Travel By Households Without Vehicles

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Executive Summary

Over the past thirty years the Federal Government has funded extensive programs to improve the travel options of those people who do not have their own vehicles.[1] During this same period, independent of government actions, economic and demographic trends have diminished the target population and made vehicle access nearly universal, even in the poorest households.

It is time to study the travel characteristics of the remaining zero-vehicle households. Where are they located and how do they travel: what kind of transit access do they have, how many have jobs and how do they commute, and how do they shop and accomplish errands? Such information will help us understand the needs of these households, and whether adjustments in Federal programs should be made.

Trends

In overall terms, the proportion of households (HHs) without vehicles has declined steadily over time. This is no surprise given the enormous increase in vehicle ownership among the general population. In 1969, 20.6 percent of HHs had no vehicle. By 1983 this had fallen to 13.5 percent. And by 1990, this had fallen to 9.2 percent of HHs. HHs without vehicles tend to be smaller than average, so in 1990, only 6.4 percent of people lived in HHs without vehicles.[2]

Who Are They?

The typical 0-vehicle HH (0-VHH) has no one in the labor force (either employed or searching for work), has a lower than average income, and lives in the central part of a large urban area. In life cycle terms, most of these HHs are either retired older people or single adults without children. Most 0-VHHs are headed by women.

Although 0-VHHs have lower incomes than HHs in the General Population, only 27 percent of them are below the poverty level (this figure excludes HHs in the New York MSA for reasons discussed below). Poverty alone is not sufficient to explain why HHs have no vehicles. Of all adults living in HHs below the poverty level, 76.1 percent are in HHs that have at least one vehicle.[3] (Again excluding data from the New York MSA.)

Where Are They?

There is a high geographic concentration of 0-VHHs along the East Coast (New England, Mid-Atlantic, South Atlantic). This region has 36 percent of the U.S. adult population, but it accounts for 46 percent of all the adults who live in 0-VHHs.

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[1] In this report the term "vehicle" includes all household-based cars, vans, and light trucks.

[2] Comparable Census data are: 1960 = 21.5 percent, 1970 = 17.5 percent, 1980 = 12.9 percent, 1990 = 11.5 percent.

[3] In this report, the term "adult" means all persons age 16 or older.

Most 0-VHHs are in central cities of Metropolitan Statistical Areas (MSAs). Looking at adults who live in 0-VHHs, 52.9 percent of them are in central cities, with the remainder about evenly split between suburbs and non-MSA locations. 0-VHHs outside the central city are less mobile: for adults living outside the central city, 52 percent took no trips at all on the sample day; inside the central city this drops to 37 percent.

To the extent that federal policy is motivated by a desire to assure mobility for all, it needs to concentrate more attention outside the central cities.

How Do They Travel?

Commuting is not an overwhelming concern since only 31.3 percent of 0-VHHs have a family member in the labor force.

Adults living in 0-VHHs make 43 percent of their daily trips by walking. Because most 0-VHHs are in central urban locations, their transit access is good: 53 percent report they have transit access within 3 blocks; and 65 percent have transit access within 12 blocks. Yet adults living in 0-VHHs use transit for only 16 percent of their trips. Surprisingly, adults living in HHs without vehicles make more than twice as many trips by private vehicle as they do on transit (36 percent versus 16 percent).

The share of travel on public transportation is essentially constant across education levels, but the private vehicle share declines as education increases, and the walk mode share increases with education.

It is interesting to examine the share of private vehicle travel in our largest cities. For cities greater than one million population, with rail transit, 23.5 percent of trips are made by private vehicle. For cities greater than one million population, without rail transit, the private vehicle share nearly doubles, to 41.7 percent of trips. Yet this significant change in mode shares is not due to the transit system itself: transit's mode share is 24.3 percent in cities with rail and 22.1 percent in cities without rail. Instead there is a large increase in the walk mode share. Perhaps the decline in the private vehicle mode, in cities with rail transit, occurs because these cities tend to be older, pre-automobile age cities with narrower streets and less parking capacity.

Trip purpose: the reason for travel tends to be about equally divided between errands, social activities, and shopping.

Mobility: How Much Do They Travel[4]

From a social viewpoint, we are interested in seeing how well the people in 0-VHHs get around, whether they have enough mobility options to lead reasonable lives. One possible measure of mobility is the average number of trips per day made by persons who live in 0-VHHs. (A trip is a one-way journey; the roundtrip commute to work would be two trips.) The average adult living in a 0-VHH made 1.8 trips per day. The corresponding figure for the General Population is 3.2 trips per day. This is a substantial difference, but we will see that much of it reflects the different proportions of workers and the elderly in the two groups.

Another possible measure of mobility is the total absence of trip-taking on the sample day: the proportion of people who took no trips at all. Of adults living in 0-VHHs, 46 percent made no trips during the sample day. The corresponding figure for the General Population is 21 percent. Again, a substantial

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[4] Data excludes the New York MSA.

difference in mobility, and again, much of it reflects the different proportions of workers and the elderly in the two groups.

In the tables below, we report both measures, "trips per day," and "percent who took no trips." Which is the better gauge? The zero-trip measure is a more sensitive measure of immobility. Trips per day, being an average, is more influenced by outliers—a few respondents with a large number of trips can affect the average, though the proportion of immobile people might still be the same.[5] From now on, we shall refer to average trips per day as a measure of *mobility*, and the zero-trip proportion as a measure of *immobility*.

Demographic Effects on Travel

Demographic differences within the 0-VHH population produce strong effects on mobility patterns:

A) Workers travel much more than non-workers: 2.85 trips/day vs. 1.35 trips/day.

B) The young (20–34) travel much more than the old (65–74): 2.48 trips/day vs. 1.34 trips/day.

C) Higher incomes produce more travel: 2.62 trips/day at $40,000 plus income vs. 1.91 trips/day for the under $10,000 income group.

D) Men travel more than women: 2.1 trips/day for men vs. 1.69 trips/day for women.

E) Education produces remarkably strong effects: 2.67 trips/day for college graduates vs. 1.28 trips/day for those without high school degrees—and only some of this change can be accounted for by income differences.

Travel Behavior of Persons Age 65 and Over

Persons 65 and older account for almost half of all 0-VHHs. Our major finding is that their travel is *not* affected by changes in most of the explanatory variables. For example, there is little difference in trips per day by gender or ethnicity, or across the observed range of income and education.

The geographic consistency is also quite striking. There is almost no difference in either trips per day, or the proportion of persons with zero-trips, as we look across the three MSA categories, or the size of the urban area, or the population density. Consider the implications of these findings. Transit access is certainly much better in the Central City of an MSA than it is in a non-MSA, yet there was no difference in mobility patterns. Transit access is certainly much better in large urban areas than in small ones, but again there was no difference in mobility patterns. Transit access is certainly much better in high density areas than in low density ones, but we find only small increases in mobility in the densest areas. Taken together, these three finding seem to indicate that the presence or absence of transit makes little difference in the mobility patterns of older people.

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[5] *The survey question asked for details on all trips the respondent took on the sample day, where a "trip" is: "any time you went from* one address to another by car, bus, walking, busying, or some other means." Taken literally, the question asks about any kind of trip at all, by any possible mode. Is it reasonable to have almost half the HHs answer that they took no trips during the sample day? Perhaps some respondents might not consider journeys made by walking to be "trips"; and perhaps some respondents might not consider very short journeys to be "trips." The 0-VHHs would be especially vulnerable to these biases. They have a high proportion of walking trips because they do not own vehicles, and they tend to take relatively short trips because of the high proportion who are retired and over age 65. There is no simple way to quantify these biases.

Immigration and Vehicle Ownership

New immigrants have much lower vehicle ownership rates than the native born population, but vehicle ownership increases strongly with length of stay in the U.S. The fastest rate of change is for Asian immigrants, the slowest is for Black immigrants. The change is inherently interesting because these immigrants come from cultures that are not as auto-obsessed as our own. What explains the change in their vehicle ownership patterns over time? The data indicate that it is increasing income, rather than any change in values toward the automobile, that is the overwhelming factor behind the decline in 0-VHHs among immigrant groups.

Exclusion of New York MSA Data [6]

Should we exclude data from New York when calculating the average characteristics of the 0-VHHs? New York is unique: no other city comes close to it in population density, difficulty and expense of operating a vehicle, or universality of transit access. Furthermore New York's 0-VHHs are atypical. Their demographic profile differs considerably from the rest of the sample, and the differences are strongly in the direction of greater trip making.

New York 0-VHHs have atypically high incomes: over 30 percent earn $30,000 or more, while only 7.8 percent of the non-New York 0-VHHs earn that much. Adults living in New York 0-VHHs have atypically high labor force participation: 64 percent are in the labor force compared to 37 percent in the rest of the country. Many fewer adults in New York 0-VHHs are retired: 18 percent versus 32 percent in the rest of the country. And adults in New York 0-VHHs are unusually well educated: 22 percent have college degrees compared to 8 percent in the rest of the country.

These demographic differences all work in the direction of much higher mobility for 0-VHHs in New York. Their combined effect is so strong that they produce essentially equal trip rates for New York HHs with and without private vehicles. The 0-VHHs have the same mobility as the HHs with vehicles. Something other than a vehicle is driving the relationship between HH mobility and various HH characteristics in the New York MSA.

Finally, New York accounts for a high proportion of the total data—almost 15 percent of all the 0-VHHs are located there. Including New York in any generalizations about the characteristics of the 0-VHHs, or their mobility patterns, will distort the results—and the distortions will be in the direction of downplaying the mobility problems of 0-VHHs. **Unless otherwise stated, from now on this Chapter excludes New York data from the statistical compilations.** (In effect we are discarding a very large, very distant outlier from the data.)

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[6] The New York Metropolitan Statistical Area (MSA) is the smallest unit of analysis in the 1990 NPTS that includes data from New York City. While it would be best to exclude only New York City, it is not possible. The New York MSA includes data from Bronx, Kings, New York, Putnam, Queens, Richmond, Rockland and Westchester Counties, and designates New York and White Plains as the Central Cities of the area. From now on, when this report refers to New York, it is referring to the New York MSA.

Introduction

Unless otherwise stated, for the remainder of this report all of the tables have the following characteristics:

1. Data for the New York MSA are excluded.
2. General Population" or "Total Sample" refers to all persons 16 years or olderliving outside New York, whether or not they own vehicles.
3. 0-VHHs" refers to HHs outside the New York MSA which do not own a car, van, or light truck.
4. Unless otherwise stated, the analyses were made using person-level data from the NPTS "Person File."[7]

Effects of Demographic Variables on Mobility

Table 1 shows the effect of employment status on travel. The top row shows the zero-trip percentage for persons living in HHs that do not own vehicles, the second row shows the corresponding data for the General Population.[8] Among workers (persons employed or actively looking for work) who live in 0-VHHs, 20 percent took no trips on the sample day. Immobility jumps to 57.5 percent for non-workers living in 0-VHHs. Contrast this to the data in the second row. Immobility increases only 7 percentage points (20 percent–13 percent) between workers living in 0-VHHs and those in the General Population. For non-workers, immobility increases 21.6 percentage points. One reason for this contrast is the unusually high proportion of older people and retired people in the 0-VHHs.

Rows 3 and 4 in Table 1 show trip rates, our measure of mobility. The average worker living in a 0-VHH made 2.85 trips on the sample day, compared to 3.61 trips in the General Population. The two categories of workers are more similar to each other than are the two categories of non-workers.

Table 1: EMPLOYMENT STATUS AND ITS EFFECT ON TRAVEL (Persons 16 and Older)

	Employment Status	
	Worker	Non-Worker
% with no Trips		
HH without Vehicles	20.0%	57.5%
Total Sample	13.0%	35.9%
# of Trips per Day		
HH without Vehicles	2.85	1.35
Total Sample	3.61	2.51
Distribution of People		
HH without Vehicles	30.7%	69.3%
Total Sample	64.2%	35.8%

[7] *Our "immobility" measure, the percentage of persons who took no trips on the sample day, causes distortions when it is applied at the HH level. The larger the number of persons in a HH, the greater the chance that at least one of them will take a trip. Hence the statistic "percentage of HHs that took no trip on the sample day" will make it seem that large households are more mobile than small ones, even though this is not true at the individual level. For example, consider the influence of ethnicity on the immobility rate. Since Hispanic HHs tend to be larger than white HHs, their immobility rate will be biased downward.*

[8] For some purposes, one might wish to compare 0-VHHs to HHs with vehicles, rather than to the General Population. But since 93.6 percent of the General Population figure is HHs with vehicles, there will be essentially no difference between the two figures.

Rows 5 and 6 in Table 1 show the distribution of employment status in the General Population. Only 30.7 percent of the persons living in 0-VHHs are in the labor force, in contrast to 64.2 percent for persons in the General Population.

Table 2 shows the effect of age on travel. Consider the population distribution in rows 5 and 6 first: 37 percent of the persons in the 0-VHHs are over age 65 (13.8 percent + 23.2 percent), while only 14.9 percent of the General Population is that old.

Table 2: AGE OF RESPONDENT AND ITS EFFECT ON TRAVEL (Persons 16 and Older)

	Age of Respondent					
	16-19	20-34	35-54	55-64	65-74	75 +
% with no Trips						
HH without Vehicles	26.2%	31.5%	32.7%	48.8%	52.5%	76.1%
Total Sample	18.1%	15.3%	17.0%	25.5%	34.2%	54.4%
# of Trips per Day						
HH without Vehicles	3.24	2.48	2.12	1.34	1.34	.68
Total Sample	3.50	3.63	3.44	2.76	2.32	1.39
Distribution of People						
HH without Vehicles	10.0%	26.5%	17.4%	9.0%	13.8%	23.2%
Total Sample	7.6%	32.4%	34.0%	11.3%	9.2%	5.7%

Immobility, rows 1 and 2, is roughly similar across the first three age groups but climbs sharply over the next three categories: among persons age 75 and older living in 0-VHHs, 76.1 percent took no trips on the travel day. A similar pattern holds for the sample as a whole, but at a lower level. The mobility measure in rows 3 and 4 shows a similar pattern to the immobility measure, with the exception of the 16-19 age group.

Figure 1 plots Age versus the Immobility Rate, the proportion of persons who took no trips on the sample day. Past age 45, immobility increases with age, and 0-VHHs track the general population in a parallel manner. Figure 2 plots Age versus Trips per Day. There is a general decline in trip taking as age increases; and again the curves for 0-VHHs and the general population are roughly parallel.

Table 3 shows the effect of Life Cycle Stage on travel.[9] Within 0-VHHs both the mobility and immobility measures are relatively constant across the first four life cycle stages, and then jump sharply upon retirement. The same pattern holds for the General Population as well.

The difference in population distributions is also of interest. Persons living in 0-VHHs are disproportionately retired, or living alone, or living without children: 46 percent of persons in 0-VHHs are

[9] The household life cycle variable (LIF_CYC) has been collapsed to assure that there are enough observations for each cell in the zero-vehicle household analysis. The following is a statement of the new life cycle variable categories, and the LIF_CYC components are in parenthesis. "1 Adult, no kids" (Single adult, no children); "2+ adults, no kids" (Two or more adults, no children; Single adult, youngest child age 16-21; Two or more adults, youngest child age 16-21); "1 adult with kids" (Single adult, youngest child age 0-5; Single adult, youngest child age 6-15); "2+ adults with kids" (Two or more adults, youngest child age 0-5; Two or more adults, youngest child age 6-15); "1 adult, retired" (Single adult, retired, no children); "2+ adults, retired" (Two or more adults, retired, no children).

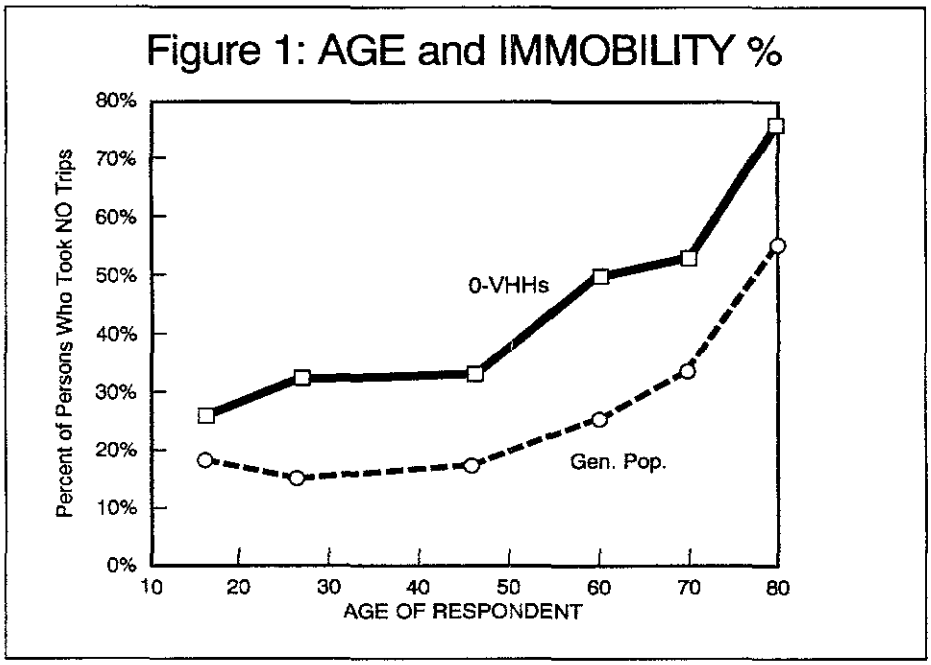


Table 3: HOUSEHOLD LIFE CYCLE AND ITS EFFECT ON TRAVEL
(Persons 16 and Older)

	Household Life Cycle					
	1 Adult no kids	2+ Adults no kids	1 Adult with kids	2+ Adults with kids	1 Adult retired	2+ Adults retired
% with no Trips						
HH without Vehicles	40.1%	32.7%	35.1%	38.7%	69.1%	58.0%
Total Sample	18.9%	17.9%	16.5%	18.1%	42.9%	34.8%
# of Trips per Day						
HH without Vehicles	2.07	2.58	1.98	2.06	.87	1.10
Total Sample	3.46	3.30	3.85	3.48	2.01	2.29
Distribution of People						
HH without Vehicles	24.0%	20.6%	10.4%	13.0%	22.0%	9.9%
Total Sample	9.2%	37.2%	3.0%	34.0%	4.3%	12.3%

lone adults, versus 13.5 percent for the General Population; 23.4 percent of persons in 0-VHHs have children, compared to 37 percent in the General Population; and 31.9 percent of persons in 0-VHHs are retired, compared to 16.6 percent in the General Population. (In HH-level data: 29.8 percent of 0-VHHs are retired, 44.7 percent have no children in the HH, two-thirds are one-person HHs, and 75.4 percent of 0-VHHs are headed by females.)

Recall that Table 1 showed the travel behavior of workers was relatively similar across the two samples (0-VHHs and the General Population), but that travel behavior of non-workers differed sharply across the two samples. We are now in a position to explore this further. We have learned that travel falls

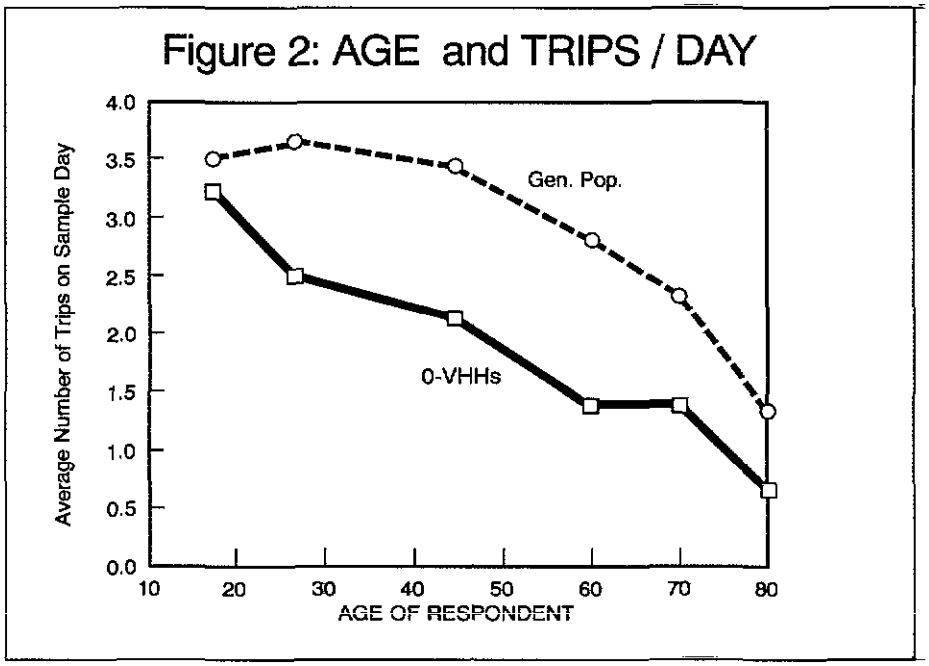


Table 4: EMPLOYMENT STATUS AND ITS EFFECT ON TRAVEL (Non-Retired Persons 16-54)

	Employment Status	
	Worker	Non-Worker
% with no Trips		
HH without Vehicles	19.9%	39.3%
Total Sample	12.5%	24.3%
# of Trips per Day		
HH without Vehicles	3.03	1.97
Total Sample	3.69	2.81
Distribution of People		
HH without Vehicles	37.4%	62.6%
Total Sample	60.1%	39.9%

off sharply by retirement status and by age, and we have learned that the 0-VHHs have a much higher proportion of retired people and old people. Thus the demographic characteristics of the non-worker portions of the population differ substantially between the two samples, and they differ in a way that exaggerates the effects on average travel behavior.

To make a more accurate comparison of non-worker travel, we should even out the demographic differences between the two samples. Table 4 does this by screening out observations on persons older than 54, and retired persons.[10] As expected, the gap in non-worker travel falls sharply.

[10] "Retired" status is approximated. Due to the nature of the household life cycle variable, only one adult had to be retired in order for the household to qualify for the reclassified category, "2+ adults, retired." There may also be a few retired individuals in the reclassified categories, "adults with children."

In Table 1, there was a difference of 21.6 percentage points between the two samples. In Table 4 the difference falls to 15 percentage points.

Table 5 shows the effect of poverty on travel. The distribution statistics in row 5 are surprising: only 28.3 percent of adults living in 0-VHHs are below the poverty level. Row 6 shows that 6 percent of the General Population are below the poverty level (This sample, however, includes the zero-vehicle households as well as those that own vehicles). Table 6 separates vehicle ownership by poverty status and shows that 76.1 percent of adults with incomes below the poverty level live in households that have vehicles. The desire to own a vehicle must be very high if so many people below the poverty level choose to do so. In addition, Table 6 illustrates that the proportion of persons in households with vehicles increases as households move out of poverty.

Table 7 compensates for differences in the age and retirement distributions in the two samples (0-VHHs and the General Population) by screening out retired persons and those over age 64. As expected the gap in mobility and immobility between the two samples is reduced. In Table 5, there was a gap of 20.8 percentage points in the immobility rates for the above poverty category. In Table 7 this gap falls to 11.3 percentage points. This is still an important difference in travel between 0-VHHs and the General Population, but it is nowhere near so large as the gross sample statistics suggest.

Table 5: HOUSEHOLD POVERTY LEVEL AND ITS EFFECT ON TRAVEL (Persons 16 and Older)

	Poverty Level of Household		
	Below	Near	Above
% with no Trips			
HH without Vehicles	41.7%	48.2%	38.0%
Total Sample	28.2%	29.9%	17.2%
# of Trips per Day			
HH without Vehicles	2.40	1.43	2.23
Total Sample	2.94	2.65	3.50
Distribution of People			
HH without Vehicles	28.3%	30.1%	41.5%
Total Sample	6.0%	8.0%	86.0%

Table 6: VEHICLE OWNERSHIP AND POVERTY LEVELS (Persons 16 and Older)

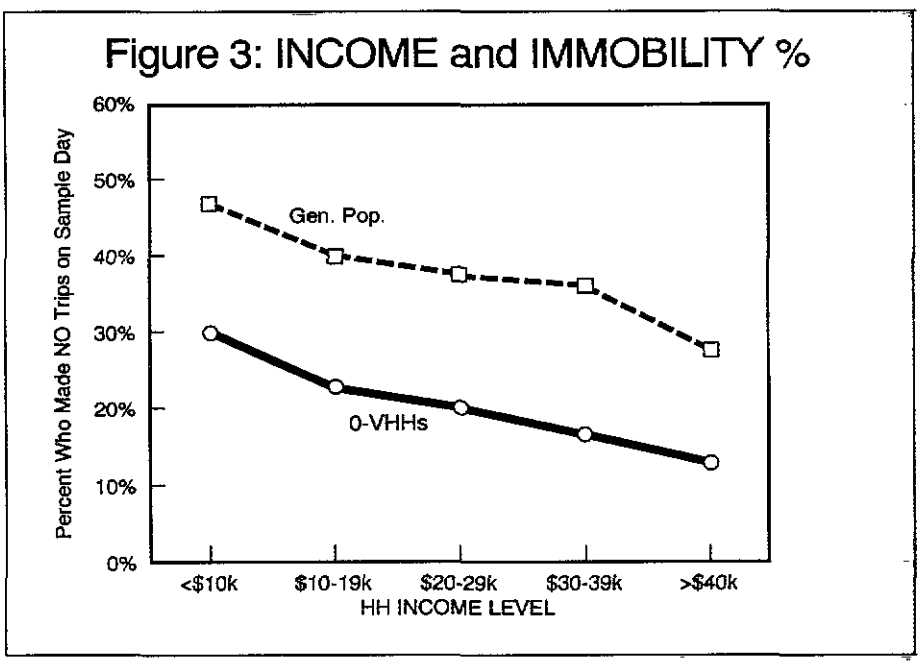
	Household Vehicle Ownership	
	One or More Vehicles	No Vehicles
Below Poverty	76.1%	23.9%
Near Poverty	81.1%	18.9%
Above Poverty	97.6%	2.4%

Table 7: HOUSEHOLD POVERTY LEVEL AND ITS EFFECT ON TRAVEL (Non-Retired Persons 16-64)

	Poverty Level of Household		
	Below	Near	Above
% with no Trips			
HH without Vehicles	30.4%	37.2%	26.3%
Total Sample	23.5%	23.8%	15.0%
# of Trips per Day			
HH without Vehicles	2.62	1.80	2.81
Total Sample	2.96	2.97	3.52
Distribution of People			
HH without Vehicles	41.1%	21.7%	37.3%
Total Sample	7.0%	6.3%	86.7%

Table 8: HOUSEHOLD FAMILY INCOME AND ITS EFFECT ON TRAVEL
(Persons 16 and Older)

	Level of Income				
	< 10,000	10,000 to 19,000	20,000 to 29,000	30,000 to 39,000	40,000 and over
% with no Trips					
HH without Vehicles	45.9%	40.1%	36.7%	35.4%	26.5%
Total Sample	30.9%	24.1%	19.0%	16.6%	14.0%
# of Trips per Day					
HH without Vehicles	1.91	1.99	2.62	2.24	2.62
Total Sample	2.70	2.99	3.39	3.51	3.73
Distribution of People					
HH without Vehicles	52.3%	30.4%	9.4%	4.4%	3.5%
Total Sample	10.5%	17.0%	17.7%	17.5%	37.3%



The income measure used in Tables 5, 6, and 7 is the poverty line, a measure that looks simultaneously at income and family size. Table 8 shows the effect of income alone. Figure 3 plots the relationship between Income and the percent of persons who took no trips on the sample day: increased income produces a large and consistent drop in immobility, and the trend lines for the General Population and the 0-VHHs show a parallel decline. Figure 4 plots the relationship between income and trips per day. Increased

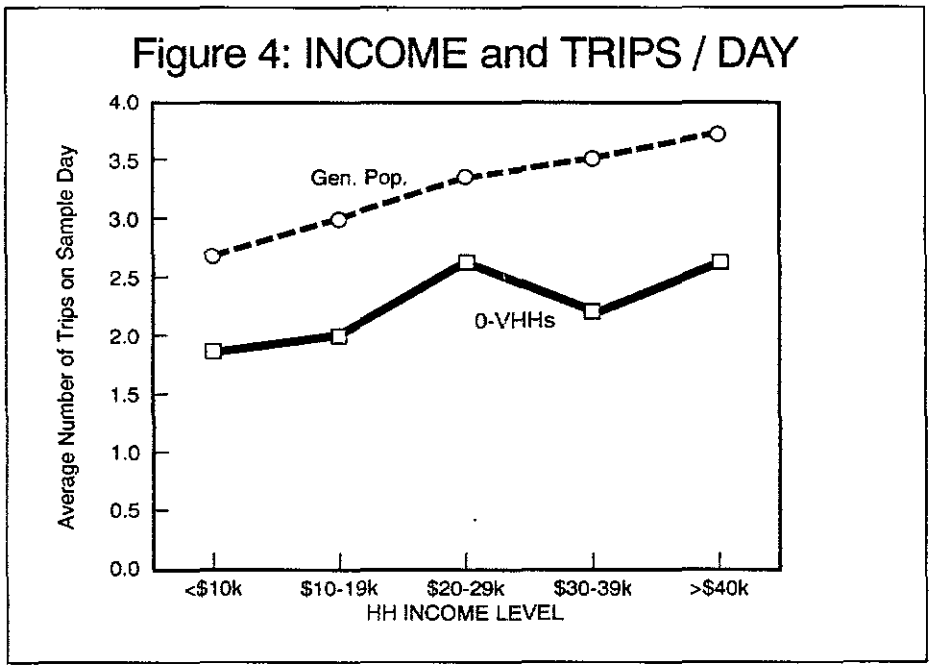


Table 9: SEX OF RESPONDENT AND ITS EFFECT ON TRAVEL (Persons 16 and Over)

	Sex of Respondent	
	Male	Female
% with no Trips		
HH without Vehicles	36.5%	50.1%
Total Sample	18.8%	23.3%
# of Trips per Day		
HH without Vehicles	2.10	1.69
Total Sample	3.17	3.25
Distribution of People		
HH without Vehicles	30.6%	69.4%
Total Sample	47.3%	52.7%

income produces a generally upward trend in mobility, though the effect is not quite as clear as the effect of income on the immobility rate.

Table 9 shows the relationship between gender and travel. Almost 70 percent of the adults living in 0-VHHs are women. (And the HH-level data show that 74.6 percent of 0-VHHs have a female head of household.) For adults living in 0-VHHs, there are large differences between men's and women's mobility and immobility. For the General Population, the differences disappear: women are slightly higher on the immobility measure, but they are also slightly higher on the mobility measure. Again, we suspect large differences in population distributions are causing the contrast. Table 10 shows the effect of holding some of the population distribution factors constant: persons who are older than age 64, or retired are screened

Table 10: SEX OF RESPONDENT AND ITS EFFECT ON TRAVEL (Non-Retired Persons 16-64)

	Sex of Respondent	
	Male	Female
% with no Trips		
HH without Vehicles	28.3%	35.9%
Total Sample	15.8%	18.2%
# of Trips per Day		
HH without Vehicles	2.50	2.29
Total Sample	3.34	3.60
Distribution of People		
HH without Vehicles	36.6%	63.4%
Total Sample	48.4%	51.6%

Table 11: LICENSED DRIVER STATUS AND ITS EFFECT ON TRAVEL (Persons 16 and Older)

	Licensed Driver Status	
	Licensed	Not Licensed
% with no Trips		
HH without Vehicles	34.3%	51.1%
Total Sample	18.3%	45.2%
# of Trips per Day		
HH without Vehicles	2.53	1.49
Total Sample	3.39	1.75
Distribution of People		
HH without Vehicles	30.0%	70.0%
Total Sample	89.2%	10.8%

out. Women's immobility gap falls from 26.8 percentage points (Table 9) to 17.7 percentage points (Table 10).

Table 11 shows the relation between having a drivers' license and travel. For persons living in 0-VHHs, 70 percent are unlicensed, compared to only 10.8 for the General Population. And for either the 0-VHHs or the General Population, there is a sharp increase in immobility, and a sharp decline in mobility, for those persons who are unlicensed.

Table 12 shows one of the most interesting results, the relationship between education and travel.[11] Figures 5 and 6 plot the data. They both show a strong, consistent effect of increased education on travel. And both the 0-VHHs and the General Population show the same effect. What's going on here? One's first inclination is to assume the education-effect is merely an artifact of the income-effect: increased education produces increased income, which in turn produces more travel. As a rough test of this idea, compare Figure 5 with Figure 3: the slope in Figure 5 is steeper; the change in education produces a greater change in immobility than the change in income.[12] Likewise, comparing Figure 6 to Figure 4, the change in education produces a greater overall effect on trip rates than the change in income. That is, it looks like the rise in travel, as education increases, is being produced by something more than the income increase. The next section tests this more precisely: we hold income effects constant, while examining the relationship between education and travel.

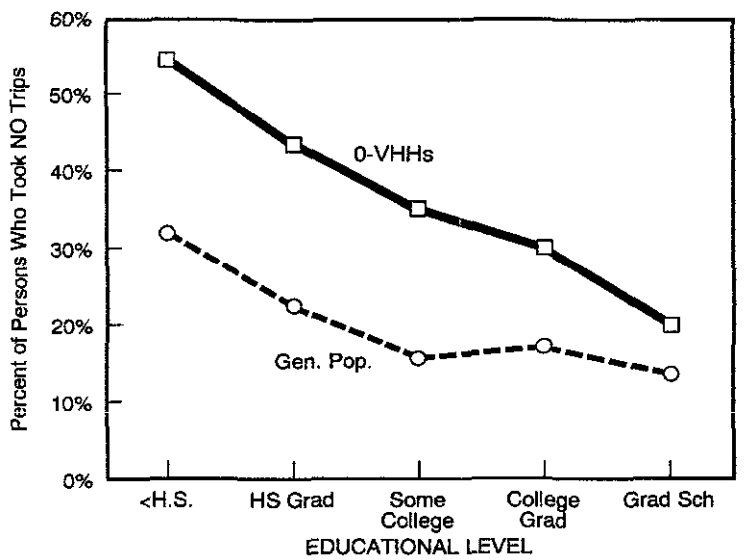
[11] The original education categories have been collapsed for the purposes of this analysis.

[12] Since the visual comparison can be distorted by the scales used on the axes, we can also make direct numerical calculations. Across the range of incomes, trips per day increases from 1.91 to 2.62, a 37 percent increase. Across the range of education, trips per day increases from 1.28 to 2.95, a 130 percent increase. Clearly, the effect of variation in education is greater than the effect of variation in income.

Table 12: RESPONDENT'S EDUCATION AND ITS EFFECT ON TRAVEL
(Persons 16 and Older)

	Respondent's Education Level				
	Non High School Grad	High School Grad	Some College	College Grad	Grad School
% with no Trips					
HH without Vehicles	54.4%	42.2%	35.8%	30.3%	19.6%
Total Sample	31.3%	22.2%	15.3%	15.5%	12.7%
# of Trips per Day					
HH without Vehicles	1.28	2.10	2.36	2.67	2.95
Total Sample	2.44	3.06	3.77	3.70	3.94
Distribution of People					
HH without Vehicles	42.8%	36.7%	12.3%	5.9%	2.4%
Total Sample	18.9%	39.5%	19.6%	14.0%	7.9%

Figure 5: EDUCATION and IMMOBILITY %



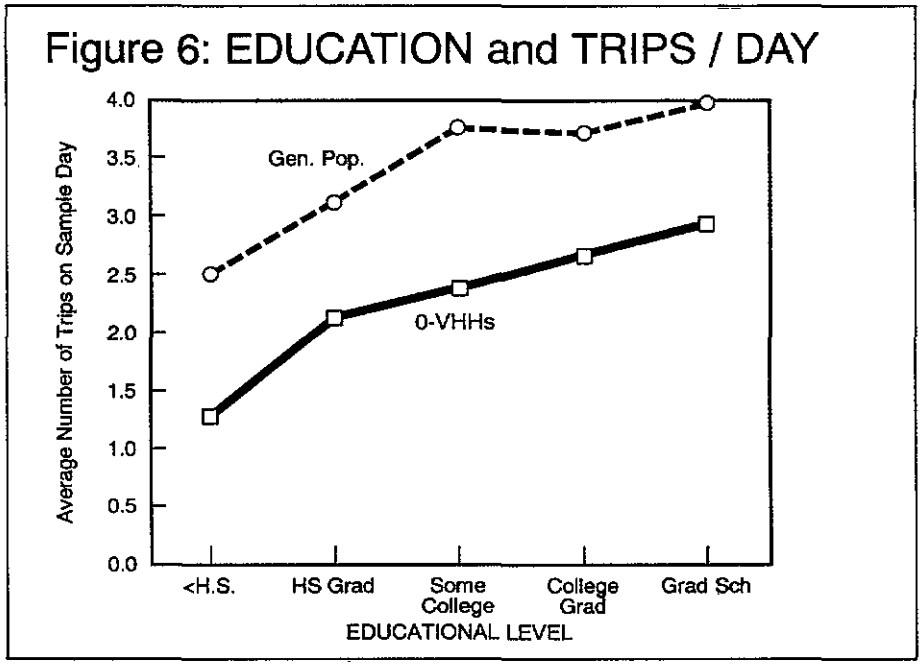


Table 13: RESPONDENT'S EDUCATION AND ITS EFFECT ON TRAVEL
(Annual Household Family Income = $15,000 - $20,000)

	Respondent's Education Level				
	Non High School Grad	High School Grad	Some College	College Grad	Grad School
% with no Trips					
HH without Vehicles	34.6%	33.7%	36.2%	9.1%	34.2%
Total Sample	26.3%	22.4%	17.5%	10.4%	22.1%
# of Trips per Day					
HH without Vehicles	2.08	2.16	2.64	3.60	2.30
Total Sample	2.64	2.98	3.74	3.89	3.50
Distribution of People					
HH without Vehicles	35.1%	30.6%	22.2%	7.9%	4.1%
Total Sample	25.1%	46.2%	17.1%	8.3%	3.3%

Tables 13, 14, and 15 examine the relationship between education and travel at three different income levels: $15–20 thousand, $30–40 thousand, and $60–70 thousand. Within each narrow income range, there is still a strong positive effect of education on mobility. Figure 7 plots trips per day for the General Population. The dark line shows the effect on the entire population, it repeats the trace from Figure 5. The lighter lines show the relations between education and trips per day at different income levels. The lighter lines are nearly as steep as the dark line — even within a narrow range of incomes, increased education is associated with increased mobility. Figure 8 makes a similar plot for the 0-VHHs. Again, we can see that education increases travel, even when income is held approximately constant.

Table 14: RESPONDENT'S EDUCATION AND ITS EFFECT ON TRAVEL
(Annual Household Family Income = $30,000 - $40,000)

	Respondent's Education Level				
	Non High School Grad	High School Grad	Some College	College Grad	Grad School
% with no Trips					
HH without Vehicles	67.4%	40.7%	36.1%	12.1%	—
Total Sample	20.3%	16.9%	15.3%	15.6%	13.3%
# of Trips per Day					
HH without Vehicles	0.91	1.85	2.81	2.60	3.46
Total Sample	3.16	3.31	3.79	3.76	4.11
Distribution of People					
HH without Vehicles	21.8%	21.4%	26.4%	20.0%	10.4%
Total Sample	12.7%	43.3%	22.3%	14.5%	7.2%

Table 15: RESPONDENT'S EDUCATION AND ITS EFFECT ON TRAVEL
(Annual Household Family Income = $60,000 - $70,000)

	Respondent's Education Level				
	Non High School Grad	High School Grad	Some College	College Grad	Grad School
% with no Trips					
HH without Vehicles	100%	—	—	—	0%
Total Sample	20.9%	19.0%	12.5%	11.0%	11.8%
# of Trips per Day					
HH without Vehicles	0.0	—	—	6.0	—
Total Sample	3.14	3.37	3.87	4.08	4.26
Distribution of People					
HH without Vehicles	91.6%	—	—	8.4%	—
Total Sample	9.1%	30.5%	22.0%	24.3%	14.1%

Why does education increase travel? A small part of the effect is caused by the increase in income, but the remainder of the effect is very much open to speculation. The authors of this chapter, who are in the education business, are tempted to suppose the answer is this: Education gives people an increased range of interests and destinations, a greater connection to the outside world.

Figure 7: EDUCATION and TRIPS / DAY

(AT DIFFERENT INCOME LEVELS)

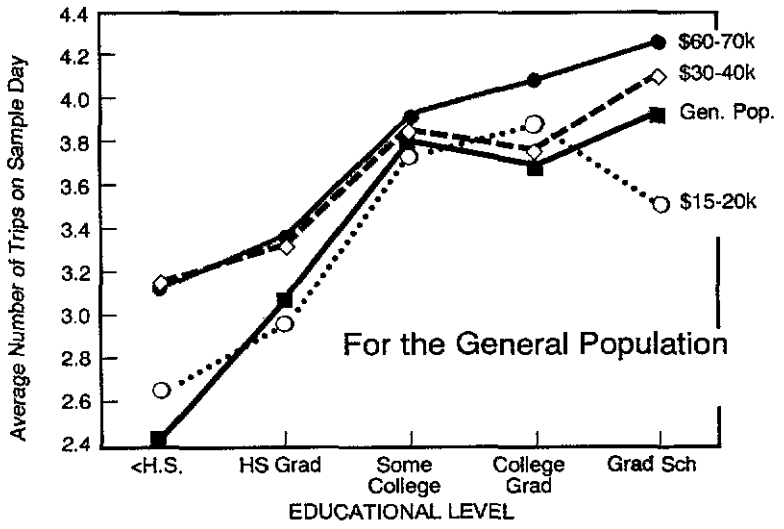


Figure 8: EDUCATION and TRIPS / DAY

(AT DIFFERENT INCOME LEVELS)

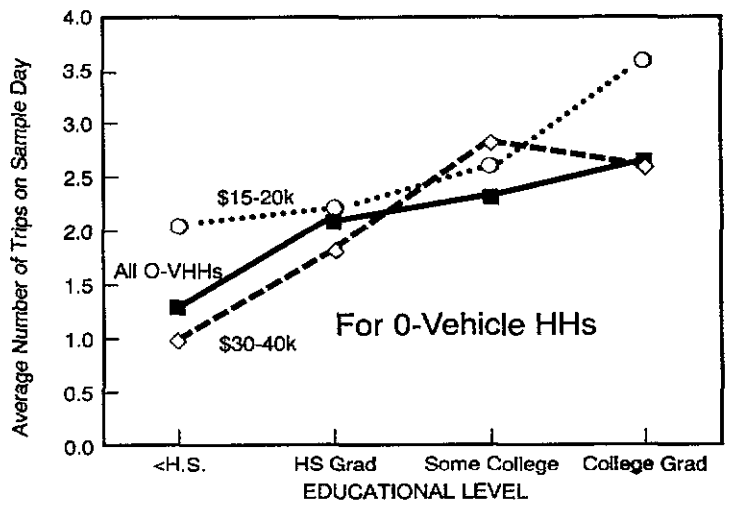


Table 16: HOUSEHOLD ETHNICITY AND ITS EFFECT ON TRAVEL (Persons 16 and Older)

	Household Ethnicity			
	White	Black	Hispanic	Other
% with no Trips				
HH without Vehicles	50.4%	39.5%	51.4%	29.2%
Total Sample	20.0%	26.0%	27.3%	22.9%
# of Trips per Day				
HH without Vehicles	1.82	1.83	1.48	2.46
Total Sample	3.31	2.87	2.75	2.79
Distribution of People				
HH without Vehicles	52.2%	33.8%	10.3%	3.7%
Total Sample	80.3%	10.0%	6.8%	3.0%

Table 17: HOUSEHOLD SIZE AND ITS EFFECT ON TRAVEL (Persons 16 and Older)

	Household Size					
	1	2	3	4	5	6 +
% with no Trips						
HH without Vehicles	53.9%	43.8%	41.5%	29.5%	34.9%	32.6%
Total Sample	26.6%	22.2%	18.6%	17.8%	20.1%	24.7%
# of Trips per Day						
HH without Vehicles	1.50	1.99	1.92	2.72	2.08	1.86
Total Sample	3.00	3.05	3.33	3.48	3.36	3.05
Distribution of People						
HH without Vehicles	45.8%	22.8%	13.1%	7.4%	6.2%	4.7%
Total Sample	13.3%	31.8%	20.1%	19.0%	10.0%	5.9%

Table 16 shows the relationship between ethnicity and travel.[13] Contrasting rows 5 and 6, we see that Blacks appear in the 0-VHH category three times more frequently than we would expect from their population proportions. On the other hand, if we try to gauge the travel handicap stemming from absence of a vehicle, Blacks show the greatest ability to maintain travel mobility: their difference in trip rates is only about one trip per day (2.87 - 1.83). Blacks also have the least increase in immobility stemming from absence of a vehicle: an increase of 13.5 percentage points (39.53–26.0).

[13] Ethnicity is a constructed variable which selects out hispanic ethnicity from the white, black and other categories of the race variable.

Table 17 shows the effect of household size. The expected direction of the effect is ambiguous. The economic argument predicts that number of trips per person will decline as household size increases because of economies of scale. Each HH has a minimal number of shopping trips and errands necessary for its maintenance; with more persons in the household, there are more persons available to split the work, hence trips per person should decline as HH size increases. The social interaction argument predicts that trips per person will increase: people stir each other into action, and it's more fun to go places with others than it is to go alone, hence trips per person will increase as HH size increases. The social interaction effect seems to dominate. Table 17 shows a small, and relatively consistent, increase in travel as HH size increases: trips per day grows, and the immobility rate falls.

Table 18: HOUSEHOLD LOCATION AND ITS EFFECT ON TRAVEL
(Persons 16 and Older)

	Inside MSA		
	Inside Central City	Outside Central City	Not in MSA
% with no Trips			
HH without Vehicles	40.6%	52.2%	54.0%
Total Sample	21.7%	19.8%	23.0%
# of Trips per Day			
HH without Vehicles	1.97	1.72	1.45
Total Sample	3.21	3.26	3.13
Distribution of People			
HH without Vehicles	57.5%	22.5%	20.0%
Total Sample	34.8%	42.2%	23.0%

Table 19: POPULATION DENSITY OF HOUSEHOLD LOCATION AND ITS EFFECT ON TRAVEL

	Population Per Sq. Mile of Household Zip Code (Persons 16 and Older)				
	0 to 249	250 to 999	1,000 to 3,999	4,000 to 9,999	10,000 to 49,000
% with no Trips					
HH without Vehicles	54.9%	48.9%	47.8%	43.6%	34.0%
Total Sample	22.8%	19.2%	20.0%	21.3%	25.6%
# of Trips per Day					
HH without Vehicles	1.70	1.75	1.69	1.61	2.40
Total Sample	3.14	3.37	3.27	3.17	2.82
Distribution of People					
HH without Vehicles	24.2%	13.1%	20.4%	23.8%	18.5%
Total Sample	31.8%	19.8%	27.0%	16.9%	4.5%

Effects of Urban and Geographic Variables on Mobility

Table 18 shows the effect of urban location on travel. There are two major effects to notice here. First, the strong difference in the population distributions: 57.5 percent of adults in 0-VHHs live in the Central City contrasted to only 34.8 percent of the General Population. Second, urban location has no significant effect on either the mobility or immobility measure for the General Population. For the adults in 0-VHHs, a Central City location produces better scores on these measures.

Table 19 shows the effect of population density on travel.[14] Again we see that 0-VHHs are disproportionately represented in high density areas, columns 5 and 6. And their immobility increases sharply in low density areas: in the densest location, only 34 percent took no trips on the sample day; in the least dense locations, 54.9 percent took no trips. The same effect shows in trip rates, though not as sharply. For the General Population, neither travel measure changes much as a function of density.

Table 20 shows the effect of urban size on travel. The most interesting contrast here is between large cities with and without rail transit systems. There is a small improvement in travel for 0-VHHs located in cities with rail systems, but this is not a function of the transit system itself — we will see later that transit's modal share is almost identical in the two city types. Rather, the increase in travel is an increase in walking trips, and this is a function of other city characteristics. Cities with rail transit tend to be those that were largely built before the automobile age, hence they are denser and more pedestrian friendly. (Table 30, below, returns to this question.)

Table 20: SIZE OF URBAN AREA AND ITS EFFECT ON TRAVEL
(Persons 16 and Older)

	Population of Urbanized Areas (thousands)				
	50-199	200-499	500-999	1,000 + without rail	1,000 + with rail
% with no Trips					
HH without Vehicles	47.0%	46.0%	38.9%	47.8%	38.8%
Total Sample	19.7%	21.1%	19.9%	21.1%	20.8%
# of Trips per Day					
HH without Vehicles	1.92	1.53	1.68	1.64	2.10
Total Sample	3.44	3.30	3.28	3.24	3.10
Distribution of People					
HH without Vehicles	16.2%	10.0%	10.5%	25.3%	38.0%
Total Sample	14.2%	11.4%	10.8%	33.0%	30.5%

[14] For this analysis, the population density categories were collapsed, and the original category 14 (1,000 or more and not in MSA) was excluded. Besides being a category with few observations, the category is too broad for the purposes of this report.

Table 21: CENSUS DIVISION AND ITS EFFECT ON TRAVEL
(Persons 16 and Older)

	Population of Census Division								
	NE	MA	ENC	WNC	SA	ESC	WSC	Mtn	Pac
% with no Trips									
HH without Vehicles	47.7%	40.3%	45.2%	48.2%	46.7%	49.5%	55.5%	43.3%	43.9%
Total Sample	20.4%	20.8%	19.7%	20.9%	21.3%	22.5%	23.1%	19.4%	22.3%
# of Trips per Day									
HH without Vehicles	1.86	1.99	2.01	1.54	1.83	1.60	1.30	1.67	1.84
Total Sample	3.25	3.10	3.26	3.38	3.19	3.20	3.22	3.35	3.14
Distribution of People									
HH without Vehicles	6.8%	18.4%	18.3%	5.7%	21.1%	5.9%	9.4%	2.3%	12.2%
Total Sample	5.4%	12.9%	17.8%	7.3%	17.9%	6.3%	11.0%	5.7%	15.7%

Table 21 shows the broader geographic patterns of travel behavior.[15] For the General Population, there is very little difference in either travel measure across regions, rows 2 and 4 seem remarkably uniform. There is some variation for the 0-VHHs: the West South Central area has the highest immobility rate, 55.5 percent took no trips; Mid-Atlantic has the lowest, 40.3 percent. On the trips per day measure, again, West South Central shows the lowest mobility, 1.3 trips/day, but this time East North Central is highest at 2.01, with Mid-Atlantic close behind at 1.99 trips/days. In terms of population distributions, the East Coast has disproportionately more adults in 0-VHHs: NE + MA + SA add up to 36.2 percent of persons in the General Population, but have 46.3 percent of persons living in 0-VHHs. And the West Coast and Mountain regions have disproportionately few: Mtn + Pac have 21.4 percent of persons in the General Population, but only 14.5 percent of persons living in 0-VHHs.

Modal Choice: How Do They Travel?[16]

How do persons living in 0-VHH accomplish their travel, what modes do they utilize? To keep the tables manageable, the modes are consolidated as follows: the "private vehicle" mode includes trips made by automobiles, vans, and light trucks, as either a passenger or driver; the "public transit" mode includes all trips by bus, subway, or railroad; the "walk" mode is as expected; and "other" includes all the remaining modes.

Table 22 contrasts the modal split of 0-VHHs inside and outside the New York MSA. The first row shows the mode split of HHs living outside New York. Only 16 percent of their trips are made on public transit, and despite the absence of a HH vehicle, 36 percent of their trips are made in private vehicles, presumably by ride sharing with friends. For persons living within New York, public transit use increases sharply to 36 percent of all trips. In general terms, the proportion of trips made by walking is about the same, but what changes is the split between private vehicles and Transit.

[15] NE = New England; MA = Middle Atlantic; ENC = East North Central; WNC = West North Central; SA = South Atlantic; ESC = East South Central; WSC = West South Central; Mtn = Mountain; Pac = Pacific.

[16] Unless otherwise stated, all data exclude the New York MSA.

Table 22: MODAL SPLIT OF ZERO VEHICLE HOUSEHOLDS
Inside and Outside New York MSA

	Private Vehicle	Public Transport	Walk	Other
Outside NY	36%	16%	43%	5%
Inside NY	11%	36%	46%	7%

Table 23: RESPONDENT'S AGE AND ITS EFFECT ON TRAVEL MODE - 0-VHH
(Trips for Persons 16 and Older)

	Share of Travel Day Trip Mode			
	Private Vehicle	Public Transport	Walk	Other
16-19	16.7%	8.5%	68.2%	6.7%
20-34	38.1%	19.1%	38.1%	4.7%
35-54	38.4%	18.1%	39.3%	4.2%
55-64	43.9%	15.3%	38.3%	2.5%
65-74	39.3%	15.3%	38.8%	6.6%
75+	49.3%	14.9%	30.1%	5.7%

Table 24: LIFE CYCLE AND ITS EFFECT ON TRAVEL MODE - 0-VHH
(Trips for Persons 16 and Older).

	Share of Travel Day Trip Mode			
	Private Vehicle	Public Transport	Walk	Other
1 Adult, No Kids	36.6%	11.9%	46.9%	4.6%
2+ Adults, No Kids	22.6%	14.7%	56.4%	6.4%
1 Adult, With Kids	49.4%	13.5%	33.1%	4.0%
2+ Adults, With Kids	40.2%	24.8%	31.1%	4.0%
1 Adult, Retired	44.6%	17.2%	31.4%	6.8%
2+ Adults, Retired	41.9%	22.3%	32.7%	3.2%

Table 25: HOUSEHOLD INCOME AND ITS EFFECT ON TRAVEL MODE - 0-VHH
(Trips for Persons 16 and Older)

	Share of Travel Day Trip Mode			
	Private Vehicle	Public Transport	Walk	Other
< 5,000	21.7%	8.1%	65.7%	4.4%
5,000 - 9,999	41.1%	18.3%	36.6%	4.0%
10,000 - 14,999	32.8%	18.0%	45.5%	3.6%
15,000 - 19,999	37.7%	18.8%	37.2%	6.3%
20,000 - 29,999	34.1%	16.5%	43.5%	5.8%
30,000 +	32.2%	17.3%	45.0%	5.5%

Table 26: GENDER AND ITS EFFECT ON TRAVEL MODE - 0-VHH
(Trips for Persons 16 and Older)

	Share of Travel Day Trip Mode			
	Private Vehicle	Public Transport	Walk	Other
Male	28.8%	17.0%	45.6%	8.7%
Female	39.7%	15.4%	41.8%	3.1%

The rest of this section explores these relationships in more detail. The tables are based on the NPTS Trip File; each observation is a trip by one person on the sample day. Thus one HH, or one person, may be represented by many observations. The tables take account of all trips by adults living in 0-VHHs outside of New York.

Table 23 shows the effect of age on mode split. In general, there is little difference in mode split among age groups 20 years old and up. But the 16–19 year old group is quite different from the others: 68.2 percent of its trips are made by walking.

Table 24 shows the effect of life cycle on mode split. There are no strong trends here, but in general, people in the earlier life cycle stages walk more.

Table 25 shows the effect of HH income on mode split. The contrast here is the comparison between the under $5,000 group and the others. There is general similarity in travel modes above $5,000 HH income level, but below it there are sharp drops in use of private vehicles and transit, and a correspondingly sharp increase in walking.

Table 26 shows the effect of gender on mode split. Interestingly, women use private vehicles for a higher proportion of their trips than men do, perhaps because of concerns about security.

Table 27: ETHNICITY AND ITS EFFECT ON TRAVEL MODE - 0-VHH (Trips for Persons 16 and Older)

	Share of Travel Day Trip Mode			
	Private Vehicle	Public Transport	Walk	Other
Hispanic	32.7%	28.0%	30.9%	8.4%
Black	36.7%	23.5%	36.6%	3.2%
Other	33.0%	21.4%	37.6%	8.1%
White	35.8%	8.7%	50.0%	5.5%

Table 28: EDUCATION AND ITS EFFECT ON TRAVEL MODE - 0-VHH (Trips for Persons 16 and Older)

	Share of Travel Day Trip Mode			
	Private Vehicle	Public Transport	Walk	Other
Non-H.S. Grad	44.3%	15.9%	33.2%	6.6%
High School Grad	32.5%	16.4%	48.4%	2.8%
Some College	27.9%	15.8%	51.8%	4.5%
College Grad/ Grad School	29.9%	16.7%	42.3%	11.0%

Table 27 shows the effect of ethnicity on mode split. Travel patterns of minorities (Hispanics, Blacks, Other) are relatively similar to each other. Whites use private vehicles the same amount as minorities do, but Whites make much less use of transit, and do much more walking.

Table 28 shows the effect of education on mode split. There is a strong decline in use of private vehicles as education increases, and a corresponding increase in walking as education increases. Use of public transit is about the same across education levels.

Table 29: POPULATION DENSITY AND ITS EFFECT ON TRAVEL MODE - 0-VHH (Trips for Persons 16 and Older)

	Share of Travel Day Trip Mode			
	Private Vehicle	Public Transport	Walk	Other
0-249	40.5%	4.7%	51.8%	3.1%
250-999	40.8%	7.5%	39.3%	12.4%
1,000-3,999 and in MSA	46.6%	18.0%	30.0%	5.5%
4,000-9,999 and in MSA	41.3%	19.2%	34.9%	4.5%
10,000-49,999 and in MSA	17.2%	26.3%	52.8%	3.6%

Table 30: URBANIZED AREA SIZE AND ITS EFFECT ON TRAVEL MODE - 0-VHH (Trips for Persons 16 and Older)

	Share of Travel Day Trip Mode			
	Private Vehicle	Public Transport	Walk	Other
50,000-199,999	35.8%	13.4%	39.2%	11.5%
200,000-499,999	47.6%	13.5%	35.0%	4.0%
500,000-999,999	56.2%	14.6%	23.9%	5.2%
1,000,000 or More Without Rail	41.7%	22.1%	31.6%	4.6%
1,000,000 or More With Rail	23.5%	24.3%	49.0%	3.2%

Table 29 shows the effect of population density on mode split. As expected, use of transit increases sharply with density. Use of private vehicles is quite constant until the very highest density level. And walking is high at the two ends of the density scale.

Table 30 shows the effect of urban size on mode split. The pattern seems to split at the one million mark. In the size range 50 thousand to one million: as urban size increases, transit usage is constant, vehicle usage increases sharply, and walking falls sharply. In the one million and up category there is a sharp difference between cities with and without rail transit systems. In the large rail-cities, vehicle usage is sharply lower and walking is sharply higher compared to the non-rail large cities. But credit for this socially desirable change cannot be attributed to the presence of the rail system since the modal share of transit is essentially the same in the two city types (22.1 percent and 24.3 percent). It seems likely that what we are observing is a side effect of city age: most rail transit cities were built before the automobile age. They are older, denser, more pedestrian-oriented and have less road and parking capacity.

Table 31: CENSUS DIVISION AND ITS EFFECT ON TRAVEL MODE - 0-VHH (Trips for Persons 16 and Older)

	Share of Travel Day Trip Mode			
	Private Vehicle	Public Transport	Walk	Other
Middle Atlantic	23.3%	20.4%	52.2%	4.2%
New England	24.3%	16.5%	56.3%	3.0%
Mountain	29.2%	10.3%	50.3%	10.2%
East North Central	33.0%	13.0%	48.3%	5.8%
Pacific	35.0%	17.6%	40.3%	7.0%
South Atlantic	41.0%	19.3%	36.1%	3.7%
West South Central	50.3%	14.1%	26.7%	9.2%
West North Central	52.3%	9.7%	34.4%	3.6%
East South Central	60.1%	3.3%	32.9%	3.7%

Table 31 shows the variation in mode split across geographic regions. The table has been ordered by the degree to which private vehicles are used. The Mid-Atlantic and New England regions have relatively low use of private vehicles, while West South Central, West North Central, and East South Central are more than twice as high. Transit use is similar across most of these regions (until a sharp drop in East South Central). And walking declines steadily in the opposite pattern to private vehicle usage.

The Journey to Work

Only 30.7 percent of adults in 0-VHHs are in the labor force (employed or looking for work), but the journey to work is one of the most important trip purposes. This section analyzes the mode split for work trips as a function of demographic and geographic characteristics. The data are for persons 16 and over, in the labor force, who do not live in the New York MSA.

Table 32 shows that Whites walk to work nearly twice as often as Blacks and more than three times as often as Hispanics. Black work trips are almost evenly split among private vehicles and public transport. Hispanics utilized private vehicles much more than public transportation. The bottom row, "Col. as percent of all Persons" shows that 9.6 percent of all workers in 0-VHHs are White, reflecting the high proportion of retired persons in White 0-VHHs.

Table 32: DISTRIBUTION OF TRIP MODE FOR WORK TRIPS BY ETHNICITY - 0-VHH
(Trips by Persons 16 Years and Older)

	Household Ethnicity			
	White	Black	Hispanic	Other
Private Vehicle	30.7%	38.9%	46.7%	32.6%
Public Transport	20.4%	36.4%	30.2%	48.1%
Walk	41.3%	22.7%	12.4%	14.5%
Other	7.5%	2.1%	10.4%	4.9%
Total	100%	100%	100%	100%
Col. as % of all Persons	9.6%	41.9%	44.4%	4.1%

Table 33: DISTRIBUTION OF TRIP MODE FOR WORK TRIPS - 0-VHH
(Trips by Persons 16 Years and Older)

	Family Income				
	< 10,000	10,000-19,999	20,000-29,999	30,000-39,999	Over 40,000
Private Vehicle	36.4%	33.6%	22.6%	19.9%	40.2%
Public Transport	26.5%	34.3%	33.5%	45.7%	27.6%
Walk	35.7%	26.8%	28.2%	28.3%	29.0%
Other	1.4%	5.4%	15.7%	6.1%	3.2%
Total	100%	100%	100%	100%	100%
Col. as % of all Persons	35.6%	34.0%	12.6%	8.1%	9.6%

Table 33 shows the relations of mode split to income. Walking is relatively consistent across income categories. The private vehicle mode decreases with income until $40,000, where it doubles. The public transportation mode moves in the opposite pattern.

Table 34 shows that the private vehicle mode increases as persons move from central city, to suburb, to non MSA. There is a corresponding decrease in public transportation use. The share of walking is relatively constant. The bottom row shows that 68.8 percent of all the 0-VHH *workers* live in the MSA Central City, while Table 18 showed that 57.5 percent of all the 0-VHH *persons* live in the MSA Central City. That is 0-VHH persons living in the MSA Central City are much more likely to be in the labor force.

Table 35 shows a general increase of transit's mode share for work trips as population density increases. The biggest change is between the MSA and non-MSA categories, with a corresponding

Table 34: DISTRIBUTION OF TRIP MODE FOR WORK TRIPS BY MSA STATUS - 0-VHH (Trips by Persons 16 Years and Older)

	MSA Status		
	In MSA Central City	In MSA non-Central City	Not in MSA
Private Vehicle	31.3%	42.5%	51.1%
Public Transport	34.7%	30.1%	7.9%
Walk	28.0%	25.0%	35.0%
Other	5.9%	2.5%	5.9%
Total	100%	100%	100%
Col. as % of all Persons	68.8%	14.9%	16.3%

Table 35: DISTRIBUTION OF TRIP MODE FOR WORK TRIPS BY POPULATION DENSITY - 0-VHH (Trips by Persons 16 Years and Older)

	Population Density				
	0-249	250-999	1,000-3,999 in MSA	4,000-9,999 in MSA	10,000-49,999 in MSA
Private Vehicle	52.4%	56.6%	37.2%	40.2%	12.2%
Public Transport	10.3%	8.9%	34.7%	34.0%	41.7%
Walk	34.0%	24.0%	19.2%	21.3%	43.4%
Other	3.3%	10.5%	8.9%	4.5%	2.7%
Total	100%	100%	100%	100%	100%
Col. as % of all Persons	14.9%	10.6%	20.8%	30.6%	23.1%

decrease in private vehicle use. There is a decrease in walk trips until the highest density is reached, where the walking to work doubles.

Table 36 compares work trip mode across sexes. Females use private vehicles and public transport more than males. The bottom row shows that 57.4 percent of the 0-VHH labor force are women: this is well below their share of the 0-VHH population, 69.4 percent (Table 9). This is an expected result given the substantial share of retired women among persons in 0-VHHs.

Table 37 shows that the private vehicle mode generally decreases with urban size, and there is a generally corresponding increase in use of public transportation. In both the 200-499 and 500-999 categories, private vehicles are used for over half the work trips. The table has two surprising results: First, looking at the 500-999 category, although its share of private vehicle is very high, its transit share is nearly equal to that of the largest urban areas with rail. Second, looking at the 1,000+ urban areas, it is the areas without rail transit that have the greatest transit mode share of the 0-VHH work trips.

TABLE 36: DISTRIBUTION OF TRIP MODE FOR WORK TRIPS BY SEX - 0-VHH
(Trips by Persons 16 Years and Older)

	Sex	
	Male	Female
Private Vehicle	33.5%	38.3%
Public Transport	24.2%	33.8%
Walk	33.2%	25.4%
Other	9.1%	2.6%
Total	100%	100%
Col. as % of all Persons	*42.6%*	*57.4%*

Table 37: DISTRIBUTION OF TRIP MODE FOR WORK TRIPS BY URBAN AREA SIZE - 0-VHH
(Trips by Persons 16 Years and Older)

	Urbanized Area Size (in thousands)				
	50-199	200-499	500-999	1,000 + No Rail	1,000 + With Rail
Private Vehicle	36.3%	52.7%	51.8%	33.7%	26.4%
Public Transport	29.4%	10.3%	33.4%	48.0%	34.8%
Walk	19.2%	33.4%	11.0%	14.2%	34.5%
Other	15.0%	3.6%	3.8%	4.1%	4.2%
Total	100%	100%	100%	100%	100%
Col. as % of all Persons	12.7%	6.7%	9.0%	21.3%	50.2%

Travel Behavior of Persons Age 65 and Older

Persons 65 and older account for 49.1 percent of all 0-VHHs. What can we say about their travel behavior? The major finding is that their travel is not affected by changes in most of the explanatory variables. All differences in mobility are primarily between 0-VHH's and the General Population (65 and older). Though the absence of a connection between mobility and transit access is, itself, significant. (As an abbreviation, we shall refer to persons age 65 and over as "older persons.")

Table 38 shows that MSA location does not matter. Immobility rates are almost the same across the three MSA categories, and trip rates are only slightly different.

Table 38: HOUSEHOLD LOCATION AND ITS EFFECT ON TRAVEL (Persons 65 and Older)

	Inside MSA		
	Inside Central City	Outside Central City	Not in MSA
% with no Trips			
HH without Vehicles	64.6%	68.3%	70.1%
Total Sample	43.7%	40.6%	41.9%
# of Trips per Day			
HH without Vehicles	1.00	0.88	0.86
Total Sample	1.95	1.94	2.02
Distribution of People			
HH without Vehicles	41.6%	29.3%	29.1%
Total Sample	31.6%	38.1%	30.3%

Table 39: SIZE OF URBAN AREA AND ITS EFFECT ON TRAVEL (Persons 65 and Older)

	Population of Urbanized Areas (thousands)				
	50-199	200-499	500-999	1,000 + without rail	1,000 + with rail
% with no Trips					
HH without Vehicles	65.8%	64.0%	66.8%	66.6%	63.8%
Total Sample	39.0%	45.0%	42.9%	40.2%	42.6%
# of Trips per Day					
HH without Vehicles	0.82	0.93	1.02	0.98	1.03
Total Sample	2.16	1.89	1.88	2.06	1.86
Distribution of People					
HH without Vehicles	18.1%	12.5%	9.9%	29.3%	30.2%
Total Sample	16.2%	13.8%	11.0%	31.5%	27.6%

Table 39 shows that size of urban area does not matter. Immobility rates are almost the same across the five urban size categories, and trip rates are only slightly different.

Table 40: POPULATION DENSITY OF HOUSEHOLD LOCATION AND ITS EFFECT ON TRAVEL

	Population Per Sq. Mile of Household Zip Code (Persons 65 and Older)					
	0 to 249	250 to 999	1,000 to 3,999	4,000 to 9,999	10,000 to 49,000	50,000 +
% with no Trips						
HH without Vehicles	70.9%	64.4%	68.4%	62.9%	62.0%	—
Total Sample	43.1%	40.6%	41.8%	39.0%	52.5%	—
# of Trips per Day						
HH without Vehicles	0.81	1.00	0.88	0.98	1.26	—
Total Sample	1.93	2.08	1.99	1.99	1.50	—
Distribution of People						
HH without Vehicles	34.4%	16.2%	21.2%	18.3%	9.9%	—
Total Sample	38.0%	18.0%	23.9%	16.9%	3.2%	—

Table 40 shows that population density makes a small difference, and only in the very densest category.

Consider the implications of the geographic findings. Transit access is certainly much better in the Central City of an MSA than it is in a non-MSA, yet there was no difference in mobility patterns. Transit access is certainly much better in large urban areas than in small ones, but again there was no difference in mobility patterns. Transit access is certainly much better in high density areas than in low density ones, but we find only small increases in mobility in the densest areas. *Taken together, these three finding seem to indicate that the presence or absence of transit makes little difference in the mobility of older people.*

Table 41 shows there is little difference across the census-geographic areas, except that older persons in the West South Central area are considerably less mobile, and the East South Central, Mountain, and Pacific regions show somewhat higher mobility.

Table 41: CENSUS DIVISION AND ITS EFFECT ON TRAVEL
(Persons 65 and Older)

	Population of Census Division								
	NE	MA	ENC	WNC	SA	ESC	WSC	Mtn	Pac
% with no Trips									
HH without Vehicles	63.8%	68.0%	70.9%	70.3%	67.7%	56.2%	77.4%	56.5%	62.5%
Total Sample	42.1%	41.0%	40.9%	39.4%	41.8%	47.9%	46.8%	41.2%	39.8%
# of Trips per Day									
HH without Vehicles	0.87	0.88	0.91	0.70	0.89	1.28	0.49	1.47	1.17
Total Sample	1.87	1.95	2.02	2.21	1.91	1.63	1.93	2.12	2.00
Distribution of People									
HH without Vehicles	6.2%	13.7%	17.4%	6.9%	21.8%	8.3%	9.7%	1.9%	14.1%
Total Sample	4.9%	12.7%	16.2%	9.1%	19.9%	6.6%	10.7%	5.0%	14.8%

Table 42: SEX OF RESPONDENT AND ITS EFFECT ON TRAVEL
(Persons 65 and Over)

	Sex of Respondent	
	Male	Female
% with no Trips		
HH without Vehicles	64.6%	67.9%
Total Sample	35.2%	46.9%
# of Trips per Day		
HH without Vehicles	0.91	0.93
Total Sample	2.25	1.77
Distribution of People		
HH without Vehicles	19.4%	80.6%
Total Sample	42.0%	58.0%

Table 42 shows that gender does not matter. The immobility rate and the trip rate are almost identical for men and women—an important finding given that 80.6 percent of older persons in 0-VHHs are women.

Table 43: RESPONDENT'S EDUCATION AND ITS EFFECT ON TRAVEL (Persons 65 and Older)

	Respondent's Education Level				
	Non High School Grad	High School Grad	Some College	College Grad	Grad School
% with no Trips					
HH without Vehicles	66.6%	64.6%	68.1%	69.4%	62.6%
Total Sample	48.7%	41.8%	31.5%	31.6%	25.9%
# of Trips per Day					
HH without Vehicles	0.91	1.07	0.94	0.83	0.91
Total Sample	1.56	1.99	2.51	2.62	2.95
Distribution of People					
HH without Vehicles	56.5%	28.4%	8.6%	4.7%	1.8%
Total Sample	35.5%	38.9%	11.8%	8.1%	5.7%

Table 43 shows that education does not matter. The immobility rate and the trip rate are almost identical across education levels. This is surprising because of the strong positive influence of education on travel for the age 16 and up sample. In fact, there is a strong positive education effect for older persons who live in HHs with vehicles, but there is none in the 0-VHHs.

Table 44 shows that ethnicity does not matter. The immobility rate is essentially identical, and the trip rate is quite similar across the White/Black/Hispanic categories. The "Other" category has double the mobility level, but this may not be an accurate finding as "Other" is only 2.5 percent of what is already a small sample.

Table 44: HOUSEHOLD ETHNICITY AND ITS EFFECT ON TRAVEL (Persons 65 and Older)

	Household Ethnicity			
	White	Black	Hispanic	Other
% with no Trips				
HH without Vehicles	68.6%	66.7%	66.2%	29.8%
Total Sample	40.6%	52.3%	56.6%	40.9%
# of Trips per Day				
HH without Vehicles	0.91	0.95	0.68	1.71
Total Sample	1.38	2.04	1.42	1.56
Distribution of People				
HH without Vehicles	74.1%	19.3%	4.0%	2.5%
Total Sample	87.8%	7.3%	3.4%	1.6%

Table 45 shows that income level does not matter. Immobility rates and trip rates are almost identical across income categories.

Table 45: HOUSEHOLD FAMILY INCOME AND ITS EFFECT ON TRAVEL
(Persons 65 and Older)

	Level of Income			
	< 10,000	10,000 to 19,000	20,000 to 29,000	Above 30,000
% with no Trips				
HH without Vehicles	62.5%	60.1%	64.5%	63.6%
Total Sample	49.7%	41.0%	34.6%	32.6%
# of Trips per Day				
HH without Vehicles	0.98	1.28	1.28	1.04
Total Sample	1.51	1.99	2.44	2.52
Distribution of People				
HH without Vehicles	57.8%	30.1%	6.2%	6.0%
Total Sample	22.8%	32.2%	17.8%	27.1%

Table 46 shows that poverty level makes a small difference. This is an income measure that balances income and family size. There is a small increase in the immobility rate in the below poverty category, and a larger change in the trip rate. (It's also interesting to compare the relative distributions of the over-16 sample (Table 5) to the over-65 sample. For persons living in 0-VHHs: in the 16 and over sample, 28.3 percent of the persons are in HHs below the poverty line; in the 65 and over sample, this falls to 16.5 pecent.)

Table 46: HOUSEHOLD POVERTY LEVEL AND ITS EFFECT ON TRAVEL
(Persons 65 and Older)

	Poverty Level of Household		
	Below	Near	Above
% with no Trips			
HH without Vehicles	74.9%	58.0%	60.8%
Total Sample	62.3%	46.0%	36.3%
# of Trips per Day			
HH without Vehicles	0.76	1.06	1.26
Total Sample	1.11	1.64	2.29
Distribution of People			
HH without Vehicles	16.5%	42.1%	41.4%
Total Sample	5.5%	18.6%	75.9%

Table 47: LICENSED DRIVER STATUS AND ITS EFFECT ON TRAVEL (Persons 65 and Older)

	Licensed Driver Status	
	Licensed	Not Licensed
% with no Trips		
HH without Vehicles	57.3%	68.8%
Total Sample	34.2%	67.0%
# of Trips per Day		
HH without Vehicles	1.22	0.88
Total Sample	2.30	0.89
Distribution of People		
HH without Vehicles	13.1%	86.9%
Total Sample	76.3%	23.7%

Table 47 shows that drivers' license status makes a small difference in trip behavior for the 0-VHHs, but it makes an enormous difference in the households with vehicles. The relative proportions of the groups are also of interest. For only 13.1 percent of persons in 0-VHHs are licensed, compared to 76.3 percent in the General Population.

Table 48: HOUSEHOLD LIFE CYCLE AND ITS EFFECT ON TRAVEL (Persons 65 and Older)

	Household Life Cycle			
	1 Adult no kids	2+ Adults no kids	1 Adult retired	2+ Adults retired
% with no Trips				
HH without Vehicles	59.5%	55.6%	70.4%	68.1%
Total Sample	38.0%	38.3%	44.9%	40.8%
# of Trips per Day				
HH without Vehicles	1.32	1.13	0.82	0.79
Total Sample	2.28	2.04	1.92	1.97
Distribution of People				
HH without Vehicles	18.8%	5.4%	57.1%	17.4%
Total Sample	8.9%	10.6%	26.1%	50.4%

Table 48 shows that life cycle stage makes a small difference: retired persons are somewhat less mobile. It is no surprise that 74.5 percent of older persons are retired, but it is noteworthy that 75.9 percent of older persons are living alone.

Appendix A:

Characteristics of 0-VHHS in New York

We begin by looking at New York's population distribution.[17] Its demographic profile differs considerably from the rest of the sample.

Table 49 shows that comparatively few 0-VHHs in New York are in the Retired stage of the life cycle, 22.0 percent for New York versus 36.5 percent in the rest of the country. It also shows that comparatively many 0-VHHs in New York live in "2 or more Adult" HHs: 40.3 percent for New York versus 20.8 percent for the rest of the country.

Table 49: HOUSEHOLD LIFE STYLE STATUS FOR NEW YORK / NON NEW YORK MSA 0-VHH

	Percentage of Household Life Cycle	
	New York 0-VHHs	Non New York 0-VHHs
1 Adult, No Kids	27.5%	32.5%
2+ Adults, No Kids	28.3%	12.9%
1 Adult, With Kids	10.3%	10.2%
2+ Adults, With Kids	12.0%	7.9%
1 Adult, Retired	15.1%	30.3%
2+ Adults, Retired	6.9%	6.2%

Table 50: HOUSEHOLD POVERTY LEVEL FOR NEW YORK / NON NEW YORK 0-VHH

	Percentage of Household Proverty Levels	
	New York 0-VHHs	Non New York 0-VHHs
Below Poverty Level	14.8%	27.0%
Near Poverty Level	17.6%	32.4%
Above Poverty Level	67.6%	40.6%

Table 50 shows that comparatively few New York 0-VHHs are below the poverty line: 14.8 percent versus 27.0 percent for the rest of the country. And comparatively many New York 0-VHHs are above the poverty line: 67.6 percent for New York versus 40.6 percent for the rest of the country.

[17] All New York data in this appendix are for persons age 16 and over who live in the New York MSA.

TABLE 51: HOUSEHOLD INCOME FOR NEW YORK / NON NEW YORK 0-VHH

	Percentage of Income Categories	
	New York 0-VHHs	Non New York 0-VHHs
Under 10,000	27.5%	55.5%
10,000-19,999	23.6%	28.5%
20,000-29,999	18.1%	8.1%
30,000-39,999	12.2%	4.3%
Over 40,000	18.5%	3.5%

Table 51 shows more detail on the income distribution. Only 27.5 percent of New York 0-VHHs earn less than $10,000 per year, while 55.5 percent of HHs in the rest of the country are below that line. On the high end, 18.5 percent of New York 0-VHHs earn more than $40,000 per year compared to only 3.5 percent in the rest of the country.

These unique demographic characteristics of New York 0-VHHs tend to move these HHs in the direction of greater travel mobility. Their combined effect is so strong that they produce essentially equal trip rates for New York HHs with and without private vehicles. The 0-VHHs have nearly the same mobility as the HHs with vehicles.

Table 52 shows that mobility increases as a function of education. What is noteworthy about this table is the similarity of mobility measures between the 0-VHHs and the Total New York Sample. Any small differences in rows 1 and 2 (the "immobility measure") largely disappear in rows 3 and 4 (the "mobility measure").

Table 52: RESPONDENT'S EDUCATION AND ITS EFFECT ON TRAVEL (Persons 16 and Older, New York MSA)

	Respondent's Education Level				
	Non High School Grad	High School Grad	Some College	College Grad	Grad School
% with no Trips					
HH without Vehicles	44.9%	33.2%	27.8%	12.8%	18.3%
HH with Vehicles	39.4%	31.1%	23.2%	17.2%	15.5%
# of Trips per Day					
HH without Vehicles	1.59	2.25	3.11	3.20	3.49
HH with Vehicles	1.86	2.24	2.84	3.23	3.47
Distribution of People					
HH without Vehicles	30.9%	32.8%	14.6%	16.1%	5.5%
HH with Vehicles	14.9%	34.7%	19.6%	20.4%	10.4%

Table 53: HOUSEHOLD FAMILY INCOME AND ITS EFFECT ON TRAVEL
(Persons 16 and Older, New York MSA)

	Level of Income				
	< 10,000	10,000 to 19,000	20,000 to 29,000	30,000 to 39,000	40,000 and over
% with no Trips					
HH without Vehicles	44.2%	28.3%	20.4%	15.1%	25.1%
HH with Vehicles	32.3%	30.2%	22.9%	33.2%	17.0%
# of Trips per Day					
HH without Vehicles	1.85	2.30	3.09	3.58	3.11
HH with Vehicles	2.47	2.36	2.65	2.60	3.05
Distribution of People					
HH without Vehicles	24.0%	24.3%	17.4%	12.3%	22.0%
HH with Vehicles	3.7%	12.5%	14.2%	15.6%	54.0%

The same similarities are seen in Table 53—the effects of HH income. Up to $30,000, there is very little variation in mobility or immobility across levels of income. These become somewhat larger beyond $30,000 for the immobility measures, but they actually reverse for the mobility measure—0-VHHs have higher trip rates.

Table 54: HOUSEHOLD LIFE CYCLE AND ITS EFFECT ON TRAVEL
(Persons 16 and Older, New York MSA)

	Household Life Cycle					
	1 Adult no kids	2+ Adults no kids	1 Adult with kids	2+ Adults with kids	1 Adult retired	2+ Adults retired
% with no Trips						
HH without Vehicles	27.7%	24.8%	22.5%	28.9%	54.8%	64.2%
HH with Vehicles	21.1%	23.0%	19.7%	28.5%	30.1%	40.7%
# of Trips per Day						
HH without Vehicles	2.76	2.49	2.64	2.62	1.20	1.09
HH with Vehicles	3.19	2.75	3.43	2.40	2.80	2.09
Distribution of People						
HH without Vehicles	18.4%	37.7%	9.6%	16.2%	9.0%	9.1%
HH with Vehicles	7.8%	41.9%	1.8%	36.3%	2.0%	10.2%

Table 54 shows the effect of HH life cycle. HHs with and without vehicles are quite similar until the retirement stage is reached.

Table 55 shows the effect of gender on travel behavior. Again there is little difference between HHs with and without vehicles.

Table 56 shows the effect of employment status on mobility. Again there is no difference between HHs with and without vehicles.

Table 55: SEX OF RESPONDENT AND ITS EFFECT ON TRAVEL (Persons 16 and Older, New York MSA)

	Sex of Respondent	
	Male	Female
% with no Trips		
HH without Vehicles	29.8%	33.6%
HH with Vehicles	25.2%	28.3%
# of Trips per Day		
HH without Vehicles	2.50	2.21
HH with Vehicles	2.54	2.66
Distribution of People		
HH without Vehicles	40.6%	59.4%
HH with Vehicles	50.0%	50.0%

Table 56: EMPLOYMENT STATUS AND ITS EFFECT ON TRAVEL (Non-Retired Persons 16-64, New York MSA)

	Employment Status	
	Worker	Non-Worker
% with no Trips		
HH without Vehicles	18.9%	36.9%
HH with Vehicles	17.6%	40.2%
# of Trips per Day		
HH without Vehicles	2.96	1.99
HH with Vehicles	2.96	2.02
Distribution of People		
HH without Vehicles	64.0%	36.0%
HH with Vehicles	74.4%	25.6%

Appendix B:

Immigration and Vehicle Ownership

In general, new immigrants arrive with lower incomes and different values regarding automobiles, compared to the native born population. This appendix examines the way their vehicle ownership patterns evolve with length of stay.[18]

Table 57 shows the overall picture. Of the 91 million U.S. HHs, 83 million were born here, and 10.7 percent of these HHs are 0-VHHs. Among the 8 million immigrant HHs, 18.5 percent are 0-VHHs. The right hand column shows that the proportion of 0-VHHs declines over time. In fact, length of stay in the U. S. appears to be the strongest predictor of 0-VHH status. This trend is generally consistent in the following immigration tables as well, which show the relation between 0-VHHs status and various demographic categories. (All the tables omit the pre-1970 category. Although it showed large proportions of 0-VHHs, this seemed an artifact of age of householder; older persons in general own fewer cars.)

Table 57: Percentage of Zero Vehicle Households by Householder's Year of Immigration

	Households Without Vehicles	Total Households	Percentage without Vehicle
Total U.S.	9,498,000	91,077,000	11.6%
Born in U.S.	8,011,800	83,059,800	10.7%
Foreign Born	1,486,200	8,017,200	18.5%
Year of Immigration			
1987-1990	155,300	572,800	28.5%
1985-1986	87,700	426,900	22.1%
1982-1984	96,300	513,200	20.9%
1980-1981	113,200	654,800	19.1%
1975-1979	133,000	1,012,100	14.8%
1970-1974	129,400	913,100	16.3%

Does the increase in vehicle ownership, over length of stay, occur because immigrant HHs increase their income, or because they gradually adopt conventional U.S. attitudes toward automobiles? Table 58 shows the pattern of vehicle ownership as a function of HH income. Looking at the first two columns, income less than $10,000 per year, there is no increase in vehicle ownership with length of stay. Even for

[18] Data for these tables comes from the 1990 U.S. Census 1 percent Public Use Microdata Sample (PUMS). The tables were run by Dr. Blair Cohen of the Massachusetts Department of Public Health.

Table 58: ZERO VEHICLE HOUSEHOLDS BY HOUSEHOLDER'S YEAR OF IMMIGRATION AND BY HOUSEHOLD INCOME

	Household Income				
	Under 5,000	5,000 to 9,999	10,000 to 12,499	12,500 to 14,999	15,000 or More
Total U.S.	44.5%	35.9%	19.7%	16.1%	5.0%
Born in the U.S.	43.8%	34.1%	18.2%	14.6%	4.3%
Year of Immigration					
1987-1990	43.9%	41.2%	31.3%	34.6%	20.4%
1985-1986	37.0%	43.4%	27.8%	33.0%	15.7%
1982-1984	48.7%	40.2%	28.5%	16.0%	15.1%
1980-1981	44.6%	43.3%	28.5%	25.6%	12.2%
1975-1979	45.5%	41.6%	23.5%	21.5%	8.8%
1970-1974	50.2%	43.5%	25.5%	25.5%	9.7%

the $10-12.5k column, the increase is very slight. That is, holding income constant, there is no evidence that values shift toward vehicle ownership. Instead, the observed overall shift toward vehicle ownership in Table 57, seems to occur because immigrant groups become richer over time; they transition from the low-income columns of Table 58 to the high-income columns.

Table 59 breaks down the time-patterns by race of householder. Blacks and "Other" start out with the highest 0-VHH proportion, probably reflecting initial income difference across races. Asians show the fastest rate of change, from 26.7 percent to 10.2 percent, probably reflecting faster income growth. Whites and "Other" show the same proportional change over time.

Table 59: Zero Vehicle Households by Householder's Year of Immigration and by Householder's Race

	Race of Householder			
	White	Black	Asian	Other
Total U.S.	8.8%	30.8%	13.8%	21.3
Born in U.S.	8.1%	30.4%	8.9%	15.8
Year of Immigration				
1987-1990	24.7%	46.7%	26.7%	35.6
1985-1986	18.8%	40.6%	16.9%	28.3
1982-1984	16.8%	37.2%	16.4%	26.4
1980-1981	17.2%	31.8%	14.9%	20.5
1975-1979	12.6%	30.9%	10.0%	17.8
1970-1974	13.6%	31.9%	10.2%	19.7

Table 60: ZERO VEHICLE HOUSEHOLDS BY YEAR OF IMMIGRATION AND BY HISPANIC ORIGIN OF HOUSEHOLDER

	Hispanic Origin of Householder					
	Non-Hispanic	Mexican	Puerto Rican	Cuban	Dominican	Other Hispanic
Total U.S.	11.1%	12.6%	43.2%	17.4%	56.5%	19.6%
Born in U.S.	10.6%	11.2%	36.8%	14.4%	37.8%	13.8%
Year of Immigration						
1987-1990	26.9%	24.4%	49.7%	18.9%	56.8%	30.1%
1985-1986	18.9%	20.9%	42.5%	15.4%	60.2%	23.5%
1982-1984	18.4%	16.0%	46.8%	20.3%	62.9%	21.5%
1980-1981	17.3%	14.3%	46.0%	22.0%	54.5%	20.7%
1975-1979	12.6%	10.8%	43.4%	27.2%	54.4%	17.7%
1970-1974	13.4%	9.2%	48.2%	19.9%	60.8%	21.4%

Table 60 shows the patterns for Hispanic groups. Immigrants of Mexican origin show the fastest change in 0-VHH status. While Puerto Ricans, Dominicans, and Cubans show essentially no change over time.