCE PERSON, THEN COLLECT FOR OTHER HOUSEHOLD MEMBERS. IF UNCOMFORTABLE GIVING CHILDREN'S NAMES, OKAY TO DO "CHILD #1, CHILD #2," ETC OR USE INITIALS

RELAT-[DON'T ASK FOR RESPONDENT] How is this person related to you?
- 0 REFERENCE PERSON [CAN'T USE FOR OTHER HH MEMBERS]
- 1 SPOUSE/PARTNER
- 2 CHILD
- 3 PARENT
- 4 GRANDPARENT
- 5 GRANDCHILD
- 6 OTHER RELATIVE
- 7 NOT RELATED
- 9 REFUSED

GEND-What is this person's gender? [RECORD BY OBSERVATION FOR RESPONDENT]
- 1 MALE
- 2 FEMALE
- 9 REFUSED

AGE- What is [your/ this person's] age?
RANGE: 0 - 105 YRS
- 98 98 or older
- 99 DON'T KNOW/ REFUSED

AGEB-IF AGE = DK/RF: Many of our questions about [you/ this person] are based on [his/her] age. Can you tell me if [you are/ NAME is] under 16, age 16 to 64, or over 64?
- 1 UNDER 16
- 2 AGE 16-64
- 3 Over 64
- 9 DK/RF

DISAB-[Do you/ Does NAME] have any type of disability that may make it difficult to travel or get around?
- 1 YES
- 2 NO
- 9 DK/RF

PROGRAMMER NOTE: IF P6 is NO, SKIP P7

TDISA- What type of disability is that?
- 1 Blind/visual impaired
- 2 Transferable wheelchair
- 3 Non-transferable wheelchair
- 4 Deaf/hearing impaired

5 Mentally disabled
6 Cane/walker
7 OTHER, SPECIFY
9 DK/RF

PROGRAMMER NOTE: IF UNDER AGE 16, SKIP TO S1

LIC-[Do you/ Does NAME] have a valid driver's license?
1 YES
2 NO
9 DK/RF

EMPLY- [Are you/ is NAME] employed, either full-time or part-time?
1 EMPLOYED FULL-TIME (30+ HOURS/WEEK)
2 EMPLOYED PART-TIME (<30 HOURS /WEEK
3 NOT EMPLOYED
9 DK/RF

VOLUN- [IF P9>2] [Do you/ Does NAME] do any type of volunteer work on a regular basis?
1 YES – DO **NOT** TREAT AS EMPLOYED
2 NO
9 DK/RF

PRIMA- [IF P9>2] Which of the following best describes [you/ NAME's] status?
1 Retired,
2 Disabled / On Disability Status,
3 Homemaker,
4 Unemployed but looking for work,
5 Unemployed and not looking for work, or
6 a Student?
7 OTHER (specify)
9 REFUSED

JOBS IF WORKER, How many jobs [do you/ does NAME] currently work?
RANGE: 1 - 9 JOBS

Work-Related Data - Age 16 and older AND (P9=1 or P9=2)

(REST SKIP TO SCHOOL SECTION)

WNAME- Transportation planners are interested in workplace location because travel to work activity often affects other daily travel. What is the name of [your/ this person's] primary employer location]?

IF SELF-EMPLOYED, OBTAIN NAME OF BUSINESS

WLOC-At what location [do you/ does this person] normally work/?

INTERVIEWER NOTE: IF THIS PERSON WORKED AT MORE THAN ONE LOCATION, OBTAIN WHERE HE OR SHE WORKED MOST (MAIN JOB).

IF WORKS BOTH AT HOME AND WORK, GET WORK ADDRESS

IF NEEDED: WE ARE NOT GOING TO CONTACT YOU THERE. TRANSPORTATION PLANNERS ARE INTERESTED IN WORKPLACE LOCATIONS BECAUSE TRAVEL TO WORK OFTEN AFFECTS OTHER DAILY TRAVEL.

IF VARIES, OBTAIN ADDRESS FOR LOCATION WORKED AT LAST WEEK

1 HOME
2 ADDRESS GIVEN – ENTER BELOW
3 VARIES – ENTER MOST RECENT LOCATION BELOW
4 NO SET WORK LOCATION – ENTER CENTRAL OFFICE IF APPLICABLE
8 DON'T KNOW
9 REFUSED

ENTER THE STREET ADDRESS OF THIS PERSON'S WORKPLACE (CANNOT ENTER 'VARIES')

WCITY: What city do(es) ***you/FNAME*** work in?_____

WCNT2: In what county do(es) ***you/FNAME*** work? _____

WSTA2: What state do(es) ***you/FNAME*** work in?_____

WADDR- What is the street address of ***your/FNAME's*** work? CANNOT ENTER 'VARIES'_____

WZIP: What is the zip code of ***your/FNAMES's*** work? _____

WXSTR-What is the nearest streets that crosses the street where YOU/FNAME work(s)?

CAN BE BLANK

Cross Street: _____

8 DON'T KNOW
9 REFUSED

WLAND-Would you please provide a landmark that is close to [your/ FNAME's] primary workplace location? This could be a well-known building, park, monument, or school.
Name of Landmark: _____
8 DON'T KNOW
9 REFUSED

WMODE-How [do you/ does this person] normally get to work? IF NEEDED: THAT IS, THE ONE USED FOR MOST OF THE DISTANCE. SKIP IF W3=1
1 DRIVE ALONE
2 SHARED RIDE-2 PERSON (CARPOOL)
3 SHARED RIDE-3+ PERSONS (CARPOOL)
4 VANPOOL
5 TRANSIT-WALK ACCESS
6 TRANSIT-AUTO ACCESS
7 WALK
8 BIKE
9 WORK AT HOME
97 OTHER, SPECIFY
99 DK/RF

WDAYS-On average, how many days per week [do you/ does NAME] work at this location? (1-7)
97 Varies week to week
99 DK/RF

WHOME-In the past year, did [you/ NAME] ever work at home instead of traveling to work? This sometimes called telecommuting or telework.
1 YES
2 NO
9 DK/RF

HOWOF- [if W8 = YES] About how often did [you/ NAME] work from home instead of traveling to [your/their] usual workplace?
1 Almost every day (4 or 5 days per week)
2 Once or twice a week
3 Once a month or more
4 A few times a year, or
5 Once a year
9 DK/RF

TPOLI- Does [your/ NAME's] employer have a formal telecommuting policy for working from home?
1 YES
2 NO
8 DK
9 RF

School-Related Data – Ask of all HH members

EDUCA- What is the highest degree or level of school [you/ this person has] completed?

1 Not a high school graduate, 12th grade or less (THIS INCLUDES VERY YOUNG CHILDREN TOO)
2 High school graduate (high school diploma or GED)
3 Some college credit but no degree
4 Associate or technical school degree
5 Bachelor's or undergraduate degree
6 Graduate degree (includes professional degree like MD, DDs, JD)
97 OTHER, SPECIFY
99 DK/RF

STUDE- [Are you/ Is this person] currently enrolled in any type of school, including [if age<6 daycare], technical school, or university? IF AGE 18+, FOLLOW UP WITH: Is that full-time or part-time? IF LESS THAN 18 SKIP TO S3.

1 YES – FULL TIME
2 YES – PART TIME
3 NO – GO TO NEXT SECTION
9 DK/RF– GO TO NEXT SECTION

SCHOL- What school grade or level [do you/ does this person] attend?

1 DAYCARE
2 NURSERY SCHOOL, PRE-SCHOOL
3 KINDERGARTEN TO GRADE 8
4 GRADE 9 TO 12
5 TECHNICAL/VOCATION SCHOOL
6 2-YEAR COLLEGE (COMMUNITY COLLEGE)
7 4-YEAR COLLEGE OR UNIVERSITY
8 GRADUATE SCHOOL/PROFESSIONAL
97 OTHER, SPECIFY
99 DK/RF

SNAME- What is the name of that school?

SLOC- Where is it located?

1 HOME
2 ADDRESS GIVEN – ENTER BELOW
7 OTHER (SPECIFY SCHOOL NAME)
9 DK/RF

ENTER THE STREET ADDRESS OF THIS PERSON'S SCHOOL if not HOME

SCITY-What city do(es) <YOU> go to school in?_____

SCNTY In what county do(es) <YOU> go to school?_____

SSTAT What state do(es) <YOU> work in? _____
SADDR What is the address of <YOUR> school?_____
SZIP What is the zip code of <YOUR> school? _____

SXSTR-(skip if home-school or if it's geocoded)What is the nearest streets that crosses the street where <YOU> go(es) to school?

CAN BE BLANK

SMODE- How [do you/ does this person] normally get to school? IF NEEDED: THAT IS, THE ONE USED FOR MOST OF THE DISTANCE. SKIP IF S5=1

1 DRIVE ALONE
2 SHARED RIDE-2 PERSON (CARPOOL)
3 SHARED RIDE-3+ PERSONS (CARPOOL)
4 SCHOOL BUS
5 TRANSIT-WALK ACCESS
6 TRANSIT-AUTO ACCESS
7 WALK
8 BIKE
9 SCHOOL AT HOME
97 OTHER, SPECIFY
99 DK/RF

HOUSEHOLD CHARACTERISTICS

RESTY -Now I just have a few more questions about your household.

Which best describes your home?

1 One-family house detached from any other house
2 One-family house attached to one or more houses [DUPLEX, ROW HOUSE, TOWNHOUSE]
3 Mobile home
4 Building with 2 or more apartments or condo units [CONDO, APARTMENT, etc.]
97 Or something else? SPECIFY
99 REFUSED

OWN- Is this home

1 Owned by you or someone in this household
2 Rented to you for cash rent or
3 Occupied by you without payment of cash rent,
97 Or something else? SPECIFY
99 REFUSED

PACKAGE DELIVERY

ASSN- Understanding your household's travel is very important for improving transportation in your area. We would like to send you a log for each member of your household to keep track of your travel for just one day [DAY AND DATE]. Is this okay?
1 Yes
2 No – Well, let's try a different time. How about [ALT DAY AND DATE].
ENTER ASSIGNMENT NUMBER

IF THERE ARE ANY STUDENTS OF ANY AGE IN THE HHLD, NEED TO SCREEN THAT ASSIGNED TRAVEL DAY WILL BE A TYPICAL SCHOOL DAY FOR THE STUDENT. AVOID SPRING BREAK.

D2 To whom should we address the envelope?

RFNAM-FIRST NAME RLNAM-LAST NAME
9 REFUSED --> INDICATE THAT INFORMATION IS NECESSARY, IF STILL REFUSE, TERMINATE

HSUIT,HXSTR,HCITY, HSTAT,HCNTY,HZIP
D3 In order to mail the diaries to you, I need your address. [CONFIRM ADDRESS FROM SAMPLE]
PHYSICAL ADDRESS. NO P.O. BOXES ALLOWED

HADDR- What is your physical street address?
REQUIRED. NO PO BOXES ALLOWED.
BE SURE TO ASK FOR THE "QUADRANT", FOR EXAMPLE, NW, SE, ETC.

HSUIT- Do you have an apartment number or suite number?
YES: What is it?
NOTE: IF NONE, LEAVE IT BLANK. DO NOT TYPE "NONE"

HXSTR- What is the nearest street that crosses the street where you live?
REQUIRED. ENTER "DK" IF RESPONDENT DOES'T KNOW

HCITY- What city is that in?
HSTAT-What state do you live in?

NCNTY-In what county do you live?

DF/RF: This information is very important for transportation research and we would really like to include your household in our study.

HZIP- What is your zip code?

MAIL Is your home address also your mailing address?

READ ONLY IF NEEDED

ADDR: <HADDR>
APPT: <HSUIT>
CITY: <HCITY>
STATE: <HSTAT>
ZIP CODE: <HZIP:C>

ALTPH- Let me verify I dialed the correct number, have I reached you at <PHONE>?

IF NO- TEL03-And what is the number?

FORMAT: 999-999-9999

HVDTP- And should we call you at this telephone number or is there a daytime or different phone number where you would prefer to be called?

1- CALL ME AT THIS NUMBER <PHONE>
2- CALL ME AT DAYTIME/DIFFERENT NUMBER

IF HVDTP=2 HWCPH- Is it a home, work or cell phone number?

HOME-1
WORK-2
CELL-3
OTHER, SPECIFY-7

IF HVDTP=2 DAYPH-What is the number?

D5 We will mail the logs to you in a few days and will call you again on [REMIND DATE] to make sure you have received them and to answer any questions. Then we will call to ask about your travel on [BEGDATE]. When would be the best time to reach you?
OBTAIN DAY AND TIME

PILOT QUESTIONS

AIDE-To help aide transportation officials in making decisions about this study, I have a few questions about this interview we just conducted.

How much did the following motivate or convince you to complete the interview:

Did not motivate you,
Motivated you a little, or
Motivated you a lot....

L1 - This study would benefit your community by identifying needed transportation improvements?
L2 - Your information would be confidential?
L3 - This study would benefit your community with better transportation planning?

L4 - That the survey was about transportation?
L5 - That the study was sponsored by T-DOT?
L6 - The study was sponsored by Knoxville TPO?

L7 - What else could have been said or done to convince someone like yourself to participate in this survey?
Nothing
Open End _____

L8 - Was anything at all surprising about this interview?
Yes (Open End) _____
No

L9 - Did you receive the advance letter mailed to your household? Yes No

L10 - Did/Would the advance letter influence your participation in this study? Yes No

CONCLUSION

Thank you for participating in the East Tennessee Travel Survey. Please tell the other members of your household how important their participation is for the success of the study. We look forward to talking with you again. If you have any questions or comments, you can reach us at 1-877-261-4621. Thank you and have a good day/night.

L12 - [DO NOT READ INTERVIEWER SHOULD RATE RESPONDENT WILLINGNESS TO PARTICIPATE IN INTERVIEW] High, Medium, Low

Appendix G: Respondent Mailing Packet

Cover Letter

Bookmark

Travel Log

Survey Sponsored by:

KNOXVILLE REGIONAL TPO TRANSPORTATION PLANNING ORGANIZATION

400 Main Street, Suite 403
Knoxville, TN 37902
www.knoxtrans.org

John Smith
1234 Main Street
Knoxville, TN zip

DATE
<Sampn>

Dear John,

Thank you for participating in the **East Tennessee Travel Survey**!

Your assigned travel day is:
<<assigned day>>

What are we asking of you?

- **First, record your travel for 24 hours.** This package contains personalized travel logs. Your family should use the logs to record all the places they visit, or stops they make, whether around town or out of town, on <<assigned day>>. Please ensure that all persons age 12 and older fill out the travel logs completely and accurately. Parents/guardians should fill out the logs of children under age 12.
- **Last, provide your travel information in a follow-up phone call.** An interviewer from NuStats/ DataSource will call after <<assigned day>> to collect the information from each person's travel log. The interviewer must speak directly with each person age 16 and older. Parents/guardians will provide information for children under age 16. Please have your completed log ready for the follow-up phone call and the interview will go fast!

Remember, all information will be held in strict confidence. If you have questions about anything related to this survey, please call the toll-free survey hotline at 877-261-4621 or contact Julie Paasche of NuStats by phone (toll-free) at 1-800-447-8287, ext. 2241 or e-mail *jpaasche@nustats.com*.

Thank you – your participation will really make a difference!

Jeffrey Welch, TPO *Director*

To begin your Log:

1. **Read the Instructions & Example page first.** It will help you correctly fill out your travel log.
2. **Record each place you go, when you arrived, how you got there, what you did there, and what time you left.** Your travel day begins at 3 a.m. (or when you wake up). Carry your log with you during your travel day - this will help you remember to record ALL your trips and the EXACT times. *Be sure to refer back to the Example page as needed.*
3. **Remember to record all trips, not just driving trips.** This includes short walks, quick stops like for gas, coffee, and other personal errands, and trips that begin and end at the same place (like walking the dog, biking, and jogging).

Project is funded in part by the Tennessee Department of Transportation

TDOT

Bookmark

East Tennessee Travel Survey

Help keep the region moving!

Top 5

Reasons to Participate:

1. Everybody needs access to transportation to do their daily activities.
2. We need reliable travel information for good transportation planning.
3. Making the right transportation improvements can help improve our local economy.
4. Improving our air quality, access to jobs, and the quality of our lives is important for our community.
5. Your participation will help make sure that future transportation projects reflect what our community needs.

Travel Log

REMEMBER TO RECORD . . .

- ✓ Each STOP you make, even:
  - Quick stops to get food, fuel, or cash from an ATM.
  - Stops where you don't have to get out of your car.
  - Bus stops or transit centers where you transfer or get on or off.
- ✓ All ACTIVITIES you do and TRIPS you make, even those:
  - You make while at work *(going out to lunch or running an errand, etc.).*
  - After 6 p.m. or after work.
- ✓ Exact place names and as complete address information as possible.
- ✓ Accurate arrival and departure times.

WHAT DO I DO WITH MY COMPLETED LOGS?

Keep your completed logs by the phone – We will call you to collect the information. Or, you can call NuStats toll-free (877-261-4621) to provide your information.

Mail – After we collect your information by phone, return your completed logs in the postage-paid envelope provided in your packet.

For assistance, call NuStats toll free at 877-261-4621

LISTS 1 & 2 are inside flap

THANK YOU FOR YOUR PARTICIPATION!

If you need help filling out your Travel Log, please call toll free at:

877-261-4621

For more information about the survey, please call:

Julie Paasche, NuStats
800-447-8287, ext. 2241
jpaasche@nustats.com

or

For more information about TPO or the survey, please call:

Mike Conger, TPO
865-215-3813
Mike.Conger@knoxtrans.org

or

visit the project web page at:
www.nustats.com/ETTS

SURVEY CONDUCTED BY NUSTATS ON BEHALF OF:

KNOXVILLE TPO TRANSPORTATION PLANNING ORGANIZATION

Project is funded in part by the Tennessee Department of Transportation

TDOT

NuStats

East Tennessee Travel Survey

Help keep the region moving!

PERSONAL ONE-DAY TRAVEL LOG FOR:

Record each PLACE you go and WHAT you do there beginning at 3:00 a.m. *(or when you wake up)* on your assigned travel day and ending at 2:59 a.m. the following day *(or when you go to sleep on your travel day).*

HINT!

Carry this log with you on your assigned travel day and record the places you visit and what you do there as you go. *This helps you remember to record all the places you visit, what you do there, and to provide exact arrival/departure times and complete addresses.*

Instructions & Example

1. Begin your Log wherever you are at 3 a.m. on your Travel Day. Record every PLACE you go, even quick stops on the way to work/school, or after you get home, including walking the dog, biking, or jogging.
2. PLACE NAME and as COMPLETE ADDRESS information as possible.
3. EXACT TIME you ARRIVE at each place.
4. Record the code from the **LIST 1 CODES** (located on the flap of this Log) for "HOW did you GET there?"
5. NUMBER of other people traveling with you (DO NOT INCLUDE YOURSELF).
6. If you traveled in a VEHICLE owned by your HOUSEHOLD, tell us the Make and Model.
7. Where did you park?
8. If you parked, did you have to pay?
9. If you walked or biked, tell us how far.
10. Record ALL the codes that apply from the **LIST 2 CODES** (located on the flap of this Log) for "WHAT did you DO there?"
11. EXACT TIME you LEAVE each place.

	FOR EACH PLACE: Please record the NAME OF THE PLACE you visited and the EXACT ADDRESS or NEAREST MAJOR INTERSECTION CITY and ZIP CODE	3 What TIME did you ARRIVE? *Record exact time*	4 HOW did you GET there? *Use the* **LIST 1 CODES**	5 NUMBER of people traveling with you? *Don't include yourself*	6 IF AUTO/TRUCK/VAN: *Which household VEHICLE? Make & Model*	7 IF AUTO/TRUCK/VAN: *Where did you PARK?*	8 IF AUTO/TRUCK/VAN: *Did you PAY to park?*	9 IF WALK/BIKE: *How FAR did you WALK or BIKE*	10 WHAT did you DO there? *Use the* **LIST 2 CODES**	11 What TIME did you LEAVE? *Record exact time*
PLACE 1	Your location at 3:00 a.m.: ☑ My Home ☐ My School ☐ My Work ☐ Other Place: → *Tell us the name of the place & address below:* Address, City, State Zip									7:11 am/pm
PLACE 2	Next PLACE: ☐ My Home ☐ My School ☐ My Work ☑ Other Place: → *Tell us the name of the place & address below:* Gas station name, Address, City, State Zip	7:16 am/pm	List ONE code only: 1	# w/ you: 1 (Exclude yourself); # of Household members w/ you: 1 (Exclude yourself)	Honda Civic	☑ Didn't park ☐ Parking lot ☐ Parking garage ☐ Street ☐ Driveway/garage ☐ Other: (specify)	☐ Yes ☑ No	#: ☐ Blocks ☐ Miles ☐ Minutes	List ALL codes that apply: 7	7:21 am/pm
PLACE 3	Next PLACE: ☐ My Home ☐ My School ☐ My Work ☑ Other Place: → *Tell us the name of the place & address below:* Name of child's school, Address, City, State Zip	7:26 am/pm	List ONE code only: 1	# w/ you: 1 (Exclude yourself); # of Household members w/ you: 1 (Exclude yourself)	Honda Civic	☑ Didn't park ☐ Parking lot ☐ Parking garage ☐ Street ☐ Driveway/garage ☐ Other: (specify)	☐ Yes ☑ No	#: ☐ Blocks ☐ Miles ☐ Minutes	List ALL codes that apply: 15	7:34 am/pm
PLACE 4	Next PLACE: ☐ My Home ☐ My School ☑ My Work ☐ Other Place: → *Tell us the name of the place & address below:* Name of your workplace, Address, City, State Zip	8:03 am/pm	List ONE code only: 1	# w/ you: 0 (Exclude yourself); # of Household members w/ you: 0 (Exclude yourself)	Honda Civic	☐ Didn't park ☑ Parking lot ☐ Parking garage ☐ Street ☐ Driveway/garage ☐ Other: (specify)	☑ Yes ☐ No	#: 1 ☑ Blocks ☐ Miles ☐ Minutes	List ALL codes that apply: 3	12:01 am/pm

Next, please tell us "WHAT did you DO there?" & "What TIME did you LEAVE?"

Person would continue to record Places 5-10

For assistance, call NuStats toll free at 877-261-4621

LIST 1 CODES: HOW did you GET there?

1 Auto/Truck/Van - Driver
2 Auto/Truck/Van - Passenger
3 Public Bus
4 School Bus
5 Motorcycle/Moped
6 Taxi/Shuttle bus
7 Walk
8 Bike
97 Other *(write code 97 & how you got there)*

LIST 2 CODES: WHAT did you DO there?

At My Home:
1 Personal activities at home
2 Work at home *(for pay)*

At My Work/Volunteer Location:
3 Work for pay *(other than at home)*
4 Volunteer work *(regularly scheduled)*

At My School:
5 School *(junior college, college/university, vocational school)*
6 School *(day care, kindergarten, elementary, middle, high)*

At Other Places:
7 Routine Shopping *(groceries, gas, pick-up fast food, etc.)*
8 Major Shopping - non routine *(clothing, furniture, autos, appliances, etc.)*
9 Personal business *(bank, post office, haircut, dry cleaning, pay bills, etc.)*
10 Medical/dental *(doctor/dentist visits, surgery, physical therapy, etc.)*
11 Eat meal outside of home/Dine in
12 Social/recreational *(visit, entertainment, exercise, outdoor sports)*
13 Civic activities *(vote, community meeting)*
14 Church activities

While Traveling:
15 Pick-up/drop-off someone
16 Change mode of transportation *(get on/off bus or train, park car, etc.)*
17 Loop Trip that begins & ends at same place *(walking dog, jogging, biking, etc.)*

97 **Other** *(write code 97 and specify activity)*

START

Record each PLACE you go, starting with your location at 3:00 a.m. on your travel day and ending with your location at 2:59 a.m. the following day.

(Questions? See the Instructions & Example or call the toll-free hotline at 877-261-4621)

	FOR EACH PLACE: Please record the NAME OF THE PLACE you visited and the EXACT ADDRESS or NEAREST MAJOR INTERSECTION CITY and ZIP CODE	What TIME did you ARRIVE? *Record exact time*	HOW did you GET there? *Use the* **LIST 1 CODES**	NUMBER of other people traveling with you? *Don't include yourself*	**IF AUTO/TRUCK/VAN:** *Which household VEHICLE?* *Make & Model*	*Where did you PARK?*	*Did you PAY to park?*	**IF WALK/ BIKE:** *How FAR did you WALK or BIKE*	WHAT did you DO there? *Use the* **LIST 2 CODES**	What TIME did you LEAVE? *Record exact time*
PLACE 1	Your location at 3:00 a.m.: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*								List ALL codes that apply	____:____ am / pm
PLACE 2	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm
PLACE 3	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm
PLACE 4	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm
PLACE 5	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself))*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm
PLACE 6	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm

Tell us "WHAT did you DO there?" & "What TIME did you LEAVE?"

Continue

CONTINUE

If you have more than 12 places, please record them on a separate piece of paper.

(Questions? See the Instructions & Example or call the toll-free hotline at 877-261-4621)

	FOR EACH PLACE: Please record the NAME OF THE PLACE you visited and the EXACT ADDRESS or NEAREST MAJOR INTERSECTION CITY and ZIP CODE	What TIME did you ARRIVE? *Record exact time*	HOW did you GET there? *Use the* **LIST 1 CODES**	NUMBER of other people traveling with you? *Don't include yourself*	IF AUTO/TRUCK/VAN: *Which household VEHICLE?* *Make & Model*	IF AUTO/TRUCK/VAN: *Where did you PARK?*	IF AUTO/TRUCK/VAN: *Did you PAY to park?*	IF WALK/BIKE: *How FAR did you WALK or BIKE*	WHAT did you DO there? *Use the* **LIST 2 CODES**	What TIME did you LEAVE? *Record exact time*
PLACE 7	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm
PLACE 8	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm
PLACE 9	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm
PLACE 10	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm
PLACE 11	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm
PLACE 12	Next PLACE: ❑ My Home ❑ My School ❑ My Work ❑ Other Place: → *Tell us the name of the place & address below:*	____:____ am / pm	List ONE code only	# w/ you: ____ *(Exclude yourself)* # of Household members w/ you: ____ *(Exclude yourself)*		❑ Didn't park ❑ Parking lot ❑ Parking garage ❑ Street ❑ Driveway/garage ❑ Other: *(specify)*	❑ Yes ❑ No	#: ____ ❑ Blocks ❑ Miles ❑ Minutes	List ALL codes that apply	____:____ am / pm

Appendix H:
CATI Data Retrieval Interview

East Tennessee Travel Survey
Retrieval Questionnaire, version 4

All Travel Days (Mon through Fri) for All Household Members
20% +/- 3% for each day of the week Monday through Friday
Black out dates: Good Friday and Easter Monday
Also need to schedule around Spring Break which will vary by school

Note #1 for Interviewers: Travel information has to be collected for all HH members. A proxy is required for persons age 11 and under. We must attempt to speak directly to persons age 16 and older, however, a proxy for these individuals is acceptable. All data collection must be completed within 10 days of the original travel date or the household is rescheduled/replaced.

Note #2 for Interviewers: A HH is considered complete only if ALL HH members completed retrieval interviews.

Note #3 for Interviewers: If ALL members of the household are unrelated college students, a valid complete is all travel for the main respondent who actually goes to college/univ class on the travel day AND as many of the other HH members as possible.

Introduction
INT02-Hi – this is _____ and I'm calling about the East Tennessee Travel Survey, sponsored by the Tennessee Department of Transportation and the Knoxville Transportation Planning Organization. We recently spoke with [informant] and are calling back now to complete the interview. SCPT0- [CONFIRM WHO YOU'RE SPEAKING WITH] You are [informant's name or initials]. [INDICATE IF TRIP INFORMATION IS BEING PROVIDED BY THE INFORMANT OR BY PROXY.
INFORMANT 1 -------→ IF INFORMANTS AGE IS GREATER THAN 10, GO TO E2, ELSE GO INTRO AND RESCHEDULE FOR WHEN SOMEONE AGE 16+ WILL BE AVAILABLE.
PROXY 2 -------→ If Proxy, indicate the person number that is reporting the trip data.

SCPT1. Last week, we spoke with you about the travel survey and sent you a log to record your travel and activities on [travel day]. I'd like to collect your information now.
First, demographic information (particularly household size, household member characteristics, and household vehicle info) is verified, along with the work and school addresses collected during recruitment.

Process Data Questions
IF NOT PROXY REPORT, ASK:

TYPDY-In general would you say that <ASSN> was a typical day for <YOU> and please also let me know if you were affected by Smartfix40?

IF NEEDED: Smartfix 40 refers to the closure of a short section of I-40 through downtown Knoxville for reconstruction.

TYPPL-Was most of your travel for this day planned in advance or did you change your travel plans as the day progressed?

IF CHANGED TRAVEL, WHATH- what happened that caused the change in plans

Trip Data

CMPLG- Now I'd like to talk about the trips [you/ this person] recorded in the travel log we sent. Did [you/ NAME] complete the travel log? [ASK OF EVERYONE REGARDLESS OF PROXY STATUS]

1 YES [COMPLETED]
2 NO [NOT COMPLETED] → GO TO T3
3 DID NOT RECEIVE MATERIALS → GO TO T3
8 DON'T KNOW → GO TO T3
9 REFUSED → GO TO T3

HVLOG- [if T1=yes] Do you have [your/ this person's] completed log with you now? IF NEEDED: I can wait while you get it.

1 YES
2 NO
9 REFUSED ----------→SAY: Let's continue with the interview anyway. Please try to recall the information as best as you can.

TOTPL- How many total places did [you/ NAME] visit over the course of the travel day?

3
4 MAKE SURE THAT YOU ENTER TOTAL NUMBER OF PLACES VISITED.

NOTE: THE 'ANCHOR" PLACE (PLACE 1) WILL BE ADDED TO THE NUMBER YOU ENTER HERE AUTOMATICALLY.

PTYPE-IF PLACE 1: Okay, where [were you/ was NAME] at 3 am on [ASSN}.
OTHERWISE: Where did [you/ NAME] go next?

1 HOME
2 MY PRIMARY WORKPLACE PROVIDED IN RECRUITMENT
3 MY SCHOOL
4 NEW PLACE (IF OUT OF THE STUDY AREA, SELECT 5)
5 OUT OF THE TRAVEL STUDY AREA (outside the state)

IF OUT OF AREA, OBTAIN CITY AND STATE _____
IF NEW PLACE, OBTAIN _____

PSTA1- What state is that in?

5 PCNT1- In what county was that?

CITY-What city is that in?

ADDR: what is the street address there?

ASK IF THERE IS AN APT/SUITE NUMBER AND INCLUDE IT IN ADDRESS

IF NEEDED: OBTAIN 2 CROSS STREETS IF FULL ADDRESS IS NOT KNOWN.

RECORD FULL STREET ADDRESS
REMEMBER QUADRANT AND DIRECTIONAL
RECORD PO BOX AS DK/RF AS THEY ARE NOT GEO-CODABLE.

PLZIP-What is the zip code there?
CROSS STREET: Can you tell me the name of cross streets closest to that location?

PROBE FOR THIS, BUT IT CAN BE BLANK.

LANDMARK: Can you tell me a nearby landmark that can be found easily on a map?

PROBE FOR THIS, BUT IT CAN BE BLANK.

ASK If PLACE > 1- ELSE SKIP

CHCK-Did [you/NAME] make any stops along your travel to [ptype] (this place), such as a quick errand, to stop for fuel, grab some food, or to pick up drop off a friend or family member?

1 Yes – Flag a counter variable ADDCHEK1 then take interviewer back to collect unreported trip info at the front of this roster.
2 No – CONTINUE COLLECTING CURRENT TRIP

ARRTM- What time did [you/ NAME] get there? MILITARY TIME

T7 TRIP DURATION CALCULATED

MODE- How did [you/ NAME] get to this place?
1 Auto/Van/ Truck - Driver
2 Auto/van/truck - Passenger
3 Transit - Public bus (KAT – KNOXVILLE AREA TRANSIT, KTRANS (OLD NAME), SUNTIME TROLLEY, DIAL-A-RIDE, CAC OR ETHRA)
4 Transit - School bus
5 Motorcycle /Moped
6 Taxi/ Shuttle bus
7 Walk
8 Bike
97 Other, SPECIFY
99 DK/RF

FOR ALL TRIPS, ASK
PARTY How many other traveled with you? NOT INCLUDING THE RESPONDENT
HHMEM-[IF T9 >0] Of these, how many were household members? DO NOT INCLUDE RESPONDENT
PERTP-[IF T10>0] Who were the household members (enter PERNO)
T12 COMPUTE NON-HH MEMBERS

TRAVEL MODE FOLLOW-UPS

IF AUTO:
VHTNO-Which vehicle did [you/ NAME] use?
ENTER HH VEH NUMBER OR 97 FOR NON-HH VEHICLE

PARK-Where did [you/ NAME] park? [IF PLACE IS NOT HOME]
1 DIDN'T PARK
2 PARKING LOT
3 PARKING GARAGE
4 STREET
5 DRIVEWAY/ GARAGE

7 OTHER (SPECIFY)
8 DON'T KNOW
9 REFUSED

PFEEW-[IF A2>1] Did [you/ NAME] pay to park?
1-YES
2-NO
9-REFUSED

IF MODE = (AUTO AND PARKED), OR PUBLIC BUS, OR WALK, OR BIKE:
HOWF-How far did [you/ NAME] [walk/ bike]? ANY WAY OF ANSWERING IS FINE – JUST OBTAIN QUANTITY

HOWFU-
ALREADY AT DESTINATION SO NO WALKING NEEDED
___ blocks
___ miles
___ minutes

Other (specify)

IF TRANSIT:

TRANS- Did [you/ NAME] have a personal automobile available to you when you made this trip by bus?
1YES
2NO
9 REFUSED

TRIP DATA (CONT)

TPUR1-What was [your/ NAME's] main purpose for traveling there?
1 Personal activities at home
2 Work at home (for pay)
3 Work for pay (other than at home)
4 Volunteer work (regularly scheduled)
5 School - Junior college, college/university, vocational school
6 School - Day care, kindergarten, elementary, middle, high)
7 Shopping - incidental (gas, 1 bag of groceries, supplies)
8 Shopping - major (clothing, furniture, autos, appliances, more than 1 bag of groceries, etc)
9 Personal business (bank, post office, haircut, dry cleaning, pay bills, dentist)
10 Medical/ Dental (doctor/dentist visits, surgery, physical therapy, etc)
11 Eat meal outside of home
12 Social/recreational (visit, entertainment, exercise, outdoor sports)
13 Civic activities (vote, community meeting)
14 Church activities
15 Pick-up/drop-off passenger at work
16 Pick-up/drop-off passenger at school
17 Pick-up/drop-off passenger at other place
18 Change mode of transportation (get on/off bus or train, park car, etc.)
19 Loop Trip that begins and ends at the same place
97 Other activity (SPECIFY)

TPUR2-And what other activities did [you/ NAME] do there?
0 No other activities
SAME LIST ABOVE

DEPTM IF LAST PLACE OF THE DAY, ENTER 0259 OTHERWISE: What time did [you/ NAME] leave for the next place? ENTER IN MILITARY TIME

ASK If DEP_TIME = 259, ELSE SKIP

LASTR- Did [you/ NAME] make any additional trips after you were settled in for the evening, such as to run a quick errand, grocery shopping, video rental, grab a bite to eat, or to pick up drop off another person?
1 Yes – Flag a counter variable ADDCHEK2 - GO BACK TO CHANGE DEPARTURE TIME AND COLLECT UNREPORTED TRIPS
2 No – CONTINUE TO NEXT PERSON

VALIDATION DATA

IF REPORTED NO TRAVEL
T12. So,[you/ NAME] made no trips, including for work or school?
TRUE: Why not?
FALSE OBTAIN TRAVEL

AT END OF SURVEY, CHECK TO SEE IF ALL HH VEHICLES WERE USED, IF NOT:
CHKV1- CHKV8 Did anyone drive the [VEHICLE YEAR, MAKE, MODEL] on TRAVEL DAY?
YES
NO-Why Not
9 REFUSED

PILOT QUESTIONS

AT THE CONCLUSION OF THE RETRIEVAL INTERVIEW, WE WILL ASK THE MAIN RESPONDENT FOR EACH HOUSEHOLD THE FOLLOWING QUESTIONS:

I have a few final questions about this interview we just conducted to aide transportation officials in making decisions about this study.

Did you use your travel log to record your travel?

If so, did you use it during the course of the travel day or after you had made all your trips for the day?

Did anything confuse you about the log?

What influenced you to participate in the study? Was it the details we provided at the start of the recruitment interview, a general concern about transportation in the county, or something else?

Because the travel times are so important to us, we'd like to know how you and your household recorded your times - did you always look at the same time source (watch or the car clock) or did you sit down at the end of the day and estimate times? Did you record times or just the fact that the trip took 5 min?

Thank you again for your participation in this important study. Have a good day/evening.

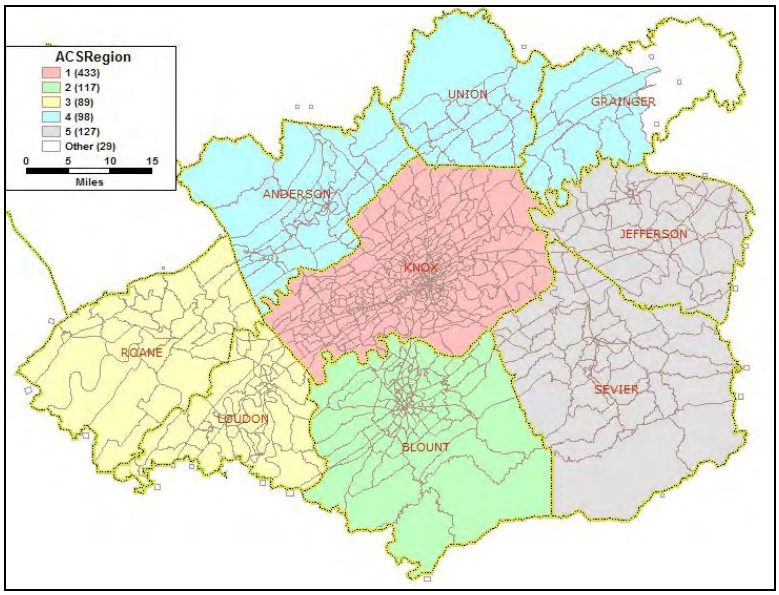
Appendix I: Weighting and Combining Surveys

The following pages, by Bernardin-Lochmueller and Associates, document the development of weights to create a single combined data set from the two household surveys conducted in 2000-01 and 2008. This data set will serve as the basis of model estimation, although some additional information from the KATS onboard ridership survey may also be incorporated, if possible, particularly for the development of mode choice models.

The approach adopted here was to first develop weights for the 2008 survey so that it better reflects the population of the region circa 2008 and then develop a second set of weights for the purpose of combining this new data with the earlier 2000-01 data, retaining the weights originally developed for that data. The advantage of this approach is that it allows the consistent use of either survey alone as well as combined. Therefore, following this approach, two types of weights were developed, demographic weights for the 2008 data and geographic/temporal weights for either using the 2008 data alone or for combining both datasets.

Demographic and geographic weights were developed for both households and persons. Trip weights are simply derived by applying the person weights of the trip-makers and normalizing so that the total number of trips is not distorted. Demographic weights will be presented first for both households and persons, followed by the geographic weights for households and for persons.

Figure I-1:
ACS Region Map



Demographic Weights for the 2008 Survey

The demographic weights for the 2008 survey were developed using the same control variables and a similar process as was used in the development of the weights for the 2000-01 survey. For the earlier survey, decennial census data was available for the development of control totals; however, the U.S. Census Bureau's 2006 American Community Survey (ACS) was the best data available for the development of control totals for the 2008 survey. While the ACS is a reasonable source for control

totals, it has a larger sampling error than the decennial census, and given the two years between the available ACS data and the survey period, it is not clear how closely the 2008 survey data should conform to the 2006 ACS data. For this reason, the demographics of the weighted survey were not forced to converge as closely as possible to those in the ACS but were allowed to take intermediate values between the ACS and the un-weighted household survey.

Due to the limited geographic resolution of the ACS data, demographics weights could not be developed for each county. Instead, demographic weights were developed for each of five sub-regions of the model area, displayed in the map above. The geographic weights are also based on these regions.

The table below compares the 2006 ACS, the un-weighted 2008 household survey and the weighted 2008 household survey across several demographic variables. Each of the variables: age, household size, household vehicles, household workers, household students, household income and household daily trips; is a sample mean, and they are displayed together with t-statistics corresponding to difference of means tests between them.

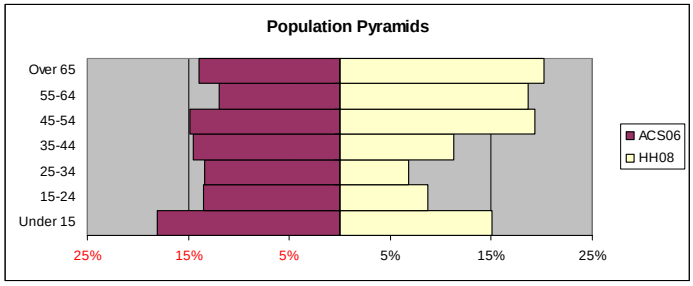
Table I-2:
Comparison of Demographic Variables

		Age	HH Size	Vehicles	Workers	Students	Income	Trips
Region 1	ACS 2006	**37.8**	**2.29**	**1.85**	**1.25**	**0.61**	**60.00**	
	HH 2008	**45.3**	**2.32**	**2.18**	**1.21**	**0.54**	**69.41**	**8.82**
	t vs. ACS	*8.73*	*0.37*	*3.67*	*-0.73*	*-1.38*	*3.27*	
	Weighted HH 2008	**39.0**	**2.35**	**2.01**	**1.20**	**0.62**	**65.16**	**9.04**
	t vs. ACS	*1.42*	*0.86*	*1.80*	*-0.97*	*0.17*	*1.85*	
	t vs. Unweighted	*-5.37*	*0.36*	*-1.84*	*-0.16*	*1.14*	*-1.15*	*0.41*
Region 2	ACS 2006	**39.1**	**2.51**	**2.07**	**1.28**	**0.54**	**53.60**	
	HH 2008	**45.2**	**2.47**	**2.40**	**1.25**	**0.56**	**70.77**	**8.95**
	t vs. ACS	*3.90*	*-0.34*	*1.62*	*-0.22*	*0.14*	*3.62*	
	Weighted HH 2008	**40.8**	**2.42**	**2.27**	**1.23**	**0.57**	**68.64**	**8.68**
	t vs. ACS	*1.08*	*-0.68*	*1.06*	*-0.39*	*0.25*	*3.23*	
	t vs. Unweighted	*-2.08*	*-0.27*	*-0.63*	*-0.12*	*0.08*	*-0.35*	*-0.29*
Region 3	ACS 2006	**40.1**	**2.46**	**2.10**	**1.21**	**0.49**	**51.76**	
	HH 2008	**46.0**	**2.33**	**2.35**	**1.06**	**0.43**	**69.03**	**8.91**
	t vs. ACS	*4.65*	*-1.87*	*1.23*	*-2.64*	*-1.05*	*5.03*	
	Weighted HH 2008	**41.7**	**2.44**	**2.27**	**1.13**	**0.51**	**67.28**	**9.31**
	t vs. ACS	*1.23*	*-0.34*	*0.82*	*-1.43*	*0.36*	*4.56*	
	t vs. Unweighted	*-3.55*	*1.12*	*-0.86*	*0.94*	*1.18*	*-0.50*	*0.71*
Region 4	ACS 2006	**39.5**	**2.49**	**1.92**	**1.14**	**0.54**	**49.25**	
	HH 2008	**44.1**	**2.38**	**2.22**	**1.10**	**0.56**	**59.90**	**8.38**
	t vs. ACS	*4.31*	*-1.10*	*0.67*	*-0.27*	*0.09*	*2.54*	
	Weighted HH 2008	**40.7**	**2.43**	**2.09**	**1.12**	**0.61**	**57.25**	**8.39**
	t vs. ACS	*1.11*	*-0.60*	*0.38*	*-0.15*	*0.33*	*1.93*	
	t vs. Unweighted	*-2.78*	*-0.60*	*0.38*	*-0.15*	*0.33*	*1.93*	*0.00*
Region 5	ACS 2006	**38.9**	**2.51**	**2.07**	**1.33**	**0.53**	**49.60**	
	HH 2008	**44.8**	**2.38**	**2.36**	**1.28**	**0.49**	**63.58**	**8.12**
	t vs. ACS	*6.36*	*-1.55*	*1.97*	*-0.98*	*-0.63*	*4.73*	
	Weighted HH 2008	**40.2**	**2.51**	**2.19**	**1.26**	**0.59**	**60.35**	**8.28**
	t vs. ACS	*1.38*	*0.02*	*0.82*	*-1.29*	*0.97*	*3.72*	
	t vs. Unweighted	*-4.07*	*1.41*	*-1.95*	*-0.27*	*1.43*	*-0.98*	*0.31*

T statistic values greater than about 2.0 suggest that the difference between the two means compared is statistically significant; these values are highlighted in red in the table. The ACS and the household survey are in reasonably good agreement regarding the number of persons, households, workers and students. However, there are some discrepancies regarding age, income and vehicle ownership. If the ACS survey can be assumed to be reasonably accurate regarding these variables, the household survey appears to have slightly over-sampled elderly and more affluent households. It is quite plausible that poorer households and households with more children may have had lower response rates in the household survey.

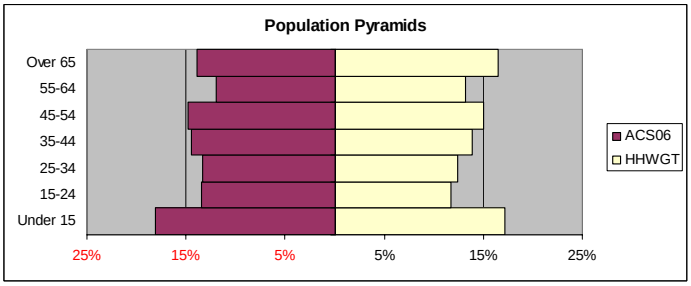
It is clear that weights must be developed to correct for the distribution of persons ages, and this was adopted as one of the control variables in developing demographic weights. The distribution of ages within the travel survey, compared to the ACS in the figure below, is not plausible. It is not possible, for instance, that there are so few 25- to 34-year-olds. It is quite possible, on the other hand, that people in this age range were less likely to participate in the survey. The increased trip rates in the weighted survey are due to the correction for under-sampling young to middle-aged adults in the household survey.

Figure I-3:
Population Pyramids – ACS 2006 and Un-weighted HHS 2008



Weights were developed also using household income as a control variable. However, these weights produced significant distortions in the other variables, particularly household size, workers and students. There are a variety of possible explanations for this. Either the ACS or household surveys may be in error, or it is also possible that household income information from the two surveys may not be comparable for other reasons (ambiguity between gross and net income, etc.). Therefore, the distribution of households by size and vehicle ownership was used together with the distribution of person ages to develop demographic weights. These provide consistency, as they are the same control variables used in developing weights for the 2000-01 survey and produced reasonable resulting weights.

Figure I-4:
Population Pyramids – ACS 2006 and Weighted HHS 2008



The weighted survey agrees very closely with both the ACS and the un-weighted survey. It only differs significantly from either with regard to age and household income. With regard to age, the figure above illustrates that the weighted survey conforms closely to the ACS data and is different than the un-weighted survey data. This is reasonable, however, given that the implausible distribution of ages in the un-weighted survey noted earlier. With regard to household income, the weighted survey represents

mean household incomes which are greater than reported in the ACS and less than reported in the un-weighted survey. The weighted survey agrees much better with the two other estimates than they do with each other, and for some regions is not statistically different from either.

The household weights were developed from the person weights and are approximately equal to the sum of the person weights of their members. The small discrepancy is due to normalization to preserve both the total number of households and persons in each region.

The person weights were developed simultaneously through iterative proportional fitting where the seed matrix was the un-weighted survey data and the marginal distributions were taken from the ACS for age and a weighted average of the ACS and the un-weighted travel survey for household size and vehicle ownership. Due to the nature of this process there are as many different person weights as combinations of control attributes. Hence, a 25- to 34-year-old in a 4 person, 3 vehicle household receives a different weight than either a 25- to 34-year-old in a 4 person, 2 vehicle household or a 35- to 44-year-old in a 4 person, 3 vehicle household. Even more, there are approximately as many household weights as combinations of person weights. Therefore, it is impractical to report each weight. Instead, averages and other characteristics of the distribution of weights are presented. Since all weights are normalized, their average over all categories is always one. However, averages for certain combinations of characteristics can help give a sense of the distribution.

Table I-5:
Average Household Weights

	Region	1 person, 0 vehicles	1 person, 1 vehicle	1 person, 2 vehicles	1 person, 3 vehicles	1 person, 4+ vehicles	2 person, 0 vehicles	2 person, 1 vehicle	2 person, 2 vehicles	2 person, 3 vehicles	2 person, 4+ vehicles	3 person, 0 vehicles	3 person, 1 vehicle	3 person, 2 vehicles	3 person, 3 vehicles	3 person, 4+ vehicles	4+ person, 0 vehicles	4+ person, 1 vehicle	4+ person, 2 vehicles	4+ person, 3 vehicles	4+ person, 4+ vehicles
ACS 2006	1	4.6%	21.1%	4.4%	0.6%	0.2%	0.7%	7.5%	20.1%	4.9%	1.2%	0.4%	2.9%	7.0%	4.9%	1.4%	0.5%	2.1%	8.8%	3.4%	3.3%
	2	3.7%	15.8%	4.0%	1.9%	0.7%	0.6%	5.7%	23.7%	8.4%	1.8%	0.4%	4.3%	5.1%	4.8%	2.1%	0.2%	1.1%	7.7%	5.4%	2.8%
	3	3.5%	14.3%	4.2%	1.4%	0.1%	0.8%	7.7%	22.1%	6.4%	3.1%	0.1%	1.5%	8.2%	5.9%	1.7%	0.3%	1.2%	7.8%	5.0%	4.8%
	4	5.9%	16.6%	5.8%	1.3%	0.3%	1.4%	7.9%	16.4%	7.2%	2.9%	0.0%	3.3%	7.5%	2.9%	1.6%	0.6%	3.2%	6.7%	4.6%	4.0%
	5	2.3%	16.4%	4.2%	0.3%	0.0%	1.0%	5.6%	21.5%	7.3%	1.6%	0.5%	2.2%	7.3%	5.2%	1.7%	0.0%	2.6%	9.8%	6.6%	3.9%
Un-weighted HHS 2008	1	1.9%	20.4%	5.1%	1.3%	0.0%	0.0%	3.2%	22.4%	7.0%	2.9%	0.0%	1.0%	7.7%	6.1%	2.6%	0.0%	0.3%	6.7%	6.7%	4.8%
	2	2.3%	12.5%	1.1%	2.3%	0.0%	1.1%	8.0%	23.9%	8.0%	2.3%	0.0%	0.0%	4.5%	5.7%	8.0%	0.0%	0.0%	6.8%	9.1%	4.5%
	3	1.5%	16.8%	5.1%	1.2%	1.2%	0.0%	3.3%	24.6%	8.7%	3.3%	0.0%	0.9%	6.6%	5.4%	4.8%	0.0%	0.0%	7.2%	4.5%	5.1%
	4	1.8%	19.7%	4.5%	2.4%	1.2%	0.0%	3.9%	19.4%	8.7%	3.3%	0.0%	1.8%	4.5%	6.9%	2.7%	0.0%	1.8%	7.8%	6.3%	3.6%
	5	0.3%	16.1%	5.2%	1.2%	0.3%	0.3%	3.0%	21.2%	11.2%	5.2%	0.0%	1.2%	6.4%	7.3%	3.9%	0.0%	0.3%	7.9%	5.2%	3.9%
Average Weights	1	*1.65*	*0.99*	*0.91*	*0.66*	*x*	*x*	*1.75*	*0.93*	*0.77*	*0.60*	*x*	*2.32*	*1.04*	*0.91*	*0.76*	*x*	*4.73*	*1.32*	*0.76*	*0.88*
	2	*1.28*	*1.15*	*2.29*	*0.96*	*x*	*0.63*	*0.77*	*1.00*	*1.02*	*1.05*	*x*	*x*	*1.27*	*0.99*	*0.61*	*x*	*x*	*1.23*	*0.88*	*0.89*
	3	*1.70*	*0.88*	*0.84*	*1.03*	*0.39*	*x*	*1.76*	*0.89*	*0.83*	*1.02*	*x*	*1.56*	*1.27*	*1.17*	*0.65*	*x*	*x*	*1.19*	*1.19*	*1.10*
	4	*2.32*	*0.87*	*1.15*	*0.68*	*0.53*	*x*	*1.59*	*0.89*	*0.87*	*0.90*	*x*	*1.70*	*1.54*	*0.68*	*0.80*	*x*	*1.63*	*1.01*	*0.91*	*1.18*
	5	*4.45*	*0.98*	*0.83*	*0.46*	*0.32*	*2.25*	*1.50*	*0.96*	*0.73*	*0.53*	*x*	*1.59*	*1.18*	*0.91*	*0.72*	*x*	*5.11*	*1.26*	*1.28*	*1.12*
Weighted HHS 2008	1	3.2%	20.3%	4.7%	0.8%	0.0%	0.0%	5.6%	20.8%	5.4%	1.7%	0.0%	2.2%	8.0%	5.6%	1.9%	0.0%	1.5%	8.9%	5.1%	4.2%
	2	2.9%	14.3%	2.6%	2.2%	0.0%	0.7%	6.2%	23.9%	8.1%	2.4%	0.0%	0.0%	5.8%	5.6%	4.9%	0.0%	0.0%	8.4%	8.0%	4.0%
	3	2.5%	14.7%	4.3%	1.2%	0.5%	0.0%	5.8%	21.8%	7.2%	3.3%	0.0%	1.4%	8.3%	6.3%	3.1%	0.0%	0.0%	8.5%	5.4%	5.6%
	4	4.2%	17.1%	5.1%	1.6%	0.6%	0.0%	6.2%	17.2%	7.6%	3.0%	0.0%	3.1%	6.9%	4.6%	2.2%	0.0%	2.9%	7.8%	5.7%	4.2%
	5	1.3%	15.8%	4.3%	0.6%	0.1%	0.7%	4.5%	20.3%	8.2%	2.7%	0.0%	1.9%	7.5%	6.6%	2.8%	0.0%	1.5%	9.9%	6.6%	4.4%

The average household weights for combinations of household size and vehicle ownership are displayed in the table above, together with the percentage of households in each region in each category in the ACS 2006, the un-weighted and weighted 2008 household survey. The maximum household weight was 5.11 and the minimum was 0.32, but 95% of the weights fell in the range from 0.53 to 2.03 and 75% fell in the range from 0.69 to 1.40.

Figure I-6:
Average Person Weights

	Region	Under 15	15-24	25-34	35-44	45-54	55-64	Over 65	Refused
ACS 2006	1	18.3%	14.8%	13.2%	14.6%	15.0%	11.5%	12.7%	0.0%
	2	17.7%	12.8%	13.9%	14.2%	14.5%	12.4%	14.5%	0.0%
	3	17.2%	12.0%	12.8%	14.5%	14.8%	12.6%	16.2%	0.0%
	4	18.6%	11.6%	12.4%	14.3%	15.4%	12.2%	15.5%	0.0%
	5	17.9%	12.6%	14.3%	14.3%	14.2%	12.1%	14.6%	0.0%
Unweighted HHS 2008	1	13.1%	10.2%	6.8%	10.2%	20.8%	19.6%	18.8%	0.6%
	2	14.3%	7.8%	6.9%	14.7%	18.9%	16.6%	20.7%	0.0%
	3	14.8%	7.7%	7.6%	9.5%	18.1%	17.4%	23.0%	1.9%
	4	16.6%	9.0%	6.3%	10.9%	18.1%	17.2%	19.8%	2.0%
	5	15.2%	7.8%	6.4%	13.0%	19.5%	20.3%	17.8%	0.1%
Average Weights	1	*1.33*	*1.34*	*1.87*	*1.38*	*0.73*	*0.63*	*0.75*	*0.75*
	2	*1.17*	*1.44*	*1.85*	*0.96*	*0.76*	*0.84*	*0.80*	*x*
	3	*1.08*	*1.38*	*1.56*	*1.43*	*0.82*	*0.77*	*0.78*	*0.99*
	4	*1.05*	*1.19*	*1.85*	*1.23*	*0.84*	*0.74*	*0.85*	*0.93*
	5	*1.15*	*1.48*	*2.02*	*1.07*	*0.75*	*0.66*	*0.90*	*1.21*
Weighted HHS 2008	1	17.4%	13.7%	12.6%	14.1%	15.2%	12.4%	14.2%	0.4%
	2	16.8%	11.3%	12.8%	14.2%	14.4%	13.9%	16.6%	0.0%
	3	15.9%	10.7%	11.9%	13.6%	14.8%	13.4%	17.9%	1.9%
	4	17.4%	10.8%	11.6%	13.5%	15.2%	12.7%	16.8%	1.9%
	5	17.4%	11.5%	12.9%	13.9%	14.6%	13.4%	16.1%	0.2%

The average person weights for each age group are displayed in the table above, together with the percentage of persons in each age group in the ACS 2006, the un-weighted and weighted 2008 household survey. The maximum person weight was 6.96 and the minimum was 0.30, but 95% of the weights fell in the range from 0.44 to 2.07 and 75% fell in the range from 0.62 to 1.45.

Geographic Weights for the 2008 Survey and Combined Data Set

The 2000-01 survey covered only Knox and Blount counties, while the 2008 survey over-sampled the other counties in the model area. Since the household survey samples were not drawn randomly over the model area, they must also be corrected for this fact so that they represent the actual geographic distribution of population within the model area. Further, in order to combine the data sets, for Knox and Blount counties, for which there is both 2000-01 and 2008 data, it must be decided whether to treat all observations equally, regardless of age, or whether to weight the more recent 2008 observations more heavily. The weights presented here reflect a discounting of the older 2000-01 observations for Knox and Blount counties, counting each 2008 observation as 1.5 observations in the older data.

Table I-7:
Geographic Weights for Households

	2000			2008	Combined		ACS 2006		Final Weights		
	Unweighted	Weighted	Discounted		HH	Pct	HH	Pct	2000-01	2008	2008 Only
Region 1:	1,158	1,208	806	313	1,119	46.1%	173,393	50.2%	*0.8676*	*1.3007*	*2.2146*
Region 2:	380	331	221	88	309	12.7%	46,551	13.5%	*0.8444*	*1.2659*	*2.1147*
Region 3:				334	334	13.8%	37,209	10.8%		*0.9347*	*0.4454*
Region 4:				335	335	13.8%	41,859	12.1%		*1.0484*	*0.4995*
Region 5:				330	330	13.6%	51,190	14.8%		*1.3015*	*0.6201*
	1,538	1,538	1,026	1,400	2,426	100.0%	345,304	100.0%			

Since the distribution of households and of persons is not exactly identical, it is necessary to develop geographic weights for both. Table I-7 above and Table I-8 below present the geographic weights for either combining the two surveys or for using the 2008 survey alone.

Table I-8:
Geographic Weights for Persons

	2000			2008	Combined		ACS 2006		Final Weights		
	Unweighted	Weighted	Discounted		HH	Pct	HH	Pct	2000-01	2008	2008 Only
Region 1:	2,808	2,919	1,947	725	2,672	46.2%	411,967	48.7%	*0.8538*	*1.2800*	*2.2156*
Region 2:	919	808	539	217	756	13.1%	118,186	14.0%	*0.8654*	*1.2975*	*2.1236*
Region 3:				778	778	13.4%	92,584	10.9%		*0.9879*	*0.4640*
Region 4:				796	796	13.8%	93,117	11.0%		*0.9711*	*0.4561*
Region 5:				785	785	13.6%	130,754	15.4%		*1.3827*	*0.6495*
	3,727	3,727	2,486	3,301	5,787	100.0%	846,608	100.0%			