The Economic Demography of Passenger Intermodal Transportation: Opportunities and Challenges

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ABSTRACT

The research on intermodal transportation is vast. However, most efforts have focused on freight transportation. There is much less research on intermodal passenger transportation—largely due to lack of a comprehensive dataset for effectively studying it [1]. It is essential to understand passenger uses of the intermodal transportation system because passengers are the biggest users of transportation systems, and passenger benefits are one of the important factors, if not the most important factor, in transportation planning and decision-making. This research examines the geographic, demographic, and socioeconomic variations of passenger intermodal transportation usage by analyzing the 2009 National Household Travel Survey data. This study presents descriptive statistics of long and short trips, mode types, and trip purposes, and explores the relationship between different intermodal measures and geographic, demographic and socioeconomic factors. Results indicate significant differences in passenger intermodal transportation usage by age, gender, race/ethnicity, educational attainment, employment, income, and metro status. Decision-makers, transportation planners, and the public can use these insights to better understand and promote efficient passenger intermodal transportation systems.

Key words: Intermodal, multimodal, transportation, passenger transportation integration, travel modes, trip purposes, 2009 NHTS, demographics, inequality

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Intermodal transportation involves transportation of passengers or freight by more than one transportation mode during a single trip through efficient connection and coordination [1]. Though related to multimodal transportation, which focuses on passenger's choice among available modes of transportation, intermodal transportation gives priority to the efficiency of the transportation. Service providers try to offer the quickest and cheapest services, which include different modes of transportation in a single trip [3]. The intermodal transportation service comes in a single package from the beginning of travel to its end. This approach includes the vision of a single ticket for a passenger and his or her baggage, which is collected at the origin and given back at the final destination [4].

The development of intermodal transportation is a complex, multi-dimensional process that involves many sectors (public, private, state and federal), as well as interdisciplinary expertise in architecture, urban development, infrastructure planning, and traffic engineering [3]. In the United States, development of intermodal transportation systems is not equal between passengers and freight. Much of the development has focused on freight, largely due to the involvement of the private sector, while intermodal passenger transportation systems are less developed and lack systematic planning [1][5]. The lack of systematic integration discourages people from taking full advantage of an intermodal system, which could be improved by efficient coordination and connection among existing passenger systems.

Little is known about the demographics, socioeconomics, and geography of intermodal transportation systems and their users. This research fills the gap in the literature by using the 2009 National Household Travel Survey (NHTS) data to examine the differences in passenger intermodal transportation usage by age, gender, race/ethnicity, educational attainment, employment, income, and metro status. Decision-makers, transportation planners, and the public can use the results to promote efficient passenger intermodal transportation systems.

OBJECTIVE

The objective of this research is to understand the demographic and socioeconomic differences of passenger intermodal transportation usages in the United States using the 2009 National Household Travel Survey (NHTS). Specifically, this research aims to investigate: 1) The geographic differences between urban and rural areas in passenger intermodal transportation; 2) The demographic differences of passenger intermodal transportation usage by age, gender, and race/ethnicity; and 3) The socioeconomic differences of passenger intermodal transportation usage by income, educational attainment, and employment status.

SCOPE

Intermodal transportation research involves studies of the modes of transportation used to reach destinations, and connectivity of these travel modes. This study focuses on the multiple modes of transportation used by travelers to reach their destinations. Understanding passengers' use of multiple modes of transportation is necessary before studying the connectivity of travel modes so that clear understanding of the available means of arriving at a destination are understood. Our definition of intermodal passenger transportation is intentionally broad, allowing for the inclusion of multiple travel modes (e.g., walking) that may be excluded in studies of freight intermodalism and connectivity.

Our analyses of differences in passenger intermodal transportation uses fall into the domains of demography, sociology, and geography. We conduct our analyses from a social science approach, rather than a civil engineering approach. Below we provide a comprehensive review of the literature on passenger intermodal transportation from the disciplines of demography, sociology, and geography. This literature review largely shapes the research design.

Geographic Inequality

In the United States, rural and urban areas show some similarities and differences on the travel mobility and behaviors. Car ownership is almost universal. Almost all households in rural and urban areas have at least one car [8]. The private vehicle is the most widely used mode of travel for all purposes; and, it provides smooth, flexible and convenient rural and urban mobility [8, 9]. In both rural and urban areas, the rate of car ownership increases along with the income level [8]. However, the car-ownership gap between poor and non-poor in urban areas is larger, probably because of accessibility to public transport services and more walkable distances. Public transportation services are almost unavailable in rural areas [8].

In urban areas, over the past four decades, the reliance of Americans on private cars for all-purpose travel has increased, while reliance on public transit and walking has declined [9]. However, trip purpose can influence the mode of transportation. For example, single occupant

vehicles (SOV) and public transit (especially rail transit) are used more for work-trips. High occupant vehicles (HOV), which have two or more passenger seats, are used more for non-work trips such as going shopping, recreational trips, or going to school. Similarly, non-motorized modes of transportation, like walking and bicycling, are used for social and recreational trips [9].

Urban dwellers with different income levels show different travel behavior, particularly in the number of trips they take and distance of the trips they make. Those whose income is less than $20,000 a year take fewer and shorter trips per day compared to those whose income is $100,000 or more. This indicates that urban low-income householders cannot afford transportation to reach destinations that they desire. Access to places that meet their medical, educational, and recreational needs may be difficult to obtain, impacting the quality of life of low-income households [9, 10].

In rural areas, all income groups are dependent on private cars for their trips [8]. Longer trip distances between residences and service centers, and no public transportation services can hinder the mobility of rural people [8]. Surprisingly, poor people and elderly people above 85, who are expected to be the least mobile in urban areas, travel more in rural areas. Dispersed destinations and longer trip distances necessitate their travel [8].

In urban areas, the relationship between income and travel behavior is indirect. Income influences car ownership, and that determines model choice. According to Pucher and Renne [9], in urban areas, the use of public transit drops sharply when a household owns a car. Similarly, bike and taxi use also decreases [9]. In urban areas, poor people walk twice as much those who are not poor; while in the rural areas, people of all income levels walk similar distances [8, 11].

In urban areas, neighborhood design affects the degree of vehicle use by the residents. Residents in transit-oriented neighborhoods drive less and walk or bicycle more than in the automobile-oriented neighborhoods [12]. Traditional neighborhoods, characterized by diverse housing, mixed land use, pedestrian connectivity and convenient transit access, are associated with low automobile ownership and favor alternative modes of transportation such as walking and public transit [13].

Similarly, Hwang and Giuliano [14] summarize the literature on ridesharing in the urban areas and rapid employment growth. Large employment sites, good transit access, restricted parking, and long commutes encourage ride sharing, whereas multiple employee sites, poor transit access, plentiful or free parking, and short commutes discourage ridesharing [14]. Ridesharing is also influenced by sex. According to Pucher and Renne [9], though urban men and women are similarly dependent on private cars, women carpool more often and bike less. In both rural and urban areas, there is not much difference in the use of private cars by race or ethnicity [8, 9, 15].

There are clear distinctions between urban and rural mobility behaviors, which are sometimes influenced by different social and economic factors. These factors may also affect behaviors if engaged in an intermodal passenger transportation system.

Demographic Inequality

Recently, the use of both private and public modes of transportation has increased considerably among Americans [16]. Transportation mode is linked to ownership of a vehicle, which is partly determined by socioeconomic status [9, 15]. The use of one transportation mode or many modes is associated with several factors including socioeconomic status [9, 15], availability of public transportation [6, 11, 17], and neighborhood design [12, 13]. Demographic features, such as race and ethnicity, gender, and aging also influence the choice of transportation modes.

Race and Ethnicity

Many researchers have demonstrated the association between race or ethnicity and travel behaviors. Chu et al. [18] argues that minorities and low-income people use public transportation much more than Whites for non-work travel. Blacks use public transportation most frequently. However, travel by private vehicle is the dominant mode of transportation for all races and ethnic groups for non-work travel. Giuliano [15] believes that our understanding of travel behavior is heavily influenced by the White population, as it comprises three-fourths of the U.S. population. If we do not take race and ethnicity clearly into account during the analysis, White's behaviors may conceal the behavior of minorities.

Racial or ethnic inequality in access to transportation modes can influence access to economic opportunities, and affect the quality of life [16]. Whites have more access to different modes of transportation, which enables greater access to employment opportunities. Walking and biking behavior differs by race and ethnicity, and by gender [8, 9, 15][19]. The time and distance that Blacks walk is longer than Whites and Asians; and males walk more than females. Hispanics and Whites bike at similar rates, and more often than Blacks, though the biking purpose is different. Whites bike for recreation, while Hispanics bikes to work. Differential ownership of private vehicles also contributes to the unequal economic outcomes. Access to a car is very important for job searching and employment stability [20]. According to Bohon, Stamps and Atiles [10] the combined effect of less car ownership with less access to the alternative modes of transportation severely affect minorities and working class populations in obtaining work and personal advancement. In urban areas, minorities rely more on public transit than Whites

Gender

Women's travel has changed remarkably in the last three decades [22]. Women used to travel shorter distances than men, but current travel patterns of women look more like men's. Recently, the mobility of women has increased [21]. Women are making more trips and cover more miles than they did in the past. Increased participation of women in the labor force drastically enhanced women's work-related travel, though they still cover fewer miles than men. The travel patterns of women are more complicated than men's [21]. Women most frequently travel by private car, and make more stops on commutes to and from work than men, irrespective of family structure and size. This may be due to stops to run household errands. Fixed route public transportation may not be as attractive to women who need flexibility in their commute for these stops.

The travel patterns of women are influenced by income, race and ethnicity and suburbanization [22]. Traditional travel analyses gave priority to income as a predictor of behavior and use of cars, and used household-level analyses, based on assumptions that men and women make similar travel decisions. However, household income does not explain women's rising use of cars. In 1990 in all metropolitan areas, women in poor households were less likely to use

alternatives to the car for work trip than men. Both men and women were more likely to drive alone as their incomes increased.

There are substantial differences in the travel patterns of subgroups of women [22]. White women make more daily trips than Black or Hispanic women. White women were substantially more likely to drive alone and less likely to carpool to work. The differences were even greater for transit use to commute to work. White women were much less likely to use transit; and Black women were significantly more likely to do so.

Similarly, the growing suburbanization of homes and jobs may have special implications for women's travel, and particularly for older women (who have fewer alternatives if they cannot drive) [22]. Women traveling in the suburbs were more dependent on cars and less dependent on transit than women living elsewhere or comparable men. In 1990, car use was highest among women in the suburbs. While there was no group of elderly women (above 65) who were more dependent on the car than comparable men, auto use was highest in the suburbs for both elderly men and women. In addition, suburban women made more personal trips than comparable men or women living elsewhere.

Men and women had different travel patterns irrespective of marital status, number and age of children, occupation and income level [23]. The impact of having children is far more on working mothers than on working fathers. Women with children are more likely to drive to work at all income levels than men and other women who do not have children. The age and number of children also matter. Women with younger children and more children are more likely to drive to work alone and less likely to use alternate modes of transportation.

Multiple factors influence travel patterns of women and men [24]. One of such factor is the number of private vehicles at home. When there are enough vehicles women drive private cars, however, in scarcity they take public transportation while men take the private vehicles to work. Additionally, males dominate the transportation service work force and women are not encouraged to handle heavy vehicles and machinery on their own. According to Loukaitou-Sideris et al. [25], fear of crime may make women feel unsafe in many public transportation

spaces such as bus stops and train cars, poorly lit park-and-ride lots, parking structures, and overcrowded transit vehicles. Women often change their transportation modes and travel patterns to avoid unsafe transportation environments.

The trips linking work and home (the commute) is shorter for women [26]. Some recent studies argue that women reduce the journey to work to accommodate the demands of family responsibilities [27]. However, others, like studies of single mothers, show mixed evidence. Single mothers may prefer to work closer to home because of their household tasks, or they may drive long distances for better paying jobs. Either way, single mothers commute for longer time and distance than married mothers. The presence of children, as well as the age of children can also greatly affect women's commuting distance decisions, and there is variation based on racial and ethnic background, as well as place of residence. In the suburbs, all single mothers commute for shorter time than in the city center.

Aging

The demographic composition of the U.S. population will change significantly in the near future [28-30]. According to Ortman, Velkoff and Hogan [30], in 2002, people who are 65 or over constitute 12 percent of the U.S. population. By 2030 this figure will go up by 20 percent, bringing the elderly population to 72 million.

Older people now have enough resources to support healthy and enjoyable lifestyles [28]. They do not want to give up their driving habits [31], because of reliability, flexibility and convenience of private vehicles [32, 33]. For non-driving older people, they prefer rides from friends and family members, though they are uncomfortable with the feeling of obligation created when asking for a ride [32, 33]. Urban non-drivers are the most likely to use public transportation.

Age has strong correlation with health and physical well-being among older people [34]. When older people reduce or stop their driving a significant change occurs in their travel behaviors [33, 35-38]. Their mobility declines [31, 39]. They try to avoid driving at night and during peak hours; they drive at lower speeds; they drive larger vehicles with fewer passengers [31]. Older

drivers are prone to crashes and injuries [31, 40, 41]. When relying on others for transportation, they work around the schedules and convenience of others. All these changes modify the customer base of transportation agencies. Hence, it is important to understand the mobility behaviors of older people, to best provide transportation services to this group [28].

According to Bailey [42], mobility declines in old age because of declining health, eyesight problems, and weakening physical and mental abilities. Older people may have safety concerns, choose not to drive, or may not have access to a private vehicle. Household size has a negative relationship with decline in mobility [34] as other adults are readily available to drive or they may make living arrangements that provide older people with a larger pool of potential drivers on which they can rely [35]. Moreover, retirement is a common factor for reduced driving [43].

Mobility influences perceptions of independence and self-control over one's life [32]. Mobility of the elderly is a means of connection to society, and gives access to family members, friends, social and economic activities, medical centers, and public and private services that enrich life. Reduced driving or driving cessation is strongly associated with reduced activities outside of home [44]. Mobility limitation can result in personal feelings of isolation, however it has greater societal impacts as well. Society suffers from older populations' reduced mobility through the loss of their productivity as workers and volunteers [36]. Thus, there should be every effort to reduce the mobility losses of older people.

Community structure influences travel behaviors of the aging population [29, 39]. It affects the number of trips taken and transportation modes used by elderly. Public transportation is one option to keep older people mobile. Research shows that in urban areas where public transportation is available, older people walk more often and use it [38, 42]. But, in many rural places and small towns, public transportation is not an option [42], often due to limited funding. Minorities, such as older African-Americans, Latinos and Asian-Americans are mostly affected by the lack of public transportation options [42]. The mixed-use communities that are also characterized by walkable urban or town areas will be the best to address the mobility needs of aging population.

Socioeconomic Inequality

Income

McDonald [45] argues that household income affects transportation modes. He shows that Black, Hispanic, and low income children's rate of physical modes of transportation (walking and biking) to go to school is higher than Whites and high-income children's rates. Similarly, the research findings of Yang and Diez-Roux [19] give insight regarding the relationship between income level, non-motorized mode of transportation (walking) and different trip purposes such as work and recreation. The households with the highest income level walk the longest distances, whereas the households with the lowest income walk for the longest duration. Similarly, the households with the highest income walk longer distance for recreation, and households with the lowest income walk longer distance for work.

The relationship between income and travel behavior is indirect. Income influences car ownership, which then determines the use of other transportation modes. Having a car reduces dependency on the public and non-motorized modes of transportation, reducing the total number of transportation modes used. According to Pucher and Renne [9], in the urban area the use of bikes, taxis, and public transit drops sharply when a household owns a car. In urban areas, poor people walk twice as much as non-poor people; while in the rural areas both poor and non-poor walk similar distances [8, 11]. In urban areas, poor people live in the central cities where trip distances are shorter and they walk for the public transportation every day. In rural areas, because of the absence of the public transportation, most residents depend on cars for travel irrespective of their income levels.

Pucher and Renne [9] also identified the association of income with the type of public transit use. Increased income is inversely associated with public bus use, and is positively associated with suburban rail use. Poorer people use the bus more than affluence people, while affluent people use the suburban rail more than poorer people. One of the reasons behind the affluent use of suburban rail is its service from the high-income suburban areas to metropolitan downtowns, where they have their jobs. Suburban rail offers fast, comfortable, dependable and stress-free travel at peak-office hours, while bus services are limited within the central cities and are slower,

less comfortable, less dependable, more stressful, and localized. According to Pucher and Renne [9], such association between income level and types of public transit can be found in New York City, Washington, DC, Boston, Chicago and other major metropolitan areas.

Education

Education influences income potential that determines the ability to afford private vehicles [46, 47]. Education and income also have an impact on selection of neighborhood, which can affect the access to transit. People with low education levels rely more on transit and carpooling. Among people with low education, women of color (especially Black women), who live in the center city and who are in the low income bracket, have disproportionately longer commute times [48]. Urban single mothers have the longest commute time across any group.

In some cases, individuals with more years of education are likely to have longer travel times [26, 46, 47]. It is especially true for minorities. Well-educated minorities, like Asians, commute more than Whites for better career opportunities. For individuals with low level of education, taking extra time to commute might not result in substantial income differences.

The level of education has close associations with the modes of transportation in determining commute time [49]. People with less education and who live in urban areas commute for longer times using public transportation, while their rural counterparts may commute for long times using bicycles in rural areas. The level of educational has a strong relationship with walking trips [17]. There is a positive association between educational attainment and recreational walking, which may be related to cultivating health benefits. However there is an inverse relationship between education level and work-related walking time [11]. Those with a graduate education walk less than people with a high school degree. Higher level of educational among commuters is associated with decline in carpooling too [47, 50].

Employment

Place of employment plays a large role in the time and distance that people commute. Where one works can be influenced by many structural factors such as the community layout and available

infrastructure for transportation, the employment opportunities available in the area, and the education level, race and ethnicity of the workforce.

Commute time varies by race and ethnicity, and education Whites have the shortest travel times, while minorities travel longer time and distances for employment [46]. Among people with low education, women of color who live in the center city have disproportionately longer commute time [48]. White people may live closer to areas that provide good employment opportunities, while public transportation systems may not be well integrated in minority localities. High education groups travel more to pursue high-income opportunities [49]. People with less education and who live in urban areas take longer time to commute using public transportation [46].

Suburbanization of low-income and low-skill jobs has been increasing over the several years. As a result, minorities' commute times increase because of longer distances to transit points. Travel times are highest during early morning and mid-day hours, possibly because of the tendency to use transit and carpooling more often. Private cars are used most often in late evening hours, primarily because of limited services offered by transit systems. The road congestion is other factor that affects the work chain trips [51]. Workers who commute in peak periods have lower tendency to form work chain trips, while a more general congestion period has no effect on the work chain trips. Access to private vehicles is very important in terms of employment opportunities and employment stability [20].

METHODOLOGY

The data for this research came from the 2009 National Household Travel Survey (NHTS), which is a nationally representative survey including information on both work and non-work trips [55, 56]. This survey is an improvement over Nationwide Personal Transportation Surveys (NPTS). Surveys on travel behavior began in 1969 and followed in 1977, 1983, 1990, 1995 and 2001; the 2009 NHTS marked forty years of transportation research [55, 56].

The NHTS 2009 used cluster sampling, and included two major sample units in the sample design [55, 56]. The first sample unit had 25,510 households that represented 50 U.S. States and the District of Columbia. The second sample unit included 124,637 households through the contribution of add-on partners from 20 states and Metropolitan Planning Organizations (MPOs). Together, the NHTS 2009 consisted of data from 150,147 households and 300,000 people on trip purposes, modes of transportation used, travel time, time of the day when the trip took place, travel day, and day of the week [55, 56]. Hence, it was a comprehensive survey that collected information on all trips, all modes, all purposes, all trip lengths, and all areas of the country, including urban and rural [55], to provide better understanding of travel behavior.

The data for the NHTS 2009 survey was collected over the course of fifteen months between 2008 and 2009 from the non-institutionalized civilian population of the United States. The 2009 NHTS excluded people from medical institutions, prisons and military barracks. Participation was solicited through Random Digit Dialing (RDD) of telephone numbers. Landline telephone interviews were conducted with the help of Computer Assisted Telephone Interviewing (CATI) technology. Each telephone number was randomly assigned a travel day assignment and detailed data were collected through travel diaries. The use of travel diaries improved the accuracy of trip reporting by allowing for the recording of odometer mileages, make, model and year of vehicles, dates, times and purposes of the vehicle used.

This research used three measures of passenger intermodal transportation – the total number of trips a person made in a trip day, the number of trip modes he or she used, and the number of travel modes used for each trip purpose. There were 11 trip purposes – going toward home,

work, school, religious activities, social activities, family/personal, transporting someone, meals, and for other purposes. Similarly, there were five categories of travel modes – personal vehicle, school bus, public transportation, non-motorized transportation (walking and biking), and other modes. The 2009 NHTS defined personal vehicle as car, van, sport utility vehicle, pickup truck, other truck, recreational vehicle, motorcycle, and light electric vehicle. Public transportation included commuter bus, charter/tour bus, city-to-city bus, shuttle bus, Amtrak/intercity train, commuter train, subway, and trolley.

The analyses were done with regression models. Since dependent variables were discrete and countable, Poisson regressions were also used. We checked for overdispersion by comparing means and variances. For the dependent variables that were overdispersed, negative binomial regression was appropriate. Fourteen models were run, one for each of the eleven trip purposes and one each for total trips, the total number of modes, and the number of travel purposes.

Geographic Inequality: To examine geographic inequality, twelve explanatory variables were used. Of these, four were demographic variables, including age, female, Hispanic, and Black. The last three variables were dichotomous and coded as 0 and 1. The remaining eight variables were socioeconomic. These included being born in the U.S., worker status, education level, household income, home ownership, urban household, household size, household vehicles, and total number of drivers in a household. Three of these were dichotomous variables: being born in the U.S., worker status, and household located in an urban area. Education and income are categorical variables, with five and 18 categories respectively. All fourteen models were developed separately for urban and rural areas.

Demographic Inequality: When examining demographic inequalities, the number of explanatory variables used varied with the demographic traits being studied. Eleven explanatory variables were used when analyzing aging and gender (female, Black, Hispanic, born in the USA, worker status, education, income, homeownership, household size, household vehicles, and household drivers). The variable for aging consisted of two categories, elderly (above 65) and oldest old (above 85). Female and male categories made the variable for gender. When examining race and ethnicity, ten explanatory variables were used (age, female, born in the USA, worker status,

education, income, homeownership, household size, household vehicles, and household drivers). Race and ethnicity included three categories – White, Black and Hispanics. Again, fourteen models were developed.

Socioeconomic Inequality: Research on socioeconomic inequality consisted of three different categories: economic class, educational group, and worker status. Economic class was based on annual household income, modifying Gilbert and Kahl's [57] model of social class. Based on the annual income, four income groups represented each social class – upper class (above $100,000), middle class ($40,000 - $99,999), working class ($20,000 – $39,999), and working poor (below $19,000). The three education groups were high school graduate, bachelor's degree, and graduate degree. Worker's status consisted of two categories – worker and non-worker. This research also used fourteen models, one for each of the eleven trip purposes and separate models for the total number of trips, the total number of modes, and the total number trip purposes.

DISCUSSION OF RESULTS

Geographic Inequality

Demographic Characteristics

Tables 2 and 3 provide the demographic characteristics of urban and rural respondents. The average age of the respondents was around 48 (48.44 in urban areas and 48.02 in rural areas) with minimum 5 and maximum 92 years. Around half of the respondents were female (53% in urban areas and 52% in rural areas). The urban rural difference in the representation of the Hispanic and Black respondents was remarkable. In urban areas, 9.5% of the respondents were Hispanic while that number was only 3.5% in rural areas. Similarly, 6.1% of the respondents were Black in urban areas, whereas only 3.4% of the respondents were Black in rural areas. The urban rural difference was also striking in the case of home ownership and US born respondents. While 95% of respondents in rural areas are born in US, only 89% of respondents were in urban areas. Home ownership was higher in rural areas (94%) than urban areas (88%), as was the average number of vehicles per household, 2.6 in rural areas and 2.2 in urban areas. However, household size was almost the same between urban (2.90) and rural areas (2.92).

Table 1: Descriptive Statistics, all trips

Variables	N	Mean	Standard deviation	Minimum	Maximum
# total trips per day	258,123	4.481	2.473	1	27
# travel modes per day	258,123	1.186	0.419	1	4
# trip purposes per day	258,123	2.955	1.005	1	8
# modes by trip purpose					
Home	246,574	1.185	0.417	1	4
Work	78,486	1.72	0.406	1	4
School	27,768	1.380	0.564	1	4
Religious activity	19,969	1.156	0.383	1	4
Medical	20,214	1.161	0.391	1	4
Shopping	125,447	1.1877	0.417	1	4
Social	97,822	1.319	0.512	1	4
Family/Personal	32,016	1.296	0.419	1	4
Transporting someone	38,753	1.199	0.432	1	4
Meals	71,955	1.206	0.440	1	4
Other purposes	3,759	1.727	0.772	1	4
Explanatory variables					
Age	258,123	48.321	21.752	5	92
Gender	258,123	0.525	0.499	0	1
Hispanic	257,224	0.077	0.267	0	1
Black	256,079	0.053	0.223	0	1
U.S. born	225,354	0.906	0.292	0	1
Worker	225,393	0.564	0.496	0	1
Education	217,632	3.168	1.171	1	5
Income	242,452	12.232	5.327	1	18
Homeownership	258,123	0.896	0.305	0	1
Urban	258,122	0.706	0.456	0	1
Household size	258,123	2.907	1.433	1	14
Household vehicles	258,123	2.346	1.181	0	27
Household drivers	258,123	2.086	0.798	0	9

Table 2: Descriptive Statistics, all trips urban

Variables	N	Mean	Standard deviation	Minimum	Maximum
# total trips per day	182,230	4.544	2.503	1	27
# travel modes per day	182,230	1.199	0.433	1	4
# trip purposes per day	182,230	2.972	1.005	1	8
# modes by trip purpose					
Home	174,399	1.198	0.430	1	4
Work	54,833	1.190	0.425	1	4
School	19,719	1.381	0.568	1	4
Religious activity	13,851	1.165	0.393	1	4
Medical	14,482	1.178	0.410	1	4
Shopping	88,921	1.203	0.432	1	4
Social	70,652	1.334	0.521	1	4
Family/Personal	22,704	1.320	0.505	1	4
Transporting someone	28,142	1.211	0.444	1	4
Meals	51,255	1.222	0.456	1	4
Other purposes	2,683	1.789	0.789	1	4
Explanatory variables					
Age	182,230	48.444	21.958	5	92
Female	182,230	0.529	0.499	0	1
Hispanic	181,572	0.095	0.293	0	1
Black	180,678	0.061	0.239	0	1
U.S. born	159,132	0.886	0.318	0	1
Worker	159,163	0.560	0.496	0	1
Education	153,639	3.243	1.172	1	5
Income	170,826	12.341	5.362	1	18
Homeownership	182,230	0.876	0.329	0	1
Urban	182,230	0.706	0.456	0	1
Household size	182,230	2.901	1.442	1	13
Household vehicles	182,230	2.232	1.128	0	23
Household drivers	182,230	2.061	0.808	0	9

Table 3: Descriptive Statistics, all trips rural

Variables	N	Mean	Standard deviation	Minimum	Maximum
# total trips per day	75892	4.329	2.392	1	25
# travel modes per day	75892	1.153	0.384	1	4
# trip purposes per day	75892	2.914	1.003	1	8
# modes by trip purpose					
Home	72,174	1.152	0.381	1	4
Work	23,652	1.131	0.356	1	4
School	8,049	1.376	0.554	1	4
Religious activity	6,118	1.134	0.359	1	4
Medical	5,732	1.122	0.338	1	4
Shopping	36,526	1.150	0.375	1	4
Social	27,170	1.280	0.486	1	4
Family/Personal	9,312	1.238	0.449	1	4
Transporting someone	10,611	1.166	0.398	1	4
Meals	20,700	1.65	0.396	1	4
Other purposes	1,076	1.570	0.705	1	4
Explanatory variables					
Age	75,892	48.023	21.247	5	92
Female	75,892	0.517	0.500	0	1
Hispanic	75,651	0.035	0.183	0	1
Black	75,400	0.034	0.180	0	1
U.S. born	66,221	0.954	0.209	0	1
Worker	66,229	0.572	0.495	0	1
Education	63,992	2.988	1.149	1	5
Income	71,625	11.970	5.234	1	18
Homeownership	75,892	0.943	0.231	0	1
Rural	75,892	0.294	0.456	0	1
Household size	75,892	2.923	1.411	1	14
Household vehicles	75,892	2.619	1.259	0	27
Household drivers	75,892	2.144	0.769	0	9

Travel Modes and Trip Purposes

Figures 1 and 2 show the mode of transportation used for all trip purposes for urban and rural areas. Personal vehicle use was higher in rural areas than in urban areas. One of the possible reasons is the unavailability or the limited availability of public transportation in rural areas so rural residents must depend on personal vehicles for all kind of trips. Public transit use and non-motorized transportation, such as walking and bicycling, were higher in urban areas. Public transit constitutes 3% of all trips in the urban areas while it is only 0.030% in rural areas. Similarly, the share of non-motorized transportation is 12% in urban areas, and 7% in rural areas, suggesting that urban areas may have travel distances and infrastructure to better support walking and biking.

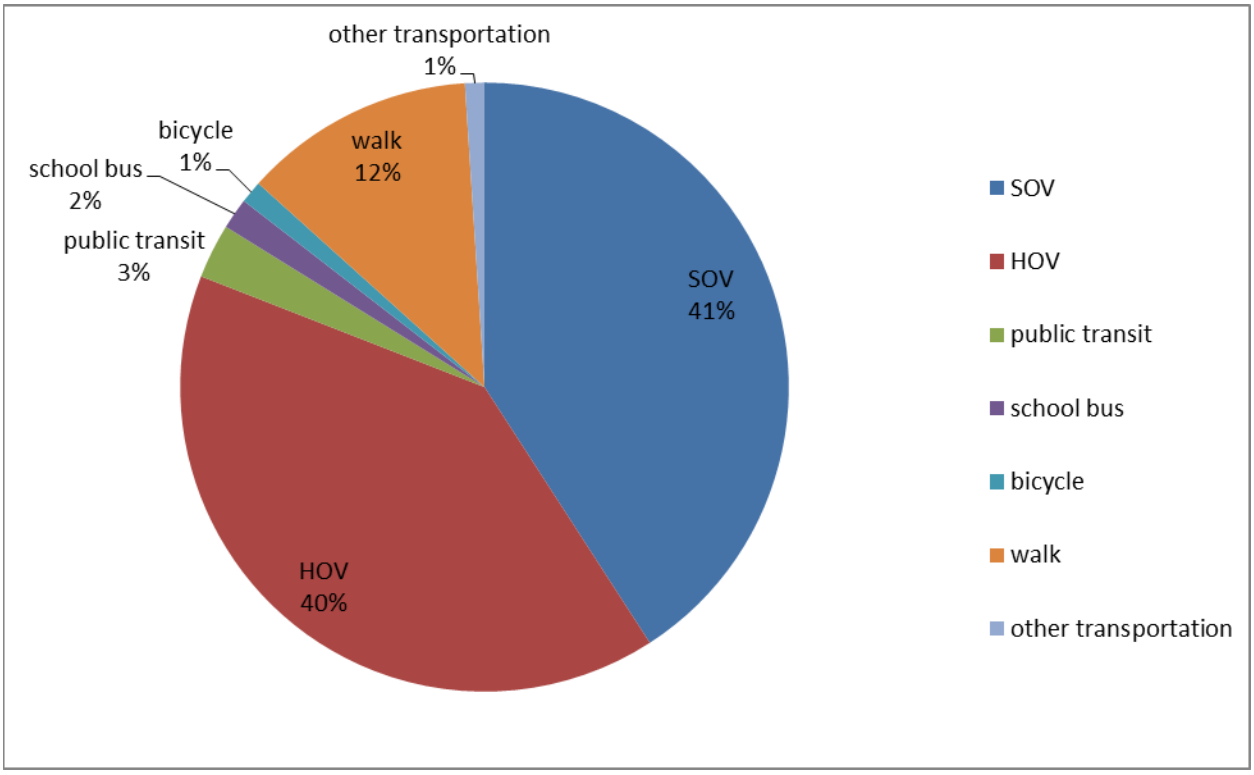

Figure 1: Distribution of Travel Modes, Urban

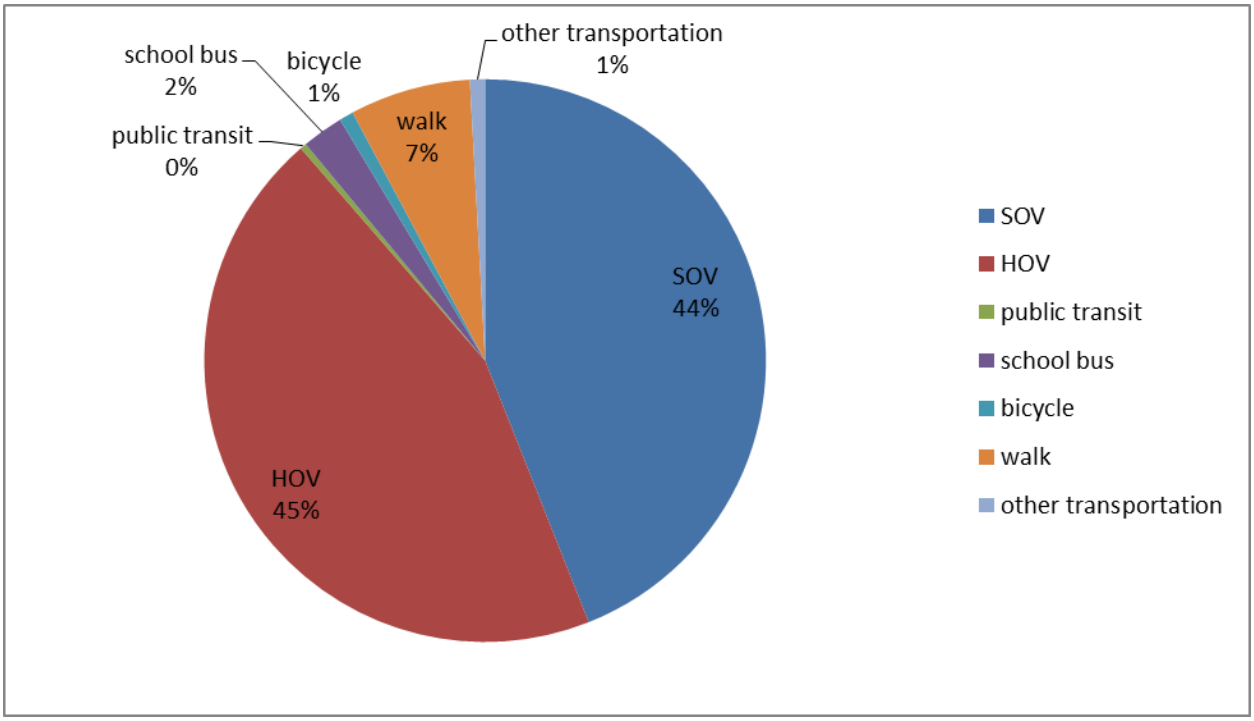

Figure 2: Distribution of Travel Modes, Rural

There were ten different trip purposes: going to home, going to work, school/daycare, religious activities, medical services, shopping/errands, social reasons, family and personal business, meals, transport someone, and others. Trips toward home constituted about one third of all trips, daily trips and long distance trips, in both urban and rural areas. This was followed by trips for shopping or running errands, which was almost the same for urban (18%) and rural areas (17%). The percentage of social and recreational trips was the same (12%) in urban and rural areas.

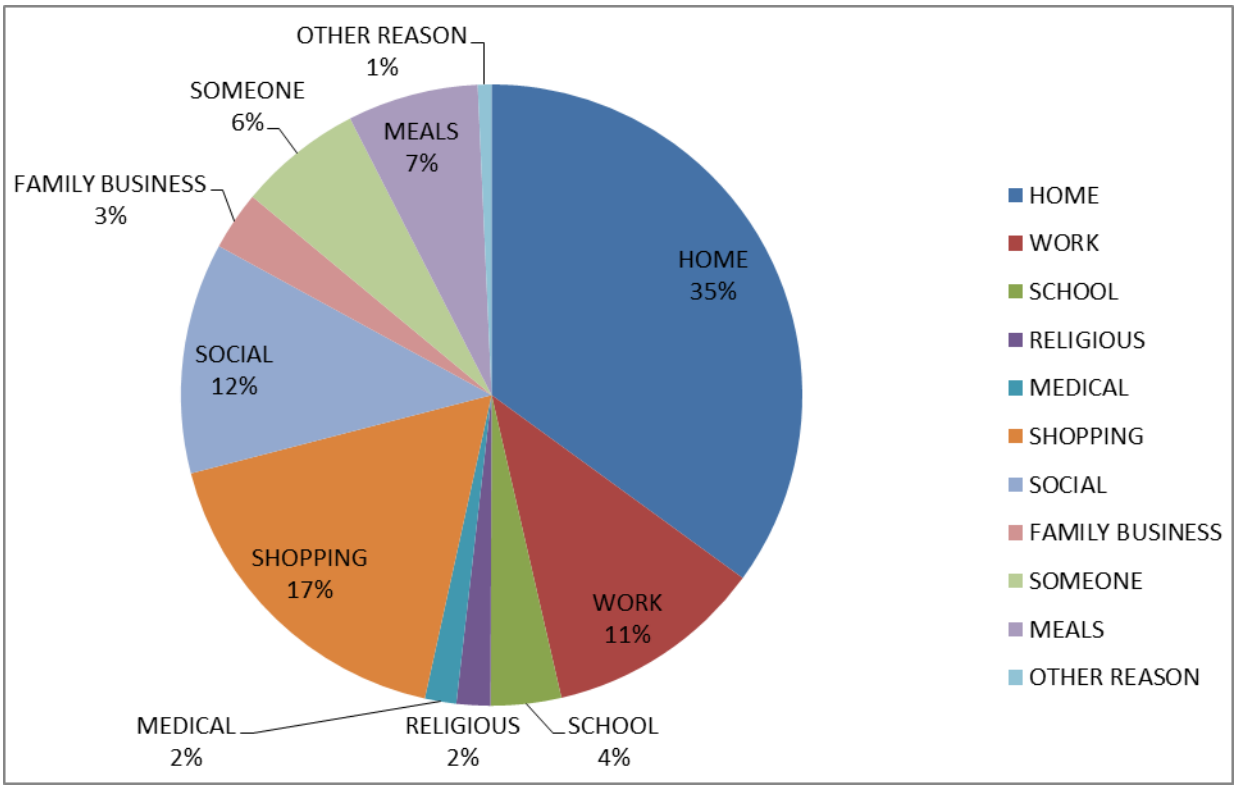

Figure 3: Distribution of Trip Purpose, Urban

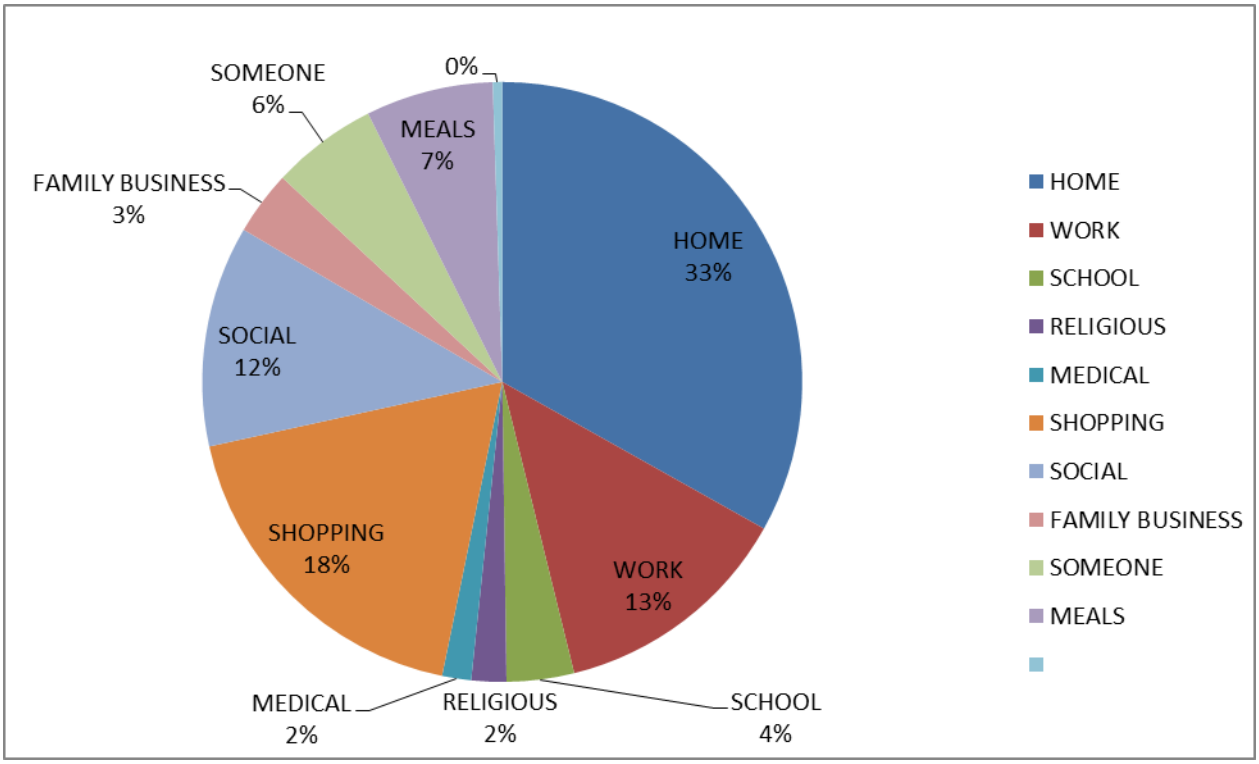

Figure 4: Distribution of Trip Purpose, Rural

Figure 5 and 6 display the transportation modes by travel purposes in urban and rural areas. Single occupancy vehicles were mostly used for work trips, whereas high occupancy vehicles were common for meals, shopping, medical, and religious trips. Walking biking were primarily used for social and recreation purposes.

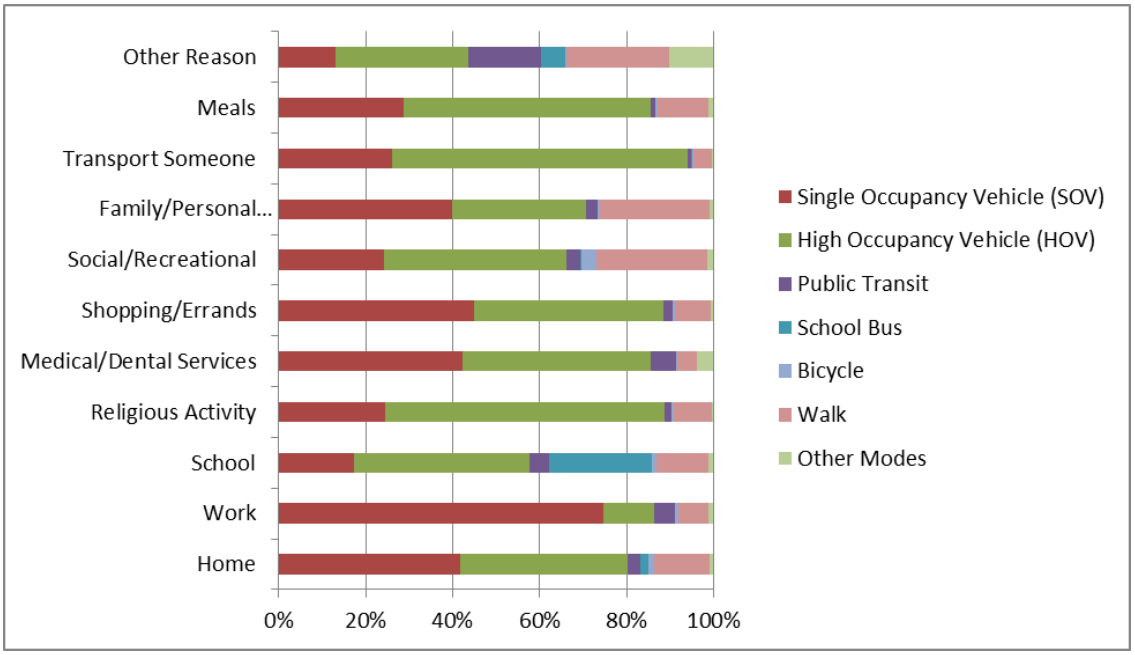

Figure 5: Travel Modes by Trip Purpose, Urban

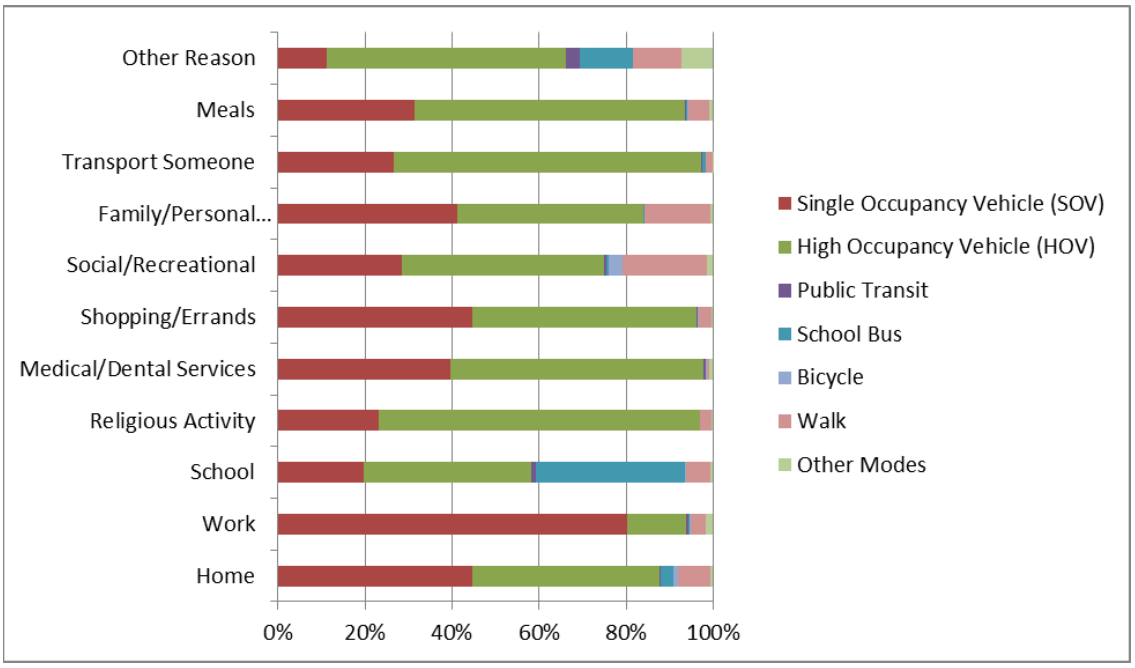

Figure 6: Travel Modes by Trip Purpose, Rural

Overall Trips

Model 1 shows regression results for the total trips for urban and rural areas, respectively. All socioeconomic variables were significant for urban areas. In rural areas, all variables were significant except age, Black, and home ownership. For urban areas, total trips were negatively associated with age, Black, Hispanic, worker, and number of household drivers.

In urban areas, it appears that older people made fewer trips. This may be due to physical limitations, or less economic engagement, such as working and regular shopping that might engage younger people. Respondents who identified as Black or Hispanic reported travelling less than their White counterparts. It is possible that socioeconomic differentials contribute to this matter. Less travel by workers may be related to their nature of jobs, or by the importance placed on living near to a job.

For the total trips, the direction of the association between urban and rural areas was similar. In both areas, the variables with positive relationships were female, born in the U.S., education, income, household size and number of household vehicles. Females traveled more than men, those born in the United States traveled more than those born elsewhere, and those with higher education, which is generally linked with higher income, traveled more than those with lower levels of education and income. Members of larger households traveled more, as did those with more personal vehicles.

Table 4: Poisson Regression Coefficients for urban Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−0.001***	−0.002***	−0.001***
	(8.440E−05)	(1.652E−04)	(1.045E−04)
Female	0.042***	−0.007	0.035***
	(2.225E−03)	(4.322E−03)	(2.749E−03)
Black	−0.007***	−0.007*	−0.002
	(1.592E−03)	(3.093E−03)	(2.000E−03)
Hispanic	−0.034***	−0.013	−0.021***
	(4.045E−03)	(7.672E−03)	(4.938E−03)
U.S. born	0.018***	−0.007	−0.007**
	(1.942E−03)	(3.760E−03)	(2.385E−03)
Worker	−0.015***	−0.005	0.010***
	(1.973E−03)	(3.845E−03)	(2.437E−03)
Education	0.023***	0.005***	0.010***
	(5.376E−04)	(9.985E−04)	(6.414E−04)
Income	0.005***	0.002***	0.003***
	(1.697E−04)	(3.278E−04)	(2.081E−04)
Homeownership	0.035***	−0.027***	0.031***
	(3.681E−03)	(6.932E−03)	(4.518E−03)
Household size	0.025***	−0.006*	0.009***
	(1.146E−03)	(2.252E−03)	(1.428E−03)
Household vehicles	0.006***	−0.022***	0.000
	(1.298E−03)	(2.588E−03)	(1.611E−03)
Household drivers	−0.035***	0.005	−0.015***
	(2.089E−03)	(4.079E−03)	(2.583E−03)
Log likelihood	181,572	181,572	181,572
N	−4.058E+05	−2.039E+05	−2.954E+05

Notes: *p≤.05; **p≤.01; ***p≤.001; Standard errors are in parentheses.

Table 5 Poisson Regression Coefficients for rural Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	0.000	−0.001***	−0.001***
	(1.437E−04)	(2.799E−04)	(1.751E−04)
Female	0.043***	0.002	0.047***
	(3.523E−03)	(6.816E−03)	(4.294E−03)
Black	0.000	−0.006	0.004
	(3.194E−03)	(6.062E−03)	(3.956E−03)
Hispanic	−0.021*	−0.001	−0.014
	(9.867E−03)	(1.862E−02)	(1.188E−02)
U.S. born	0.010**	−0.008	−0.010*
	(3.401E−03)	(6.557E−03)	(4.128E−03)
Worker	−0.009**	−0.007	0.013**
	(3.431E−03)	(6.665E−03)	(4.189E−03)
Education	0.020***	0.003	0.008***
	(8.817E−04)	(1.634E−03)	(1.037E−03)
Income	0.005***	0.002***	0.003***
	(2.769E−04)	(5.318E−04)	(3.351E−04)
Homeownership	0.010	−0.006	0.019*
	(7.901E−03)	(1.499E−02)	(9.599E−03)
Household size	0.022***	−0.007	0.011***
	(1.891E−03)	(3.688E−03)	(2.307E−03)
Household vehicles	0.007***	−0.012***	0.001
	(1.686E−03)	(3.325E−03)	(2.062E−03)
Household drivers	−0.038***	0.005	−0.017***
	(3.348E−03)	(6.480E−03)	(4.067E−03)
Log likelihood	75,651	75,651	75,651
N	−1.656E+05	−8.296E+04	−1.225E+05

Notes: *p≤.05; **p≤.01; ***p≤.001; Standard errors are in parentheses.

Model 2 displays the number of travel modes, which were significantly associated with age, income, and number of household vehicles in both urban and rural areas. The age and number of household vehicles were negatively associated, while the association of income was positive. In urban areas, house ownership and education were significant in opposite directions. Those who own their homes may have the capacity to afford a personal vehicle, which could be used for any trip purpose. Urban areas may offer more economic as well as recreational opportunities, particularly for educated people who may have more opportunities to earn and to spend; and urban areas also offer public transportation. All these factors together enable the use of more travel modes in urban areas than in rural areas. For number of trip purposes, which is given in Model 3, all variables were significantly associated except Black, Hispanic, and household vehicles in both urban and rural areas. Hispanic was negatively significant in urban areas, but not in rural areas.

Income was the only variable, which was positively significant across all three models, total trips, travel modes and trip purposes, for both urban and rural areas. Probably, higher income people make more total trips, which naturally includes more travel modes and more trip purposes. From this perspective, income was the most influential variable associated with travel behavior. The next strongest variable was education. Both of these variables had positive associations with total number of trips, the number of travel modes and the number of trip purposes.

Trips by Purposes

Tables 7 and 9 present the regression result for the relationship between intermodal passenger transportation and trip purposes for urban and rural areas respectively. Age was negatively and significantly associated with trips for home, shopping, social, family and meals in urban and rural areas. Gender differences were not significant in both areas for any trip purposes except going to school in urban areas. Hispanic was not significant for any trip purposes in both urban and rural areas. Similarly, Black was not significant for any trip purposes in rural areas, but it was significantly and negatively associated with trips for home, social activities and transporting someone in urban areas.

Table 6: Poisson Regression Coefficients for Urban Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.002***	−0.001	0.000	−0.001	−0.002***	−0.002***
	(1.691E−04)	(3.345E−04)	(7.309E−04)	(6.231E−04)	(5.867E−04)	(2.383E−04)
Female	−0.007	−0.007	−0.024*	−0.018	−0.003	−0.003
	(4.421E−03)	(7.919E−03)	(1.220E−02)	(1.618E−02)	(1.586E−02)	(6.219E−03)
Black	−0.006*	−0.007	−0.004	−0.007	0.001	−0.006
	(3.153E−03)	(5.319E−03)	(8.893E−03)	(1.195E−02)	(1.280E−02)	(4.449E−03)
Hispanic	−0.013	−0.012	−0.018	0.019	0.024	−0.009
	(7.807E−03)	(1.419E−02)	(1.814E−02)	(2.830E−02)	(2.842E−02)	(1.132E−02)
U.S. born	−0.007	−0.005	−0.005	−0.005	−0.013	−0.011*
	(3.855E−03)	(8.525E−03)	(1.620E−02)	(1.369E−02)	(1.407E−02)	(5.402E−03)
Worker	−0.004	−0.022*	−0.002	−0.001	−0.003	0.000
	(3.944E−03)	(9.593E−03)	(1.733E−02)	(1.402E−02)	(1.407E−02)	(5.414E−03)
Education	0.004***	0.012***	−0.008***	0.003	0.008	0.009***
	(1.022E−03)	(2.176E−03)	(2.307E−03)	(3.676E−03)	(4.081E−03)	(1.632E−03)
Income	0.002***	0.003***	0.001	0.001	0.001	0.002***
	(3.353E−04)	(6.354E−04)	(1.001E−03)	(1.177E−03)	(1.160E−03)	(4.680E−04)
Homeownership	−0.029***	−0.053***	0.000	−0.042	−0.056*	−0.042***
	(7.064E−03)	(1.275E−02)	(1.885E−02)	(2.697E−02)	(2.432E−02)	(9.813E−03)
Household size	−0.006*	−0.001	0.000	−0.002	0.000	−0.006
	(2.298E−03)	(4.078E−03)	(5.243E−03)	(7.750E−03)	(8.835E−03)	(3.410E−03)
Household vehicles	−0.023***	−0.030***	−0.021**	−0.030**	−0.035***	−0.026***
	(2.652E−03)	(4.564E−03)	(7.082E−03)	(1.085E−02)	(9.900E−03)	(3.759E−03)
Household drivers	0.005	0.008	0.002	0.014	0.001	0.005
	(4.170E−03)	(7.374E−03)	(1.031E−02)	(1.557E−02)	(1.508E−02)	(6.086E−03)
N	173,763	54,634	19,656	13,795	14,435	88,598
Log likelihood	−1.950E+05	−6.110E+04	−2.384E+04	−1.523E+04	−1.601E+04	−9.967E+04

Notes: *p≤.05; **p≤.01; ***p≤.001; Standard errors are in parentheses.

Table 6: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.002***	−0.003***	−0.001**	−0.002***	−0.003*
	(2.561E−04)	(4.611E−04)	(4.644E−04)	(3.110E−04)	(1.209E−03)
Female	−0.006	−0.013	−0.002	−0.015	−0.032
	(6.579E−03)	(1.177E−02)	(1.126E−02)	(8.078E−03)	(2.927E−02)
Black	−0.009*	−0.011	−0.015*	−0.009	−0.018
	(4.543E−03)	(8.729E−03)	(7.602E−03)	(5.983E−03)	(2.480E−02)
Hispanic	−0.022	−0.020	−0.002	−0.024	−0.049
	(1.221E−02)	(2.402E−02)	(1.770E−02)	(1.614E−02)	(5.208E−02)
U.S. born	−0.031***	−0.035***	−0.005	−0.020**	−0.071*
	(5.824E−03)	(1.059E−02)	(9.424E−03)	(7.475E−03)	(2.921E−02)
Worker	0.021***	0.026*	−0.008	0.009	0.071*
	(6.033E−03)	(1.061E−02)	(9.623E−03)	(7.556E−03)	(3.050E−02)
Education	0.007***	0.012***	0.005*	0.008***	0.009
	(1.509E−03)	(3.133E−03)	(2.750E−03)	(1.973E−03)	(6.455E−03)
Income	0.002***	0.003***	0.002*	0.002***	0.006*
	(4.928E−04)	(8.774E−04)	(8.834E−04)	(6.122E−04)	(2.323E−03)
Homeownership	−0.028*	−0.014	−0.026	−0.056***	−0.013
	(1.102E−02)	(2.017E−02)	(1.750E−02)	(1.383E−02)	(4.596E−02)
Household size	−0.006	−0.016*	0.001	−0.011*	−0.023
	(3.512E−03)	(6.851E−03)	(5.182E−03)	(4.604E−03)	(1.429E−02)
Household vehicles	−0.021***	−0.022**	−0.018**	−0.025***	−0.053**
	(3.989E−03)	(6.917E−03)	(6.359E−03)	(4.784E−03)	(1.825E−02)
Household drivers	0.002	0.010	−0.001	0.010	0.039
	(6.344E−03)	(1.172E−02)	(9.793E−03)	(8.119E−03)	(2.674E−02)
N	70,409	22,612	28,057	51,093	2,667
Log likelihood	−8.372E+04	−2.667E+04	−3.171E+04	−5.805E+04	−3.680E+03

Notes: *p≤.05; **p≤.01; ***p≤.001; Standard errors are in parentheses.

Table 7: Poisson Regression Coefficients for Rural Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001***	0.000	0.000	−0.001	−0.001	−0.001**
	(2.875E−04)	(5.418E−04)	(1.263E−03)	(1.014E−03)	(1.040E−03)	(4.077E−04)
Female	0.001	0.001	−0.015	−0.007	0.001	0.006
	(6.992E−03)	(1.235E−02)	(1.911E−02)	(2.463E−02)	(2.583E−02)	(9.887E−03)
Black	−0.004	−0.012	0.021	−0.013	−0.002	−0.006
	(6.275E−03)	(1.103E−02)	(2.049E−02)	(2.077E−02)	(2.000E−02)	(8.535E−03)
Hispanic	−0.005	0.010	−0.004	−0.012	0.032	−0.005
	(1.905E−02)	(3.379E−02)	(4.245E−02)	(6.830E−02)	(6.889E−02)	(2.791E−02)
U.S. born	−0.009	−0.011	0.002	−0.017	−0.014	−0.016
	(6.709E−03)	(1.602E−02)	(3.262E−02)	(2.298E−02)	(2.651E−02)	(9.339E−03)
Worker	−0.006	−0.015	−0.013	0.003	0.001	0.002
	(6.820E−03)	(1.654E−02)	(3.491E−02)	(2.300E−02)	(2.601E−02)	(9.306E−03)
Education	0.002	0.008*	−0.009*	0.003	0.008	0.007**
	(1.673E−03)	(3.448E−03)	(3.945E−03)	(5.995E−03)	(6.946E−03)	(2.662E−03)
Income	0.002***	0.002*	0.002	0.001	0.003	0.002**
	(5.463E−04)	(1.001E−03)	(1.568E−03)	(1.890E−03)	(1.982E−03)	(7.726E−04)
Homeownership	−0.008	−0.015	0.000	−0.053	−0.049	−0.010
	(1.535E−02)	(2.806E−02)	(3.913E−02)	(5.705E−02)	(5.623E−02)	(2.119E−02)
Household size	−0.006	−0.003	−0.001	−0.003	−0.004	−0.007
	(3.784E−03)	(6.653E−03)	(8.248E−03)	(1.270E−02)	(1.468E−02)	(5.673E−03)
Household vehicles	−0.012***	−0.011*	−0.017	0.000	−0.013	−0.012*
	(3.413E−03)	(5.709E−03)	(9.542E−03)	(1.246E−02)	(1.313E−02)	(4.811E−03)
Household drivers	0.004	0.003	0.008	−0.011	−0.003	0.003
	(6.652E−03)	(1.151E−02)	(1.596E−02)	(2.312E−02)	(2.528E−02)	(9.794E−03)
N	71,950	23,598	8,026	6,104	5,711	36,408
Log likelihood	−7.884E+04	−2.560E+04	−9.686E+03	−6.628E+03	−6.156E+03	−3.988E+04

Notes: *p≤.05; **p≤.01; ***p≤.001; Standard errors are in parentheses.
Table 9: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.001*	−0.003***	−0.001	−0.002**	−0.002
	(4.479E−04)	(7.918E−04)	(7.959E−04)	(5.393E−04)	(2.334E−03)
Female	0.005	−0.002	0.002	0.007	−0.075
	(1.082E−02)	(1.894E−02)	(1.869E−02)	(1.302E−02)	(4.946E−02)
Black	−0.007	−0.015	0.000	−0.003	−0.029
	(9.720E−03)	(1.575E−02)	(1.789E−02)	(1.368E−02)	(7.325E−02)
Hispanic	0.004	−0.025	−0.006	0.025	0.042
	(3.063E−02)	(6.163E−02)	(4.407E−02)	(3.818E−02)	(1.369E−01)
U.S. born	−0.028**	−0.032	−0.013	−0.011	−0.102
	(9.673E−03)	(1.816E−02)	(1.617E−02)	(1.240E−02)	(5.837E−02)
Worker	0.016	0.018	−0.007	0.000	0.096
	(9.995E−03)	(1.799E−02)	(1.628E−02)	(1.247E−02)	(6.039E−02)
Education	0.004	0.012*	0.004	0.005	0.007
	(2.504E−03)	(5.263E−03)	(4.525E−03)	(3.290E−03)	(1.207E−02)
Income	0.002**	0.003*	0.001	0.002*	0.009*
	(8.391E−04)	(1.410E−03)	(1.472E−03)	(1.011E−03)	(4.069E−03)
Homeownership	−0.004	0.029	−0.017	−0.012	0.011
	(2.438E−02)	(4.492E−02)	(3.932E−02)	(3.081E−02)	(1.075E−01)
Household size	−0.007	−0.018	−0.005	−0.010	0.005
	(5.910E−03)	(1.138E−02)	(8.725E−03)	(7.580E−03)	(2.747E−02)
Household vehicles	−0.018***	−0.014	−0.011	−0.015	−0.016*
	(5.371E−03)	(9.102E−03)	(9.208E−03)	(6.294E−03)	(2.527E−02)
Household drivers	0.009	0.000	0.018	0.009	0.015
	(1.043E−02)	(1.904E−02)	(1.623E−02)	(1.301E−02)	(4.640E−02)
N	27,085	9,273	10,581	20,636	1,069
Log likelihood	−3.150E+04	−1.057E+04	−1.168E+04	−2.278E+04	−1.386E+03

Notes: *p≤.05; **p≤.01; ***p≤.001; Standard errors are in parentheses.

In both rural and urban areas, individuals born in the U.S. used fewer travel modes for social trips compared to individuals born elsewhere. This may be related to having access to a personal vehicle and driver's license. Being born in the United States was more significant for urban areas, and was negatively associated with trips for shopping, family and personal business, meals and other reasons. In rural areas, it was negatively associated with trips related to social and recreational activities.

Education was significantly associated with work, school, and family in both rural and urban areas. The association was negative for school trips, implying that people use few modes of transportation for going to school regardless of their geographic location. In urban areas, education was associated with trips for home, social and recreational activities, transporting someone, and trips for meals.

In both areas, income was positively associated with home, work, shopping, social, family, meals and other trip purposes. It indicates that people with higher household income use more modes of transportation for these trip purposes than people with lower household incomes. In urban areas, income was also significant for transporting someone else, suggesting that car sharing may be more common in urban areas. In rural areas, home ownership and household size were not significantly associated with any trip purposes. In urban areas, home ownership was negatively associated with trips for home, work, medical services, shopping, social activities, and meals, while household size was negatively associated with trips for home, family, personal business, and meals.

Households' number of vehicles was negatively associated with trips to home, work, shopping, social activities and other purposes in both areas. In urban areas, the number of household vehicles was negatively associated with all trip purposes. The number of drivers in a household was the weakest variable and does not associate strongly with any trip purposes in any areas.

Demographic Inequality

Ageing: Elderly (65+)

Table 10 shows regression results for the elderly (65+) people for total trips, travel modes and trip purposes. Model 1 shows elderly women, people born in the U.S., worker, level of education, income, home ownership, household size, number of vehicles in the household and total number of drivers in the household were significantly associated with the total number of trips elderly people take. Out of these variables, elderly women and the household size were negatively associated. The total number of trips for elderly women was greater than elderly men, possibly because of household and social responsibilities where elderly women actively participate in family activities that cause them to drive more.

The total number of trips taken by elderly people declined as family size increased, possibly because other family members were taking care of elderly people's responsibilities outside the home so that they do not have to leave. The total number of trips for native-born people was greater than of those who were born outside of the United States. Elderly people who work were positively associated with the total number of trips. These elderly people are economically active and probably have to take more work related trips than those who do not work. Elderly people who have higher levels of education took more trips than those who have lower levels of education, and income was also positively associated with the total number of trips Probably those with high income and with higher levels of education can afford more trips. Homeowners took more trips than those who do not own their homes, as did elderly people with more household vehicles. All of these measures are probably related with elderly people's financial situation, where those who have more also have increased mobility. Model 1 shows a positive association between the total number of drivers in household and the total number of trips. With many people who can drive in the household, the opportunities to leave the home for any purpose increased for elderly people.

Model 2 represents the results of the regression analysis between the number of travel modes and demographic, social and economic variables. Four variables (education, income, homeownership and total number of household vehicles) were strongly associated with the total number of travel

modes. Out of the four, two variables (education and income) had positive associations, while the other two (homeownership and the total number of vehicles in households) had negative associations with the total number of travel modes.

Elderly people with higher levels of education and income used more modes of travel. This may be due, in part, to their increased overall travel and the advantages provided through more income and social capital. However, those who also exhibit financial security through other measures (those who own their homes and have many vehicles associated with their household) were less likely to use many modes of travel. Perhaps because they have their own vehicles, there was less incentive to use other forms of transportation.

Model 3 represents regression result of demographic, social, and economic variables on the total number of trip purposes. The results showed both positive and negative significant relationships. People born in the United States, workers, education, income, homeownership and total number of drivers on household had positive associations, meaning they take trips for a variety of reasons. Elderly people who were born in the United States may have more connections than their counterparts, and hence more reasons to travel. Elderly people who still work may travel to work as well as for other social or recreational purposes. Again, for those groups who take many trips, such as the elderly with higher levels of education, higher income, who own their homes, and who have many drivers in their homes, they were also likely to go out for many different purposes. The only variable that is significantly and negatively associated with total number of trip purposes was the household size.

Table 11 shows regression results of the different trip purposes on the number of travel modes. The table has eleven trip purposes or reasons, such as going toward home, work, school, religious activities, medical, shopping, social, family, transporting someone, meals, and others, to travel. The table shows the relationship between these trip purposes and the number of travel modes taken by elderly people.

Education and income had positive associations with the number of travel modes elderly people have taken while going toward home and shopping, and education was also positively associated

with number of travel modes for religious activities, travelling for meals, and traveling for family and personal reasons. However, like before, homeownership and number of vehicles in household had an inverse relationship. Following this trend, travel to social activities had a positive association with education, income, and worker status, while number of vehicles in household has negative association with travel modes. The inverse relationship between number of household vehicles and travel modes suggest that elderly people who have many vehicles at home did not need to depend on alternate modes of transportation.

ELDERLY (65+) TRIPS

Table 8: Poisson Regression Coefficients for Elderly Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Female	−0.014***	−0.001	0.011
	(0.004)	(0.008)	(0.005)
Black	−0.002	−0.003	3.15E−5
	(0.003)	(0.006)	(0.004)
Hispanic	0.009	0.007	0.016
	(0.010)	(0.019)	(0.012)
U.S. born	0.043***	−0.020	0.032***
	(0.007)	(0.011)	(0.008)
Worker	0.044***	0.007	0.039***
	(0.005)	(0.009)	(0.006)
Education	0.028***	0.016***	0.014***
	(0.001)	(0.002)	(0.002)
Income	0.004***	0.002***	0.002***
	(2.74E−4)	(0.001)	(3.37E−4)
Homeownership	0.045***	−0.037*	0.030***
	(0.008)	(0.014)	(0.009)
Household size	−0.063***	−0.009	−0.037***
	(0.004)	(0.008)	(0.005)
Household vehicles	0.013***	−0.017***	0.004
	(0.002)	(0.005)	(0.003)
Household drivers	0.050***	0.007	0.029***
	(0.005)	(0.010)	(0.006)
Log likelihood	−141,271	−69,886	−103,384
N	64,463	64,463	64,463

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 9: Poisson Regression Coefficients for Elderly Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Female	−0.001	−0.001	−0.029	−0.010	−0.001	0.003
	(0.008)	(0.025)	(0.078)	(0.024)	(0.021)	(0.010)
Black	−0.002	−0.003	0.023	−0.002	0.005	0.002
	(0.006)	(0.016)	(0.093)	(0.020)	(0.018)	(0.008)
Hispanic	0.005	−0.031	0.023	0.052	0.023	0.004
	(0.020)	(0.065)	(0.178)	(0.056)	(0.049)	(0.025)
U.S. born	−0.022	−0.036	−0.030	−0.019	−0.030	−0.025
	(0.012)	(0.039)	(0.155)	(0.030)	(0.038)	(0.015)
Worker	0.007	−0.012	−0.012	0.019	0.011	0.013
	(0.009)	(0.033)	(0.105)	(0.026)	(0.030)	(0.012)
Education	0.016***	0.023**	0.019	0.015*	0.012	0.017***
	(0.003)	(0.008)	(0.027)	(0.008)	(0.007)	(0.003)
Income	0.002***	0.003	0.000	0.002	0.002	0.002**
	(0.001)	(0.002)	(0.005)	(0.002)	(0.002)	(0.001)
Homeownership	−0.038**	−0.044	−0.140	−0.036	−0.049	−0.050**
	(0.015)	(0.047)	(0.148)	(0.046)	(0.038)	(0.018)
Household size	−0.009	−0.003	0.047	−0.007	0.005	−0.013
	(0.008)	(0.029)	(0.068)	(0.023)	(0.020)	(0.011)
Household vehicles	−0.018***	−0.018	−0.003	−0.022	−0.020	−0.020***
	(0.005)	(0.013)	(0.046)	(0.016)	(0.014)	(0.006)
Household drivers	0.007	0.008	−0.039	0.017	−0.008	0.008
	(0.010)	(0.037)	(0.093)	(0.030)	(0.024)	(0.013)
Log likelihood	−67,200	−7,084	−729	−7,558	−9,283	−42,640
N	62,046	6,517	672	7,002	8,627	39,023

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 9: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Female	0.001	−0.009	−0.001	−3.01E−4	0.002
	(0.012)	(0.019)	(0.025)	(0.013)	(0.068)
Black	−0.005	−0.010	−0.004	−0.003	−0.012
	(0.009)	(0.017)	(0.017)	(0.012)	(0.048)
Hispanic	0.009	0.009	0.003	0.011	0.014
	(0.031)	(0.051)	(0.058)	(0.038)	(0.188)
U.S. born	−0.021	−0.035	−0.033	−0.012	0.058
	(0.018)	(0.036)	(0.050)	(0.023)	(0.133)
Worker	0.031**	0.036	0.013	0.018	0.226**
	(0.015)	(0.022)	(0.030)	(0.015)	(0.086)
Education	0.019***	0.025***	0.013	0.019***	0.050*
	(0.004)	(0.006)	(0.008)	(0.005)	(0.024)
Income	0.002**	0.002	0.002	0.002	0.003
	(0.001)	(0.001)	(0.002)	(0.001)	(0.005)
Homeownership	−0.031	−0.034	−0.055	−0.057*	−0.130
	(0.023)	(0.038)	(0.047)	(0.027)	(0.107)
Household size	−0.007	−0.013	−0.001	−0.009	−0.012
	(0.013)	(0.021)	(0.021)	(0.015)	(0.067)
Household vehicles	−0.023**	−0.018	−0.008	−0.018*	−0.066
	(0.008)	(0.011)	(0.015)	(0.008)	(0.048)
Household drivers	0.008	0.002	−0.008	0.003	0.035
	(0.016)	(0.026)	(0.030)	(0.018)	(0.088)
Log likelihood	−28,479	−11,635	−6,722	−22,404	−767
N	24,885	10,340	6,180	20,492	602

Notes: *p≤.05; **p≤.01; ***p≤.001; Standard errors are in parentheses.

Oldest old (85+)

Table 12 and 13 show the regression results for the oldest old, who are 85 years old or more. Table 6 shows the relationship between explanatory variables and total number of trips, total number of travel modes and total number of trip purposes. Explanatory variables such as female, worker status, education, homeownership, household size and number of drivers at home were significantly associated with total number of trips (Model 1).

Oldest old women drive less than men, and the larger the family size is, the less the oldest old take trips. Oldest old people who work had positive associations with the total number of trips. It is surprising that the oldest old people still work, but a regular working schedule is probably what increases their number of trips compared to those who do not work. The oldest old who had higher levels of education, who own homes, and who have many other drivers at home traveled more often, probably because they can afford to go out for trips and they had access to the means to do so.

Model 3 shows regression results for the total number of trip purposes. Only two variables show significant association. The oldest old people with more drivers in their families report traveling for more purposes. However, those who live in large households have a negative association with trip purposes, they travel for fewer different reasons. Perhaps those who live in households with many drivers can tag along on many different kinds of trips, while those who live in households with many people need to share the space in vehicles with others and cannot always leave the house. They may also have family members who run their errands and do tasks for them, so they do not have as many purposes for trip taking.

OLDEST OLD (85+) TRIPS

Table 10: Poisson Regression Coefficients for Oldest Old (85+) Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Female	−0.057***	−0.006	−0.011
	(0.015)	(0.028)	(0.018)
Black	0.028	−0.004	0.020
	(0.015)	(0.025)	(0.017)
Hispanic	−0.017	−0.013	−0.010
	(0.046)	(0.082)	(0.053)
U.S. born	−0.009	−0.024	0.018
	(0.028)	(0.050)	(0.034)
Worker	0.093*	−0.014	0.056
	(0.040)	(0.080)	(0.049)
Education	0.016***	0.009	0.008
	(0.004)	(0.008)	(0.005)
Income	0.002	0.002	0.001
	(0.001)	(0.002)	(0.001)
Homeownership	0.059**	−0.009	0.045
	(0.023)	(0.041)	(0.027)
Household size	−0.100***	−0.001	−0.044**
	(0.014)	(0.024)	(0.016)
Household vehicles	0.002	−0.022	−0.008
	(0.011)	(0.022)	(0.014)
Household drivers	0.105***	−0.002	0.054**
	(0.017)	(0.031)	(0.020)
Log likelihood	−9,729	−5,179	−7,576
N	4,881	4,881	4,881

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 11: Poisson Regression Coefficients for Oldest Old (85+) Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Female	−0.007	−0.017	0.112	−0.042	−0.028	−0.012
	(0.029)	(0.266)	(0.353)	(0.083)	(0.071)	(0.038)
Black	−0.004	−0.110	0.117	0.000	0.030	0.007
	(0.025)	(0.637)	(0.652)	(0.158)	(0.102)	(0.038)
Hispanic	−0.012	−0.160	0.206	0.034	−0.074	−0.015
	(0.083)	(0.608)	(0.674)	(0.260)	(0.194)	(0.113)
U.S. born	−0.025	−0.338	0.115	0.007	−0.063	−0.024
	(0.050)	(0.415)	(0.577)	(0.201)	(0.153)	(0.061)
Worker	−0.014	−0.052	−0.143	−0.025	−0.082	−0.045
	(0.081)	(0.294)	(0.772)	(0.247)	(0.283)	(0.114)
Education	0.009	−0.002	0.015	0.015	0.011	0.011
	(0.008)	(0.063)	(0.089)	(0.024)	(0.019)	(0.011)
Income	0.002	0.004	0.009	0.005	−2.97E−4	0.001
	(0.002)	(0.018)	(0.025)	(0.006)	(0.005)	(0.003)
Homeownership	−0.012	−0.209	0.231	−0.036	−0.028	−0.021
	(0.042)	(0.374)	(0.558)	(0.124)	(0.105)	(0.054)
Household size	−0.001	−0.120	−0.027	0.031	−0.001	−0.007
	(0.025)	(0.284)	(0.305)	(0.066)	(0.066)	(0.035)
Household vehicles	−0.022	−0.017	0.026	−0.036	0.002	−0.023
	(0.022)	(0.148)	(0.173)	(0.070)	(0.055)	(0.030)
Household drivers	−0.002	0.089	−0.177	−0.020	−0.014	−0.001
	(0.031)	(0.296)	(0.407)	(0.096)	(0.076)	(0.042)
Log likelihood	−5,047	−75	−46	−621	−837	−2,978
N	4,754	73	43	589	789	2,780

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 11: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Female	−0.012	−0.038	0.018	0.012	−0.185
	(0.048)	(0.074)	(0.113)	(0.051)	(0.352)
Black	−0.003	0.015	0.064	0.007	−0.403
	(0.043)	(0.063)	(0.321)	(0.070)	(1.113)
Hispanic	−0.010	0.002	−0.030	−0.048	−0.120
	(0.139)	(0.303)	(0.354)	(0.164)	(0.859)
U.S. born	−0.034	−0.005	0.009	−0.052	0.245
	(0.096)	(0.172)	(0.208)	(0.115)	(0.496)
Worker	−0.010	−0.072	0.040	−0.006	−1.247
	(0.139)	(0.224)	(0.275)	(0.145)	(1.143)
Education	0.004	0.015	0.023	0.014	0.070
	(0.014)	(0.019)	(0.040)	(0.014)	(0.140)
Income	0.003	0.001	−0.001	0.003	0.013
	(0.003)	(0.005)	(0.008)	(0.004)	(0.027)
Homeownership	0.038	−0.011	−0.004	−0.032	−0.457
	(0.071)	(0.106)	(0.166)	(0.077)	(0.459)
Household size	−0.012	−0.010	0.101	−0.001	0.151
	(0.041)	(0.063)	(0.095)	(0.044)	(0.292)
Household vehicles	−0.020	−0.022	−0.085	−0.030	−0.015
	(0.038)	(0.049)	(0.108)	(0.040)	(0.272)
Household drivers	0.002	−0.002	0.002	−0.010	−0.313
	(0.054)	(0.080)	(0.129)	(0.055)	(0.356)
Log likelihood	−1,728	−803	−321	−1,607	−44
N	1,542	744	303	1,505	36

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Whites

Table 14 represents regression results between different explanatory variables and total number of trips, total number of travel modes and total number of trip purposes for the White population. Model 1 shows the impact of different variables on the total number of trips. Almost all variables, except the number of vehicles at home, are significantly associated with the total number of trips. Age, worker status and number of drivers at home are negatively associated with the total number of trips. The number of trips taken by the White population gradually reduces as their age increases. It probably indicates that as people age they become less active, and need to take fewer trips. Interestingly, White people who work drive less than those who do not work. Perhaps workers are confined by their work, or those without jobs are actively travelling to seek work. Also, as the number of drivers in White families increases, the respondent reports taking fewer trips, a somewhat counterintuitive find.

White females take more trips than their male counterparts. Since females are increasingly participating in the labor force, yet still bear the burden of most housework and family responsibility, they may be taking trips for both work and home tasks. Being born in the U.S, having higher education levels, income, homeownership, and family size are also positively related to the total number of trips. These people may be able to afford more trips.

Model 2 shows that age, homeownership, family size, number of household vehicles, and being born in the United States all have a negative relationship with number of travel modes. White people with such traits use fewer different modes of transportation. They may rely on private vehicles, or stick to one form of transportation so that they do not need to depend on alternative modes. On the other hand, education and income have positive relationships with number of travel modes.

In Model 3, age, U.S. born, and number of drivers at home are negatively associated with total number of trip purposes. These people give fewer reasons for traveling. .

White women give more trip purposes, supporting earlier suggestions that White women take care of their work as well as family businesses. White people who work give many reasons to travel compared to those who do not work. Working outside the home, gives regular need to travel, but also may provide other social reasons to leave the home. Education, income, homeownership, and household size are also positiviely related to number of trip purposes. Not only can these people afford to travel for many reasons, but those in large families may have diverse needs to be met outside the home.

Model 4 in Table 15 shows the influence of the number of explanatory variables on the number of travel modes taken by Whites as they travel towards home. Age, Whites who are born in the U.S., who own a house, whose household size is bigger, and who have multiple vehicles at home need fewer transportation modes to travel towards home. Contrarily, Whites with higher education and income use multiple modes of transportation while travelling towards home.

For travelling towards work (Model 5), four variables, education, income, homeownership, and number of household vehicles, are significantly associated with the number of transportation modes. Education and income have positive associations, and homeownership and number of household vehicles have negative associations. For travelling towards school (Model 6), only two variables, education and number of vehicles in household, are significant and have negative association. Whites with higher levels of education can afford private vehicles to go to school, and if there are many vehicles available in the household, it is unlikely that the respondent would use other modes of transportation to get to school.

Age and number of household vehicles are negatively associated with the number of transportation modes used when travelling for medical reasons (Model 8). The aged, who often have regular medical appointments, probably have a routine mode of transportation that they use each time they visit the doctor. Again, those with private vehicles in the household would probably use their own car for travel to medical appointments, rather than many other modes of transportation.

Education and income are positively associated with the number of transportation modes while taking trips for shopping (Model 9). In general, higher education levels are associated higher income. Whites with higher education and higher income level can afford frequent shopping trips and may diversify this endeavor with different means for getting to the mall or store. Other variables, such as age, born in USA, homeownership, household size, and number of household vehicles are negatively associated with the number of transportation modes while travelling for shopping.

The variables positively associated with the number of transportation modes while travelling for social purposes (Model 10) are worker status, education and income. Whites who work, who have higher levels of education, and who have better income, get to their social events in a variety of ways. Variables that are negatively related are born in USA, homeownership, and number of vehicles at home. The negative association of the household size indicates that family members may share rides when travelling for social reasons.

While travelling for family or personal reasons (Model 11), work status, education and income are positively associated with the number of modes of transportation. The number of transportation modes is negatively associated with being born in USA, household size, and number of household vehicles. Probably Whites who were born in USA and who have multiple vehicles at home do not have to depend on the alternate modes of transportation. The negative association of the family size indicates that family members share vehicles while travelling for family or personal reasons.

Education and income are positively associated with the number of modes of transportation, while travelling to transport someone else. Age and number of vehicles at homes are negatively associated with the number of transportation modes. Older Whites may travel less frequently to transport someone, and having vehicles at home that the respondent does not need to depend on alternate modes of transportation when transporting someone.

The number of transportation modes used when travelling for meals (model 13), has a positive association with education and income, but a negative association with age, born in USA,

homeownership, household size, and numbers of vehicles at home. Whites with higher levels of education and higher level of income use different means to get to their restaurant destination, while those with the other traits are less likely to use many different modes of transportation to obtain their meals outside the home.

WHITE TRIPS

Table 12: Poisson Regression Coefficients for White Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−0.001***	−1.47E−3***	−7.29E−4***
	(8.18E−5)	(1.61E−4)	(1.01E−4)
Female	0.042***	−0.004	0.040***
	(0.002)	(0.004)	(0.003)
U.S. born	0.007***	−0.013***	−0.015***
	(0.002)	(0.004)	(0.002)
Worker	−0.006**	−0.003	0.017***
	(0.002)	(0.004)	(0.002)
Education	0.023***	0.007***	0.010***
	(0.001)	(0.001)	(0.001)
Income	0.005***	0.003***	0.003***
	(1.58E−4)	(3.06E−4)	(1.93E−4)
Homeownership	0.030***	−0.021**	0.027***
	(0.004)	(0.008)	(0.005)
Household size	0.028***	−0.008***	0.013***
	(0.001)	(0.002)	(0.001)
Household vehicles	0.000	−0.019***	−0.002
	(0.001)	(0.002)	(0.001)
Household drivers	−0.034***	0.007	−0.015***
	(0.002)	(0.004)	(0.002)
Log likelihood	−473,159	−236,257	−345,193
N	212,026	212,026	212,026

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 13: Poisson Regression Coefficients for White Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−1.44E−3***	−3.65E−4	−1.29E−4	−1.02E−3	−2.13E−3***	−1.68E−3***
	(1.65E−4)	(3.18E−4)	(7.22E−4)	(6.08E−4)	(5.77E−4)	(2.32E−4)
Female	−0.004	−0.003	−0.024	−0.017	2.54E−4	0.001
	(0.004)	(0.007)	(0.012)	(0.015)	(0.015)	(0.006)
U.S. born	−0.014***	−0.016	−0.004	−0.018	−0.018	−0.019***
	(0.004)	(0.010)	(0.018)	(0.015)	(0.014)	(0.005)
Worker	−0.003	−0.013	−0.008	0.007	4.67E−4	0.002
	(0.004)	(0.010)	(0.019)	(0.015)	(0.014)	(0.005)
Education	0.006***	0.014***	−0.007**	0.004	0.010**	0.012***
	(0.001)	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)
Income	0.003***	3.21E−3***	0.001	0.001	0.002	0.002***
	(3.13E−4)	(0.001)	(0.001)	(0.001)	(0.001)	(4.36E−4)
Homeownership	−0.023**	−0.045***	−0.006	−0.041	−0.033	−0.029**
	(0.008)	(0.014)	(0.022)	(0.031)	(0.027)	(0.011)
Household size	−0.007**	−0.003	−0.002	−0.001	−0.008	−0.009**
	(0.002)	(0.004)	(0.005)	(0.008)	(0.009)	(0.003)
Household vehicles	−0.019***	−0.022***	−0.018**	−0.015	−0.021*	−0.019***
	(0.002)	(0.004)	(0.006)	(0.009)	(0.009)	(0.003)
Household drivers	0.006	0.007	0.007	7.65E−5	−0.001	0.005
	(0.004)	(0.007)	(0.010)	(0.015)	(0.015)	(0.006)
Log likelihood	−224,984	−71,333	−25,391	−17,732	−18,374	−115,824
N	202,109	64,397	20,932	16,152	16,782	103,901

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 13: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−1.50E−3***	−3.28E−3***	−0.001**	−0.002***	−0.002
	(2.48E−4)	(4.41E−4)	(4.62E−4)	(2.97E−4)	(0.001)
Female	−0.001	−0.007	−0.001	−0.009	−0.044
	(0.006)	(0.011)	(0.011)	(0.007)	(0.028)
U.S. born	−0.037***	−0.046***	−0.012	−0.019**	−0.107***
	(0.006)	(0.010)	(0.010)	(0.007)	(0.031)
Worker	0.023***	0.029**	−0.008	0.005	0.097**
	(0.006)	(0.010)	(0.010)	(0.007)	(0.032)
Education	0.008***	0.016***	0.008**	0.010***	0.014**
	(0.001)	(0.003)	(0.003)	(0.002)	(0.007)
Income	0.003***	0.003***	0.002**	0.002***	0.008***
	(4.61E−4)	(0.001)	(0.001)	(0.001)	(0.002)
Homeownership	−0.024**	0.003	−0.019	−0.044**	−0.061
	(0.012)	(0.022)	(0.020)	(0.015)	(0.050)
Household size	−0.009**	−0.021**	−0.003	−0.013**	−0.012
	(0.003)	(0.007)	(0.005)	(0.004)	(0.015)
Household vehicles	−0.022***	−0.020***	−0.015**	−0.023***	−0.040*
	(0.003)	(0.006)	(0.006)	(0.004)	(0.016)
Household drivers	0.007	0.011	0.009	0.011	0.026
	(0.006)	(0.011)	(0.010)	(0.008)	(0.026)
Log likelihood	−96,969	−32,041	−34,252	−69,734	−4,105
N	82,108	27,423	30,502	61,961	3,026

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Blacks

Table 16 shows the association between different response (total trips, number of travel modes and number of trip purposes) and explanatory variables (demographic and socioeconomic) for Black people. For total number of trips (Model 1), age and number of drivers at home show negative associations, indicating that older Blacks and Blacks who have multiple drivers at home drive less. The number of total trips taken by Black women is greater than Black men. Like White women, Black women may travel for both work and home responsibilities. Education and income are also positively associated with the total number of trips, as are household size and number of vehicles at home.

Model 2 shows associations with the number of travel modes. Both age and number of vehicles at home are negatively associated with use of many transportation modes, indicating that old Black people and those with more vehicles at home take fewer different kinds of transportation modes overall.

Model 3 represents regression result for the number of trip purposes. Significantly associated variables are age, female, worker status, education and income. Age is negatively associated with the total number of trip purposes, while all other variables have positive associations. The number of trip purposes for Black women is higher than Black men, again probably due to home and work responsibilities. Like Whites, Black workers, those with higher levels of education and income traveled for more reasons. .

Model 4 in table 17 shows regression result of number of transportation modes while travelling toward home. Age, homeownership and number of vehicles at home are negatively and significantly associated with the transportation modes, indicating that these variables are associated with using fewer different kinds of transportation modes when making the journey back to homes..

Model 5 represents regression result for travel towards work. Two variables, homeownership and number of vehicles at home, have negative associations, indicating that these variables are

associated with using fewer transportation modes when traveling to work. When travelling for medical reasons (Model 8), only the number of vehicles at home is negatively and significantly associated with the number of transportation modes. Probably, Blacks who have multiple vehicles at home can afford private vehicle and do not need to rely on other modes of transportation. Model 9 represents regression result for the shopping. Three variables, age, homeownership and number of vehicles at home, are significantly and negatively associated with the number of transportation modes. The number of vehicles at home is negatively associated with travelling for family or personal reason (Model 11) and travelling for meals (Model 13). All of these indicate that when there are vehicles available at home, Blacks do not need to rely on multiple modes of transportation to get to their destinations.

BLACK TRIPS

Table 14: Poisson Regression Coefficients for Black Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−0.002***	−0.002**	−0.002***
	(3.10E−4)	(0.001)	(3.78E−4)
Female	0.046***	−0.009	0.037***
	(0.009)	(0.016)	(0.010)
U.S. born	0.012	0.002	−0.016
	(0.008)	(0.015)	(0.009)
Worker	−0.004	−0.003	0.022**
	(0.008)	(0.015)	(0.010)
Education	0.023***	−0.004	0.011***
	(0.002)	(0.003)	(0.002)
Income	0.007***	0.002	0.004***
	(0.001)	(0.001)	(0.001)
Homeownership	−0.015	−0.040	0.009
	(0.011)	(0.020)	(0.013)
Household size	0.013***	−0.001	4.80E−4
	(0.004)	(0.007)	(0.005)
Household vehicles	0.012*	−0.041***	0.006
	(0.005)	(0.009)	(0.006)
Household drivers	−0.021**	0.015	−0.008
	(0.007)	(0.013)	(0.009)
Log likelihood	−29,597	−15,003	−21,794
N	13,493	13,493	13,493

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 15: Poisson Regression Coefficients for Black Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.002**	−0.001	−0.001	−1.83E−4	−0.002	−0.002**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Female	−0.011	−0.020	−0.006	−0.015	−0.043	−0.019
	(0.017)	(0.030)	(0.041)	(0.052)	(0.057)	(0.023)
U.S. born	0.000	−0.014	0.056	0.008	0.020	−0.007
	(0.015)	(0.037)	(0.045)	(0.037)	(0.059)	(0.021)
Worker	−0.001	−0.027	−0.055	−0.010	−0.035	0.011
	(0.016)	(0.040)	(0.049)	(0.038)	(0.060)	(0.022)
Education	−0.004	0.002	−0.012	−0.004	−0.002	−0.003
	(0.003)	(0.008)	(0.008)	(0.011)	(0.014)	(0.005)
Income	0.002	0.003	0.006	0.001	0.005	0.002
	(0.001)	(0.003)	(0.004)	(0.004)	(0.005)	(0.002)
Homeownership	−0.041**	−0.078**	−0.026	−0.046	−0.098	−0.059**
	(0.021)	(0.039)	(0.050)	(0.065)	(0.069)	(0.028)
Household size	−0.001	−0.004	3.88E−4	0.014	0.025	−0.002
	(0.007)	(0.014)	(0.014)	(0.024)	(0.027)	(0.010)
Household vehicles	−0.044***	−0.050**	−0.041	−0.030	−0.081**	−0.056***
	(0.009)	(0.017)	(0.024)	(0.030)	(0.031)	(0.013)
Household drivers	0.017	0.019	0.009	0.005	0.017	0.026
	(0.014)	(0.026)	(0.032)	(0.046)	(0.046)	(0.019)
Log likelihood	−14,466	−4,314	−2,106	−1,638	−1,324	−7,519
N	13,009	3,904	1,743	1,514	1,181	6,745

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 15: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.001	−0.003	−0.001	−0.002	−0.006
	(0.001)	(0.002)	(0.002)	(0.001)	(0.004)
Female	−0.002	−0.038	−0.011	−0.027	0.011
	(0.027)	(0.047)	(0.042)	(0.035)	(0.105)
U.S. born	−0.011	−0.013	−0.005	−0.024	−0.059
	(0.024)	(0.039)	(0.034)	(0.036)	(0.103)
Worker	0.011	0.019	0.004	0.024	0.078
	(0.025)	(0.039)	(0.035)	(0.036)	(0.110)
Education	−0.004	−0.001	−0.006	−0.001	0.002
	(0.006)	(0.010)	(0.010)	(0.008)	(0.020)
Income	0.001	0.001	0.002	0.003	−0.004
	(0.002)	(0.004)	(0.003)	(0.003)	(0.008)
Homeownership	−0.024	−0.010	−0.029	−0.063	0.198
	(0.035)	(0.063)	(0.050)	(0.046)	(0.136)
Household size	0.017	0.012	0.011	−0.004	−0.060
	(0.012)	(0.021)	(0.016)	(0.016)	(0.043)
Household vehicles	−0.027	−0.061*	−0.025	−0.059**	−0.124
	(0.015)	(0.026)	(0.023)	(0.020)	(0.069)
Household drivers	−0.012	0.014	−0.016	0.016	0.090
	(0.022)	(0.041)	(0.033)	(0.031)	(0.084)
Log likelihood	−5,091	−1,789	−2,473	−3,165	−302
N	4,325	1,573	2,248	2,812	221

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Hispanics

Tables 18 and 19 represent regression results for Hispanics trips. Model 1 represents the association between the total number of trips and various explanatory variables. Age has negative association with total number of trips taken, indicating that Hispanics at older ages travel less. Interestingly, being a worker and having many drivers at home is also associated with fewer trips for Hispanics. Perhaps Hispanic workers take fewer trips because they are engaged in time-consuming jobs, or that those with many drivers in their households rely on others to take extraneous trips for them rather than traveling themselves. Like with White and Black women, Hispanic women take more trips than Hispanic men. Similarly, the total number of trips for the US born Hispanics is greater than of those who do not born in the USA, and education, income, and household size have positive associations with trips taken as well.

Model 2 is on the total number of travel modes. Age, homeownership, and number of vehicles at home are negatively associated with the total number of travel modes. Older Hispanics rely on fewer modes of transportation to go on their trips, and those who are homeowners or have many vehicles in their households also use fewer modes of transportation.

The regression results of Model 3 represent the association between the total number of trip purposes and various explanatory variables for Hispanics population. Age is negatively associated with the total number of trip purposes, indicating that Hispanics at older age have fewer different trip purposes. The number of trip purposes for Hispanic women is greater than Hispanic men. Hispanics with higher levels of education and higher incomes also are associated with taking trips for more reasons..

The regression results for Models 4 to 14 are on the number of transportation modes for different trip purposes. Age, homeownership, and number of vehicles are negatively associated with the number of transportation modes used to travel home and to go shopping. This indicates that older Hispanics, those who own homes, and those who have many vehicles in the household are likely to use fewer different modes of transportation to get home or to go out to shop. Age and number of vehicles in the household also are negatively associated with number of transportation modes

used for going on social trips. For work related travel, medical travel, and traveling for meals the number of vehicles at home is negatively and significantly associated with number of transportation modes. When travelling to school, education is negatively associated with transportation modes. Age also is associated with using fewer modes of transportation for family or personal trips. These results suggest that older Hispanic people use fewer different modes of transportation for a variety of trip purposes, and that when there is access to vehicles in the home, they are likely to not rely on many different transportation modes to get to their destinations.

HISPANIC TRIPS

Table 16: Poisson Regression Coefficients for Hispanic Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−0.001***	−0.001**	−0.001***
	(2.53E−4)	(4.83E−4)	(3.09E−4)
Female	0.065***	0.006	0.035***
	(0.007)	(0.013)	(0.008)
U.S. born	0.025***	0.004	0.007
	(0.005)	(0.009)	(0.006)
Worker	−0.022***	−0.005	−0.004
	(0.005)	(0.010)	(0.006)
Education	0.024***	−0.003	0.011***
	(0.002)	(0.003)	(0.002)
Income	0.006***	0.002	0.004***
	(0.001)	(0.001)	(0.001)
Homeownership	0.006	−0.039**	0.015
	(0.009)	(0.017)	(0.011)
Household size	0.018***	−0.003	0.002
	(0.003)	(0.005)	(0.003)
Household vehicles	0.006	−0.033***	−0.002
	(0.004)	(0.008)	(0.005)
Household drivers	−0.033***	0.010	−0.010
	(0.005)	(0.010)	(0.007)
Log likelihood	−42,684	−22,264	−31,744
N	19,822	19,822	19,822

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 17: Poisson Regression Coefficients for Hispanic Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001**	−0.001	−2.87E−4	−0.001	−0.001	−0.002*
	(4.91E−4)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Female	0.006	0.002	−0.005	0.028	0.010	0.014
	(0.013)	(0.024)	(0.030)	(0.049)	(0.050)	(0.020)
U.S. born	0.003	0.001	−0.017	0.006	−0.018	−0.001
	(0.010)	(0.019)	(0.035)	(0.032)	(0.037)	(0.014)
Worker	−0.005	−0.030	0.021	−0.009	0.014	−0.002
	(0.010)	(0.024)	(0.038)	(0.033)	(0.038)	(0.014)
Education	−0.003	0.003	−0.011*	−0.003	−0.004	0.001
	(0.003)	(0.006)	(0.006)	(0.010)	(0.012)	(0.004)
Income	0.002	0.004	−0.001	0.001	0.002	0.001
	(0.001)	(0.002)	(0.003)	(0.004)	(0.004)	(0.002)
Homeownership	−0.040*	−0.051	−0.001	−0.076	−0.110	−0.059*
	(0.017)	(0.032)	(0.037)	(0.062)	(0.061)	(0.024)
Household size	−0.003	0.005	0.004	−0.018	0.008	−0.002
	(0.005)	(0.009)	(0.011)	(0.019)	(0.020)	(0.008)
Household vehicles	−0.035***	−0.045***	−0.022	−0.053	−0.083**	−0.042***
	(0.008)	(0.014)	(0.018)	(0.033)	(0.031)	(0.012)
Household drivers	0.012	0.014	0.004	0.032	0.034	0.012
	(0.010)	(0.018)	(0.023)	(0.038)	(0.038)	(0.015)
Log likelihood	−21,547	−6,714	−3,987	−1,633	−1,615	−10,184
N	19,182	6,056	3,296	1,455	1,420	9,037

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 17: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.002*	−0.004*	−0.001	−0.001	4.38E−4
	(0.001)	(0.002)	(0.001)	(0.001)	(0.004)
Female	−0.009	0.011	0.024	0.002	−0.090
	(0.021)	(0.043)	(0.031)	(0.028)	(0.092)
U.S. born	−0.017	−0.013	−0.001	−0.009	0.008
	(0.015)	(0.034)	(0.024)	(0.021)	(0.086)
Worker	0.014	0.013	−0.005	0.016	0.009
	(0.016)	(0.035)	(0.024)	(0.021)	(0.090)
Education	−3.34E−4	0.004	−0.001	−0.007	−0.012
	(0.004)	(0.010)	(0.007)	(0.006)	(0.017)
Income	2.15E−4	0.001	0.001	0.003	0.011
	(0.002)	(0.004)	(0.003)	(0.002)	(0.008)
Homeownership	−0.023	−0.069	−0.064	−0.075	0.021
	(0.028)	(0.057)	(0.038)	(0.039)	(0.126)
Household size	−0.005	−0.016	0.003	−0.006	−0.010
	(0.009)	(0.018)	(0.012)	(0.013)	(0.036)
Household vehicles	−0.033*	−0.037	−0.037	−0.035*	−0.123*
	(0.013)	(0.026)	(0.019)	(0.018)	(0.059)
Household drivers	0.011	0.011	0.007	0.004	0.066
	(0.017)	(0.033)	(0.023)	(0.024)	(0.071)
Log likelihood	−8,034	−2,032	−4,265	−4,716	−392
N	6,772	1,726	3,769	4,164	294

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Female

Table 20 and Table 21 show women's travel behaviors. Model 1 represents the associations between the total number of trips and various explanatory variables. Age is negatively associated with the total number of trips, indicating that older women take fewer trips than younger women. Black and Hispanic have negative associations too, indicating that White women take more trips than Black or Hispanic women. Working women, and those who have many drivers in the home took fewer trips than those women who do not work or who have fewer drivers in the home. This may indicate that women who are not working are making many trips for social outings or errands that support the family, and that women may take the primary responsibility for driving when there are not many other drivers in the home. Women who were born in the U.S. were likely to take more trips than women born elsewhere, which may reflect cultural attitudes towards women's mobility, or their access to transportation. Women with higher levels of education, more income, and who are homeowners all took more trips. All of these may indicate that the frequency of travel may be related to the capacity to afford to take trips. Household size is also positively associated with the total number of trips. Women who have larger families take more trips, probably, for more errands and social responsibilities associated with all of their family members.

Model 2 represents regression results for the number of travel modes. Older women, and those who were born in the United States used fewer different modes of transportation for their travels. Homeownership and household size also had negative associations with number of travel modes, and this is probably related to the number of vehicles in the household, which is also negatively related to number of travel modes. Those women who may be transporting big families, and have a car to do so may be less likely to use many forms of travel to get to their destinations. Education and income have positive associations with using different modes of transportation, Perhaps women with high levels of education and high incomes take many trips and choose to get to their destinations in a variety of ways because they have the means to try different forms of transportation.

The regression results of Model 3 represent the association between the total number of trip purposes and various explanatory variables. Like with total number of trips and modes of transportation, age is negatively associated with the total number of trip purposes. This indicates that older women are less likely to have a variety of travel purposes, than younger women. However, women who work, have higher levels of education, higher income, own homes, and live in large households are likely to travel for many different reasons. This makes intuitive sense, since these women may be traveling for work, social, home, and family responsibilities. Those women who were born in the United States had fewer numbers of trip purposes than women who were born elsewhere, and having many drivers in the household was also associated with less variety in women's trip purposes. Perhaps women in these circumstances have other family members who can take care of some of their business outside of the home for them. The negative association of Hispanic with number of trip purposes indicates that Hispanic women have a smaller array of trip purposes than White women.

The regression results for Model 4 show the association between the number of transportation modes used and various explanatory variables when women are traveling home. Older women, those who were born in the U.S., homeowners, and those with many vehicles in the household used fewer modes of transportation to get home. It is likely that these women own their own vehicles, or have established patterns for traveling home, so they use the same mode each time. Education and income have positive associations with number of travel modes used to get home. This indicates that women with high levels of education and high incomes will use many different ways to reach their home destination. Perhaps they are more likely to travel from a variety of places, and rely on different services that are suitable from those locations to reach home.

While travelling for work (Model 5), education and income are again positively associated with number of transportation modes. Homeownership and having vehicles in the household are associated with using fewer modes of transportation. These women probably have access to their own vehicles and do not need to rely on other modes of transportation for work related trips.

Model 6 represents regression results for travel to school. Education is negatively associated with transportation modes, indicating that women with higher levels of education use fewer transportation modes to get to school. Number of vehicles at home is also negatively associated with transportation modes.

The regression results for Model 8 represent travel for medical purposes. Older women use fewer modes of transportation to travel for medical reasons, which may be a result of older women driving less or the reliance on a single, routine mode, such as being driven by a family member, to get to appointments. Homeownership and number of household vehicles also are associated with using fewer modes of transportation for medical travel

Model 9 represents the regression results for shopping trips. Education and income are positively associated with using different modes of transportation for shopping trips, which may be related to greater frequency of shopping trips for women with higher levels of education and income. However, homeownership and number of vehicles in the households are associated with using fewer modes of transportation for going shopping. Perhaps these two are related, where those who own homes and cars live in areas, like the suburbs, where access to shopping areas necessitates driving in a private car. Older women and those who were born in the U.S. used fewer modes of transportation for their shopping trips. Its possible that the economic situation of these women affords them the ability to own private vehicles, and thus they do not need to rely on other modes of transportation.

The modes of transportation used when travelling for social purposes (Model 10) is positively associated with worker status, indicating that working women are likely to use different transportation modes to travel to social events. Higher education and income are also associated with using a variety of transportation modes for social trips. Age, being born in the United States, and having many vehicles in the household are negatively associated with transportation modes for social events.

Model 11 represents regression results for family or personal trips. Like many of the other travel purposes, education and income are positively associated with using a variety of different modes

of transportation when headed to these destinations. Like with social outings, working women are likely to use more modes of transportation for family and personal trips than women who are not working. Again being older, being born in the U.S. and having vehicles in the household are all associated with using fewer modes of transportation to reach these destinations.

Model 12 represents regression results for transporting someone. Age has a negative association with the number of transportation modes used, which may be a reflection of the infrequency that elderly women are transporting someone else on their trips. Education and income have positive associations, indicating that women with higher levels of education and income use greater numbers of transportation modes even when transporting someone else. The more vehicles are in the household, the less likely women are to use a large number of modes of transportation to take someone to a destination. This is probably because they are using their own private cars for this transportation.

Model 13 represents travelling for meals. Many of the patterns seen for other trip purposes appear again. Education and income are associated with using more modes of transportation when traveling for meals. Age, being born in the U.S., homeownership, and number of household vehicles are all negatively associated with number of modes of transportation used to go for meals. Household size also has a negative association, indicating that women with bigger families use fewer transportation modes when travelling for meals.

FEMALE TRIPS

Table 18: Poisson Regression Coefficients for Female Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−0.002***	−0.002***	−0.001***
	(1.00E−4)	(1.98E−4)	(1.24E−4)
Black	−0.005**	−0.006	−0.001
	(0.002)	(0.004)	(0.003)
Hispanic	−0.023***	−0.001	−0.023***
	(0.005)	(0.010)	(0.006)
U.S. born	0.021***	−0.010*	−0.010***
	(0.002)	(0.004)	(0.003)
Worker	−0.015***	−0.002	0.016***
	(0.002)	(0.005)	(0.003)
Education	0.026***	0.005***	0.011***
	(0.001)	(0.001)	(0.001)
Income	0.005***	0.002***	0.003***
	(1.97E−4)	(3.83E−4)	(2.40E−4)
Homeownership	0.041***	−0.026**	0.031***
	(0.004)	(0.008)	(0.005)
Household size	0.035***	−0.005*	0.012***
	(0.001)	(0.003)	(0.002)
Household vehicles	−3.62E−4	−0.019***	3.41E−5
	(0.001)	(0.003)	(0.002)
Household drivers	−0.042***	0.004	−0.017***
	(0.002)	(0.005)	(0.003)
Log likelihood	−303,033	−150,528	−221,203
N	135,143	135,143	135,143

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 19: Poisson Regression Coefficients for Female Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001***	−0.001	−0.001	−0.001	−0.002**	−0.002***
	(2.03E−4)	(4.28E−4)	(0.001)	(0.001)	(0.001)	(2.79E−4)
Black	−0.005	−0.010	0.006	−0.003	0.001	−0.006
	(0.004)	(0.007)	(0.013)	(0.014)	(0.014)	(0.005)
Hispanic	−0.001	−0.003	−0.007	0.040	0.038	0.007
	(0.010)	(0.019)	(0.024)	(0.034)	(0.033)	(0.014)
U.S. born	−0.011*	−0.008	−0.002	−0.014	−0.013	−0.014*
	(0.005)	(0.011)	(0.019)	(0.016)	(0.015)	(0.006)
Worker	−0.002	−0.016	−0.006	0.006	0.000	0.002
	(0.005)	(0.012)	(0.020)	(0.016)	(0.015)	(0.006)
Education	0.005***	0.010***	−0.006*	0.005	0.008	0.009***
	(0.001)	(0.003)	(0.003)	(0.004)	(0.005)	(0.002)
Income	0.002***	0.003***	0.001	0.002	0.002	0.002***
	(3.92E−4)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Homeownership	−0.027**	−0.051**	0.002	−0.045	−0.059*	−0.038***
	(0.009)	(0.017)	(0.024)	(0.031)	(0.028)	(0.012)
Household size	−0.005	−0.003	0.003	−0.005	0.002	−0.005
	(0.003)	(0.005)	(0.006)	(0.009)	(0.009)	(0.004)
Household vehicles	−0.020***	−0.026***	−0.018*	−0.017	−0.031**	−0.021***
	(0.003)	(0.005)	(0.008)	(0.011)	(0.010)	(0.004)
Household drivers	0.003	0.009	0.001	0.007	−0.006	0.001
	(0.005)	(0.009)	(0.012)	(0.017)	(0.017)	(0.007)
Log likelihood	−144,170	−40,458	−16,912	−12,772	−13,353	−78,128
N	129,571	36,556	14,078	11,686	12,120	69,941

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 19: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.002***	−0.003***	−0.001*	−0.002***	−0.002
	(3.10E−4)	(0.001)	(0.001)	(3.77E−4)	(0.001)
Black	−0.007	−0.015	−0.014	−0.008	−0.009
	(0.006)	(0.011)	(0.009)	(0.008)	(0.030)
Hispanic	−0.014	0.003	0.013	−0.002	−0.065
	(0.016)	(0.029)	(0.021)	(0.020)	(0.069)
U.S. born	−0.033***	−0.040***	−0.007	−0.018*	−0.101**
	(0.007)	(0.012)	(0.010)	(0.009)	(0.036)
Worker	0.023***	0.027*	−0.009	0.007	0.098**
	(0.007)	(0.012)	(0.010)	(0.009)	(0.037)
Education	0.007***	0.015***	0.007*	0.008***	0.010
	(0.002)	(0.004)	(0.003)	(0.002)	(0.008)
Income	0.002***	0.003**	0.002*	0.002**	0.007*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Homeownership	−0.018	−0.005	−0.032	−0.048**	−0.060
	(0.014)	(0.024)	(0.020)	(0.017)	(0.058)
Household size	−0.006	−0.015	3.74E−4	−0.012*	−0.004
	(0.004)	(0.008)	(0.006)	(0.005)	(0.018)
Household vehicles	−0.020***	−0.018*	−0.018**	−0.022***	−0.052*
	(0.005)	(0.008)	(0.007)	(0.005)	(0.020)
Household drivers	0.005	0.001	0.005	0.007	0.013
	(0.008)	(0.013)	(0.011)	(0.010)	(0.033)
Log likelihood	−60,748	−20,886	−26,346	−42,393	−2,611
N	51,478	17,913	23,482	37,695	1,945

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Male

Table 22 and Table 23 display male transportation behaviors. Model 1 represents regression results for associations between total number of trips and various explanatory variables. Age is positively associated with the total number of trips, indicating that older men take more trips than younger ones. This positive association is unique because in all other cases age has a negative association with number of trips. It may indicate the economic strength of older men, who can afford to take many trips, or may be the result of a combination of other factors.

Men with higher levels of education and higher income take more trips, as do men who reside in large household and have many vehicles in the household. This is probably because they can afford to take many outing, and their family size may necessitate going out frequently. However, if there are many drivers in the household, men take fewer trips. Perhaps, like women, when there are many drivers in the home men can rely on other family members to run errands for them. The variables Black and Hispanic have negative associations with number of trips taken, indicating that White men take more trips.

Model 2 represents regression results for the total number of transportation modes used by men. Like their female counterparts, highly educated men and those men with higher incomes use more modes of transportation than less educated men and those with lower incomes. Age, homeownership, family size, and the number of household vehicles have negative associations with the number of transportation modes used by men

Model 3 displays men's total number of trip purposes. Education, income, worker status, and homeownership have positive associations with the number of trip purposes, indicating men with these characteristics are likely to travel for a variety of reasons. Older men, those who were born in the United States, and Hispanic men travel for fewer reasons. Household size and number of drivers have opposite associations with number of trip purposes. Those in large households travel for many purposes, but when there are many drivers in the household reasons for traveling are reduced.

Model 4 represents regression result on the association between the number of transportation modes used by men for various trip purposes and numerous explanatory variables. When traveling home, older men, those who own their homes, have many vehicles in the household, and have large families use fewer modes of transportation. This may be because they own their own vehicles, and do not need to rely on other modes of transportation, they share rides with family members regularly, or they have a routine mode of transportation that they use to get home. Like women, men with higher levels of education and income use a variety of transportation modes to travel home compared to their less educated or less moneyed counterparts. This association of education and income with number of travel modes continues for travel to work (Model 5), and homeownership and number of vehicles in the household is also negative for work travel.

Model 6 examines school travel. Men who have higher level of education and multiple vehicles at home use fewer transportation modes when driving toward school. These men may have access to private vehicles and do not rely on alternate modes of transportation. Having many vehicles in the household also is negatively associated with the number of travel modes used for medical travel (Model 8). Older men are also less likely to use many modes of transportation to access medical destinations.

Model 9 represents regression results for shopping trips. Age is negatively associated with transportation modes, indicating that older men use fewer transportation modes when travelling to shop, as do men who are homeowners or men who have many vehicles at home. However, education and incomes are positively associated with using a variety of modes of transportation for shopping.

The modes of transportation used when traveling for social purposes (Model 10) is negatively associated with age, being born in the U.S., homeownership, and number of vehicles in the home. However those men with higher levels of education, more income, and working men are more likely to use a variety of transportation modes when going out to socialize. Men's trips for family or personal reasons follow a similar pattern, where age, being born in the U.S., and the number of vehicles at home are negatively associated with number of modes of transportation

used, while education and income are positively associated. However, household size also has a significant and negative relationship with modes of transportation used for family or personal trips. Perhaps those with large families need to use personal vehicles, or some other form of regular and reliable transportation when planning family and personal outings.

For transporting someone (Model 12), only the number of vehicles at home is negatively associated with transportation modes, indicating that men who have multiple vehicles at home use fewer transportation modes. They may have access to private vehicles and do not need to rely on other modes of transportation.

Modes of transportation used for travel for meals (Model 13), is negatively associated with age, homeownership, and number of vehicles in the home. Older men, homeowners, and men with many vehicles in the household may be more likely to rely on just one type of transportation, like a private car, when going out to eat. Men with higher levels of education and incomes are likely to use more modes of transportation when going out for meals, possibly because they are coming from a variety of places to get to the restaurant, like work, home, or other social events, or because they make these trips more often.

MALE TRIPS

Table 20: Poisson Regression Coefficients for Male Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	0.001***	−0.001***	−2.62E−4*
	(1.06E−4)	(2.05E−4)	(1.31E−4)
Black	−0.006**	−0.007	−0.001
	(0.002)	(0.004)	(0.003)
Hispanic	−0.030***	−0.013	−0.013*
	(0.005)	(0.010)	(0.007)
U.S. born	0.001	−0.006	−0.007*
	(0.003)	(0.005)	(0.003)
Worker	−0.003	−0.007	0.007*
	(0.003)	(0.005)	(0.003)
Education	0.018***	0.004**	0.008***
	(0.001)	(0.001)	(0.001)
Income	0.005***	0.003***	0.003***
	(2.13E−4)	(4.07E−4)	(2.60E−4)
Homeownership	0.010	−0.031***	0.021***
	(0.005)	(0.009)	(0.006)
Household size	0.011***	−0.006*	0.007***
	(0.001)	(0.003)	(0.002)
Household vehicles	0.005***	−0.021***	−0.002
	(0.001)	(0.003)	(0.002)
Household drivers	−0.023***	0.007	−0.012***
	(0.003)	(0.005)	(0.003)
Log likelihood	−268,197	−136,395	−196,700
N	122,081	122,081	122,081

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 21: Poisson Regression Coefficients for Male Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001***	−4.64E−4	0.001	−0.001	−0.002*	−0.002***
	(2.10E−4)	(3.82E−4)	(0.001)	(0.001)	(0.001)	(3.06E−4)
Black	−0.007	−0.006	−0.005	−0.016	−3.83E−4	−0.006
	(0.004)	(0.007)	(0.011)	(0.016)	(0.016)	(0.006)
Hispanic	−0.014	−0.006	−0.024	−0.018	0.019	−0.015
	(0.010)	(0.018)	(0.023)	(0.041)	(0.043)	(0.016)
U.S. born	−0.007	−0.009	−0.006	−0.004	−0.018	−0.013
	(0.005)	(0.010)	(0.023)	(0.017)	(0.022)	(0.007)
Worker	−0.007	−0.022	−0.002	−0.005	−3.77E−4	−1.95E−4
	(0.005)	(0.012)	(0.024)	(0.018)	(0.022)	(0.007)
Education	0.003**	0.013***	−0.010***	0.001	0.008	0.008***
	(0.001)	(0.003)	(0.003)	(0.005)	(0.005)	(0.002)
Income	0.003***	0.003***	0.002	0.001	0.001	0.002***
	(4.17E−4)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Homeownership	−0.034***	−0.055***	−0.005	−0.056	−0.068	−0.047***
	(0.009)	(0.016)	(0.024)	(0.039)	(0.037)	(0.014)
Household size	−0.007*	−0.001	−0.004	3.64E−4	−0.008	−0.009
	(0.003)	(0.005)	(0.006)	(0.010)	(0.013)	(0.004)
Household vehicles	−0.022***	−0.024***	−0.022**	−0.021	−0.027*	−0.024***
	(0.003)	(0.005)	(0.008)	(0.012)	(0.012)	(0.004)
Household drivers	0.008	0.006	0.007	0.002	0.007	0.009
	(0.005)	(0.008)	(0.012)	(0.019)	(0.021)	(0.008)
Log likelihood	−129,684	−46,259	−16,616	−9,082	−8,815	−61,440
N	116,143	41,677	13,604	8,213	8,026	55,065

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 21: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.001***	−0.003***	−0.001	−0.002***	−0.003*
	(3.21E−4)	(0.001)	(0.001)	(3.88E−4)	(0.002)
Black	−0.011	−0.008	−0.010	−0.009	−0.034
	(0.006)	(0.011)	(0.011)	(0.008)	(0.038)
Hispanic	−0.013	−0.028	−0.019	−0.022	0.007
	(0.016)	(0.034)	(0.026)	(0.022)	(0.068)
U.S. born	−0.030***	−0.033*	−0.014	−0.018	−0.068
	(0.007)	(0.014)	(0.014)	(0.009)	(0.038)
Worker	0.019*	0.022	−0.001	0.007	0.066
	(0.008)	(0.014)	(0.014)	(0.010)	(0.040)
Education	0.006**	0.010*	0.003	0.007**	0.009
	(0.002)	(0.004)	(0.004)	(0.002)	(0.008)
Income	0.003***	0.004***	0.001	0.003***	0.007*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Homeownership	−0.039**	−0.023	−0.023	−0.059***	0.009
	(0.015)	(0.028)	(0.026)	(0.018)	(0.061)
Household size	−0.007	−0.020*	−0.002	−0.010	−0.029
	(0.004)	(0.009)	(0.007)	(0.006)	(0.018)
Household vehicles	−0.025***	−0.027***	−0.017*	−0.026***	−0.050*
	(0.004)	(0.008)	(0.008)	(0.005)	(0.021)
Household drivers	0.004	0.018	0.005	0.014	0.057
	(0.008)	(0.015)	(0.013)	(0.010)	(0.032)
Log likelihood	−54,491	−16,364	−17,046	−38,452	−2,463
N	46,016	13,972	15,156	34,034	1,791

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Socioeconomic Inequality

Poor (income = <$19,000)

Tables 24 and 25 show the transportation behaviors of low-income people. Table 4 is composed of three models, and table 5 has eleven models. Model 1 represents regression results for associations between total number of trips and various variables. Age is negatively associated with total number of trips, indicating that people who are low income and who are older take fewer trips. Female has positive association, indicating women in this income bracket take more trips than men. Since the participation of women in labor force is increasing, women are driving for both work and household purposes, which may increase their total number of trips. Education and number of vehicles at home are also positively associated with the total number of trips.

Model 2 represents regression result for travel modes. Two variables (age and number of vehicles at home) are negatively associated with travel modes. People who are low income and who are older use fewer modes of transportation, as do people who have multiple vehicles at home. Its possible that these people use private vehicles for most of their travel and do not need other modes.

Model 3 describes variables related to trip purposes. Older people in this low-income bracket cite fewer purposes for going out of the home. However, Female, education, and number of vehicles at home are all positively associated with number of trip purposes. This means that low-income women are more likely to travel for a variety of purposes than men. It also indicates that as people have higher levels of education, or more vehicles available in the household, they are more likely to travel for numerous reasons.

Model 4 represents regression results for associations between the transportation modes used by people whose income is less than $19,000 when traveling home and various explanatory variables. Almost all significant associations were negative, including age, Black, and nativity status. Older people used fewer transportation modes than younger people in the same income bracket. African Americans used fewer modes than Whites, and those who were boen in the United States used fewer modes than those who were born elsewhere. Homeownership,

household size and number of vehicles at home also had negative associations with modes of transportation used to travel home. Education was the one variable with a significant positive relationship with transportation modes, indicating that poor people with higher levels of education use a wider variety of transportation modes when traveling home.

The number of vehicles at home was a significant predictor on the modes of transportation used when traveling to work (Model 5), school (Model 6), and for medical reasons (Model 8). This is probably because access to a private vehicle is a disincentive to use other modes of transportation. In Model 6, age also had a negative relationship with the number of modes of transportation used when traveling to school. The regression result of model 9 represents the association between transportation modes used for shopping trips by low-income people and explanatory variables. Age, homeownership, and the number of vehicles at home were all negatively associated with using multiple modes of transportation for shopping.

Age was also a significant predictor for number of transportation modes used when traveling for social trips (Model 10) and family or personal purposes (Model 11). Like with other trip purposes, the number of vehicles at home reduced the likelihood of using multiple modes of transportation when traveling for social trips (Model 10) or when transporting someone else (Model 12). Model 13, showing associations between the number of modes of transportiation used when traveling for meals by people who make less than $19,000 and other variables, followed similar patterns. Age, homeownership, and number of vehicles at home all reduced the number of modes of transportation used when going out for food.

POOR TRIPS

Table 22: Poisson Regression Coefficients for Poor Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−0.003***	−0.002***	−0.002***
	(2.07E−4)	(3.88E−4)	(2.51E−4)
Female	0.057***	−0.007	0.042***
	(0.006)	(0.012)	(0.008)
Black	7.97E−5	−0.001	6.65E−5
	(0.005)	(0.009)	(0.006)
Hispanic	−0.003	0.014	3.67E−4
	(0.009)	(0.017)	(0.011)
U.S. born	0.007	−0.004	−0.009
	(0.006)	(0.010)	(0.007)
Worker	−0.003	0.001	0.012
	(0.006)	(0.011)	(0.007)
Education	0.025***	0.001	0.010***
	(0.002)	(0.003)	(0.002)
Homeownership	0.011	−0.026	0.012
	(0.007)	(0.014)	(0.009)
Household size	0.002	−0.001	−0.004
	(0.003)	(0.005)	(0.004)
Household vehicles	0.020***	−0.040***	0.012*
	(0.004)	(0.008)	(0.005)
Household drivers	−0.004	0.008	2.45E−4
	(0.005)	(0.010)	(0.006)
Log likelihood	−55,997	−28,995	−41,459
N	26,253	26,253	26,253

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 23: Poisson Regression Coefficients for Poor Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.002***	−0.001	−0.004*	−0.002	−0.002	−0.002***
	(1.66E−4)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Female	−0.008	−0.007	0.015	−0.009	−0.033	−0.012
	(0.004)	(0.028)	(0.036)	(0.043)	(0.036)	(0.016)
Black	−0.006*	0.012	−0.020	0.011	0.010	0.005
	(0.003)	(0.021)	(0.035)	(0.032)	(0.030)	(0.013)
Hispanic	−0.019	−0.001	0.010	0.053	0.054	0.003
	(0.008)	(0.040)	(0.041)	(0.059)	(0.054)	(0.024)
U.S. born	−0.010**	−0.008	−0.002	−0.008	−0.001	−0.014
	(0.004)	(0.028)	(0.049)	(0.039)	(0.037)	(0.014)
Worker	−0.003	−0.019	0.009	0.008	−0.014	0.010
	(0.004)	(0.030)	(0.053)	(0.039)	(0.038)	(0.014)
Education	0.005***	−0.001	−0.005	0.002	0.007	0.003
	(0.001)	(0.006)	(0.007)	(0.010)	(0.009)	(0.004)
Homeownership	−0.022**	−0.044	0.018	−0.050	−0.071	−0.036*
	(0.007)	(0.032)	(0.040)	(0.048)	(0.041)	(0.018)
Household size	−0.006*	0.009	−0.003	−0.004	0.009	0.001
	(0.002)	(0.012)	(0.012)	(0.019)	(0.018)	(0.008)
Household vehicles	−0.021***	−0.051**	−0.038	−0.051	−0.071**	−0.052***
	(0.003)	(0.016)	(0.022)	(0.030)	(0.024)	(0.010)
Household drivers	0.008	0.004	0.009	0.010	0.022	0.010
	(0.004)	(0.021)	(0.026)	(0.035)	(0.031)	(0.014)
Log likelihood	−195,010	−5,015	−2,764	−2,480	−3,364	−16,192
N	173,763	4,535	2,281	2,266	3,031	14,549

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 23: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.002***	−0.004***	−0.001	−0.002**	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Female	−0.007	0.005	−0.004	−0.018	−0.026
	(0.019)	(0.035)	(0.035)	(0.025)	(0.094)
Black	−0.007	−0.010	0.003	−0.013	−0.039
	(0.015)	(0.027)	(0.030)	(0.022)	(0.064)
Hispanic	0.002	0.008	0.033	0.007	0.086
	(0.027)	(0.053)	(0.043)	(0.041)	(0.134)
U.S. born	−0.025	−0.032	−0.014	−0.005	−0.017
	(0.017)	(0.030)	(0.029)	(0.027)	(0.090)
Worker	0.024	0.029	0.010	0.007	0.037
	(0.018)	(0.030)	(0.029)	(0.027)	(0.092)
Education	0.002	0.005	−0.002	0.005	−0.014
	(0.004)	(0.009)	(0.008)	(0.006)	(0.017)
Homeownership	−0.008	0.002	−0.021	−0.062*	0.014
	(0.023)	(0.041)	(0.037)	(0.031)	(0.109)
Household size	0.003	0.004	0.023	0.005	−0.037
	(0.009)	(0.018)	(0.013)	(0.014)	(0.046)
Household vehicles	−0.044***	−0.035	−0.053*	−0.039*	−0.135*
	(0.013)	(0.022)	(0.022)	(0.017)	(0.060)
Household drivers	0.006	−0.035	0.003	−0.013	0.054
	(0.016)	(0.031)	(0.026)	(0.024)	(0.072)
Log likelihood	−10,154	−3,405	−3,649	−6,194	−404
N	8,684	2,979	3,271	5,544	311

Notes: *p≤.05; **p≤.01; ***p≤.001; Standard errors are in parentheses.

Working class ($20,000-$39,999)

Table 26 and Table 27 show the transportation behaviors of those who make between $20,000 and $39,999. Model 1 displays results of the number of trips taken overall. As age or the number of drivers at home increased, the number of trips decreased, indicating that older people and those with more drivers in their home did not go out as often. Women in this income bracket too more trips than men, as did native born citizens. As people's education increased, they were more likely to take more trips. This pattern continued for those who had bigger households and more vehicles. With more people in the household, or more cars, people may take more trips outside the home.

Model 2 represents associations between travel modes and explanatory variables for working class people. Both, age and vehicles at home have negative associations, indicating that working class people, who are old and who have multiple vehicles at home, use fewer transportation modes. At old age, working class people may have access to private vehicles and do not need to depend on other modes of transportation. Those who have multiple vehicles at home may not need to rely on other modes of transportation either.

Model 3 represents trip purposes of working class people. Age has negative association, indicating that working class people at old age drive for fewer reasons. Probably, at old age, working class people are less active. Female has positive association, indicating that working class women drive for more reasons than men. It may show their commitments on work and home responsibilities. Education has positive association too. Having more drivers at home was associated with fewer different trip purposes. It is possible that the other drivers can divide up trip tasks, so that no one person has to drive for many purposes.

Model 4 displays number of transportation modes used while driving toward home by working class people. Age has negative association, indicating that working class people at old age use fewer transportation modes. Homeownership and number of vehicles at home have negative associations, indicating that working class people, who own homes and who have multiple vehicles at home, use fewer modes of transportation, while driving toward home.

The negative associations of homeownership and number of vehicles at home indicate that working class people, who own homes and who have multiple vehicles at home, use fewer transportation modes, while travelling for work purposes (Model 5). Education has negative association, while travelling toward school (Model 6); indicating that working class people who have higher levels of education use fewer transportation modes. While travelling for medical purposes (Model 8), working class people who have multiple vehicles at home use fewer transportation modes. They may have access to private vehicles and do not need to rely on other modes of transportation.

For shopping trips (Model 9), age, homeownership, and number of vehicles at home are negatively associated with transportation modes used for shopping.. Age and number of vehicles at home were also related to using fewer modes of transportation when driving for social reations (Model 10). When traveling for family or personal business (Model 11), age and number of vehicles at home were again negatively associated. However, education was positively associated, indicating that working-class people with higher levels of education would be more likely to use multiple modes of transportation when traveling for family. Like many of the other trip reasons, when traveling for meals (Model 13), older people and those with more vehicles at home were less likely to use many modes of transportation.

WORKING CLASS TRIPS

Table 24: Poisson Regression Coefficients for Working Class Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−0.001***	−0.002***	−0.001***
	(1.64E-4)	(3.19E−4)	(2.01E−4)
Female	0.029***	−0.002	0.034***
	(0.005)	(0.009)	(0.006)
Black	−0.005	−0.007	0.002
	(0.004)	(0.008)	(0.005)
Hispanic	−0.001	0.005	−0.001
	(0.008)	(0.015)	(0.010)
U.S. born	0.010*	−0.002	−0.009
	(0.004)	(0.008)	(0.005)
Worker	−0.006	−0.009	0.012*
	(0.004)	(0.008)	(0.005)
Education	0.022***	0.002	0.009***
	(0.001)	(0.002)	(0.001)
Homeownership	−0.005	−0.028*	0.006
	(0.007)	(0.012)	(0.008)
Household size	0.014***	−0.007	−0.001
	(0.002)	(0.005)	(0.003)
Household vehicles	0.009***	−0.022***	0.003
	(0.003)	(0.005)	(0.003)
Household drivers	−0.043***	0.001	−0.015**
	(0.004)	(0.008)	(0.005)
Log likelihood	−100945	−50,366	−73,882
N	45988	45,988	45,988

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 25: Poisson Regression Coefficients for Working Class Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.002***	−0.001	−0.001	−0.001	−0.002	−0.002***
	(3.26E−4)	(0.001)	(0.001)	(0.001)	(0.001)	(4.52E−4)
Female	−0.003	1.34E−4	−0.027	−0.014	0.006	−0.005
	(0.009)	(0.018)	(0.028)	(0.031)	(0.029)	(0.012)
Black	−0.007	−0.012	−0.010	−0.013	0.013	0.001
	(0.008)	(0.015)	(0.020)	(0.036)	(0.033)	(0.011)
Hispanic	0.004	−0.007	−0.006	0.002	0.057	0.006
	(0.015)	(0.030)	(0.033)	(0.054)	(0.052)	(0.022)
U.S. born	−0.003	−0.013	0.015	−0.017	−0.019	−0.009
	(0.009)	(0.022)	(0.037)	(0.030)	(0.033)	(0.012)
Worker	−0.008	−0.037	−0.020	0.010	−0.002	−0.002
	(0.009)	(0.024)	(0.039)	(0.029)	(0.032)	(0.012)
Education	0.002	0.008	−0.011*	0.001	0.007	0.007
	(0.002)	(0.005)	(0.005)	(0.008)	(0.009)	(0.003)
Homeownership	−0.029*	−0.055*	−0.004	−0.048	−0.031	−0.037*
	(0.013)	(0.023)	(0.033)	(0.048)	(0.044)	(0.017)
Household size	−0.007	−0.002	−0.013	−0.001	0.009	−0.001
	(0.005)	(0.009)	(0.010)	(0.016)	(0.017)	(0.007)
Household vehicles	−0.022***	−0.027**	−0.018	−0.015	−0.038*	−0.026***
	(0.005)	(0.010)	(0.016)	(0.018)	(0.018)	(0.007)
Household drivers	2.04E−4	0.004	0.007	0.001	−0.011	−0.007
	(0.008)	(0.016)	(0.021)	(0.029)	(0.028)	(0.012)
Log likelihood	−48,535	−12,166	−4,709	−4,315	−4,713	−26,796
N	44,320	11,177	3,912	3,986	4,346	24,392

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 25: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.002***	−0.003***	−0.001	−0.002***	−0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Female	−0.008	−0.008	0.004	−0.001	−0.031
	(0.014)	(0.024)	(0.025)	(0.017)	(0.072)
Black	−0.013	−0.016	−0.016	−0.004	0.160
	(0.013)	(0.021)	(0.018)	(0.016)	(0.116)
Hispanic	0.001	0.005	0.008	0.008	0.066
	(0.025)	(0.047)	(0.035)	(0.032)	(0.106)
U.S. born	−0.025	−0.024	−0.002	−0.009	−0.068
	(0.014)	(0.024)	(0.023)	(0.018)	(0.078)
Worker	0.012	0.004	−0.013	−3.00E−4	0.079
	(0.014)	(0.024)	(0.023)	(0.017)	(0.081)
Education	0.005	0.015*	9.86E−5	0.005	−0.013
	(0.003)	(0.007)	(0.006)	(0.005)	(0.017)
Homeownership	−0.021	−0.030	−0.050	−0.040	−0.023
	(0.020)	(0.036)	(0.032)	(0.025)	(0.089)
Household size	−0.005	−0.010	0.001	−0.010	−0.032
	(0.008)	(0.015)	(0.011)	(0.010)	(0.033)
Household vehicles	−0.027***	−0.033*	−0.012	−0.024*	−0.046
	(0.009)	(0.014)	(0.014)	(0.010)	(0.041)
Household drivers	−0.004	0.007	2.72E−4	0.003	0.014
	(0.014)	(0.024)	(0.021)	(0.017)	(0.062)
Log likelihood	−18,430	−6,621	−6,759	−13,259	−700
N	15,891	5,815	6,138	12,045	549

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Middle class ($40,000-$99,999)

Table 28 and Table 29 display transportation behaviors of middle class people. Model 1 represents regression results for total number of trips and several variables. Females took more trips than males, and those who were born in the United States took more trips than those born elsewhere. Additionally, those with higher levels of education were likely to take more trips, and those who lived in larger households were likely to take more trips. However, if the household had many drivers, respondents were likely to take fewer trips. The variable Hispanic had negative associations with number of trips, indicating that middle class Hispanics drive less than Whites. Worker status also had negative associations with total trips. It may indicate that working middle class people take fewer trips than non-working. The mobility may be limited because of job responsibilities for working middle class people.

Model 2 displays the overall number of transportation modes used by middle class people. Age is negatively associated with transportation modes, as are homeownership, household size and number of vehicles at home. The positive association of education indicates that middle class people with higher levels of education use more transportation modes. Model 3 shows regression results for the number of trip purposes for middle class people. Older people traveled for fewer purposes than younger people, Hispanics traveled for fewer reasons than Whites, those who were born in the United States traveled for fewer reasons than foreign-born people, and those with more drivers in the home traveled for fewer purposes However, women traveled for more purposes than men. Additionally, four other variables – worker status, education, homeownership and household size – are positively associated with the number of trip purposes.

When middle-class people are traveling home (Model 4), four variables– age, homeownership, household size, and number of vehicles in house – indicate strong negative associations with the number of transportation modes used. Homeownership and number of vehicles at home were also negatively associated with the number of transportation modes used when traveling to work (Model 5). Those who had higher levels of education used more modes of transportation when traveling to work. However, the opposite was true for traveling to school (Model 6), indicating that those with higher levels of education used fewer modes of transportation when traveling to school, just like people who had many vehicles at home.

Like when traveling home, when middle-class people go shopping (Model 9), age, homeownership, household size and number of vehicles at home are negatively associated with the number of transportation modes used. Education has a positive association. Perhaps those with higher levels of education have greater variety in their shopping trips and need to take different forms of transportation to get to their destinations. The number of modes of transportation used when traveling for social purposes (Model 10) is fewer when people are old, native born, or have more vehicles in their homes. Workers and those with higher levels of education were more likely to use more modes of transportation.

In Model 11, six variables were significantly associated with number of transportation modes used while driving for family or personal reasons by middle class people. Worker status and education have positive associations. Variables that have negative associations are age, born in the U.S., household size and number of vehicles at home. When transporting someone (Model 12), the number of vehicles at home reduced the number of transportation modes used. The number of transportation modes used for trips to get meals was lower for older people than for younger people. It was also lower for homeowners and those with more vehicles at home, and those with larger households. Those with higher levels of education used more modes of transportation when traveling for meals.

MIDDLE CLASS TRIPS

Table 26: Poisson Regression Coefficients for Middle Class Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−1.05E−4	−0.001***	−0.001***
	(1.15E−4)	(2.28E−4)	(1.42E−4)
Female	0.043***	−0.002	0.044***
	(0.003)	(0.006)	(0.004)
Black	0.001	−0.006	0.004
	(0.002)	(0.005)	(0.003)
Hispanic	−0.026***	−0.019	−0.018*
	(0.006)	(0.012)	(0.008)
U.S. born	0.018***	−0.006	−0.009**
	(0.003)	(0.006)	(0.003)
Worker	−0.015***	−0.008	0.013***
	(0.003)	(0.006)	(0.004)
Education	0.020***	0.003*	0.009***
	(0.001)	(0.001)	(0.001)
Homeownership	0.014	−0.026*	0.022**
	(0.006)	(0.011)	(0.007)
Household size	0.029***	−0.008**	0.013***
	(0.002)	(0.003)	(0.002)
Household vehicles	−0.002	−0.018***	−0.003
	(0.002)	(0.003)	(0.002)
Household drivers	−0.044***	0.006	−0.023***
	(0.003)	(0.006)	(0.003)
Log likelihood	−242,094	−120,831	−177,125
N	108,596	108,596	108,596

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 27: Poisson Regression Coefficients for Middle Class Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001***	−0.001	3.33E−4	−0.001	−0.002*	−0.001***
	(2.33E−4)	(4.20E−4)	(0.001)	(0.001)	(0.001)	(3.34E−4)
Female	−0.003	−0.001	−0.023	−0.010	−0.003	0.003
	(0.006)	(0.010)	(0.016)	(0.020)	(0.022)	(0.008)
Black	−0.005	−0.006	0.003	−0.019	0.009	−0.009
	(0.005)	(0.008)	(0.014)	(0.018)	(0.020)	(0.007)
Hispanic	−0.020	−0.016	−0.036	0.014	0.003	−0.021
	(0.012)	(0.021)	(0.028)	(0.042)	(0.050)	(0.018)
U.S. born	−0.008	−0.014	−0.015	−0.008	−0.020	−0.013
	(0.006)	(0.013)	(0.021)	(0.021)	(0.020)	(0.008)
Worker	−0.006	−0.011	0.007	2.57E−4	0.004	−0.001
	(0.006)	(0.015)	(0.023)	(0.021)	(0.020)	(0.008)
Education	0.003	0.011***	−0.010***	−2.04E−4	0.008	0.009***
	(0.001)	(0.003)	(0.003)	(0.005)	(0.006)	(0.002)
Homeownership	−0.028*	−0.052**	0.011	−0.041	−0.031	−0.034*
	(0.011)	(0.018)	(0.028)	(0.045)	(0.044)	(0.016)
Household size	−0.008**	−0.004	0.001	−0.003	−0.012	−0.013**
	(0.003)	(0.005)	(0.007)	(0.010)	(0.012)	(0.005)
Household vehicles	−0.019***	−0.019***	−0.024**	−0.020	−0.018	−0.018***
	(0.003)	(0.005)	(0.008)	(0.012)	(0.012)	(0.004)
Household drivers	0.006	0.005	0.005	0.006	0.008	0.009
	(0.006)	(0.009)	(0.014)	(0.020)	(0.022)	(0.008)
Log likelihood	−115,278	−40,495	−14,635	−9,332	−8,567	−57,258
N	103,655	36,846	12,075	8,497	7,809	51,445

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 27: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.001**	−0.003***	−0.001	−0.002***	−0.004*
	(3.52E−4)	(0.001)	(0.001)	(4.22E−4)	(0.002)
Female	−0.002	−0.006	−0.005	−0.009	−0.029
	(0.009)	(0.015)	(0.015)	(0.011)	(0.041)
Black	−0.009	−0.013	−0.013	−0.002	−0.021
	(0.007)	(0.014)	(0.012)	(0.010)	(0.047)
Hispanic	−0.030	−0.033	−0.014	−0.007	−0.051
	(0.019)	(0.038)	(0.027)	(0.024)	(0.087)
U.S. born	−0.033***	−0.045**	−0.008	−0.015	−0.050
	(0.008)	(0.015)	(0.013)	(0.010)	(0.046)
Worker	0.022*	0.035*	−0.009	0.002	0.043
	(0.009)	(0.015)	(0.013)	(0.010)	(0.048)
Education	0.005*	0.010*	0.004	0.007**	0.011
	(0.002)	(0.004)	(0.004)	(0.003)	(0.010)
Homeownership	−0.033	−0.003	−0.026	−0.049*	−0.075
	(0.017)	(0.032)	(0.027)	(0.021)	(0.072)
Household size	−0.008	−0.027**	−0.008	−0.015*	−0.030
	(0.005)	(0.009)	(0.007)	(0.006)	(0.021)
Household vehicles	−0.020***	−0.021*	−0.016*	−0.024***	−0.069**
	(0.005)	(0.008)	(0.008)	(0.006)	(0.025)
Household drivers	0.005	0.016	0.005	0.014	0.063
	(0.009)	(0.016)	(0.013)	(0.011)	(0.040)
Log likelihood	−48,622	−15,544	−18,509	−34,454	−1,960
N	41,174	13,291	16,610	30,716	1,464

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Upper class (>$100,000)

Table 30 and Table 31 show transportation behaviors of upper class people. Model 1 represents regression results for total number of trips. In this income bracket, age has positive association with total number of trips. Wealthy older people take more trips that younger wealthy people. Native-born wealthy people take more trips than those who were born in other countries, those with more education take more trips, and those in larger households take more trips than those in small households. However, in households with more drivers at home, the number of trips taken was reduced. Like in other income brackets, women take more trips than their male counterparts. The negative association of Black indicates that, wealthy African Americans take fewer trips that wealthy White people.

In Model 2, three variables are significantly associated with the number of transportation modes used by upper class people. Age and number of vehicles at home have negative associations, indicating that at older upper class people and those with more vehicles at home use fewer transportation modes. On the other hand, education has a positive association, indicating that upper class people with higher levels of education use more modes of transportation. It may indicate their active lifestyle as well as their economic strength to afford multiple modes of transportation. Five variables in Model 3 show strong association with number of trip purposes for upper class people: female, education, household size, number of vehicles at home, and number of drivers at home. The first three variables have positive association, and the last two variables have negative association.

In model 4, three variables have strong associations with number of transportation modes used while travelling home. Like the other income brackets, age and the number of vehicles at home are negatively associated with using many modes of transportation to get home. Education has the opposite relationship. When traveling to work (Model 5), education is also positively associated with using more modes of transportation, and again the number of vehicles at home is associated with using fewer modes of transportation. Traveling for shopping (Model 9) continues these similar findings, where older people and those with many vehicles at home use fewer modes of transportation to get to their shopping destinations, while higher levels of education are associated with using more modes of transportation when shopping.

Trips for social purposes (Model 10) have four variables with significant association. Those with higher levels of education and those who work were likely to use more modes of transportation than those with lower levels of education or those who did not work. Native-born members of the upper class used fewer modes of transportation than those who were born in other countries, and those who had many vehicles at home did not use many modes of transportation.

Like previous findings, those in upper class who are older or who have many vehicles at home used fewer modes of transportation when traveling for family or personal business (Model 11), while those with higher levels of education used more modes. Number of vehicles at home is the only variable that has strong negative associations with transportation modes while transporting someone (Model 12). Number of vehicles at home and homeownership were both associated with fewer modes of transportation used for trips to get meals (Model 13).

UPPER CLASS TRIPS

Table 28: Poisson Regression Coefficients for Upper Class Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	0.001**	−0.001*	−2.61E−4
	(1.70E−4)	(3.39E−4)	(2.13E−4)
Female	0.056***	−0.007	0.038***
	(0.004)	(0.007)	(0.005)
Black	−0.009***	−0.005	−0.002
	(0.003)	(0.005)	(0.003)
Hispanic	−0.017	−0.016	−0.012
	(0.009)	(0.017)	(0.011)
U.S. born	0.039***	−0.007	−0.003
	(0.004)	(0.007)	(0.005)
Worker	−0.033***	−0.006	0.009
	(0.004)	(0.007)	(0.005)
Education	0.018***	0.004**	0.008***
	(0.001)	(0.002)	(0.001)
Homeownership	0.020	−0.036	0.016
	(0.011)	(0.021)	(0.014)
Household size	0.044***	−0.006	0.022***
	(0.002)	(0.004)	(0.002)
Household vehicles	−0.002	−0.023***	−0.005*
	(0.002)	(0.004)	(0.002)
Household drivers	−0.053***	0.010	−0.023***
	(0.004)	(0.007)	(0.004)
Log likelihood	−138,100	−69,639	−100,526
N	60,909	60,909	60,909

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 29: Poisson Regression Coefficients for Upper Class Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001*	1.33E−4	0.003	−2.20E−5	−0.002	−0.001*
	(3.50E−4)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female	−0.007	−0.006	−0.026	−0.021	0.013	0.002
	(0.008)	(0.012)	(0.019)	(0.030)	(0.032)	(0.011)
Black	−0.004	−0.006	0.002	−4.73E−4	−0.014	−0.006
	(0.005)	(0.009)	(0.015)	(0.020)	(0.021)	(0.008)
Hispanic	−0.016	0.002	−0.019	−0.001	−0.041	−0.015
	(0.018)	(0.028)	(0.040)	(0.086)	(0.079)	(0.027)
U.S. born	−0.008	1.01E−4	0.001	0.002	−0.001	−0.011
	(0.007)	(0.017)	(0.029)	(0.029)	(0.029)	(0.010)
Worker	−0.006	−0.027	−0.016	−0.016	−0.011	3.12E−4
	(0.008)	(0.018)	(0.031)	(0.030)	(0.029)	(0.011)
Education	0.004*	0.014***	−0.009	0.005	0.007	0.007*
	(0.002)	(0.004)	(0.004)	(0.007)	(0.008)	(0.003)
Homeownership	−0.040	−0.059	−0.016	−0.071	−0.068	−0.050
	(0.022)	(0.035)	(0.059)	(0.097)	(0.094)	(0.031)
Household size	−0.005	−0.005	0.010	−0.001	0.001	−0.010
	(0.004)	(0.007)	(0.010)	(0.015)	(0.017)	(0.006)
Household vehicles	−0.023***	−0.031***	−0.014	−0.018	−0.023	−0.024***
	(0.004)	(0.006)	(0.010)	(0.018)	(0.016)	(0.006)
Household drivers	0.010	0.017	0.009	0.012	−0.016	0.011
	(0.007)	(0.012)	(0.017)	(0.029)	(0.031)	(0.011)
Log likelihood	−65,511	−25,148	−10,144	−4,180	−3,966	−30,662
N	57,416	22,154	8,352	3,732	3,527	26,804

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 29: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.001	−0.003***	−0.001	−0.001	−4.40E−4
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Female	0.002	−0.022	0.008	−0.012	−0.036
	(0.011)	(0.020)	(0.018)	(0.013)	(0.042)
Black	−0.007	−0.008	−0.004	−0.009	0.018
	(0.008)	(0.014)	(0.013)	(0.010)	(0.057)
Hispanic	−0.029	−0.035	−0.018	−0.039	−0.005
	(0.026)	(0.052)	(0.037)	(0.032)	(0.097)
U.S. born	−0.040***	−0.030	0.001	−0.022	−0.095
	(0.010)	(0.019)	(0.016)	(0.013)	(0.045)
Worker	0.030**	0.020	−0.014	0.014	0.090
	(0.011)	(0.019)	(0.016)	(0.013)	(0.047)
Education	0.005*	0.012*	0.005	0.004	0.009
	(0.002)	(0.005)	(0.004)	(0.003)	(0.010)
Homeownership	−0.036	−0.007	−0.009	−0.081*	−0.098
	(0.031)	(0.058)	(0.050)	(0.036)	(0.112)
Household size	−0.011	−0.020	−0.004	−0.011	−0.003
	(0.006)	(0.012)	(0.009)	(0.007)	(0.022)
Household vehicles	−0.024***	−0.022*	−0.021*	−0.028***	−0.022
	(0.006)	(0.010)	(0.010)	(0.007)	(0.023)
Household drivers	0.011	0.021	0.011	0.017	0.020
	(0.010)	(0.019)	(0.016)	(0.013)	(0.038)
Log likelihood	−31,132	−9,241	−12,500	−21,998	−1,730
N	25,847	7,674	10,881	19,009	1,222

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

High school graduate

Table 32 and Table 33 are on transportation behaviors of high school graduates. Model 1 shows association between total number of trips and several explanatory variables. Eight variables show significant associations with total number of trips for high school graduates. Female and Hispanic, being born in the United States, income, homeownership, household size and number of vehicles at home have positive associations, indicating that these variables are associated with greater number of trips. The negative association of number of drivers at home indicates that high school graduates with more drivers at home take fewer trips. Family members in such households may share responsibilities and do not need to take frequent trips.

The total number of transportation modes used by those with a high school degree (Model 2) is negatively associated with three variables: age, homeownership, and number of vehicles at home. Six variables are strongly associated with number of trip purposes (Model 3). Female has positive association indicating that female high school graduates travel for more reasons than males. Hispanic has a positive association indicating that Hispanic high school graduates drive for more purposes than Whites. The positive association of worker status indicates that high school graduates who work travel for more purposes than who do not work. Work might keep them active socially and economically causing them drive for several reasons. Income and homeownership also have positive associations. Probably, these are indicators of the better economic situation of high school graduates with higher levels of income and who own homes. Household size has a positive relationship with number of trip purposes, while number of drivers at home has a negative relationship. In Model 4, age, homeownership and number of vehicles at home have negative associations with number of transportation modes while driving towards home. While travelling for work (Model 5), the number of vehicles at home is the only variable that has significant negative association with transportation modes. Age and the number of vehicles at home are negatively associated with traveling for medical reasons (Model 8) and social purposes (Model 10). These two variables, and homeownership are also negatively related to the number of transportation modes used for shopping (Model 9). Older people are also less likely to use numerous modes of transportation when traveling for family (Model 11) or meals (Model 13).

HIGH SCHOOL GRADUATE TRIPS

Table 30: Poisson Regression Coefficients for High School Graduate Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−4.52E−5	−0.001***	−7.96E−5
	(1.56E−4)	(3.04E−4)	(1.92E−4)
Female	0.043***	0.005	0.049***
	(0.004)	(0.008)	(0.005)
Black	0.002	0.006	0.005
	(0.004)	(0.008)	(0.005)
Hispanic	0.031***	0.010	0.021*
	(0.008)	(0.016)	(0.010)
U.S. born	0.040***	−0.014	0.027
	(0.007)	(0.012)	(0.008)
Worker	−0.001	−0.011	0.028***
	(0.004)	(0.009)	(0.006)
Income	0.004***	0.001	0.002***
	(3.32E−4)	(0.001)	(4.04E−4)
Homeownership	0.014*	−0.036**	0.018*
	(0.007)	(0.013)	(0.008)
Household size	0.022***	0.001	0.008**
	(0.002)	(0.005)	(0.003)
Household vehicles	0.008***	−0.016***	0.001
	(0.002)	(0.004)	(0.003)
Household drivers	−0.033***	−0.004	−0.012*
	(0.004)	(0.008)	(0.005)
Log likelihood	−124,793	−61,004	−91,179
N	56,854	56,854	56,854

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 31: Poisson Regression Coefficients for High School Graduate Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001***	−0.001	−0.002	−0.001	−0.002*	−0.002***
	(3.12E−4)	(0.001)	(0.002)	(0.001)	(0.001)	(4.35E−4)
Female	0.004	0.013	−0.019	0.004	−0.002	0.002
	(0.008)	(0.014)	(0.056)	(0.031)	(0.027)	(0.011)
Black	0.005	0.005	0.030	0.012	0.016	0.011
	(0.008)	(0.015)	(0.064)	(0.034)	(0.029)	(0.012)
Hispanic	0.009	0.007	−0.001	0.018	0.031	0.007
	(0.017)	(0.027)	(0.091)	(0.063)	(0.057)	(0.023)
U.S. born	−0.014	−0.009	−0.007	−0.023	−0.042	−0.027
	(0.013)	(0.020)	(0.093)	(0.044)	(0.055)	(0.018)
Worker	−0.009	−0.023	−0.011	0.002	−0.011	−0.004
	(0.009)	(0.030)	(0.056)	(0.032)	(0.030)	(0.012)
Income	0.001	0.002	−0.002	0.001	0.001	0.001
	(0.001)	(0.001)	(0.004)	(0.002)	(0.002)	(0.001)
Homeownership	−0.038**	−0.053	0.005	−0.037	−0.056	−0.046**
	(0.014)	(0.023)	(0.085)	(0.054)	(0.043)	(0.018)
Household size	0.001	0.005	0.022	0.004	0.005	−1.44E−4
	(0.005)	(0.007)	(0.024)	(0.017)	(0.017)	(0.007)
Household vehicles	−0.017***	−0.015*	−0.034	−0.024	−0.035*	−0.019**
	(0.004)	(0.007)	(0.028)	(0.017)	(0.016)	(0.006)
Household drivers	−0.003	−0.009	−0.010	0.007	−0.001	−0.004
	(0.008)	(0.013)	(0.041)	(0.029)	(0.026)	(0.011)
Log likelihood	−58,579	−19,615	−1,315	−4,713	−5,725	−32,467
N	54,623	18,266	1,176	4,434	5,350	29,988

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 31: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.001*	−0.003***	−0.001	−0.002**	−0.003
	(4.97E−4)	(0.001)	(0.001)	(0.001)	(0.003)
Female	0.012	−0.010	−2.51E−4	0.004	0.010
	(0.014)	(0.022)	(0.023)	(0.016)	(0.081)
Black	0.006	0.003	−0.003	−0.001	−0.015
	(0.014)	(0.031)	(0.022)	(0.018)	(0.073)
Hispanic	0.012	0.013	0.010	0.011	0.111
	(0.027)	(0.048)	(0.038)	(0.034)	(0.157)
U.S. born	−0.017	−0.019	−0.019	−0.031	0.063
	(0.021)	(0.034)	(0.029)	(0.031)	(0.154)
Worker	0.018	0.029	−0.020	3.83E−4	0.066
	(0.015)	(0.025)	(0.023)	(0.017)	(0.086)
Income	0.001	0.001	3.64E−4	0.001	0.005
	(0.001)	(0.002)	(0.002)	(0.001)	(0.006)
Homeownership	−0.026	−0.015	−0.043	−0.042	−0.058
	(0.023)	(0.038)	(0.034)	(0.028)	(0.121)
Household size	0.003	−0.003	0.002	−0.003	−0.014
	(0.008)	(0.014)	(0.011)	(0.010)	(0.043)
Household vehicles	−0.023***	−0.023	−0.012	−0.015	−0.049
	(0.007)	(0.012)	(0.011)	(0.008)	(0.044)
Household drivers	−0.006	0.001	−0.004	−0.010	−0.031
	(0.013)	(0.022)	(0.019)	(0.016)	(0.074)
Log likelihood	−20,961	−7,873	−8,127	−16,553	−605
N	18,479	7,046	7,529	15,284	476

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Bachelor's Degree

The travel behaviors of people who have bachelor degree are shown in Tables 34 and 35. The total number of trips (Model 1) was associated with nine variables. The variables with positive associations are age, female, born in the U.S., income, homeownership, and household size. Black, Hispanic and number of drivers at home have negative associations. The number of transportation modes used (Model 2) was negatively associated with age, household size, and number of vehicles at home. It was positively associated with income, indicating that those with a bachelor's degree who had higher levels of income used multiple modes of transportation. The number of trip purposes (Model 3) was positively associated with female, native-born, worker status, income, and household size. Only having more drivers at home was associated with fewer reasons for going out.

When those with a bachelor's degree were traveling home (Model 4) older people, homeowners, and people with many vehicles at home used fewer different modes of transportation, which might indicate their access to resources, like a private car for their travel needs. However, those with a college degree who had higher incomes were more likely to use numerous modes of transportation when traveling for work (Model 5), while again the number of vehicles at home decreased the number of transportation modes used. Age and number of vehicles at home were negatively associated with the number of modes of transportation used for shopping trips (Model 9). Living in a big family was also negatively associated, which may indicate that they travel together in one car. Like work travel, income was positively associated with modes of transportation used for shopping.

The number of vehicles at home also had a negative association with driving for social purposes (Model 10) and for family or personal business (Model 11). Workers were more likely to use multiple modes of transportation for social trips than non-workers. Older people used fewer modes of transportation for personal and family trips and for traveling for meals (Model 13) than young people. Larger households used fewer transportation modes when traveling for meals.

BACHELOR'S DEGREE TRIPS

Table 32: Poisson Regression Coefficients for Bachelor Degree Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	4.79E−4**	−0.001**	−6.02E−5
	(1.76E−4)	(3.51E−4)	(2.21E−4)
Female	0.055***	−0.001	0.044***
	(0.004)	(0.008)	(0.005)
Black	−0.012***	−0.007	−0.002
	(0.003)	(0.006)	(0.004)
Hispanic	−0.031**	−0.027	−0.011
	(0.010)	(0.020)	(0.012)
U.S. born	0.068***	0.002	0.039***
	(0.006)	(0.012)	(0.008)
Worker	−0.003	3.00E−4	0.037***
	(0.004)	(0.009)	(0.006)
Income	0.003***	0.002**	0.002***
	(3.14E−4)	(0.001)	(3.91E−4)
Homeownership	0.020*	−0.029	0.014
	(0.008)	(0.017)	(0.011)
Household size	0.053***	−0.011*	0.027***
	(0.002)	(0.005)	(0.003)
Household vehicles	0.003	−0.021***	−0.001
	(0.002)	(0.005)	(0.003)
Household drivers	−0.061***	0.010	−0.031***
	(0.004)	(0.009)	(0.005)
Log likelihood	−111,962	−54,307	−79,921
N	48,342	48,342	48,342

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 33: Poisson Regression Coefficients for Bachelor Degree Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001**	−3.77E−4	−0.001	−0.001	−0.002	−0.001**
	(3.61E−4)	(0.001)	(0.002)	(0.001)	(0.001)	(4.88E−4)
Female	−0.001	−0.013	−0.029	−0.003	0.012	0.008
	(0.009)	(0.013)	(0.059)	(0.032)	(0.032)	(0.012)
Black	−0.006	−0.009	0.009	0.001	0.002	−0.005
	(0.006)	(0.009)	(0.047)	(0.024)	(0.025)	(0.008)
Hispanic	−0.026	−0.019	−0.010	0.002	−0.002	−0.033
	(0.021)	(0.030)	(0.107)	(0.084)	(0.079)	(0.029)
U.S. born	0.001	0.006	0.014	0.002	4.13E−4	−2.76E−4
	(0.012)	(0.017)	(0.086)	(0.047)	(0.058)	(0.016)
Worker	2.43E−4	−0.025	0.024	0.003	0.014	0.005
	(0.009)	(0.026)	(0.059)	(0.033)	(0.032)	(0.012)
Income	0.002**	0.003*	0.000	0.001	0.002	0.002*
	(0.001)	(0.001)	(0.004)	(0.002)	(0.002)	(0.001)
Homeownership	−0.035*	−0.044	−0.041	−0.066	−0.062	−0.033
	(0.017)	(0.026)	(0.092)	(0.063)	(0.061)	(0.022)
Household size	−0.011*	−0.011	0.012	−0.006	−0.005	−0.014*
	(0.005)	(0.007)	(0.025)	(0.017)	(0.018)	(0.007)
Household vehicles	−0.022***	−0.026***	−0.066	−0.010	−0.026	−0.025***
	(0.005)	(0.008)	(0.037)	(0.022)	(0.019)	(0.007)
Household drivers	0.010	0.018	0.023	0.007	0.006	0.012
	(0.009)	(0.013)	(0.049)	(0.033)	(0.033)	(0.012)
Log likelihood	−51,550	−21,138	−1,214	−4,000	−3,972	−28,774
N	45,968	18,782	1,067	3,633	3,576	25,408

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 33: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.001	−0.003**	−0.001	−0.002**	−0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Female	0.004	−3.08E−4	0.002	−0.001	−0.074
	(0.013)	(0.021)	(0.021)	(0.015)	(0.060)
Black	−0.008	−0.011	−0.006	−0.008	0.048
	(0.009)	(0.017)	(0.014)	(0.011)	(0.135)
Hispanic	−0.037	−0.031	−0.020	−0.044	−0.045
	(0.031)	(0.059)	(0.042)	(0.037)	(0.138)
U.S. born	−0.014	0.012	0.015	−0.014	−0.054
	(0.017)	(0.041)	(0.030)	(0.023)	(0.099)
Worker	0.040**	0.034	−0.003	0.012	0.048
	(0.014)	(0.022)	(0.022)	(0.015)	(0.055)
Income	0.002	0.002	0.001	0.002	0.006
	(0.001)	(0.002)	(0.002)	(0.001)	(0.004)
Homeownership	−0.025	−0.017	−0.020	−0.054	−0.041
	(0.025)	(0.044)	(0.041)	(0.030)	(0.114)
Household size	−0.012	−0.024	−0.011	−0.017*	−0.022
	(0.007)	(0.012)	(0.010)	(0.008)	(0.032)
Household vehicles	−0.022**	−0.024*	−0.016	−0.031***	−0.040
	(0.008)	(0.012)	(0.013)	(0.009)	(0.034)
Household drivers	0.011	0.021	0.014	0.031*	0.016
	(0.013)	(0.022)	(0.019)	(0.015)	(0.054)
Log likelihood	−23,197	−8,422	−9,537	−17,581	−895
N	19,495	7,082	8,465	15,417	644

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Graduate Degree

Table 36 and 37 display transportation behaviors of graduate degree holders. The total number of trips taken by those with graduate degrees (Model 1) is positively associated with being female, being born in the United States, and having a higher income. The negative association of worker status indicates that graduate degree holders who are in the workforce take fewer trips. They might have limited free time to take trips. Again we see that larger household size is associated with more trips, but that more drivers in the home is associated with fewer trips. The number of transportation modes used by those with graduate degrees (Model 2) is negatively associated with age, homeownership, household size and number of vehicles at home. However, those with higher incomes were likely to use more modes of transportation. The number of purposes that graduate degree holders went on trips is shown in Model 3. Graduate degree holders who were born in the United States, who were female, who have higher incomes, and larger households were likely to have more reasons for going out. Those with many drivers in their homes had fewer trip purposes.

When those with graduate degrees are traveling home (Model 4) older people used fewer transportation modes, as did homeowners, those in larger households, and those with more vehicles at home. While travelling for work purposes (Model 5), the number of vehicles at home and number of drivers at home have strong associations with transportation modes but in opposite directions. More vehicles at home were associated with using fewer transportation modes, yet more drivers at home was associated with using more transportation modes.

For shopping trips (Model 9) and travel for social purposes (Model 10), age and number of vehicles at home show negative associations with transportation modes. However, graduates who work use more transportation modes when traveling for social purposes than non-workers.

Age was the only influential factor when traveling for family or personal business (Model 11), and like the other transportation purposes, its relationship with number of modes of transportation was negative. Age was also negatively related when traveling for meals (Model 13). Homeownership, household size and number of vehicles at home have negative association with transportation modes for meals, while workers were likely to use more modes of transportation when traveling for meals than non-workers.

GRADUATE DEGREE TRIPS

Table 34: Poisson Regression Coefficients for Graduate Degree Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−3.12E−4	−0.001***	−4.55E−4
	(2.17E−4)	(4.38E−4)	(2.76E−4)
Female	0.041***	−0.004	0.035***
	(0.005)	(0.010)	(0.006)
Black	−0.002	−0.011	0.001
	(0.003)	(0.006)	(0.004)
Hispanic	0.002	−0.038	0.011
	(0.012)	(0.025)	(0.015)
U.S. born	0.057***	0.013	0.039***
	(0.007)	(0.012)	(0.008)
Worker	−0.013**	0.017	0.026***
	(0.005)	(0.010)	(0.006)
Income	0.002***	0.001*	0.001***
	(3.51E−4)	(0.001)	(4.41E−4)
Homeownership	0.010	−0.039*	0.011
	(0.010)	(0.019)	(0.012)
Household size	0.039***	−0.012*	0.024***
	(0.003)	(0.006)	(0.004)
Household vehicles	0.005	−0.027***	−0.001
	(0.003)	(0.006)	(0.004)
Household drivers	−0.055***	0.020	−0.031***
	(0.005)	(0.010)	(0.006)
Log likelihood	−84,059	−41,288	−59,961
N	36,017	36,017	36,017

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 35: Poisson Regression Coefficients for Graduate Degree Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001**	−3.11E−4	−8.37E−5	−0.001	−0.002	−0.002**
	(4.50E−4)	(0.001)	(0.003)	(0.002)	(0.002)	(0.001)
Female	−0.003	−0.022	−0.027	−0.012	0.022	0.006
	(0.010)	(0.015)	(0.071)	(0.037)	(0.035)	(0.013)
Black	−0.010	−0.004	0.011	−0.019	−0.013	−0.011
	(0.006)	(0.009)	(0.049)	(0.021)	(0.023)	(0.008)
Hispanic	−0.037	−0.025	0.006	−0.016	−0.014	−0.032
	(0.025)	(0.036)	(0.151)	(0.091)	(0.085)	(0.034)
U.S. born	0.013	0.026	−0.007	0.014	0.001	0.003
	(0.013)	(0.020)	(0.093)	(0.042)	(0.045)	(0.017)
Worker	0.019	0.008	−0.010	0.022	0.010	0.017
	(0.011)	(0.029)	(0.073)	(0.039)	(0.036)	(0.014)
Income	0.001	0.002	−0.004	−1.26E−4	0.001	0.001
	(0.001)	(0.001)	(0.005)	(0.003)	(0.002)	(0.001)
Homeownership	−0.041*	−0.054	−0.081	−0.052	−0.037	−0.040
	(0.020)	(0.030)	(0.122)	(0.074)	(0.068)	(0.026)
Household size	−0.012*	−0.010	−0.024	−0.013	−0.024	−0.014
	(0.006)	(0.008)	(0.033)	(0.020)	(0.023)	(0.008)
Household vehicles	−0.028***	−0.041***	0.009	−0.023	−0.033	−0.029***
	(0.006)	(0.009)	(0.040)	(0.024)	(0.021)	(0.008)
Household drivers	0.020	0.032*	0.001	0.002	0.031	0.020
	(0.011)	(0.016)	(0.065)	(0.039)	(0.039)	(0.015)
Log likelihood	−39,048	−16,408	−843	−3,063	−3,314	−21,762
N	34,148	14,181	735	2,739	2,941	18,878

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 35: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.002**	−0.003**	−4.09E−4	−0.002*	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Female	−0.003	−0.004	0.008	−0.018	−0.022
	(0.014)	(0.023)	(0.024)	(0.017)	(0.063)
Black	−0.015	−0.013	−0.027	−0.012	−0.017
	(0.008)	(0.014)	(0.015)	(0.011)	(0.036)
Hispanic	−0.052	−0.020	−0.032	−0.068	−0.024
	(0.037)	(0.066)	(0.054)	(0.045)	(0.163)
U.S. born	0.004	−0.005	0.018	0.011	−0.027
	(0.017)	(0.033)	(0.030)	(0.026)	(0.088)
Worker	0.045**	0.047	0.017	0.035*	0.173*
	(0.015)	(0.024)	(0.024)	(0.018)	(0.076)
Income	0.001	0.002	0.001	0.001	0.001
	(0.001)	(0.002)	(0.002)	(0.001)	(0.004)
Homeownership	−0.039	−0.032	−0.024	−0.073*	0.047
	(0.028)	(0.048)	(0.048)	(0.032)	(0.106)
Household size	−0.016	−0.027	−3.48E−5	−0.020*	−0.032
	(0.008)	(0.015)	(0.012)	(0.010)	(0.032)
Household vehicles	−0.023**	−0.025	−0.021	−0.027**	−0.040
	(0.009)	(0.013)	(0.014)	(0.010)	(0.035)
Household drivers	0.023	0.019	0.010	0.021	0.054
	(0.016)	(0.026)	(0.023)	(0.019)	(0.058)
Log likelihood	−18,986	−6,825	−7,103	−13,852	−838
N	15,697	5,647	6,155	11,862	594

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Worker

Tables 38 and 39 are on workers' transportation behaviors. Model 1 shows relationships between total number of trips and several explanatory variables. Age has positive association indicating that working older people drive more frequently than non-working older people. Working women also drive more frequently than working men. The negative associations of working Blacks and Hispanics indicate that they take fewer trips than White workers. Workers who are born in the U.S. take more trips than their foreign-born counterparts. People who have higher levels of education and income take more trips, as do working people in large families. The negative association of number of drivers at home indicates that workers who have multiple drivers at home drive less. Family members may share their responsibilities that make each of them drive less.

Model 2 displays relationships with transportation modes. Older workers use fewer transportation modes than younger workers, working African American use fewer transportation modes than working white people. Homeowners and those with multiple vehicles at home use fewer modes of transportation. However, education and income have positive associations indicating that workers with higher levels of education and income use more transportation modes. It may indicate their higher trip frequency and stronger economic situation.

The number of workers' trip purposes (Model 3) is positively associated with many variables. Women, those who were born in the United States, those with higher education, those with greater income, homeowners, and those with larger households, are likely to have more purposes for traveling. The number of vehicles at home and number of drivers at home have negative associations. Family members in such households may share responsibilities that reduce the number of trip purposes.

When workers are traveling home (Model 4) older people use fewer different forms of transportation than younger workers. African Americans use fewer modes than white workers, and homeowners and those with more vehicles at home are also likely to use fewer modes of transportation to get home. Education and income have positive associations with transportation

modes indicating that workers with higher levels of education and income use more modes while travelling toward home.

Four variables are significantly associated with number of transportation modes used while travelling for work (Model 5). The positive association of education and income indicate that workers with higher level of education and income use more transportation modes. The negative associations of homeownership and number of vehicles at home indicate that workers who own homes and who have multiple vehicles at home use fewer transportation modes for work trips.

Number of vehicle is the only variable that is negatively and significantly associated with transportation modes while travelling toward school (Model 6). While taking trips for shopping (Model 9), older workers, homeowners, and those with many vehicles at home used fewer transportation modes. Again, education and income were associated with using more modes of transportation for shopping, and for social trips (Model 10). The model shows that working Blacks use fewer transportation modes than working Whites when traveling for social trips. Like in other trip purposes, the number of travel modes used for traveling for social purposes was negatively associated with homeownership and number of vehicles at home.

The number of transportation modes used when workers travel for family or personal business (Model 11) was negatively associated with age, household size, and number of vehicles at home. Education and income have positive associations with transportation modes for travel for family or personal business, for travel to transport someone else (Model 12), and for travel to meals (Model 13). When transporting someone else, Black workers used fewer modes of transportation than White workers, and those with more vehicles in the home used fewer modes than those with few vehicles in the home. Older people, homeowners, and those with many vehicles in the home traveled using fewer modes of transportation when they went out for meals. They may use their own vehicles for the trip.

WORKER TRIPS

Table 36: Poisson Regression Coefficients for Worker Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	0.002***	−0.001***	−2.45E−5
	(1.13E−4)	(2.22E−4)	(1.38E−4)
Female	0.058***	0.002	0.058***
	(0.003)	(0.005)	(0.003)
Black	−0.008***	−0.009*	−0.003
	(0.002)	(0.004)	(0.002)
Hispanic	−0.024***	−0.008	−0.011
	(0.005)	(0.010)	(0.007)
U.S. born	0.051***	−0.006	0.029***
	(0.004)	(0.007)	(0.005)
Education	0.018***	0.009***	0.009***
	(0.001)	(0.001)	(0.001)
Income	0.004***	0.003***	0.003***
	(2.11E−4)	(4.17E−4)	(2.59E−4)
Homeownership	0.001	−0.044***	0.014*
	(0.005)	(0.009)	(0.006)
Household size	0.045***	−0.004	0.023***
	(0.001)	(0.003)	(0.002)
Household vehicles	0.001	−0.023***	−0.004*
	(0.001)	(0.003)	(0.002)
Household drivers	−0.057***	0.006	−0.027***
	(0.002)	(0.005)	(0.003)
Log likelihood	−287,934	−140,399	−208,656
N	126,615	126,615	126,615

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 37: Poisson Regression Coefficients for Worker Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.001**	−4.40E−4	−0.001	−3.02E−4	−0.001	−0.001**
	(2.27E−4)	(2.91E−4)	(0.001)	(0.001)	(0.001)	(3.37E−4)
Female	0.001	−0.005	−0.016	−0.003	0.012	0.004
	(0.005)	(0.007)	(0.029)	(0.022)	(0.023)	(0.008)
Black	−0.008*	−0.008	0.002	−0.014	−0.006	−0.009
	(0.004)	(0.005)	(0.022)	(0.016)	(0.016)	(0.006)
Hispanic	−0.008	−0.005	0.015	−0.008	0.023	−0.008
	(0.011)	(0.013)	(0.051)	(0.045)	(0.048)	(0.016)
U.S. born	−0.006	−0.006	−0.008	4.72E−4	−0.010	−0.010
	(0.007)	(0.009)	(0.039)	(0.031)	(0.035)	(0.011)
Education	0.009***	0.012***	−0.005	0.005	0.010	0.011***
	(0.001)	(0.002)	(0.003)	(0.005)	(0.007)	(0.002)
Income	0.003***	0.003***	0.001	0.001	0.003	0.002***
	(4.26E−4)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Homeownership	−0.047***	−0.052***	−0.046	−0.050	−0.066	−0.052***
	(0.009)	(0.012)	(0.051)	(0.041)	(0.041)	(0.013)
Household size	−0.004	−0.002	0.008	−0.002	−0.008	−0.006
	(0.003)	(0.004)	(0.013)	(0.010)	(0.013)	(0.004)
Household vehicles	−0.023***	−0.025***	−0.043**	−0.020	−0.024	−0.024***
	(0.003)	(0.004)	(0.015)	(0.012)	(0.012)	(0.004)
Household drivers	0.006	0.008	0.003	0.008	0.003	0.006
	(0.005)	(0.006)	(0.023)	(0.020)	(0.022)	(0.007)
Log likelihood	−134,176	−84,582	−4,519	−8,401	−7,399	−64,268
N	121,166	76,359	3,988	7,678	6,693	57,335

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 37: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−3.06E−4	−0.002***	−2.60E−4	−0.001**	−1.16E−4
	(3.64E−4)	(0.001)	(0.001)	(4.16E−4)	(0.002)
Female	0.006	−0.003	0.002	−0.006	−0.050
	(0.009)	(0.014)	(0.013)	(0.010)	(0.040)
Black	−0.013*	−0.010	−0.018*	−0.011	−0.028
	(0.006)	(0.010)	(0.009)	(0.007)	(0.034)
Hispanic	−0.011	−0.010	0.004	−0.027	−0.001
	(0.018)	(0.032)	(0.023)	(0.021)	(0.084)
U.S. born	−0.013	−0.022	−0.005	−0.023	−0.020
	(0.011)	(0.022)	(0.017)	(0.015)	(0.064)
Education	0.011***	0.020***	0.011**	0.013***	0.015
	(0.002)	(0.005)	(0.004)	(0.003)	(0.010)
Income	0.003***	0.004**	0.002*	0.002**	0.007*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Homeownership	−0.050***	−0.028	−0.039	−0.064***	0.004
	(0.015)	(0.027)	(0.022)	(0.018)	(0.070)
Household size	−0.008	−0.021**	−0.004	−0.009	−0.027
	(0.004)	(0.008)	(0.006)	(0.005)	(0.021)
Household vehicles	−0.026***	−0.021**	−0.020**	−0.028***	−0.046*
	(0.005)	(0.008)	(0.007)	(0.005)	(0.021)
Household drivers	0.009	0.014	0.011	0.015	0.046
	(0.008)	(0.014)	(0.011)	(0.009)	(0.035)
Log likelihood	−49,027	−17,442	−23,212	−40,235	−1,960
N	41,312	14,670	20,808	35,515	1,405

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Non-workers

Table 40 and 41 are on transportation behaviors of non-workers. Model 1 shows regression results for total number of trips. Non-workers at older ages drive less than younger people who are not working. Women who are not working take more trips than their male counterparts, and native-born citizens who are not working drive more than those who were born elsewhere. Non-workers with higher levels of education and income take more trips, as do homeowners, people with many vehicles at home, and those in larger households. The negative association of number of drivers at home indicates that non-workers who have multiple drivers at home take fewer trips. The number of transportation modes used by those who are not working (Model 2) was positively associated with education and income, but negatively associated with age and number of vehicles in the home. Model 3 examines the number of trip purposes cited by non-workers. Only age was negatively associated with the number of trip purposes. Females, those who were born in the United States, those with higher levels of education, those with greater incomes, and those who are homeowners were likely to have many reasons for going out. This may indicate their economic and social position.

When traveling home (Model 4), those who were not working but had high levels of education and income were likely to use multiple modes of transportation. However, age, homeownership, and number of vehicles at homes were negatively associated with the number of transportation modes used to get home. Education had the opposite effect when non-workers traveled to school (Model 6). Non-workers were likely to use few modes of transportation to travel to school. Non-workers with many vehicles at home also used fewer modes of transportation, but those in large households might use more transportation modes to get to school.

Age has a negative association with transportation modes while travelling for religious purposes (Model 7), travel for medical reasons (Model 8), shopping travel (Model 9), and social trips (Model 10). Non-workers who own their homes and who have multiple vehicles at home also use fewer transportation modes while travelling for medical reasons and shopping. Education and income have positive associations with the number of transportation modes used for shopping and social trips. The number of vehicles at home is negatively associated with social trips.

The number of transportation modes used by those who were not working for their family or personal trips (Model 11), or for travel to meals (Model 13) increased with the education and income levels of the respondent. However, the number of vehicles at home was negatively associated with these trips. Older non-workers used fewer modes of transportation for family or personal trips, when transporting someone (Model 12), or when traveling for meals (Model 13). Non-workers who own homes used fewer modes of transportation when traveling for meals.

NON−WORKER TRIPS

Table 38: Poisson Regression Coefficients for Non-worker Trips

	Model 1: Total trips (#)	Model 2: Travel modes (#)	Model 3: Trip purposes (#)
Age	−0.002***	−0.002***	−0.001***
	(1.09E−4)	(2.13E−4)	(1.36E−4)
Female	0.031***	−0.007	0.027***
	(0.003)	(0.006)	(0.004)
Black	−0.003	−0.004	0.001
	(0.002)	(0.005)	(0.003)
Hispanic	−0.004	0.002	−6.08E−5
	(0.007)	(0.013)	(0.008)
U.S. born	0.024***	−0.013	0.023***
	(0.005)	(0.008)	(0.006)
Education	0.029***	0.003*	0.011***
	(0.001)	(0.001)	(0.001)
Income	0.005***	0.002***	0.003***
	(2.21E−4)	(4.33E−4)	(2.73E−4)
Homeownership	0.041***	−0.025*	0.030***
	(0.005)	(0.010)	(0.007)
Household size	0.015***	−0.004	0.001
	(0.002)	(0.004)	(0.002)
Household vehicles	0.006***	−0.022***	0.003
	(0.002)	(0.004)	(0.002)
Household drivers	−0.018***	1.94E−04	−0.006
	(0.003)	(0.006)	(0.004)
Log likelihood	−218519	−107,627	−157,611
N	97983	97,983	97,983

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 39: Poisson Regression Coefficients for Non-worker Trip Purposes

	Model 4: Home	Model 5: Work	Model 6: School	Model 7: Religious Activities	Model 8: Medical	Model 9: Shopping
Age	−0.002***	−0.002	−0.001	−0.002*	−0.002***	−0.002***
	(2.19E−4)	(0.002)	(0.001)	(0.001)	(0.001)	(2.89E−4)
Female	−0.008	0.011	−0.027	−0.016	−0.007	−0.001
	(0.006)	(0.045)	(0.024)	(0.021)	(0.018)	(0.008)
Black	−0.004	0.002	0.007	−0.004	0.005	−0.001
	(0.005)	(0.027)	(0.019)	(0.016)	(0.015)	(0.006)
Hispanic	0.003	0.031	0.006	0.039	0.030	0.003
	(0.013)	(0.083)	(0.038)	(0.041)	(0.036)	(0.017)
U.S. born	−0.013	−0.018	−0.022	−0.019	−0.023	−0.015
	(0.009)	(0.047)	(0.033)	(0.026)	(0.028)	(0.010)
Education	0.002*	0.008	−0.006*	0.003	0.007	0.007***
	(0.001)	(0.009)	(0.003)	(0.004)	(0.004)	(0.002)
Income	0.002***	0.003	1.73E−4	0.002	0.002	0.002***
	(4.44E−4)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Homeownership	−0.028**	−0.080	−0.036	−0.047	−0.059*	−0.035**
	(0.010)	(0.072)	(0.038)	(0.036)	(0.028)	(0.013)
Household size	−0.004	0.010	0.022*	−0.003	0.003	−0.006
	(0.004)	(0.024)	(0.010)	(0.012)	(0.010)	(0.005)
Household vehicles	−0.022***	−0.028	−0.045***	−0.022	−0.031**	−0.022***
	(0.004)	(0.023)	(0.013)	(0.013)	(0.011)	(0.005)
Household drivers	1.53E−4	−0.020	−0.006	0.002	−0.007	−1.35E−5
	(0.006)	(0.040)	(0.018)	(0.020)	(0.017)	(0.008)
Log likelihood	−102,554	−1,837	−6,386	−10,139	−13,420	−65,580
N	93,488	1,629	5,497	9,355	12,328	59,402

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

Table 39: (continued)

	Model 10: Social	Model 11: Family/personal	Model 12: Transporting someone	Model 13: Meals	Model 14: Others
Age	−0.002***	−0.003***	−0.002**	−0.003***	−0.005**
	(3.21E−4)	(0.001)	(0.001)	(3.99E−4)	(0.002)
Female	−0.005	−0.012	−3.02E−04	−0.009	−0.028
	(0.009)	(0.015)	(0.018)	(0.011)	(0.048)
Black	−0.007	−0.013	−0.005	−0.006	−0.003
	(0.007)	(0.013)	(0.012)	(0.010)	(0.045)
Hispanic	−0.005	−0.006	0.012	0.008	0.025
	(0.019)	(0.035)	(0.029)	(0.026)	(0.097)
U.S. born	−0.015	−0.014	−0.009	−0.015	−0.064
	(0.012)	(0.025)	(0.021)	(0.019)	(0.082)
Education	0.004**	0.009**	0.001	0.005*	0.008
	(0.002)	(0.003)	(0.003)	(0.002)	(0.007)
Income	0.002***	0.003**	0.002	0.003***	0.008
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Homeownership	−0.021	−0.007	−0.021	−0.054**	−0.072
	(0.016)	(0.027)	(0.026)	(0.020)	(0.072)
Household size	−0.001	−0.004	0.005	−0.010	−0.003
	(0.005)	(0.010)	(0.008)	(0.007)	(0.024)
Household vehicles	−0.026***	−0.026**	−0.013	−0.022***	−0.082**
	(0.005)	(0.008)	(0.009)	(0.006)	(0.028)
Household drivers	−0.001	−0.001	−0.010	4.65E−5	0.005
	(0.009)	(0.016)	(0.014)	(0.012)	(0.042)
Log likelihood	−48,044	−17,427	−15,192	−33,115	−1,550
N	41,562	15,288	13,699	29,897	1,193

Notes: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$; Standard errors are in parentheses.

CONCLUSIONS

Geographic Inequality

This research provides a quick look into urban and rural passenger intermodal transportation, based on the 2009 NHTS data. The intermodal transportation is measured on the number of trips a person made in a day, the number of total travel modes used, the number of travel purposes and the number of travel modes used for the trip purposes. Poisson regression is used for the analysis because the dependent variables are count data. The demographic and socioeconomic explanatory variables are used to examine the influential factors for passenger intermodal transportation for urban and rural areas.

Age and gender are two strong demographic explanatory variables. In both urban and rural areas, age is strongly and negatively associated with total trips, travel modes and trip purposes. Similarly, female is strongly associated with total trips and trip purposes, but in positive direction. Education and income are important and strong socioeconomic explanatory variables in urban and rural areas. House ownership and household size are also influential socioeconomic factors that affect travel behaviors. In terms of the number of modes used for trip purposes, the number of vehicles in the household is the strongest variable. Its association with trip purposes is negative. The second and third most influential variables are income and age respectively. The association of these two factors with trip purposes is in opposite direction. Income has positive association and age has negative association with trip purposes. Education is the fourth most influential factor. Hispanic, and the number of drivers in household are the weakest variables and do not influence any trip purposes in both areas.

Demographic Inequality

Age

Going toward home, shopping, and travelling for social activities are the most important purposes when elderly people use multiple transportation modes. These are likely the most frequent reasons elderly people travel. Out of all explanatory variables, education is the most influential variable that is associated with the number of transportation modes. Probably, the elderly people, who have higher levels of education, are more socially, economically and

politically active; they have higher travel frequency; they have more reasons to travel; and they need to use and they can afford multiple modes of transportation compared to their counterparts who have lower level of education.

The second most influential variable is the number of vehicles at home, and it is negatively associated with the number of travel modes. The elderly people who have multiple vehicles at home probably have their own private vehicle and do not need to depend on alternate mode of transportation. The third most influential factors are income and homeownership. Income has positive association, suggesting that elderly people with higher income can afford multiple modes of transportation. The homeownership has negative association and it may indicate that elderly people who own can afford their own private vehicle and do not need to rely on the alternate modes of transportation.

Race/ethnicity

Age is the strongest explanatory variable, which is significantly and negatively associated with the total trips, travel modes and trip purposes in all race and ethnicity. Education and income are the next strongest explanatory variables, which are positively associated with the total trips, travel modes and trip purposes. Similarly, female is the third strongest variable that has significant and positive association. Regarding number of modes used for trip purposes, number of household vehicles is the strongest explanatory variable with negative association. Age stands second, which also has negative association with trip purposes. Education is the third strongest variable, which has mostly positive association with trip purposes.

Gender

In terms of overall trips, four strongest explanatory variables are age, education, income and household size. Age has negative association indicating that with increasing age, both genders travel less; they also use fewer transportation modes; and they have fewer reasons to travel. On the other hand, education and income have opposite associations. Higher levels of education and income are associated with more travel, more transportation modes and more travel purposes. Household size has mixed results, it has a positive association with total number of trips and trip purposes and negative association with number of transportation mode. In terms of trip purposes,

the four strongest explanatory variables are number of household vehicles, income, education and age. Number of household vehicles and age have negative association with trip purposes, while income and education have mostly positive associations for both males and females.

Socioeconomic Inequality

Class

Education is the strongest explanatory variable that has positive associations with total trips, transportation modes and trip purposes in all economic classes. It may be because the relationship between income and education is very strong. Age is the second strongest variable with mostly negative associations except for total number of trips for upper classes. It may indicate that upper class people at old ages can be in good financial position to afford greater numbers of trips. Female is the third strongest explanatory variable with a positive association, which indicates that in all classes females take more trips than males. They also use more transportation modes, and have more trip purposes than males.

Regarding the number of transportation modes for trip purposes, number of household vehicles is the strongest explanatory variable, and has a negative association with all trip purposes. It shows that having access to vehicles is the most influential factor for the choice of transportation mode. As long as they have access to vehicles, they do not want to use multiple transportation modes. The second strongest explanatory variable is age, which has negative association with trip purposes. It may indicate that at old age, reasons to take trips reduce in all economic classes. Education is the third strongest variable with mostly positive association. It indicates that people with higher levels of education may have more reasons to take trips and they can afford more transportation modes.

Education

For overall trips, income is the strongest variable, and is positively associated with total trips, transportation mode and trip purposes in all level of education. Higher levels of income help to afford more trips, transportation modes and trip purposes. The next strongest variable is household size, which has mostly positive associations with overall number of trips, transportation modes and trip purposes. It shows that bigger households take more trips, use multiple transportation modes and travel for many purposes. Female and number of drivers at

household are the third strongest variables with positive and negative associations, respectively. In all educational levels, women take more trips, use more transportation modes and travel for more reasons compared to men. Similarly, households with more drivers are associated with fewer total trips, transportation modes and trip purposes. In terms of the number of transportation modes used for different trip purposes, the number of household vehicles, age, and home ownership and household size are the strongest explanatory variables. All of these variables are negatively associated with the number of transportation modes.

Worker

For overall trips, education and income are the strongest variables with positive associations to total trips, transportation modes and trip purposes. Age and home ownership are the next strongest variables. Age mostly has negative association, and home ownership mostly has positive association. The third strongest variables are born in the United States and household vehicles, with mostly positive and negative associations respectively. In terms of number of transportation modes used for different trip purposes, number of household vehicles is the strongest variable with negative association. Similarly, age is the second strongest variable with negative associations. Education and income are the next strongest variables with mostly positive associations, probably indicating that people with higher levels of education and income can afford more transportation modes.

RECOMMENDATIONS

This is the first empirical study to comprehensively examine passenger intermodal transportation. While this research provides important insights into the demographic, socioeconomic, and geographic influences on passenger intermodal transportation, further insights could be gained in four directions. First, future research could focus more on the connectivity and efficiency of passenger intermodal transportation. This research is focused more on the multimodal perspective (i.e., the "broader" definition) of passenger intermodal transportation. Second, most of the households sampled in the 2009 NHTS are from urban areas, which may have produced bias results. In the future, the survey could include more samples for rural areas. Third, the 2009 NHTS's representation of home ownership is biased. Almost 90 percent of respondents in the sample own homes, which is much higher than the homeownership rate of the population. Future waves of the NHTS could include more respondents who rent homes or apartments, or at least provide a more accurate weight. The importance of passenger intermodal transportation for renters is higher than homeowners, as renters rely on public transportation more than homeowners. Fourth, future research could examine the role that transportation policies and investments play in passenger intermodal transportation. Widespread ownership of private cars in the United States hinders development of intermodal transportation [6] [5]. According to the United States Government Accountability Office [7], the federal government does not have specific national goals for the intermodal projects and funding programs. Most of the federal funding is for single transportation modes, and intermodal projects do not have a strong and continuous source of funding.

ACRONYMS, ABBREVIATIONS, AND SYMBOLS

NHTS	National Household Travel Survey
MPOs	Metropolitan Planning Organizations
USA	United States of America
SOV	Single Occupancy Vehicle
HOV	High Occupancy Vehicle
OLS	Ordinary Least Squares
Coef	Coefficient
SE	Standard Error

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