Travel by Women

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Executive Summary

The Background

Our society has undergone profound social and demographic changes in the last thirty years, changes differentially affecting women and their children. Today most women live in low density communities, and most have salaried employment even if they have very young children. The number of families headed by a woman alone has increased substantially and many such families—including some with a parent in the paid labor force—are living in poverty.

As women obtain jobs, increase their income, and acquire licenses they drive longer and use the car for more of their trips, just as men in the paid labor force have traditionally done. However, because their work duties are added to their childcare and domestic responsibilities they also exhibit markedly different patterns than working fathers.

This report analyzes data from the 1990 NPTS data in order to identify and evaluate the differences, if any, in the travel behavior of women in different household and family settings today. The data cannot tell us is if a) these differences will continue into the future and b) if they will not, what women's travel will look like instead. But the analysis is the first step in making our travel estimates more accurate, our planning efforts more responsive, and our policymaking more equitable.

Overall Travel Patterns

The NPTS data show wide differences in the basic travel patterns of men and women. Overall, women 16-64 in both urban and rural areas made more person trips per day than men. However, women made shorter trips; men travelled 27% more person miles than comparable women in urban areas and 16% more in rural areas. Men made more vehicle trips than comparable women and, in both urban and rural areas, covered 60% more vehicle miles.

Overall, traditional travel variables—household income, license-holding, employment—did more to explain the differences among women and among men than they to explain the differences *between* comparable men and women. The higher person trip rates of women persisted through every traditional analysis, as generally did the shorter distances and fewer private vehicle trips. The one major exception: the travel patterns of people from households with low incomes.

Low income people of both sexes in urban areas and low income women in rural areas worked further from home than comparable people from households making more money. At the very lowest income levels women workers travelled further than comparable male workers.

These patterns strongly suggest that women are affected by variables other than, or in addition to, household income or license holding.

The Impact of Children

The NPTS data clearly show that while the presence of children impacts both men and women, having children had profound impact on the trip rates of women and far less impact on the travel patterns of men. The number of trips and the distance travelled by women was much more responsive to both having children and to changes in the age of their children.

Married women made **more** *person trips* than all categories of married men, including those who are not parents; however, they travelled **fewer** *person miles* and made **fewer** *vehicle trips* than comparable men. Married women with children under six made **more** *person trips*, travelled **fewer** *person miles*, and made

the **same** number of *vehicle trips* as single mothers with children under six. However, once their youngest children were school-age, single mothers made **more** *person trips,* travelled **fewer** *person miles,* and made **more** *vehicle trips* than comparable married mothers. In a few categories, single women even made more trips than comparable married men.

Married male parents almost always made fewer trips than comparable female parents regardless of income. Relatively independent of income, married women who were parents travelled less and made fewer vehicle trips than comparable male parents.

Very low income households acted differently; low income mothers travelled further and more often than comparable male parents and more than parents with higher incomes.

Neither marital status nor household income explained the differences between male and female parents. Relatively independent of household income, married women who are parents travel **fewer** *person miles* and make **fewer** *vehicle trips* than comparable male parents. Regardless of household income single mothers travel **fewer** *person miles* but make **more** *vehicle trips* than comparable married mothers. It appears that women who are mothers make more trips because of their family obligations but travel less distance because of their desire to stay closer to home. Single mothers, lacking in-home help with their children, make more trips than married mothers.

The Intersection of Race and Ethnicity

There were sometimes major variations in travel patterns by race and ethnicity; White men travelled more than all other men while White women travelled more than all other women. The gap between Whites and others was so large that occasionally White women travelled more than men in another group. In general men and women in the same group were more similar than were either all men or all women.

White women and men made the longest commute trips; while all men drove more than all comparable women, the gap between the sexes was *largest* among Whites. White women, however, always drove more than women of any other races.

Hispanic women and those from Other Races made fewer trips than comparable men. The differences between Hispanic men and women on all indicators of travel were two to three times greater than the differences between the sexes in any other grouping.

There were large differences in the license status of women. While over 90% of all White women 16-64 were licensed only 71% of Black women and 66% of Hispanic women had a license. Being licensed greatly increased total trip making for all women but the least for Hispanic women. In fact, the gap between Hispanic men and women was consistently larger than that seen in any other group, independent of income, license holding, or employment status.

Although most people drove for the majority of their trips, there were major differences among the groupings. White men and women drove for substantially more of their trips than any other ethnic or racial grouping. However, both White and Black women took more of their trips in a private car than comparable White and Black men.

Implications and Research Needs

These findings raise as many questions as they answer. The first is whether the differences between **comparable** men and women and among women will continue and if they do what variables will be the most important. It would be useful to have both panel studies and longitudinal studies to better understand why women make the travel choices they do (and the employment and childcare decisions that create their travel patterns) and how these choices change over time in response to family events.

Second, the data clearly show that *household income* is a good but flawed indicator of travel behavior, especially when it comes to understanding the dynamics of women's travel. With the growth of two worker households we need a better indicator of the joint impact of personal and total household income on all the major indicators of travel behavior.

Third, in order to make intelligent and equitable transportation investment and financing policies we must know why poor workers are making what may be real sacrifices to travel as they do.

Fourth, it is important to document changes in male parents' travel behavior over time in response to domestic obligations—and the resulting impact on women's travel patterns. It would be useful to see if changes are fast enough or of a magnitude that will lighten the domestic burdens which create such variations in women's travel.

Fifth, it is important to evaluate the policy implications of these findings, in both the short and long term. If we accept that women's travel patterns are different from men's largely or only partly because they are balancing home and work in a way that men do not, we need to consider the impact of pending transportation control programs (to be developed to respond to ISTEA and Clean Air Act Amendment mandates).

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Introduction and Overview

Converging Societal Trends

American society has experienced a number of major changes in the decades since WWII, changes which may have differentially affected women and ultimately their travel patterns. Among the most significant are the suburbanization of homes and jobs, increasing real incomes, the growing diversity of our population, the almost total automobility of society, the transformation of the structure of the traditional American family, and the increasing involvement of women in the labor force.

All of these changes are inter-related in a complex way and their effects on women are far reaching. Altered household structures and changing family relationships also have profound social and ultimately transportation implications; today most women have salaried employment and many head their own families. In 1990 only one out of five households corresponded to our traditional idea of the family—a working father and a homemaker mother. Instead, over sixty percent of *married* women were in the paid labor force while women alone headed one out of five families. All of these living arrangements and family structures create travel patterns different than those seen just a few years ago.

Moreover most jobs and homes are in the suburbs—a situation arguably caused by, but certainly made possible by, the car. However the low density development which defines the suburbs now requires even low income workers to have a car. Unfortunately, the suburbanization of jobs and the need for a car have disadvantaged certain workers, particularly women, who live in the central city but must commute out to the suburbs for employment.

Allied with the suburbanization of society is the growth in median family income; higher incomes are also clearly associated with greater use of the private car. But increased incomes have not been achieved equally by men and women nor by those of all races and ethnic backgrounds. Certain kinds of households, particularly those headed by a woman alone, have suffered declining real incomes in the last three to five years. Moreover, a greater percentage of single parent households are headed by women from ethnic and racial minorities.

The most salient fact today is that most women, and most women with children, are in the labor force, generally retaining substantial childcare and domestic obligations in addition to their jobs. At the same time, a growing number have also assumed duties for aging parents and in-laws. These compound responsibilities have important transportation implications: they create the need for multiple trips in addition to any work trips, they create the incentive to link trips, and they reduce the ability to use alternative modes, like transit, which are inflexible and time consuming. All of these needs are intensified by the low density suburban development of jobs and homes.

This report uses data from the 1990 NPTS, as well as other sources, to evaluate major questions raised by these trends. What will happen in the future if even more, indeed most, women join the paid labor force? If most employed women have children? If most have very young children? If a significant percent head their own households, or live in poverty, or...?

The NPTS data give us the ability to see the differences, if any, in the travel behavior of women in different settings *today*. They cannot tell us if a) these differences will continue into the future and b) if they will not, what women's travel will look like instead. On the other hand, analyzing NPTS data to highlight the variation in women's travel, and differences between otherwise comparable men and women, is an important first step in making our travel estimates more accurate, our planning efforts more responsive, and our policymaking more equitable.

The report uses largely descriptive analyses and cross-tabulations to address these issues. The approach is dictated by both the data and the policy purposes to which it might be put. While it has limits, it seems appropriate for a first cut at the issues under study.

This, the first major section of the report, will cover each of these issues in greater depth, highlighting the transportation implications for women of the profound demographic and social changes our society has witnessed in the last thirty years. The second section of the report compares and evaluates the travel patterns of men and women in terms of traditional variables: household income, employment status, and license holding. The third major section focuses on the possible impact of less commonly studied variables on women and men's travel behavior. The fourth section summarizes the major findings and the last section briefly describes the research implications of the findings.

Women's Employment Trends and Changes in the American Family

Married Women in the Labor Force

American family life has changed dramatically during the last four decades, but especially since the mid-1970's; overall, the labor force participation rate of married women has increased substantially since the end of the second World War. In 1960 less than one third of married women were in the paid labor force; in 1990 almost 60% of all married women were employed[1]. But the more striking phenomenon is the number of women *with children* who have taken jobs; in 1960 only 27% of married women with children under 18 had salaried employment but that number had grown to 61% by 1986. As a result only 21% of families conform to the traditional family model today: a husband working full time year-round and a wife not in the paid labor force[2].

On the other hand, the percentage of married women without children who are in the labor force has actually declined. In 1970 only 46% of women without children did not have paid employment; in 1990 that figure had increased to over half.[3] In general, the increase is a result of the aging of society; the largest number of those married women not in the labor force are over 50.

In 1990 roughly 28% of all married couples with children under 18 had two full time, year-round workers. In an additional 30% of married couples with children, both spouses worked—the husband full time but the wife either less than full time or not work year-round[4]. There were differences in the employment experience of different kinds of families. In 1990 roughly 74% of women in a married couple with children under 18 were employed; this was roughly comparable for Blacks and White but Hispanic couples (of any race) with children were far less likely to have two workers (only 55% of such couples did).

Within the overall increase in the employment of married mothers is the even more rapid increase in the number of married women with *very young* children who have entered and remained in the labor force. In 1960 only 18% of married women with children under 6 were in the paid labor force; in 1970 only 30% of married women with children under six had salaried jobs. By 1986 over 53% of comparable women were employed[5]. Today almost 60% of married women with young children have salaried employment (while almost three fourths of married women with children from six to seventeen have paid jobs)[6].

Moreover, many of the employed women with children under six had *very* young children. In 1976 only 31% of women 18-44 with children under 12 months of age were in the paid labor force; by 1990 over half of comparable women who had given birth in the previous year were employed and the big jump came between 1980 and 1985[7].

In fact, in 1990 almost half of all mothers of babies under *six months* were in the paid labor force—one in twelve employed women had an infant[8]. A 1990 Department of Labor study found that over 44% of all women return to work before their babies are six months of age, over two-thirds of those on a full-time basis [9]. Thus the child care obligations of working women interact with their home to work travel patterns in a way not seen in previous generations.

Families Headed by Women

Over the last three decades the number of families headed by a woman alone have increased substantially. In 1970 just 11% of all families were maintained by a woman alone; that grew to 15% in 1980, 16% in 1985[10] and almost 20% in 1990. The growth of such families has not been uniform throughout the population; in 1986 13% of White, 44% of Black, 23% of American Indian, and 23% of Hispanic (of any race) families were headed by a woman alone[11].

Another way to look at the impact of this type of family structure is to identify the household situation of children. The proportion of children living with both parents dropped over fifteen percentage points since 1960 while the percentage of children living with just one parent almost tripled; in 1990 3% of children lived only with their father while almost 22% lived with just their mother[12].

While the number of children of all races and ethnic backgrounds who live with both parents has decreased, it has decreased most rapidly for non-Whites. In 1960 over two thirds of Black children lived with both parents; this fell to roughly 38% in 1990. Just under 80% of White children and just under 67% of Hispanic children (of any race) lived with both parents in 1990[13].

Moreover, a substantial and increasing number of children living with one parent live with a *never married* parent—as opposed to one who was widowed or separated or divorced. In 1990 almost 31% of all children in one-parent families lived with a never married parent while over 60% lived with a divorced or separated parent. In contrast, in 1970 less than 7% of children living with one parent had a parent who was never married[14].

Working Women and Their Children

How—and where—working women take care, or arrange for care, of their children while they work has important transportation implications. During the last two decades working women have relied less on relatives to care for their children and more on commercial enterprises; in 1977 over one third of young children with working mothers were cared for in their own homes but by 1988 that number had dropped to 28%. The Census Bureau surmises that this may reflect the growth in labor force participation by women outside the home reducing the number of available relatives.

> The location of childcare activities for full-time working mothers tends to be *outside of the child's home* with nonrelatives, rather than in the child's home with family members[15]. (emphasis added)

Conversely, working mothers are much more likely to use organized child care facilities (such as day or group care centers or nursery or pre-schools). In 1977 an estimated 13% of mothers with children under five used such facilities; by 1988 over 26% of all working mothers were placing their young children in organized child care facilities while they were at work[16]. The use of organized care was much higher among women working full time (when 31% used them) than among those working part time (17% using organized care)[17] and higher among those with incomes above poverty levels.

In 1988 the school-age children of working mothers spent less time in organized care or in school than those under five—roughly 4 hours less per week. The Census Bureau attributes most of this difference to the time associated with "the transportation of the child between home and child care providers,"

> [T]hese discrepancies do not necessarily mean that the child is alone all these hours as some of this time may constitute travel time to school with other children or in the presence of other adults[18].

Census data show that roughly 60% of all women workers have a day shift job (defined as a work schedule where at least one-half of the hours fall between 8:00 AM and 4:00 PM) and the use of organized care was more prevalent among such women. Conversely women with non-day shifts were substantially

less likely to use organized care, probably because these facilities are rarely available during evenings or weekends[19].

The schedules of working women, as well as those of their care providers, interact in ways that have profound transportation impacts. Twenty-three percent of all full time working mothers and almost 60% of those working part time not only don't work the classic 9-to-5 day, they don't even work most of their hours during that traditional period[20]. Working at non-traditional hours may reduce their impact on peak period traffic congestion but may also reduce their ability to join carpools or find appropriately scheduled, let alone safe, transit options, even if their need to transport children didn't require the use of the car.

Not surprisingly, a recent study done for the Department of Labor found that mandatory or inflexible work hour changes created serious problems for working women with children. Only variable work hours which allowed daily fluctuations reduced work/family conflict or increased job satisfaction[21]. Surprisingly, the study concluded that cost was not the most important factor in obtaining child care; much more important were the woman's work schedule, particularly having a day shift, and having supportive managers who allowed some flexibility in work schedules[22].

The relationship between home to work travel patterns and childcare and other domestic responsibilities is also seen in studies of travel reduction programs (which are designed to encourage or force workers to stop driving alone to work or to use transit). Many workers report that their inability to stop driving alone is due entirely or in significant part to their need for their car immediately before and after work, to their child care needs, and to their concern that they might be faced with a family emergency during the middle of the work day[23 24 25 26 27].

Working Women and Eldercare

Many working women also have to care for older relatives[28]. Those currently of working age have been called the "sandwich generation" because they may have responsibilities to both their children and their parents at the same time. This situation arises because many people have delayed the birth of their children while their older parents are living longer. In fact the ratio of those 50-64 to those over 85 has tripled since 1950 and will triple again over the coming sixty years,

> More people will face the concern and expense of caring for their very old, frail relatives since so many people now live long enough to experience multiple chronic illnesses...the oldest old [those over 85] are the most likely to have pressing needs for economic and physical support[29].

The evidence is overwhelming that women—both daughters and daughters-in-law—provide the overwhelming percentage of the care given to older people living in the community, whether or not they are in salaried employment [30 31 32].

The Census found that, in 1988, 15% of working women said that the main reason that they chose their work schedule was to arrange better childcare for their children while an additional 6% said that they did so to arrange for the care of other members of their family. Women working part-time were more likely to report choosing their schedules to accommodate their child or elder care needs[33].

The Transportation Implications of Balancing Home and Work

Research clearly shows that, because they retain child and eldercare responsibilities while working, women have different travel patterns than comparable men. A 1980 Swedish study found that salaried married women made more shopping and domestic trips than their spouses—and fewer social and recreational trips[34]. A 1990 study in four Chicago suburbs found that employed women made *twice* as many trips as comparable men for errands, groceries, shopping, and chauffeuring children[35]. Preliminary 1990 NPTS analyses show that women between 20 and 60 make more trips per day than men of the same age, the largest component of the difference being the trips women take for family and personal business[36].

Comparative work by Rosenbloom in The Netherlands, France, and the United States found that women's travel patterns varied significantly with the age of their youngest child[37]. Perez-Cerezo also found that the age and presence of children more influenced the travel patterns of American women in all types of household[38].

Raux, in a 1983 study in Lyon, France found that working women were the parent in two worker households who arranged their work and travel schedules to fit child care needs[39]. Fagnani has consistently found similar patterns among French families in the Île-de-France (the Paris metropolitan region)—even married women employed full time chose or changed their work schedules to meet the needs of their children while their spouses did not[40]. None of these researchers found that children had comparable (or any) impacts on the travel patterns of married fathers—even those with wives in the *full-time* labor force.

Overall, most research on this issue has found that, to accommodate their children and their household role, employed women adjust their work schedules and job locations[41 42 43 44] and/or their travel patterns [45 46]. Their home to work travel generally becomes shorter as a result of their employment decisions but the impact of these adjustments doesn't stop there. Most working women also make more linked trips to and from work and choose travel modes which allow them the time and flexibility to carry out domestic responsibilities and to respond to children in an "emergency" situation—such as a child becoming ill at school or daycare.

For example, Pickup found that British women in Reading with the greatest child care obligations made the shortest work trips, passing up better jobs with longer commute times. He concluded that women do not travel further because their child care obligations—and not the travel costs—limit them. In support, he found that a significant number of women *without children* were willing to drive considerable distances for even low pay[47].

These findings are supported by a 1988 Census study which found that 4.4% of working women with children under 15 reported losing time in the last month as a result of a failure in their childcare arrangements (including sick children). Strikingly, there were no differences between married and single female parents; the Census Bureau concludes this is "because lost time from work was overwhelmingly the responsibility of the mother" regardless of marital status[48]. No more than 0.7% of men reported losing time from work because of childcare problems.

Rosenbloom's comparative work in Europe and the US found that women were far more likely to link trips to and from work than comparable men; linked trips indicate complicated travel patterns which are not easily served by modes other than the private car. A 1992 survey in Southern California found that 29% of female workers made a stop on the way home compared to 19% of men[49] and that more women made stops on the way to work as well[50]. More than one-fourth of women workers making a stop *to* work were dropping off children, a detour almost always made five or more days per week[51]. When asked which factors they considered when choosing their travel mode to work, women in the Southern California survey were more than twice as likely as men to report both needing a vehicle to take children to daycare and school, and, their concerns about safety[52].

Moreover, working women often retain responsibility for taking children to and from their activities. Rosenbloom found that over 80% of all married American working women reporting "routinely" making trips solely for children, compared to 50% of all men. But the actual incidence of fathers driving children dropped still further when they were questioned about the actual frequency of these "routine" trips. While a majority of women made one or more trips *per week* for each of their children, American fathers with working wives rarely made more than two trips *per month* solely to take their children somewhere. Most American fathers appeared to really provide only a back-up function[53].

When Rosenbloom asked employed parents to describe their children's most frequent travel "mode"[54], both married parents overwhelmingly agreed that the *employed* mother was the most frequent travel "mode" for both young and school-age children. Only 5% of all American working women and 2% of all American

men reported that the father had greater responsibility for children's transportation (and then only for children under six)[55].

The Travel Patterns of Single Female Parents

Research shows that women householders with no spouse have travel patterns that are different from both married parents, in part because of differences in employment and in part because of differences in the way these women organize their domestic and job related responsibilities. Kostyniuk and Kitamura found that, except for the very poorest women who did not drive, single parents in Rochester, NY made *more trips* and *travelled further* for all purposes than comparable married workers. They attribute these patterns to the need to balance employment and domestic responsibilities without the help of a resident partner[56].

Johnston-Anumonwo found that although single women with children in Worcester, Massachusetts were less likely to own cars, they were more likely to make their work trips in cars; she also found that single mothers had *longer work trips* than comparable married women[57]. In later work she concluded that Afro-American single mothers were forced to make longer trips because of spatial imbalances in employment opportunities[58].

Rutherford and Wekerle studied single and married workers in a Toronto suburb and concluded that single mothers spent *more time travelling to work* and that they were less likely to work in the suburb in which they lived than comparable married women[59]. Rosenbloom found that single mothers in Houston and Dallas had very different travel patterns than comparable married women, generally *travelling further* and *using a car more often* than either married worker at all but income levels below $5,000 a year [60].

These findings suggest that single mothers both face more domestic burdens and a different set of employment options than either other women or men. Moreover, they are substantially more likely to have low incomes, even when employed full-time. Clearly all of these factors have transportation implications.

Income Changes and Disparities

Household and Family Income

From 1967 to 1991 median *household*[61] money income, in real dollars, increased in the United States almost 14% while the income of Black households increased almost 16%[62]. However Hispanic households actually made less in 1991 than they had in 1972 in constant dollars and most income groups suffered a decline in real income from 1989 to 1991. For example, the real income of White households declined by 3% between 1990 and 1991 while that of Black households nationally declined only slightly. However, Black household income in the South—where over 54% of such households live—fell over 6%[63]. The income of families maintained by women with no spouse dropped over 5% compared to a 1.4% drop for married-couple families[64].

The impact of the increasing involvement of women in the labor force can be seen in median figures: families with two workers have substantially higher median incomes than other kinds of families. The median income in 1990 for *families* with children who had two full time workers was just over $53,000 while the median income of a family with children in which only the husband worked was just under $34,000[65].

Yet it is striking how little female employment has stabilized household income. Although median family income increased 104% between 1947 and 1973, it only increased 6% between 1973 and 1990[66]. Moreover, families with children were less likely to share in the overall increase in median family income. Between 1969 and 1989 families with children were increasingly more likely to have incomes below the median of all families[67]. In general, the large increase in one-parent families after 1970 tended to hold down the increase in overall median family income. However, even among married-couple families with children, the median income in 1990 was only 11% higher than it had been in 1973.

Women and Poverty

What did increase was the level of poverty among families with two adults; the poverty rates for all married couples and for white couples, for example, were higher in 1990 than they were in 1975. The poverty rate for married Black couples was almost twice that of White couples, and higher in 1990 than it had been in 1978[68].

In 1990 a family headed by a women alone (with no husband) earned 42% less than the families of married couples[69]. Strikingly, among families with children the disparity was even greater, in part because women alone *with* children earned *less* than those without; the median income of female householders with children was $13,092 compared to $41,260 for married couples with children (and $16,939 for female heads of household without children)[70].

There are differences by race and ethnic background, as might be expected. White women heading a household alone earning just under half of what a married couple earned while Black women and those of Hispanic origin (of any race) earned roughly 42% of the amount earned by married couples of similar ethnic or racial backgrounds[71].

In 1990, the median income of all women working full-time, year-round was $20,000 compared to approximately $28,000 for comparable men; in other words men working full-time year round made 40% more than comparable women. However, the gap was much smaller for Blacks and those of Hispanic origin: Black men working full-time year round made 17% more while Hispanic men made 22% more than comparable women[72].

The median earnings of women were significantly lower in every occupational category than those of comparable men. For example, men in professional occupations earned almost 41% more than women in those occupations while men in technical occupations earned greater than 52% more than women.

Conversely, families headed by a woman with no husband have considerably higher poverty rates than any other type of family; over one third of all such families (with and without children) have income below the poverty line. What is really surprising is that the incidence of poverty among such families has been remarkable constant in the long run, although often volatile on a yearly basis. For example, the poverty rate of families headed by a women alone was roughly the same in 1990 as it had been in 1971 and 1976—although it was much higher between 1979 and 1987[73].

Worse, even when the adult in such families worked, they were still likely to be in poverty; poverty rates were higher among the two family types that depended mainly on female workers—two-parent families where only the wife worked and female headed households where the women worked. Over 24% of families with children headed by a *working* women were in poverty—36% of comparable Hispanic and 38% of comparable Black families.

As a result of these high rates of poverty, families headed by a woman alone constituted a substantial portion of *all* poor families: over 50% in 1978 and over 53% in 1990[74]. In order to raise themselves just over the poverty line, the average family headed by a woman alone would require an additional $5,661 per year in 1990 dollars![75]

Many poor female heads of household actually worked; in 1989 roughly 45% of all such women worked some time during the year while just over 8% worked full-time year round[76]. Almost two thirds of those who did not work said the reason was their family responsibilities. Hispanic women heading poor households were substantially less likely to be in the labor force; roughly two thirds of Hispanic compared to just over half of Black and of White women heading families alone did not work at all[77].

Travel Implications of Income Disparities

Much of the (limited) women's travel literature suggests that women's travel patterns are better explained by their household responsibilities than by simple economic factors—although no one argues that

income differentials have no impact[78]. However, a small but growing body of research argues that the intersection of race and income and *not* sex or household responsibilities (at all or alone) influences women's employment choices—and thus the dimensions of their work trip (i.e., length and time).

McLafferty and Preston's analysis of working men and women in New York City found, for example, that commuting times for Black and Hispanic women were *equal to* those of Black and Hispanic men—but far greater than those for either White men or women. The researchers conclude that this proves that simple economic variables do explain travel differences since race, income, and industry of employment are so strongly related[79].

Spalter-Roth and Hartmann found significant differences in wages and work patterns among women that could not be explained by sex or family structure. They concluded that societal changes have had more impact on women's employment and income, and ultimately their travel patterns, than do household structure or implied responsibilities (younger vs. older children)[80]. This study has been widely quoted as showing that single mothers are not disadvantaged by simply being a mother at an early age or lacking a husband; rather that their wage potential is circumscribed by lack of education, failing to receive appropriate credit for work experience, and the shortage of jobs with a future.

In addition there is a growing literature which shows that the jobs open to working women are located in different places in a region than those open to men. Several analysts have concluded that gender segmentation in labor markets has a clear spatial expression and that very localized labor markets exist which have important implications for low skilled women workers[81 82 83]. Hanson and Pratt, for example, have described very small labor catchment areas surrounding suburban firms that hire low skilled women workers; they argue that many employers locate to tap such female labor markets, knowing that these workers will not travel far from home[84].

However even if there are localized labor catchment areas, most employment opportunities are not located close to the homes of most low skilled women workers[85 86 87]. For example, some industries have mixed labor needs and may locate near the source of their skilled workers or they may locate to take advantage of cheaper land, recognizing that higher skilled workers are willing to travel longer for higher wages[88 89]. Therefore, spatial differences in labor markets may force low income women to travel farther to work than comparable men and than higher income workers of either sex.

Certainly the research described above, focusing on single parents, supports this conclusion; Kostyniuk and Kitamura[90], Johnston-Anumonwo[91], and Rosenbloom[92] found that single mothers had very different travel patterns than comparable married women, generally *travelling further* and *using a car more often* than either married worker.

Rosenbloom and Burns found substantial indication that lower income women were forced to travel further regardless of marital status; in a large study in two Arizona cities they found that poor women, whether married or single, were travelling longer to work than comparable men and than women with higher incomes[93].

These findings may well reflect the fact that many families headed by a woman alone have central city residences. Therefore, inner city residents, particularly minority women, may have to travel further to find any clustering of employment opportunities[94] given that almost 70% of jobs are now in suburban areas. In recent work, Johnston-Anumonwo concluded that although both white and black women face a "form of spatial entrapment" the impact on black women is more insidious since they are travelling longer distances for low wage, low status jobs[95].

Women in Our Auto Dependent Society

Women are travelling longer and making more trips—and doing more of that travel in a car.

> Although travel by males still accounts for a majority of total travel, travel by females continues to increase. A significant jump in the share of travel by females was observed in the past twenty years—from 26.8% in 1969 to 35.4% in 1990...travel by females increased across all age groups, except for the 55 to 64 age group[96].

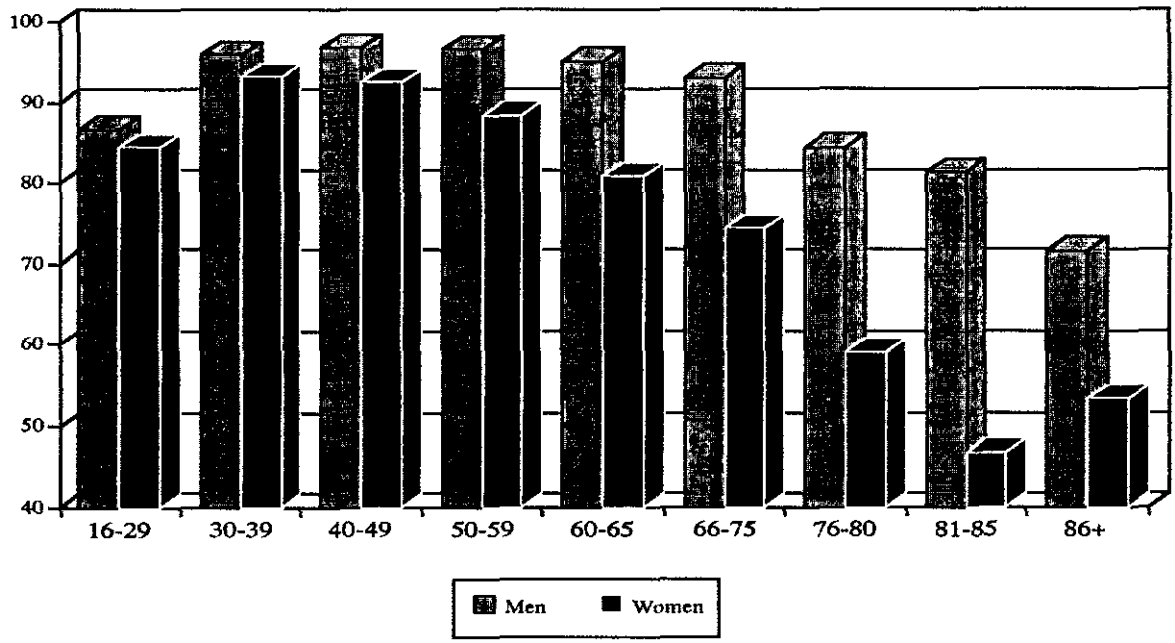
In 1990 urban women (over five) made 86.7% of all trips, and 88.2% of work trips, in a private vehicle; urban males actually made slightly fewer of their total trips by car (85.2%) and only slightly more work trips (89.3%). Women in rural areas were even more dependent on the car than either urban travellers or than rural men: men (over five) made 89.5.7% of all trips and 96% of all work trips by car. However, rural women (over five) made 90.6% of all trips and 96% of work trips by car.

Interestingly, these numbers only reflect a trend already seen in earlier NPTS data. In 1969 all women (five and up) took 90.1% of all trips in an auto, motorcycle or truck, compared to 91.6% of the trips of comparable men. In 1977 women (over five) took 92.7% of all trips in a private vehicle compared to the 93.1% taken by comparable men[97].

As people have come to depend on the car, their use of alternatives have declined—but faster for women than for men. In 1990 urban men 16-64 made 1.9% of all trips and 4.2% of work trips via mass transit; comparable women made 1.5% of all trip and 4.4% of work trips via transit. In contrast, in 1969 women made 4.2% and men made 3.1% of all trips via various mass transit modes; by 1977 women's use of transit had declined to 3.2% of all trips while men's dropped to 2.7%[98].

The increase in travel mirrors the rapidly increasing number of women who have driver's licenses. Figure 1 displays 1990 NPTS data on licensing rates. The figure makes very clear that the gap between men and women has largely closed among younger people. While it appears that the gap between the sexes will

Figure 1 Licensing Rates Among Men and Women, by Age, 1990 NPTS



not totally disappear in the next few decades, a great difference in rates is only seen among those over 65. It too will decrease, however, as younger cohorts of licensed women age.

Other research chronicles women's increasing dependence on the car, regardless of income or occupational status. A recent study by Rosenbloom and Burns for the U.S. Department of Labor, based on very large data sets from Tucson and Phoenix (over 50,000 respondents in each region in each of two years), found that women were as or more dependent on the car as men. Women at all household income levels but the very highest were more likely to drive alone to work than *comparable* men[99].

Rosenbloom and Burns found that women were more likely to work substantially closer to home than comparable men but to take relatively longer to make those commutes, independent of the mode chosen. The researchers concluded that these patterns reflect women's need to combine domestic and employment responsibilities; women work closer to where they live than comparable men because they want to be available to their children and their homes. Moreover women take longer to cover the same distance because they link trips to work with trips to school or child care centers or shopping.

Rosenbloom and Burns also found that the travel differences between men and women held even when controlling for marital status and the presence of children of various ages. Having children had far less impact on the travel patterns of working fathers than on those of working mothers. Women with children were more likely to drive to work at all income levels; the younger their children and the more children they had the more likely women were to drive to work alone.

But the Arizona researchers also determined that women, whether or not married and whether or not a parent, were more likely to drive alone to work than comparable men. That is, unmarried women were more likely to drive alone than unmarried men, female parents were more likely to drive alone than male parents, mothers of small children were more likely to drive alone than fathers of small children. They conclude that women are more dependant on the car because a) even those without children have more domestic responsibilities requiring the flexibility of a car, and b) the car affords women a measure of safety not of the same importance to comparable men.

Travel Trends

Introduction

Society's overall dependance on the car has been driven by higher household incomes and suburban development as well as women's increasing involvement in the paid labor force. All of these variables are, in turn, linked to increased licensing of women. In his preliminary review of 1990 NPTS data, Alan Pisarski concluded that, "...for every 1 percent shift from nondriver to driver in the female population, total travel jumps almost 10 billion miles per year"[100]. Clearly, women's travel patterns are coming to more resemble men's. Yet at the same time, while some patterns are converging—increasing dependance on the auto—others are not—trip lengths to work, for example.

First, the areas of convergence: in spite of very large occupational and earning differences between men and women in 1990 women were roughly as likely to come to work in a car as men. These patterns sharply differ from what we have traditionally known, or thought we knew, about women's travel patterns. In the past men and women had different travel patterns, in part because so many fewer women were in the paid labor force. However, even among salaried workers, men and women had measurably different travel patterns; women worked closer to home, spent less time in travelling to work, and more often used public transit[101 102].

All three facts seemed related to economic variables;[103] it made sense for those with low incomes to use the cheapest travel mode and not travel far to work. Poor women and poor men were assumed to behave in a similar manner; since there were so many more poor women than men, the aggregate differences simply reflected the far higher proportion of poor women in the overall population. The assumption was that as women continued to enter the labor force and increase their incomes, their travel would become roughly similar to that of comparable men—and we have, indeed, seen some of that convergence.

However, as women have joined the labor force, many of the differences seen in the past have persisted. Clearly some of these differences may be explained by traditional economic variables—but many may not be. Women have continued to work closer to home and spend less time in commuting even as they have become as dependent on the car as men. Since the late 1970's a growing body of research suggests that 1) working women have different travel patterns and needs than *comparable* men because they retain primary child care and domestic responsibilities when they enter the paid labor force, and 2) the location of jobs available to women differs from those available to men. These issues are examined below in the context of the 1990 NPTS data.

Basic Travel Patterns

In 1983 men and women (five and over) made roughly the same number of trips per day; between 1983 and 1990 men increased their number of daily trips by 5% while women increased their trip rate over 9%. In 1990 men made just over 3 trips while women made 3.13 trips per day. However rates of increase were not uniform for women; women between 20 and 50 showed the greatest increase in the number of daily trips, with those 40-49 increasing their trips by over 14%[104]. Pisarski suggests that, while the differences between men and women may be explained by childrearing duties and household activities, the increase in travel by women largely represents a shift from non-driver to driver status. Conversely the increased travel by men represents more travel by men with licenses[105].

Figure 2 illustrates the daily travel patterns of men and women, aged 16-64, in urban and rural areas in 1990. When younger and older travellers are removed from the overall patterns, the average trip rates climb and the differences between the sexes become more marked—and arguably more meaningful;

women in urban areas made 3.5 trips per day compared to 3.3 trips by men. Women in rural areas made even more trips—3.6 per day—but rural men had almost the same trip rate as urban men.

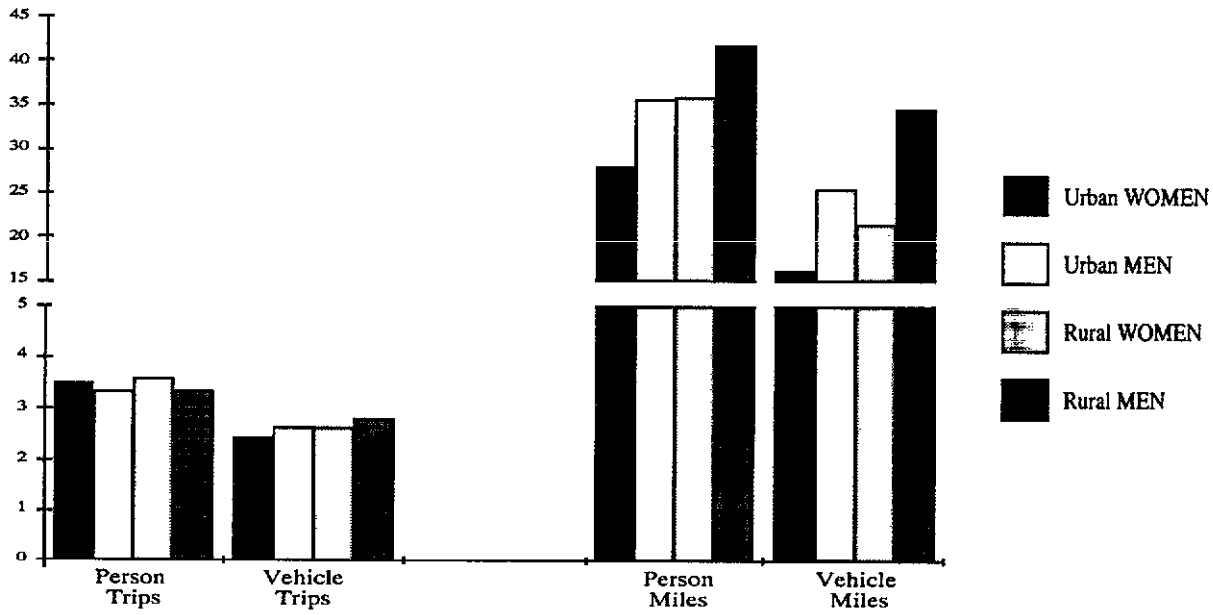
However, in spite of making more trips, women made shorter trips. In urban areas men travelled almost 36 miles per day, or 27% more miles than urban women. In rural areas, both sexes travelled further and the gap between men and women was less; rural men travelled almost 42 miles per day or 16% more than rural women.

One explanation of the mileage differences between the sexes (and between those in rural and urban areas) can be seen in the *vehicle trip rates* shown in Figure 2. Because people make some trips walking (or by other modes) daily vehicle trip rates are always lower than person trip rates. Figure 2 indicates that men made more vehicle trips than comparable women, and rural travellers made more vehicle trips than urban travellers. Since it is possible to travel much further, much faster by car than other mode, people who make more vehicle trips can easily generate more miles in fewer trips—as do both urban and rural men.

These differences are seen even more clearly in the *vehicle mile rates* shown at the far right of Figure 2. Urban men 16-64 travel almost 60% more miles daily than comparable women while rural men travel just over 61% more miles than rural women. Moreover both groups of rural travellers covered more miles than their urban counterparts; for example, rural women—who made only .2 more vehicles trips daily—travelled a third more vehicle miles. These figures clearly indicate the impact of men making more trips in a private vehicle and of rural people doing the same.

Obviously, some travel differences may be caused by differences in work status; Figure 3 illustrates the daily trip rates (person and vehicle) for men and women in urban areas by work status. Since the aggregate of all women take more person trips than men, even though women are less likely to be employed, it isn't surprising that the gap still remains; what is interesting is that gap is greater between the sexes among

Figure 2 Average Daily Travel Parameters, by Sex, People 16-64, 1990



workers than among non-workers. Working women 16-64 in urban areas take 3.8 person trips a day, or 12% more than comparable men, but those who are not paid workers take 2.9 person trips per day, only 1% more than comparable men.

Figure 3 clearly shows that workers make substantially more trips than non-workers but again the gap is greater among women—in other words, having a job more strongly influences the trip rate of women. Urban women 16-64 who work make 31 % more trips than those who do not (3.8 vs. 2.9) while urban men who work make only 25% fewer trips than those who do not work. Both these patterns support the contention that women are more likely to simply add employment trips to most of their existing trips when they enter the labor force (or add additional domestic trips—associated with marriage or children—when already employed).

Figure 3 does show, however, that controlling for employment considerably narrows the gap between men and women in *vehicle trips*. Urban men 16-64 who work make .1 more vehicle trips daily than comparable working women; there is no appreciable difference in the vehicle trip rate of rural workers 16-64. Urban women without paid employment actually make a very small amount more daily vehicle trips than comparable men, but substantially less than urban women who work (2.73 vs. 1.74). In short, the differences in vehicle trip rates seen in Figure 3 appear to be largely explained by the employment status of women—when women work they make almost the same number of daily vehicle trips as men.

Figure 4 shows, however, how little employment explains mileage differences between the sexes. Working men and women travel nowhere near the same person or vehicle miles—although, again, workers of both sexes travel further than those who are not employed. Urban women 15-64 with paid employment travel 31.5 miles daily or 19.1 miles in a vehicle; those numbers are, respectively, 18% and 32% lower than those of comparable men. Rural women with paid employment actually travel more person miles than urban male workers (38.4 vs. 38.3) but 14% less than comparable rural men.

Figure 3 Average Daily Trips, by Sex and Work Status, People 16-64, 1990

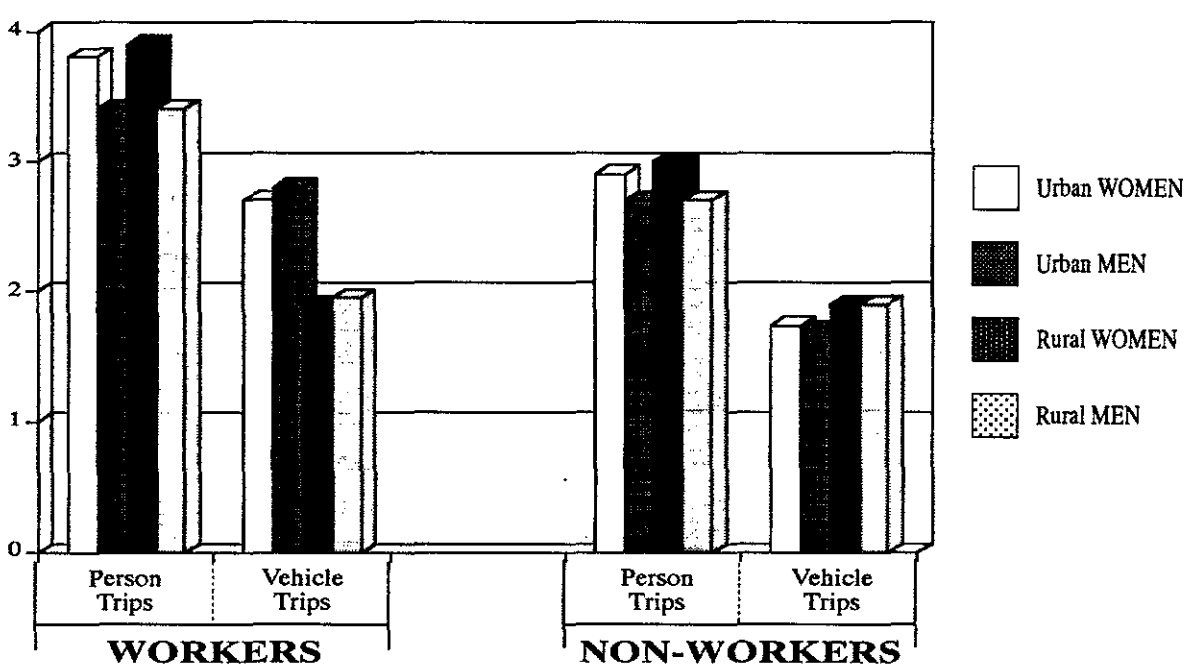
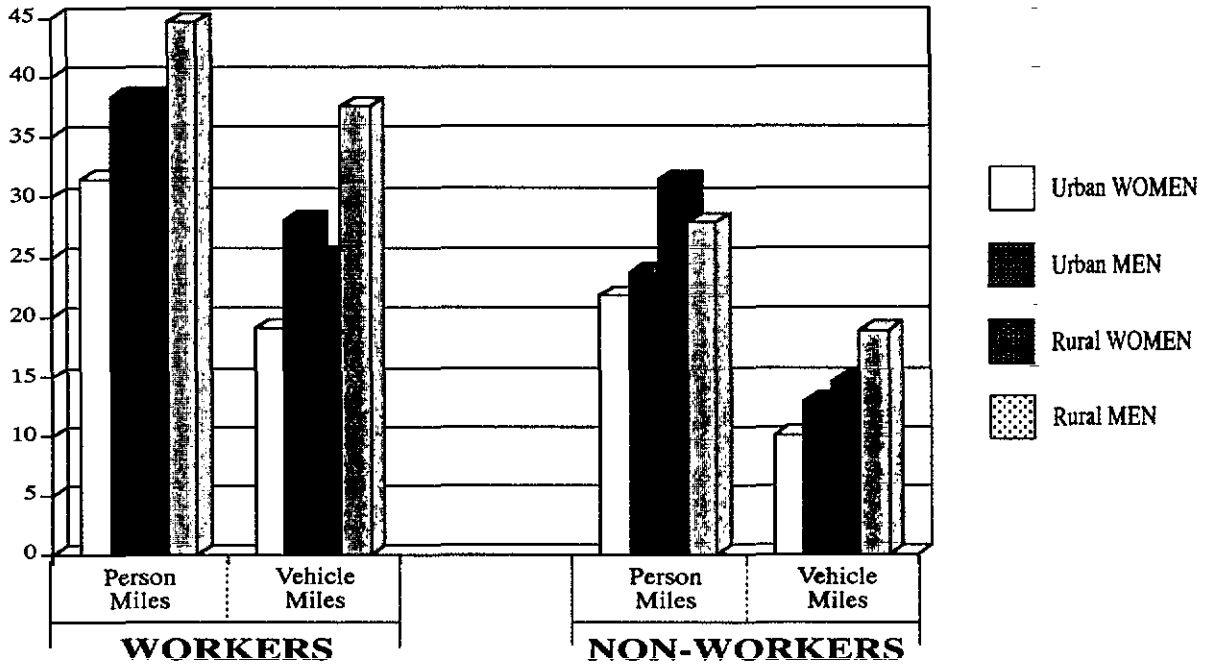


Figure 4 Average Daily Miles, by Sex and Work Status, People 16-64, 1990



Those who do not work travel less distance, but as in the trip rate patterns seen in earlier Figures, the differences between comparable men and women are larger among workers than among non-workers. For example, urban women 16-64 without paid employment travel only 8% fewer person miles than comparable men. In addition, the difference between person miles and vehicle miles is much larger in percentage terms among non-workers; for example rural women without paid employment travel almost 54% fewer vehicle than person miles (23.7 vs. 14.6).

Overall, while Figure 3 shows that employment has more impact on the *number of trips* made by *women,* Figure 4 suggests that employment has considerably more impact on the *total distance* that *men* travel. Both Figures suggest that working is associated with travelling a higher percentage of total miles in a vehicle, although the increase in vehicle trips is much higher for women than for men (over comparable non-workers).

The Impact of Licensing on Travel Behavior

Traditionally women have taken fewer of their trips in a car than men—because they earned less (or had no personal income), had less access to a car, and/or were less likely to be licensed. All of these factors are changing—albeit at different speeds. In 1990 urban women (16-64) made 92.3% of all trips, and 91.0% of work trips, in a private vehicle; urban males actually made slightly fewer of their total trips by car (91.62%) and only slightly more work trips (91.8%). Women in rural areas were even more dependent on the car than either urban travellers or than rural men: men (16-64) made 94.7% of all trips and 96.2% of all work trips by car. However, rural women 16-64 made 95.2% of all trips and 96.8% of work trips by car.

The area most approaching parity between the sexes is licensing rates. Data from FHWA shows that in 1951 90% of men but only 55% of women 30-39 had licenses; by 1984 almost 100% of men of that age and 90% of comparable women were licensed[106]. But in 1992 the gap between the sexes in that age group

had narrowed even further—to just 4% points. Moreover, the gap was even smaller among younger people; 88.9% of men and 85.4% of women aged 20-24 had licenses[107].

Table 1 displays daily travel parameters for men and women 16-64, with and without licenses, in urban and rural areas, in order to gauge the impact of the growing licensing of women—and the table has some interesting messages. First, people of both sexes with licenses travel more, sometimes substantially more, than comparable people without licenses. In fact women without licenses actually make fewer person trips than comparable men in both urban and rural areas; it is only when woman have a license that we see the trip patterns shown in previous figures. More drastic, those without licenses make barely any *vehicle* trips wherever they live. For example, rural women with a license travel almost 23 vehicle miles a day; those without a license travel less than one vehicle mile per day.

Second, having a license has a more profound impact on women; urban women who are licensed make 76% more person trips and travel 191% more person miles than women without. Urban men with licenses make "only" 42% more trips and travel 137% more miles than men without. As a result of having a license, women make more person trips than comparable men; in rural areas, for example, women make 12% more trips than comparable men (3.7 vs. 3.3) although rural men without licenses made more trips than rural women without licenses (2.1 vs. 1.9).

A third message in Table 1 is that, in urban areas, men and women with licenses are more similar than men and women without licenses—that is, that the person mile gap between the sexes is less for licensed people. For example, urban men without licenses travel almost 50% more person miles than comparable women but those with licenses travel only 21% more than comparable licensed women.

But the fourth message of Table 1 is that, even with a license, both urban and rural women still travel fewer person and vehicle miles than their male counterparts. Urban men with a license, for example, cover 50% more vehicle miles than comparable women while rural men with a license cover almost 60% more than comparable women. Since vehicle trips are roughly comparable (at least in urban areas), the table clearly shows that, even with a license and even making the majority of their trips in a car, women simply take shorter trips.

Table 1 Average Daily Travel Parameters, by Sex and License Holding, People 16-64, 1990

LOCATION and License Holding		PERSON TRIPS		PERSON MILES		VEHICLE TRIPS		VEHICLE MILES	
		Women	Men	Women	Men	Women	Men	Women	Men
URBAN	With License	3.7	3.4	30.9	37.5	2.8	2.9	18.5	27.7
	Without License	2.1	2.4	10.6	15.8	.1	.1	.4	1.1
RURAL	With License	3.7	3.3	37.3	43.0	2.7	2.9	22.7	36.0
	Without License	1.9	2.1	16.0	16.5	.1	.2	.9	1.4

The Impact of Household Income

The keystone of traditional explanations of travel behavior is the impact of household income on mode choice and trip rates; as income rises, people make more trips, travel longer, and make more trips by car. Thus differences in the trip patterns of men and women has been attributed to differences in economic variables at the household level. The 1990 NPTS data suggest that household income, while a powerful factor, does not explain most of the differences between comparable men and women and between married and single mothers.

Figure 5 show that both men and women's mode choice in urban areas are affected by rising household income—but there are some differences worth note. At very low incomes, very high incomes, and those between $10,000 and $25,000 women 16-64 are more likely to make more of their trips by car. The differences are substantial at lower incomes; at household incomes below $5,000 almost 74% of women's trips but only 61% of men's trips are taken in a private vehicle. At incomes between $10-15,000 women make over 84% of their trips by car compared to just under 78% of men's trips.

The differences in urban areas between men and women's *work trip* travel mode are even stronger. For all incomes levels below $25,000—except those under $5,000—women 16-64 are more likely to use a private vehicle to get to work than comparable men. For example, almost 80% of the work trips of women but only 77% of the work trips of men with incomes between $5-10,000 are taken in a private vehicle.

Not surprisingly, mass transit use in urban areas falls as income increases but it moves at different speeds for men and women and there are anomalies at high and low incomes. First, men have higher transit usage than women until household incomes of $15-20,000 per year; for example, 8.1% of all trips of men with incomes of $10-15,000 are taken using transit—compared to 5.2% of the trips of comparable women. After incomes of $20,000 women are slightly more likely to make more of their trips on transit; 1.7% vs. 2.1% at household incomes of $30,000, for example. However, at incomes above $60,000 men again make more of their trips by transit (2.8% vs. 1.6% at incomes above $70,000).

Figure 5 Percentage of Urban Trips Taken in Private Vehicles, People 16-64, by Sex and Income Categories

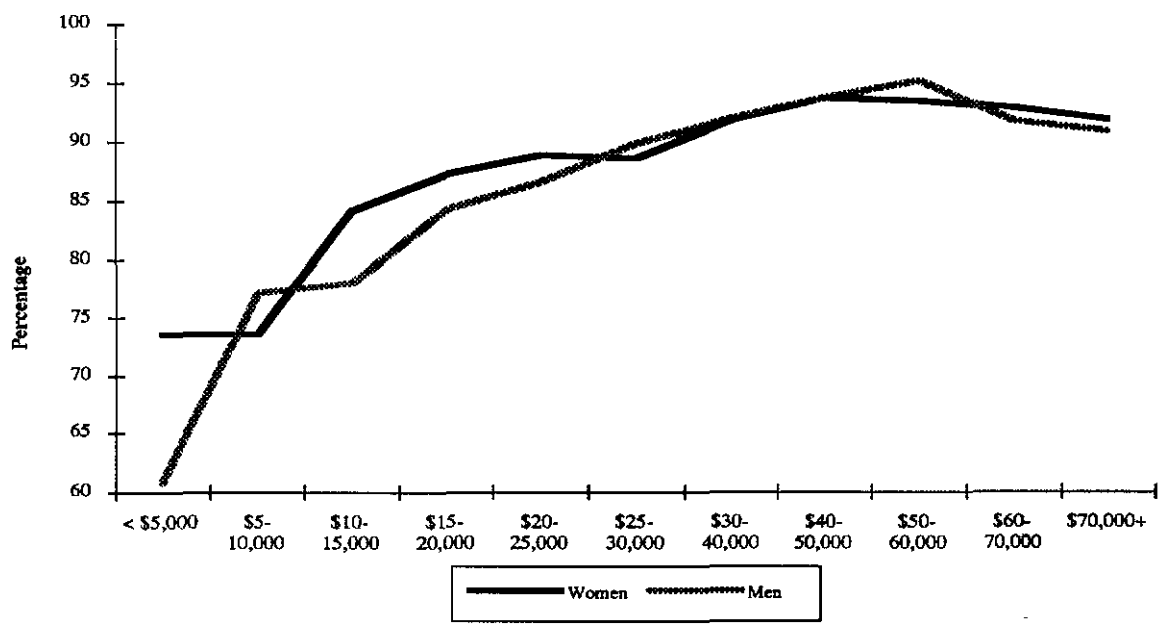


Table 2 focuses specifically on the *work trip* modes of low income urban households. Although the sample sizes are small, it appears that very low income women 16-64 in urban areas rely far more heavily on both walking and transit for their "commute." This confirms some of the research discussed earlier which suggests that some low skilled women only take jobs very close to where they live where/so it is feasible to use these inexpensive modes. The data suggest that men either don't impose such constraints on themselves or they are unable to find work within walking or transit distance.

However, the second very clear message of this table is that at the still low incomes above $5,000, women in urban areas are more dependant on the private car than comparable men even though they still use transit far more than the average of the population.

Private vehicle use data for rural travellers are similar but, as seen in many of the analyses already presented, rural people are generally more dependent on the car. While no urban income group below $30,000 took more than 90% of all trips in a private vehicle, rural households reached the 90% mark at annual incomes of only $10,000. Just as importantly, women at all income levels below $40,000 took more of their trips in a private vehicle than comparable men and the differences were the greatest at the lowest income levels; for example, women in households with incomes $5-10,000 took 91% of all trips in a car—compared to 83% of the trips of comparable men.

Moreover some of the high income anomalies seen in the urban data are seen in rural data: higher income people of both sex made slightly *fewer* of their trips in a car than those with incomes from $30 or 40-60,000 and women from very high income groups made more trips in a car than comparable men. For example, rural women with household incomes between $60-70,000 took over 92% of their trips in a private vehicle compared to just over 90% of comparable men.

Figure 6 illustrates the impact of income on average *work trip* length; like many of the previous analyses it has some challenges for traditional explanations of women's travel behavior. First, at all income levels women work closer to home than comparable men in both urban and rural areas—although the gap is substantially more among rural workers. Second, and just as important, above household incomes of $10,000 distance to work goes up as income rises but it clearly goes up much faster and further for men. Women's lowest urban commute is 5.89 miles and rises to 9.35 miles (at incomes over $70,000) or a 59% increase in distance with an (estimated)1300% rise in income. Men's lowest urban commute is 7.97 miles rising to 14.30 miles at incomes above $70,000—or an 80% increase in distance with an (estimated) 366% increase in income.

Table 2 Work Trip Mode of Selected Low Income Urban Households, by Sex, 1990

	PRIVATE VEHICLE		TRANSIT		WALK	
INCOME	Women	Men	Women	Men	Women	Men
Under $5,000	73.8%	92.5%	11.9%	1.9%	14.3%	5.7%
$5-10,000	79.8	77.2	9.9	11.8	9.2	6.4
$10-15,000	80.2	78.7	14.5	10.6	4.4	9.6
$15-20,000	86.6	84.3	7.8	8.6	5.1	5.2

Source: Trip Files.

Figure 6 also shows the low income anomalies seen in early analyses. Low income urban workers of both sexes and women in rural areas tend to work further from home than workers from households making $25,000 and more. Once again this suggests that the employment opportunities available to low skilled workers, and particularly women workers, are located in different places than those available to workers earning more. For example, urban women from households making $5-10,000 travel further to work than women from households making up to $50-60,000. Just as relevant, urban women workers with very low incomes commute just under 6 miles from home—which helps explain their work trip mode patterns show above in Table 2.

Figure 7 examines the impact of household income on person and vehicle trip patterns in urban areas. Again the table shows that rising income is associated with more trip making but that there are interesting differences between men and women. At all but one income level, women make more *person* trips than comparable men and the gap widens as income goes up; since the trip patterns seen in the aggregate figures hold when they are disaggregated by income, income does not appear to explain why women take more person trips than men. Nor does income help explain why men, in the aggregate, take more vehicle trips. At all but the lowest low income level, women make fewer vehicle trips than comparable men (their vehicle trip making is roughly identical at household incomes of $20-25,000).

Figure 8 illustrates comparable person and vehicle *mile* data in urban areas. While distance increases with income, there are again differences between men and women which are not consistent with traditional thinking. First, the gap in vehicle miles widens as income increases; men from high income households (over $70,000) are travelling a) 221% more miles than men in low income households and b) 66 % more miles than women in with comparable high incomes. However the highest income women are only travelling 61% more miles than the lowest income women; moreover the percentage gap between men and women with incomes between $5-10,000 is only 27 % (10.3 vs. 13.1).

Figure 6 Average Work Trip Length in Urban and Rural Areas, People 16-64, by Sex and Income Categories

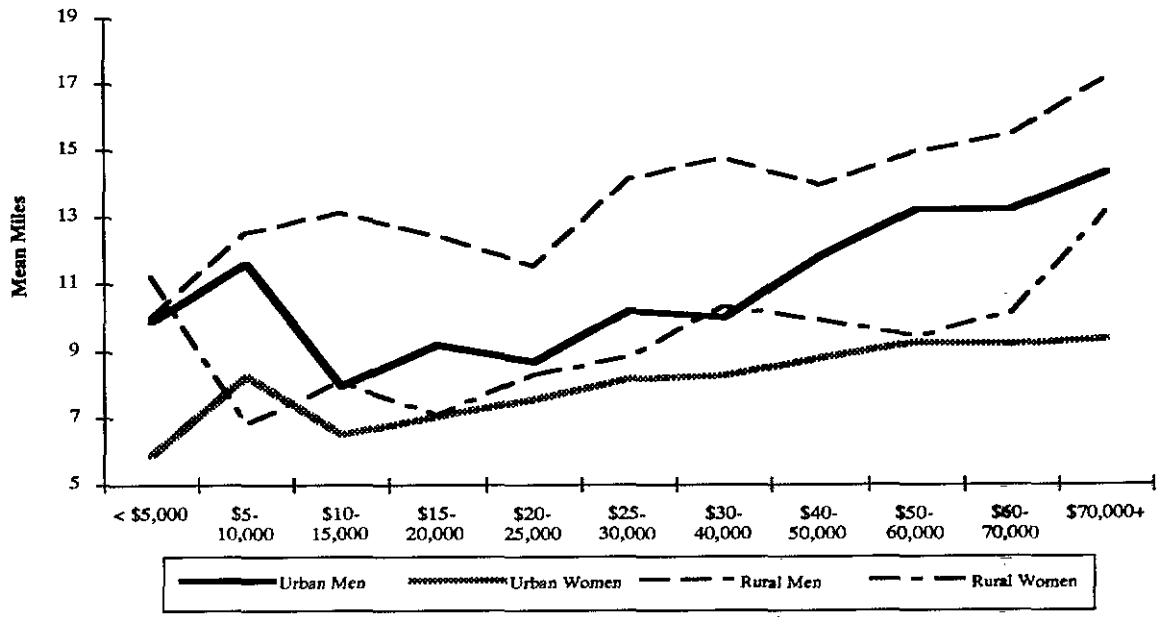


Figure 7 **Urban Daily Person and Vehicle Trips, People 16-64, by Sex and Income Categories**

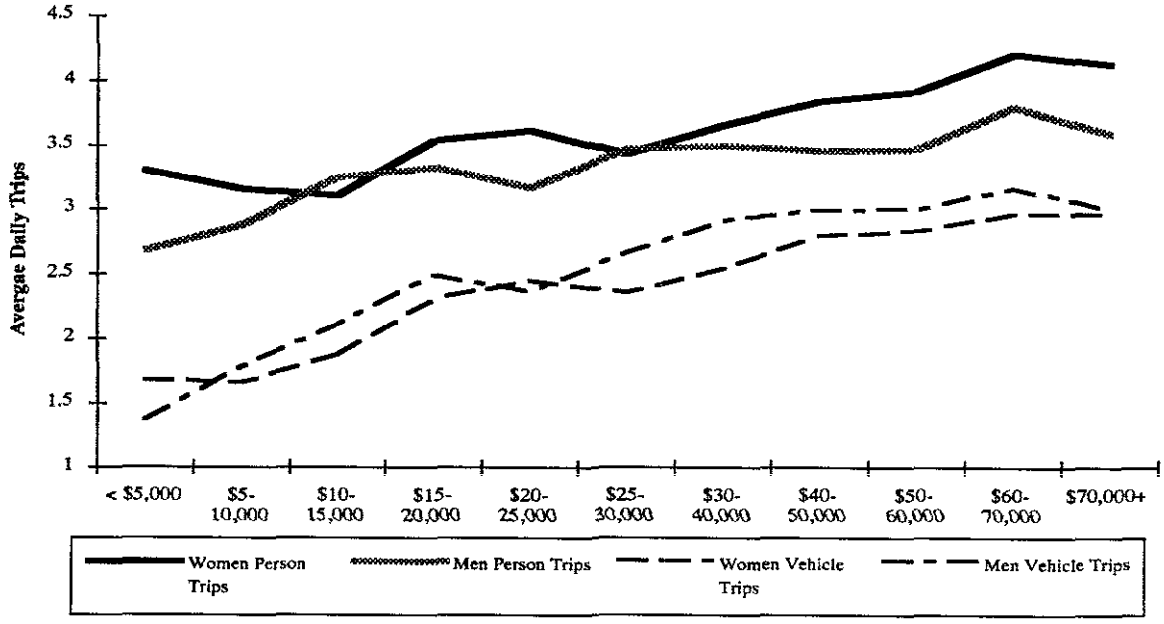
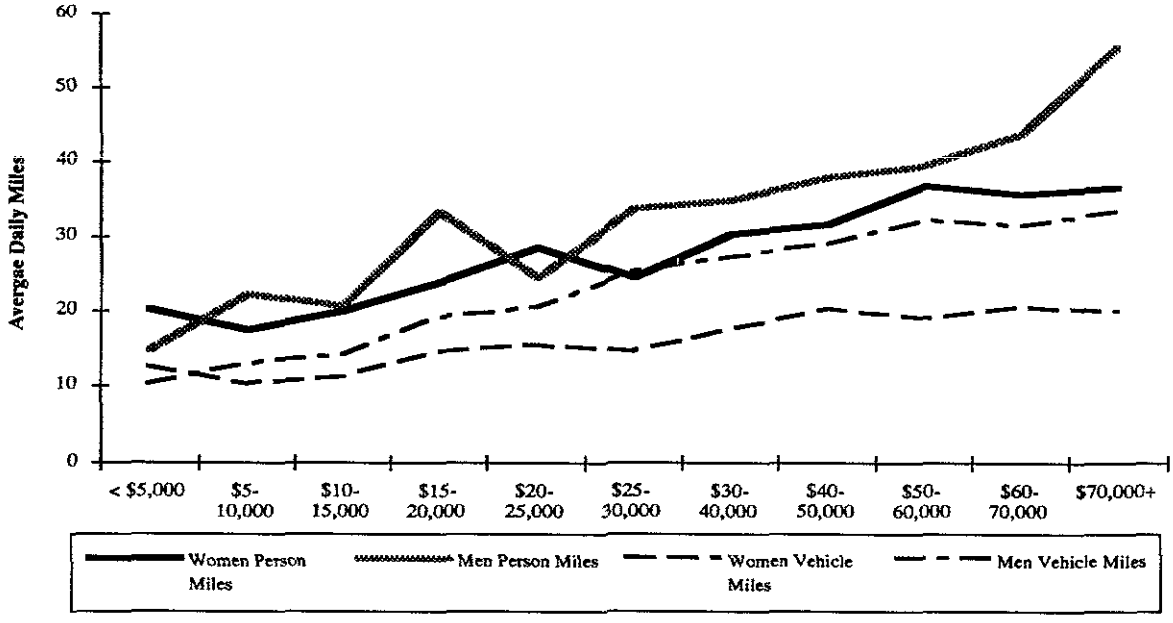


Figure 8 **Urban Daily Person and Vehicle Miles, People 16-64, by Sex and Income Categories**



While there is more variation in the total person mile category, similar patterns are seen: mileage increases with income but men are almost always travelling further than comparable women (again with the exception of those with very low incomes), and men's distances increase more rapidly with income than do women's. Figure 9 gives comparable data for rural areas showing that rural patterns are roughly similar to urban ones although the distances are greater.

Table 3 combines two powerful determinants of overall travel: income and worker status. Overall Table 3 has a number of messages: in every income category but the very highest women who are workers make substantially more person trips than women who are not. While men make more trips when employed the difference is nowhere near as great—on average working men make 19% more trips than those not working while working women make 33% more than those not working.

A second message is that the increase in *trip* rates accompanying employment is generally greatest among women in the lowest income categories but there is no consistent pattern among men. Third, there is no income category in which male workers make more person trips than employed women. There are, however, several categories where male non-workers make more person trips than women without paid employment.

Fourth, urban workers 16-64 travel more person *miles* in all but the highest income category if they are employed—and generally more miles as income increases. However, the mileage increase associated with having a job is greater for women in each income category than for comparable men; overall women travelled 34% more miles when they had a job while men only travelled 21% further. Women in several income categories increased their mileage over 85% when they had a salaried job but there was only one income category in which men displayed a difference of that magnitude.

Moreover Table 3 indicates that there are two income categories where women workers travel further than male workers—the very lowest and among those having household incomes of $20-25,000 per year. It still is true, however, that mileage among male workers went up far faster as income increased.

Figure 9 Average Daily Rural Person and Vehicle Miles, People 16-64, by Sex and Income Categories

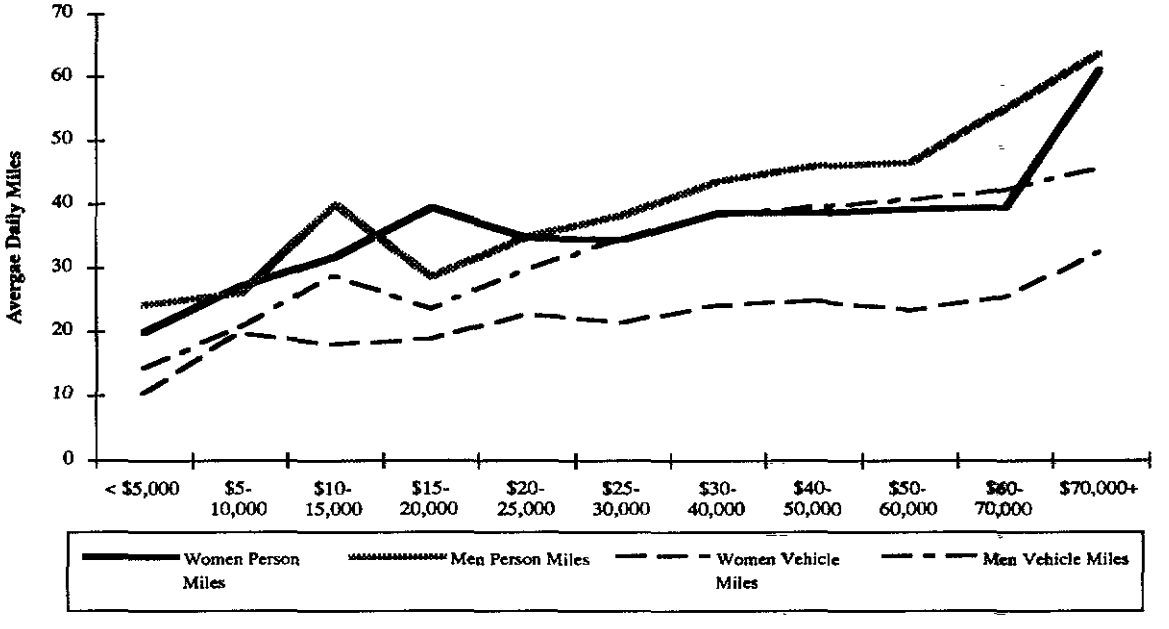


Table 3 **Average Daily Person Trips and Miles in Urban Areas, People 16-64, by Sex, Work Status, and Income Categories**

		WOMEN		MEN	
		WORKER	NON-WORKER	WORKER	NON-WORKER
UNDER $5,000	TRIPS	4.37	2.87	2.42	2.86
	MILES	28.06	16.93	15.02	14.85
$5-10,000	TRIPS	3.80	2.59	3.34	2.32
	MILES	23.09	12.70	25.83	17.86
$10-15,000	TRIPS	3.57	2.57	3.45	2.76
	MILES	21.39	18.43	23.88	13.07
$15-20,000	TRIPS	4.03	2.56	3.55	2.53
	MILES	28.32	14.79	36.59	21.56
$20-25,000	TRIPS	3.96	2.92	3.20	3.03
	MILES	34.97	15.65	26.26	17.05
$25-30,000	TRIPS	3.8	2.61	3.59	2.93
	MILES	28.13	16.57	31.89	42.36
$30-40,000	TRIPS	3.87	3.14	3.50	3.37
	MILES	34.66	19.83	35.84	27.74
$40-50,000	TRIPS	4.02	3.38	3.55	2.88
	MILES	33.31	27.96	40.47	20.54
$50-60,000	TRIPS	4.08	3.49	3.56	2.79
	MILES	33.22	47.11	41.74	22.41
$60-70,000	TRIPS	4.44	3.37	3.86	3.26
	MILES	38.20	27.44	43.60	46.08
$70,000+	TRIPS	4.09	4.24	3.65	2.96
	MILES	36.58	37.43	55.91	53.45

Source: Person Files.

Figure 10 Average Daily Person Miles, People 16-64, by Sex, Income Categories, and License Holding

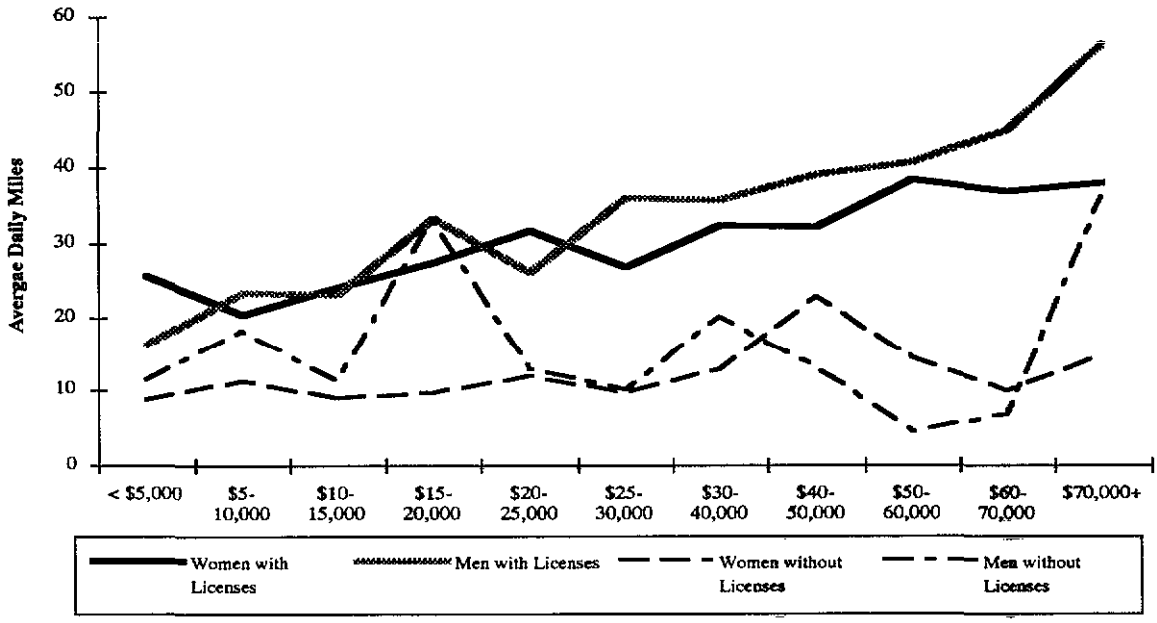


Figure 10 combines two different traditional indicators of travel behavior to examine daily person miles in urban areas among those 16-64: license holding and income. Although the patterns are roughly comparable to those seen in the previous analyses, there are more variations. People with licenses were strongly affected by rising incomes, but people without licenses, particularly women, were far less affected. Women without licenses travelled roughly between 9-10 miles per day until their household incomes reached $25,000; although there were some substantial increases in mileage at higher incomes there was also wide variation; women without licenses in households making $60-70,000 travelled less than those in households making under $20-25,000.

The impact of increasing income on men without licenses was even more variable; men without licenses in urban households making $20-25,000 covered the same number of person miles as comparable men *with* licenses (33.4 miles)—and almost as much as both men and women without licenses in households making over $70,000 per year (36.0 miles).

The Impact of Traditional Variables

Overall, the variables which have been traditionally used to explain travel variations—household income, employment status, licensing rates—clearly explain less of the difference between men and women's travel behavior than has been assumed. Indeed these variables explain far more of the differences *among* women and *among* men and far less of the differences between otherwise comparable people. In short, while income and license holding and employment status aid in understanding travel behavior, they don't go far enough or supply meaningful insight into differences between men and women's travel behavior. The following section of this report attempts to remedy this deficiency.

Contributing Elements

The section above clearly indicates that traditional variables are not adequate to describe or define the travel behavior of most women, and particularly low income women. This section examines the impact of the far less studied factors affecting travel behavior: marital status, the presence and age of children, race and ethnicity—alone, in combination with each other, and in combination with the more traditional variables of employment and income.

Marital Status and the Presence of Children

Much of the literature on women's travel patterns cited in the first section of this report stresses the impact of children on both married and unmarried female parents, although observers have commented that children may also affect the travel patterns of men in ways hidden by aggregate analysis. Table 4, which examines the impact of both marital status and children on urban person trips for people 16-64, 1) confirms the findings of the existing literature on women's travel and 2) suggests that men are *not* very affected by children unless they are a single parent (in fact there are so few single male parents in the NPTS that most of those numbers are suspect).

Table 4 indicates the daily person trip rate for men and women and then indicates percentage differences in rates a) between men and men, and, b) between comparable people of the same sex. The trip rate of married men was almost identical, whether or not they had children, and whatever the age of their youngest child. Married men always travelled significantly less than comparable married women, with the largest gap in households with children 6-15. The larger gap reflects the fact that both married and single women with children 6-15 made more trips than those with children of any other age group; this is consistent with earlier work by Rosenbloom[108 109]. Both sets of women had lower mileage with older children which could mean that older children both take care of themselves and travel more independently.

In addition, Table 4 tends to support the hypothesis that single mothers, lacking the help given by another resident parent, have more obligations affecting their travel patterns; single mothers always make more trips than comparable married women, with the largest gap among women with children over 16. However, overall, the differences between married and single female parents are less than the differences between comparable men and women.

Table 4 **Differences in Average Daily Urban Person Trips, by Sex and Selected Lifecycles, 1990**

Gender and Presence of Children		Two Adult Household	One Adult Household	Difference in Travel Between Comparable Adults in Households*
Children 0-5	Men	3.2	3.1	-3.1%
	Women	3.5	3.6	2.9%
	DIFFERENCE	-8.6%	-13.9%	---
Children 6-15	Men	3.3	3.7	12.1%
	Women	4.0	4.1	2.5%
	DIFFERENCE	-17.5%	-9.8%	---
Children 16-21	Men	3.3	3.8	15.2%
	Women	3.4	3.6	5.9%
	DIFFERENCE	-2.9%	5.6%	---
No Children	Men	3.3	3.6	9.1%
	Women	3.4	3.7	8.2%
	DIFFERENCE	-2.9%	-2.2%	---

*Note: The difference between One and Two Adult Households expressed as a percentage of Two Adult Households. Also note: percentages computed before rounding.

Source: Person Files

Table 5 displays a comparable assessment of differences in urban person miles. Married men travel more miles than married women, but men with children travel roughly the same number of person miles regardless of the age of their children (34-35.6 miles, or a 4.7% from high to low). Married women on the other hand, travelled slightly more miles as the age of the youngest child went up (11% from high to low). Strikingly, the mileage of single women consistently went down as the age of the youngest child went up—again suggesting that the heavier domestic burden carried by working women lightens as children grow up. It is also interesting that, while single mothers always make **more** *trips* than married mothers in each category, they travel **fewer** *miles* after their youngest child is in school, 22% fewer among women with children over 16.

As in Table 4, Table 5 shows that the differences between women with children of comparable age are substantially less than the differences between men and women. However the gaps in *mileage* among the sexes are far greater in percentage terms than are the gaps in *trips*. For example, married men with children 6-15 cover one third more miles than married women (17.5% fewer trips), while single women only travel 8% fewer miles than comparable women (but take 2.5% more trips). Table 5 also shows that both married and single people of either sex *with no children* travel substantially more miles than people with children, although they made roughly the same number of trips.

Table 6 presents a comparable assessment of urban vehicle trip patterns; it is here that we find the most interesting variations. Both married men and women with children make fewer *vehicle trips* than those without children. However women with children older than six actually make more vehicle trips than comparable men. Single women with children 6-15 make a) more vehicle trips than either married parent with comparably aged children, and b) more trips than married parents and single fathers in every category shown on the table, including those without children.

For children over six, the differences between married men and women are, for the first time in this series of analyses, smaller than the differences between comparable women. Married women with children 6-15 made 7% fewer vehicle trips than comparable men but over 14% fewer vehicle trips than comparable single women.

Comparing married parents with children to two adult couples without children shows additional differences between comparable men and women. As previously noted, married men with and without children make roughly the same number of trips; however married men with children actually travel fewer miles and make fewer vehicle trips than those without children. Among married women, however, those with kids make more person and vehicle trips than married women 16-64 without children, although they travel fewer person miles. Again these patterns suggest that having children, particularly children 6-15, strongly influences the travel patterns of married women while having little effect on those of married men.

To summarize, married women make **more** *person trips* than all categories of married men, including those who are not parents; however, they travel **fewer** *person miles* and make **fewer** *vehicle trips* than comparable men. Married women with children under six make **more** *person trips,* travel **fewer** *person miles,* and make the **same** number of *vehicle trips* as single mothers with children under six. However, once their youngest children are school-age, single mothers make **more** *person trips,* travel **fewer** *person miles,* and make **more** *vehicle trips* than comparable married mothers. In a few categories, single women even make more trips than comparable married men.

All of these findings strongly support the contention that women who are mothers make more trips because of their family obligations but travel less distance because of their desire to stay closer to home. Single mothers, lacking in-home help with their children, make more trips than married mothers—but they stay even closer to home (perhaps because they know they are the only back-up their children have). These findings also support previous work which found that the age of the youngest child may make some difference in the travel patterns of male parents but strongly impacts female parents, and single female parents even more so.

Table 5 Differences in Average Daily Urban Person Miles, by Sex and Selected Lifecycles, 1990

Gender and Presence of Children		Two Adult Household	One Adult Household	Difference in Travel Between Comparable Adults in Households*
Children 0-5	Men	34.0	8.0	-76.5%
	Women	24.9	25.1	.8%
	DIFFERENCE	36.5%	-68.1%	---
Children 6-15	Men	35.6	38.0	6.7%
	Women	26.7	24.6	-7.9%
	DIFFERENCE	33.3%	54.5%	---
Children 16-21	Men	35.0	28.0	-20.0%
	Women	27.7	21.5	-22.4%
	DIFFERENCE	26.4%	30.2%	---
No Children	Men	40.1	33.3	-17.0%
	Women	31.9	39.1	22.6%
	DIFFERENCE	25.7%	-14.8%	---

*Note: The difference between One and Two Adult Households expressed as a percentage of Two Adult Households. Also note: percentages computed before rounding.

Source: Person Files

Table 6 **Differences in Average Daily Urban Vehicle Trips, by Sex and Selected Lifecycles, 1990**

Gender and Presence of Children		Two Adult Household	One Adult Household	Difference in Travel Between Comparable Adults in Households*
Children 0-5	Men	2.7	2.0	-25.9%
	Women	2.5	2.5	0.0%
	DIFFERENCE	8.0%	-20.0%	---
Children 6-15	Men	2.6	2.0	-23.1%
	Women	2.8	3.2	14.3%
	DIFFERENCE	-7.1%	-37.5%	---
Children 16-21	Men	2.5	2.3	-8.0%
	Women	2.2	2.5	13.6%
	DIFFERENCE	13.6%	-8.0%	---
No Children	Men	2.7	2.8	-1.5%
	Women	2.2	2.8	25.1%
	DIFFERENCE	22.7%	1.4%	---

*Note: The difference between One and Two Adult Households *expressed as a percentage of Two Adult Households. Also note:* percentages computed before rounding.

Source: Person Files

It makes sense to question if some of the differences just seen between married and single parents, or even among married parents are, in fact, income related. Figure 11 adds household income to one of the previous analysis; it examines the person trips rates of all women 16-64 with children as their household income rises. Although there are sample size problems among the single parents, the overall patterns are very clear; at almost every household income level single mothers make more trips than married mothers, sometimes by large margins.

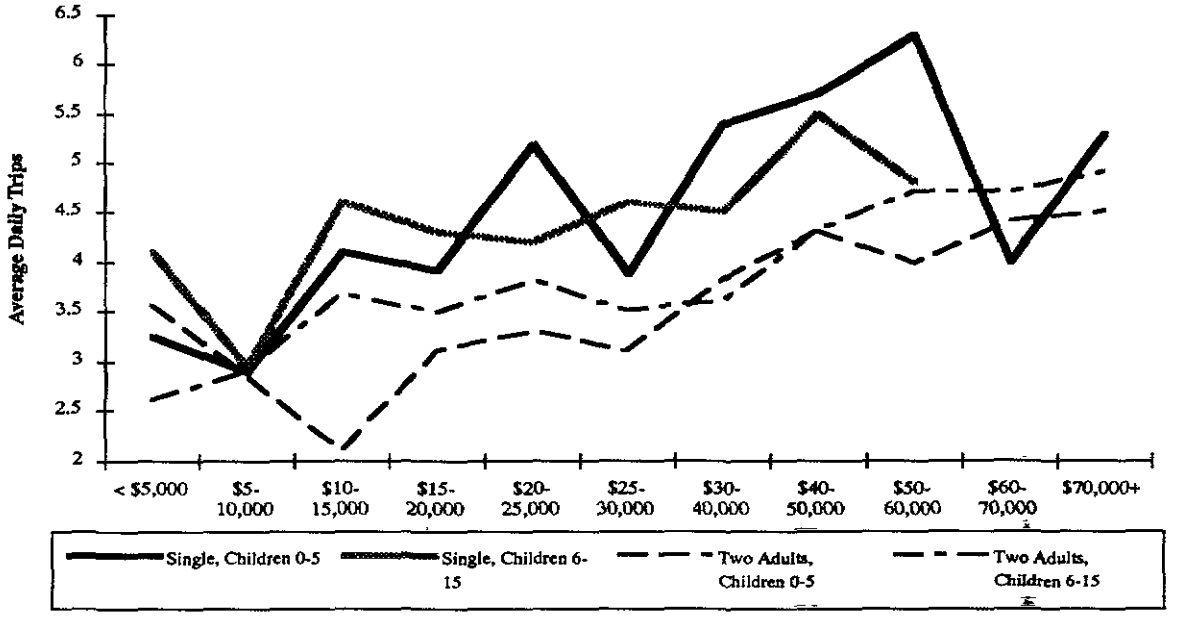
Moreover, Figure 11 shows the low income anomaly seen in previous analyses in this paper; all low income single female parents and low income married mothers with children under six make more trips than those with sometimes substantially higher household incomes.

Additional analyses of NPTS data by income show that married male parents 16-64 with children under six actually make **more** trips than comparable women—but only at incomes between $10-20,000. Married men make fewer trips than comparable female parents at all other income levels, sometimes by considerable margins. For example, at household incomes between $40-50,000 married men with children under six made 3.6 person trips daily while comparable women made 4.3 person trips (or 21% more).

Married men with children 6-15 made **fewer** person trips than comparable women at all but the highest and lowest income levels, although the gap was narrow in some categories. For example, at incomes between $10-15,000 married men made 2.2 person trips, compared to 3.6 by comparable women (or 64% more). Married men with children 6-15 in households earning $30-40,000 made 3.54 while comparable women made 3.63 person trips per day.

Overall, analyzing vehicle trip patterns as well as personal and vehicle miles shows roughly the same thing: household income does not explain well the differences between comparably situated married parents nor between single and married mothers. *Relatively independent of household income, married*

Figure 11 Average Daily Person Trips of Urban Female Parents, by Income Categories



women who are parents travel **fewer** *person miles* and make **fewer** *vehicle trips* than comparable male parents. Regardless of household income single mothers travel **fewer** *person miles* but make **more** *vehicle trips* than comparable married mothers. Moreover, in every grouping very low income people, but particularly the women, often travel further and more often than people with much higher household incomes. In short, the patterns seen in the initial analyses hold, even when considering income.

Race and Ethnicity

The analysis above has shown that low income people in general, and single mothers in particular, have different travel patterns than higher income and/or married individuals. But households headed by racial and ethnic groups are more likely to be low income or have a single female heads. Moreover, there is growing evidence of lifestyle and residential differences between Blacks, Whites, Asians, and Hispanics[110], some of which can lead to differences in the travel patterns. For example, a recent study in Los Angeles found that Asian commuters there had a higher drive alone and a lower carpool rate than comparable travellers in other ethnic groups[111].

NPTS data previously discussed showed sometimes substantial differences between people of different racial and ethnic backgrounds, and between otherwise comparable men and women, in drivers licensing. Therefore this section evaluates the intersection of race and ethnic background with more traditional travel variables and with the not so traditional life cycle variables just raised.

Table 7 License Holding, People 16-64, by Sex, Race, and Ethnicity, 1990

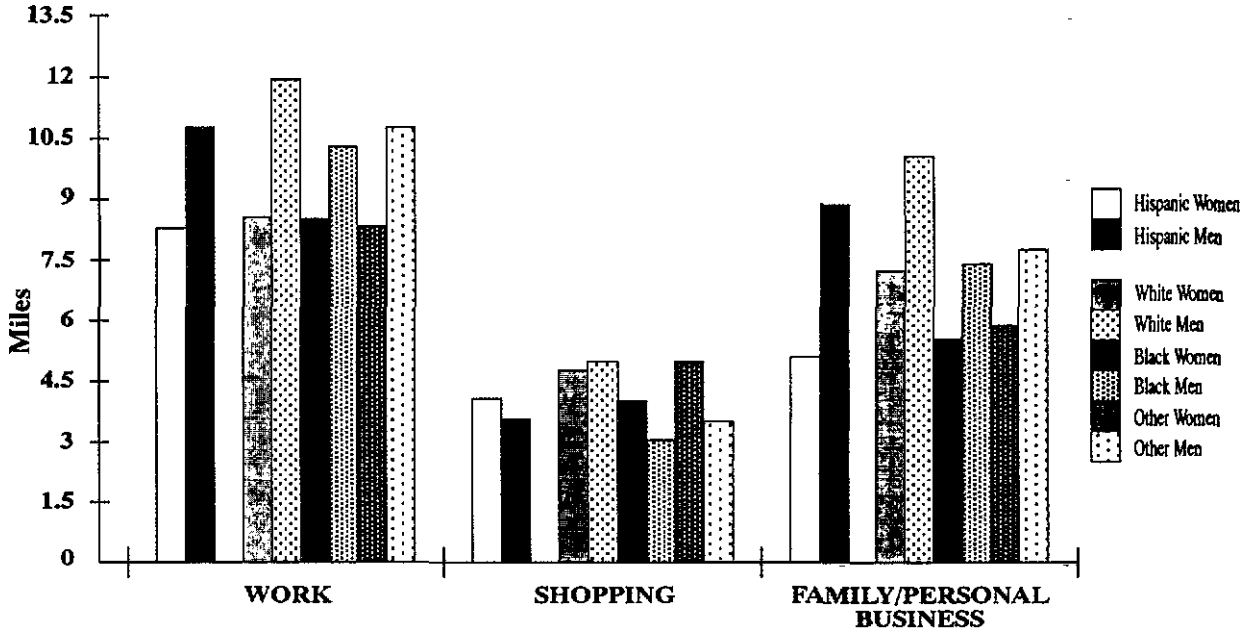
	URBAN		RURAL	
RACE	Women	Men	Women	Men
HISPANIC (All Races)	65.6%	79.6%	81.7%	88.9%
WHITE	91.3	94.8	94.8	95.9
BLACK	70.8	80.5	77.7	82.0
OTHER	66.9	80.5	79.6	89.2

Basic Travel Parameters

NPTS data show that there is some variation in work trip distance by race or ethnicity in urban areas. Figure 12[112] disaggregates the average trip length of various travellers for three major non-work trip purposes. White men between 16-64 travel 11.9 miles to work compared to the 10.8 mile commute of Hispanic males (of any race) and those of Other (Non-White, Non-Black) races while Black men make the shortest commute:10.1 miles. There is less variation among women: all urban women travel on average shorter distances to work than comparable men and all urban women 16-64 average between 8 and 8.5 miles.

The figure also shows that White men made longer shopping trips in urban areas than comparable women but all other men made shorter trips than comparable women with not much difference in length;

Figure 12 Average Length of Selected Urban Trips, by Sex, Race, and Ethnicity, People 16-64, 1990



the greatest gap between the sexes was among people of Other Races (4.9 vs. 3.9 miles). All men, however, made substantially longer personal business trips than comparable women; White men made the longest personal business trips (10.1 miles) while Black men made the shortest (7.3). While White urban women made the longest personal business trips (7.1 miles) Hispanic women made the shortest (5.1).

There are much greater differences in work trip commutes in *rural* areas; White men 16-64 travel just over 14 miles to work compared to 12.8 miles by Blacks, and 11.9 miles for Hispanics. All women travel less than comparable men but Black rural women travel 12% more than White women (10.8 vs. 9.7 miles); women from Other Races travel the longest (11 miles) and Hispanic women commute the shortest (7.9).

Table 8 analyzes the impact of race and ethnicity on annual miles driven in urban areas by people 16-64. The Table clearly show differences between people of different backgrounds and between otherwise comparable men and women. White men drive the furthest and men from Other Races drive the least; White men drive 10% more miles annually than Hispanic men and 22% more miles annually than Black men. Moreover, all men drive more than all comparable women although there are sometimes major differences among men and among women. The gap between the sexes in miles driven, for example, is greater (in percentage terms) among Whites than among Hispanics or Blacks.

Table 8 also attempts to identify the impact of employment status on annual miles driven. Many of the patterns seen in the aggregate racial breakdowns still hold; White men, whether or not they are workers, drive more than any other men; the same is true of White women. And men in every category drive more than the women in that category. Among male workers, those from Other Races drive the least number of miles while among those not employed Blacks drive the least.

Table 9 is the comparable rural analysis. Most, but not all of the urban patterns are seen in the rural data: White men drive the furthest but it is Hispanic men who drive the least in rural areas, whether or not

Table 8 Annual Miles Driven by Urban Travellers 16-64, by Sex, Work Status, Race, and Ethnicity, 1990

RACE	ALL Women	ALL Men	WORKER Women	WORKER Men	NON-WORKER Women	NON-WORKER Men
(All Races) HISPANIC	9,100	15,320	10,679	16,040	5,692	10,003
WHITE	9,790	16,888	10,746	17,676	7,365	11,474
BLACK	8,831	13,799	10,002	15,137	5,220	8,216
OTHER	8,079	13,731	9,647	14,332	4,982	9,812

Source: Person Files.

they are employed. All rural men drive substantially more than all urban travellers and than rural women but the gap between the sexes is far greater in rural areas.

Clearly work status alone does not explain the travel differences between people of different backgrounds (any more than it explained the differences between the sexes in the aggregate data).

Table 10 clearly shows that there are some major differences in the modal choice patterns of men and women with different backgrounds. First, use of the car is not at all uniform; while it accounts for the majority of trips for people from all racial and ethnic backgrounds, and for men and women, there is a substantial difference in the share of trips taken. White people 16-64 in urban areas take over 90% of all trips while Blacks take no more than 78% of all trips in a car. Conversely, while Whites take no more than 2% of their trips using transit, Hispanics take roughly 7% and Blacks roughly 8% of all trips using public transport modes. Interestingly, Blacks are more likely to take trips in a taxi,although the numbers are not high.

There are some surprising gender differences in modal choice data disaggregated by race and ethnic background. Both White and Black women take **more** of their trips in a private car than comparable men; women in the other two groupings take only slightly fewer trips in a private vehicle. The differences between the sexes in each grouping are far less than the differences between the racial and ethnic groupings. White men are more likely to use public transit than comparable women, although women in all other groupings are more often transit users than men. A very interesting finding is the number of women walking for trips; except for White women, women make a greater share of their trips walking than men.

Table 11 applies the same type of analysis to the four major indicators of urban travel. As in Table 10 the differences between the races are often greater than the differences between men and women in the same categories. White men take more person and vehicle trips than any other men and they travel more person and vehicle miles, sometimes by wide margins. For example, White men travel almost 12 miles more per day (or 73% more) than Black men and 11 miles more than those from Other Races (or 64% more).

When travel patterns are disaggregated this way, it becomes clear that not all women make more person trips than men; Hispanic women and those from Other Races make fewer person trips than men in their grouping. In fact the gap on all travel parameters is greatest between Hispanic men and women; Hispanic women make 29% fewer vehicle trips than men (compared to 10% differences for White and Black women) and travel 110% fewer vehicle miles (compared to a 56% difference among Whites and a 46% difference among Blacks).

Table 9 **Annual Miles Driven by Rural Travellers 16-64, by Sex, Work Status, Race, and Ethnicity, 1990**

RACE	ALL Women	ALL Men	WORKER Women	WORKER Men	NON-WORKER Women	NON-WORKER Men
(All Races) HISPANIC	10,179	16,963	11,406	18,363	7,503	8,334
WHITE	11,040	19,839	12,282	21,035	8,497	12,746
BLACK	8,146	18,157	9,495	21,286	5,494	7,442
OTHER	9,777	17,572	10,613	18,919	7,586	7,265

Source: Person Files.

Table 10 **Travel Mode for All Urban Trips, by Sex, Race, and Ethnicity, People 16-64, 1990**

RACE AND SEX		PRIVATE VEHICLE	TRANSIT	WALK	BIKE	TAXI	OTHER
HISPANIC (All Races)	Men	83.6%	6.6%	8.0%	1.2%	.4%	.2
	Women	80.4	7.4	11.5	.1	.2	.4
WHITE	Men	91.6	1.9	4.9	.7	.2	.7
	Women	92.3	1.5	5.2	.3	.2	.5
BLACK	Men	76.3	8.2	12.3	.9	.7	1.6
	Women	78.7	8.5	11.0	---	.6	1.2
OTHER	Men	82.7	6.1	8.9	1.6	.3	.4
	Women	80.0	7.7	11.1	.1	.4	.7

Table 11 Daily Parameters of Urban Travel, by Sex, Race, and Ethnicity, People 16-64, 1990

RACE AND SEX		PERSON TRIPS	PERSON MILES	VEHICLE TRIPS	VEHICLE MILES
HISPANIC (All Races)	Men	2.8	29.5	1.98	18.9
	Women	2.7	17.4	1.41	9.0
WHITE	Men	3.4	38.9	2.8	27.8
	Women	3.7	31.1	2.6	17.8
BLACK	Men	3.0	24.1	2.0	16.1
	Women	3.1	19.7	1.8	11.0
OTHER	Men	2.8	23.5	1.9	16.9
	Women	2.8	16.8	1.5	9.1

Table 12 is the comparable rural analyses; while it shows many of the same patterns seen in urban areas there are some important differences. First the similarities: Whites of either sex take the most person and vehicle trips and cover the most person and vehicle miles. However, all rural women—except those of Other Races—make more person trips than comparable men. Hispanic women 16-64 in rural areas take more vehicle trips and cover more person miles daily than Hispanic men. Black rural women travel a greater percentage of the person miles covered by comparable rural men (30 vs. 26.4) than they did in urban areas while women from Other Races actually travel more personal miles than comparable men.

Table 13 identifies the mode choice patterns for three major types of trips. As in the aggregate figures shown in Table 12 White men and women are the most reliant on the car for all kinds of trips while Blacks are generally the least reliant—although everyone makes the overwhelming majority of their trips in a private vehicle. As would be expected, transit use is highest for the work trip and generally lowest for the family and personal business trip among all travellers, where the car is used by over 85% of people.

Table 13 shows some interesting differences between the sexes; Black women use the car more than comparable men for both the work trip and shopping while White women use the car more than comparable men for shopping and personal business travel. Hispanic women are almost twice as likely to walk for shopping than comparable men and almost twice as likely as all other women. Women from Other Races are more than twice as likely than comparable men or all other travellers to use public transit for personal business trips.

Table 14 evaluates the impact of employment status on the four major types of travel parameters in urban areas while Table 15 describes the complementary rural analyses. The lesson to be learned from this level of disaggregation; when employed all women make more person trips and very close to the same

Table 12 Daily Parameters of Rural Travel, by Sex, Race, and Ethnic People 16-64, 1990

RACE AND SEX		PERSON TRIPS	PERSON MILES	VEHICLE TRIPS	VEHICLE MILES
HISPANIC (All Races)	Men	2.8	29.1	2.24	25.9
	Women	3.5	31.8	2.37	19.1
WHITE	Men	3.3	42.8	2.8	35.0
	Women	3.6	35.9	2.6	21.8
BLACK	Men	3.0	30.0	2.3	25.7
	Women	3.1	26.4	2.0	15.3
OTHER	Men	3.1	28.6	2.5	25.0
	Women	2.8+	28.8	1.9	17.5

number of vehicle trips as comparable men. Thus some of the ethnic and racial differences seen in previous analyses all but disappear when we control for employment.

However, the differences between Hispanic men and women tend to be larger than those between any other group. In urban areas, for example, employed Hispanic men travel 48.5% more person miles and make 18.6% more vehicle trips than comparable Hispanic women; Black male workers in urban areas, however only travel 12.5 % more person miles and make only 1% more vehicle trips than comparable women.

These patterns are also seen among non-workers in urban areas. Hispanic men who do not work travel 67% more person miles and make 13% more vehicle trips than comparable female Hispanic workers. Yet White men who do not work travel only 5% more person miles and make 5% *fewer* vehicle trips than comparable women. Clearly, employment does not explain all of the differences between the sexes.

Being in a rural area does reverse some of these trends. As Table 12 forewarned, Hispanic women in rural areas take more trips and travel longer than comparable men, whether or not they are a worker. Hispanic women who do not have paid employment travel over four times the number of person miles of comparable Hispanic men, and make 57% more vehicle trips. For all other travellers being a worker explains more of the differences between men and women in rural areas than does race or ethnicity.

Licensing Rates

License holding is clearly related to increased travel and in 1992 just over 92% of all men and 82% of all women had licenses in 1992. But the 1990 NPTS data show important differences in licensing rates along racial and ethnic lines, differences which may have strong travel implications. Table 7 showed that among Whites in urban areas the licensing gap between men and women 16-64 was only 3.5 percentage points—94.8% of men and 91.3% of White women had licenses.

Table 13 Principal Travel Modes for Selected Urban Trips, by Sex, Race, and Ethnicity, People 16-64, 1990

RACE AND SEX		WORK			SHOPPING			FAMILY/ PERSONAL BUSINESS		
		Private Vehicle	Transit	Walk	Private Vehicle	Transit	Walk	Private Vehicle	Transit	Walk
HISPANIC (All Races)	Men	82.2%	10.5%	5.1%	83.3%	3.5%	12.4%	86.9%	4.6%	6.5%
	Women	80.4	13.9	5.5	78.9	4.6	23.5	85.2	3.9	10.8
WHITE	Men	91.8	4.2	3.0	93.3	.6	5.5	94.3	.7	4.2
	Women	91.0	4.4	3.8	94.0	.5	5.3	94.9	.5	4.2
BLACK	Men	75.7	16.5	12.3	74.6	2.3	21.3	87.7	4.5	6.0
	Women	79.1	14.2	12.5	79.2	4.3	15.8	86.2	4.2	8.9
OTHER	Men	82.2	9.9	5.8	86.4	2.3	10.2	87.3	4.2	6.3
	Women	75.8	16.6	7.3	80.8	5.0	13.5	86.9	10.8	18.9

However the gap between comparable Black men and women was over 10 percentage points—80.5% of urban Black men 16-64 but only 70.8% of comparable Black women had licenses. The contrast was even greater among Hispanics (of any race): in urban areas 80% of Hispanic men but just under 66% of comparable women drove.

There was far less of a gap between the sexes in rural areas for all racial and ethnic groups generally because a much higher percentage of rural women were licensed. Roughly 95% of both White men and women living in rural areas drove; over 77% of rural Black women and almost 82% of rural Hispanic women had licenses.

Licensing rates were also related to household income, although race and ethnicity had greater impact on differences between the sexes. Roughly 70% of all people 16-64 with household incomes below $5,000 had licenses (71% of the men, 68% of the women) while 95.9% of those with incomes over $70,000 drove (96.5% of the men and 95.2% of the women). However, licensing rates for those 16-64 hit 90% at household incomes of only $25,000—where the difference between the sexes was roughly 4 percentage points.

Figure 13 shows that, overall, having a license was associated with 39% more person trips for men in urban areas and 74% more trips for women. However, there were differences along racial and ethnic lines. White women were most affected by having a license—their daily trips increased almost 80%—but both Hispanic women and women form Other Races substantially increased their travel with a license. Figure 14 shows that having a license increases the substantially increases the *trip-making* of women but increases the mileage of men.

Other analyses strongly suggest that having a job explains more of the differences in men's and women's travel patterns than licensing but not all the differences. Moreover, having a job does not have the same impact on the travel patterns of Hispanic women as it does on the patterns of other women. For example

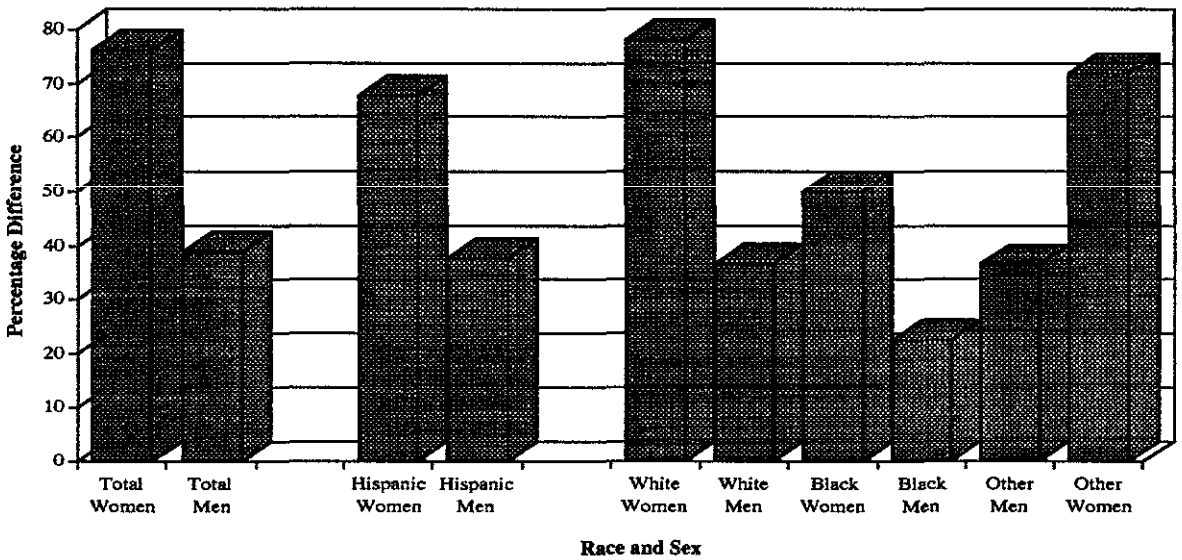
Table 14 **Average Daily Parameters of Urban Travel, by Sex, Work Status, Race, and Ethnicity, People 16-64, 1990**

RACE AND SEX		PERSON TRIPS		PERSON MILES		VEHICLE TRIPS		VEHICLE MILES	
		Worker	Non-Worker	Worker	Non-Worker	Worker	Non-Worker	Worker	Non-Worker
Hispanic (All Races)	Men	3.0	2.0	31.5	21.2	2.2	.9	21.7	37.3
	Women	3.1	2.1	21.2	12.7	1.8	.8	13.1	3.9
White	Men	3.5	2.8	41.0	26.8	2.9	1.9	30.1	15.1
	Women	3.9	3.2	33.7	25.6	2.9	2.0	20.6	12.0
Black	Men	3.2	2.4	27.0	15.8	2.3	1.0	19.4	6.9
	Women	3.4	2.4	24.0	11.7	2.3	.9	14.0	5.5
Other	Men	2.9	2.2	25.4	15.8	2.1	1.0	19.2	7.7
	Women	3.4	2.2	22.2	10.1	2.0	1.0	12.8	4.6

Table 15 **Average Daily Parameters of Rural Travel, by Sex, Work Status, Race, and Ethnicity, People 16-64, 1990**

RACE AND SEX		PERSON TRIPS		PERSON MILES		VEHICLE TRIPS		VEHICLE MILES	
		Worker	Non-Worker	Worker	Non-Worker	Worker	Non-Worker	Worker	Non-Worker
Hispanic (All Races)	Men	2.9	2.1	34.1	5.0	2.2	1.3	30.4	4.1
	Women	3.6	3.3	38.6	22.9	2.7	1.9	25.7	10.6
White	Men	3.5	2.7	41.0	30.0	3.0	2.0	30.2	20.3
	Women	3.9	3.1	33.7	30.6	2.9	1.9	20.6	15.0
Black	Men	3.3	2.4	37.7	12.5	2.7	1.3	32.8	9.4
	Women	3.5	2.4	32.1	18.0	2.4	1.4	17.8	11.3
Other	Men	3.1	2.7	32.9	9.2	2.7	1.1	29.7	3.9
	Women	3.2	2.3	34.4	18.3	2.3	1.2	24.7	6.9

Figure 13 Impact of Driver's License Holding on Person Trips, by Sex, Race, and Ethnicity



Note: % difference in daily person trips between indicated people with and without a driver's license.

while the difference in the vehicle trip rate of Hispanic men and women drops from 40% to 19% when controlling for employment that gap is still more than three times more than that experienced by any other set of workers.

Marital Status and Children

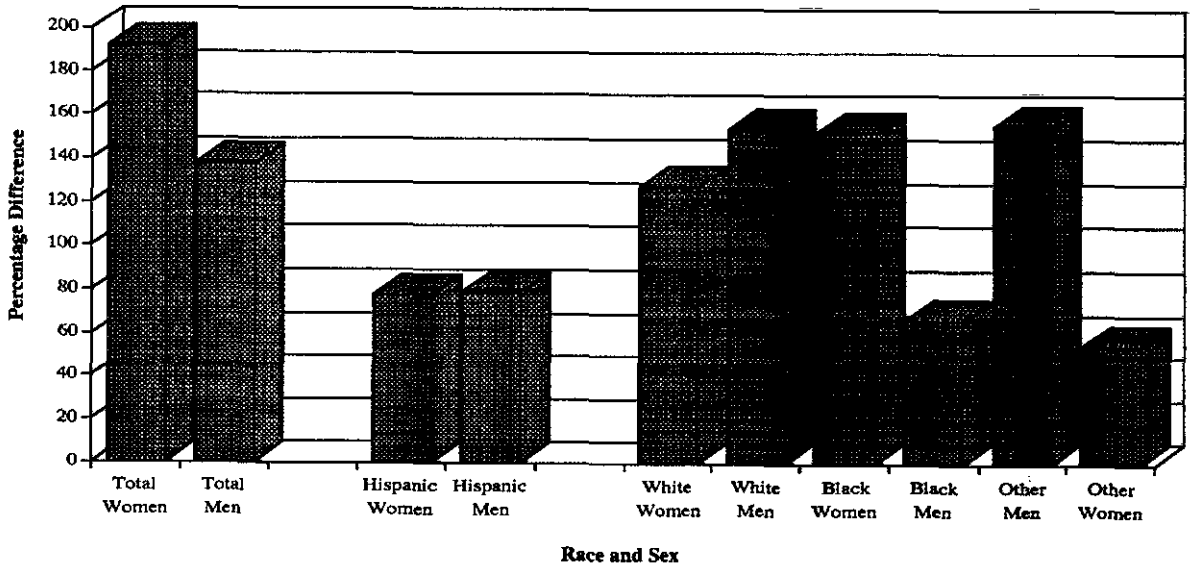
Analyses in a previous section showed that both marital status and the presence and age of children in the household had serious impact on *women's* travel behavior. Here that analysis is disaggregated further by race and ethnicity to see if they add to our understanding of women's travel behavior.

Figure 15 displays the daily trip rate of single female parents 16-64 in urban areas by the age of their children. In the aggregate, as the report showed earlier, those with children 6-15 make more daily person trips than women whose youngest child was younger or older; moreover all of these mothers made in excess of 3.6 person trips per day. However, 1) that pattern is not found among Hispanic single mothers or those of Other Races, and 2) the number of trips taken by Hispanic and non-White single mothers is substantially different than the aggregate or that taken by Whites.

Hispanic single mothers diverge from the overall pattern; they take slightly more trips when they have older children and slightly fewer when their youngest child is 6-15. However, whatever the age of their children, they take fewer trips than Black women and those of Other Races and no more than 60% of the trips of White women. Although Black female parents conform to the overall pattern (the highest trip rate with children 6-15) they make nowhere near the number of trips made by White single parents.

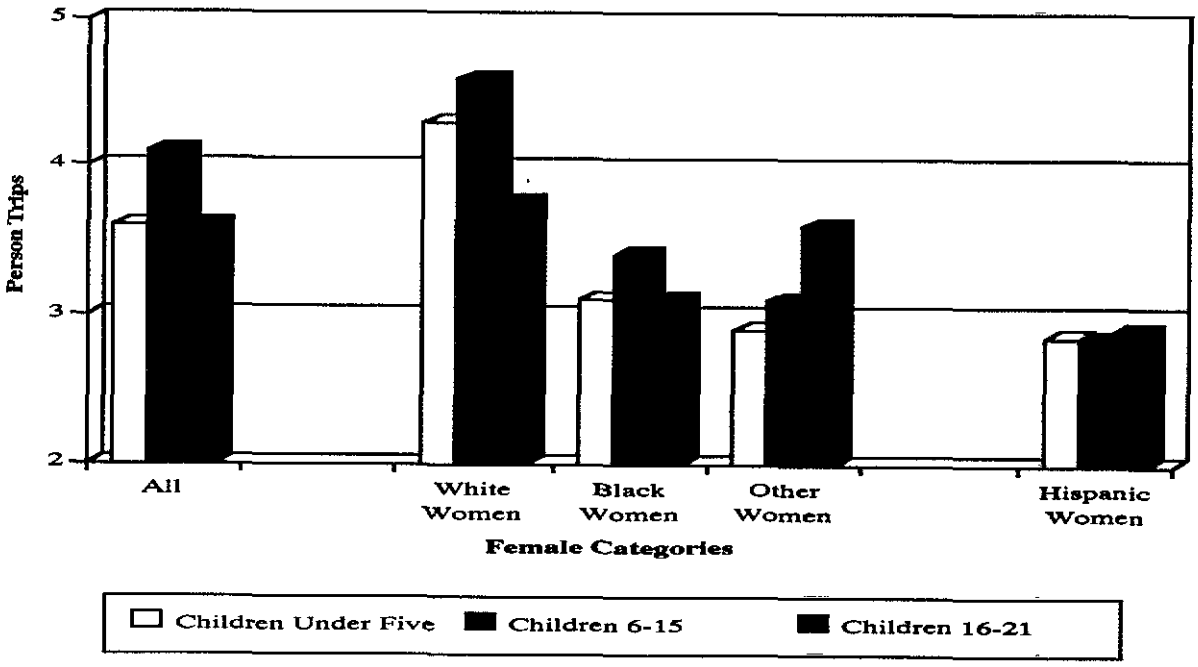
Figure 16 compares the travel patterns of female parents in two adult households in urban areas. The aggregate patterns at the left of the Figure have been seen in earlier analyses; married women take more trips when their youngest child is 6-15 and slightly fewer trips than comparable single female parents. Once again White women have patterns substantially different from other women. Black married women take a

Figure 14 Impact of Driver's License Holding on Person Miles, by Sex, Race, and Ethnicity



Note: % difference in daily person trips between indicated people with and without a driver's license.

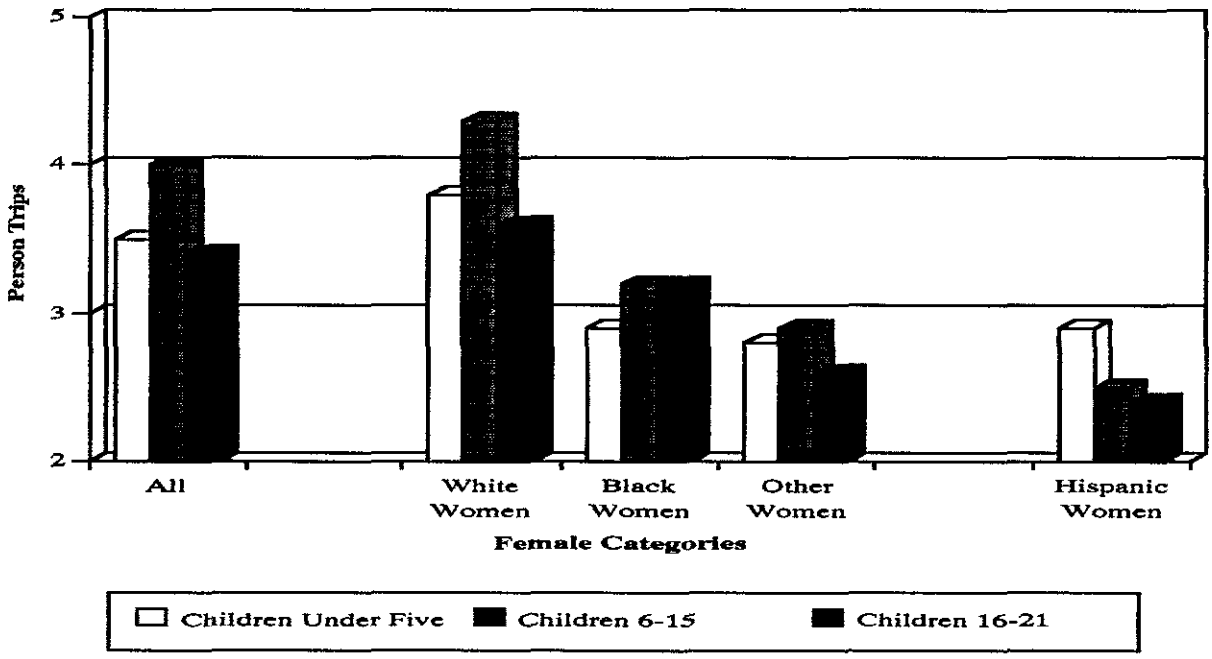
Figure 15 Average Daily Urban Trip Rates of Single Female Parents, by Selected Lifecycles, Race, and Ethnicity, 1990



roughly comparable number of trips for their children over six and substantially fewer trips than women from Other Races.

Again Hispanic women are very different from both the aggregate figures and from non-White women; married Hispanic mothers make more of their trips before their children are school age and fewer as their children get older. Hispanic women actually make fewer trips than any other groups—except for those having very young children, where they make more trips than any other group than Whites.

Figure 16 Average Daily Urban Trip Rates by Female Parents in Two Adult Households, by Selected Lifecycles, Race, and Ethnicity, 1990



Findings and Conclusions

The Societal Backdrop

Our society has undergone profound social and demographic changes in the last thirty years, Census data and a growing body of research show us that many of these changes have differentially affected women and their children and ultimately their travel patterns. Today most women live or work in low density communities. Overall, women account for roughly two thirds of the new entrants into the labor force in the last twenty years and their new trips to work account for a substantial portion of the growth in both travel and auto use. The most drastic increases in auto use in the last 20 years, and the most drastic decreases in transit use, have been among working women.

The majority of married women, and women with children, and women with very young children, are in the labor force, so they must add their job-related duties to their existing childcare and domestic responsibilities. This network of complicated obligations demands multiple and linked trips.

Moreover, the travel patterns of working women are related to where they can find employment and how—and where—they take care, or arrange for care, of their children while they work. Research shows that the jobs open to working women are located in different places in a region than those open to men. Moreover most women cannot have their children cared for in their own homes. Both situations alter and complicate their travel patterns and their mode choices.

The number of families headed by a woman alone has increased substantially and many such families—including some with a parent in the paid labor force—are living in poverty. Many of those heading households by themselves, as well as many of those who are poor, are members of racial or ethnic minorities. Moreover, studies also show that women householders often have travel patterns that are different from both married parents, in part because they are often inner city residents who have to travel further to find any clustering of employment opportunities.

All of these complex situations collide with the escalating dependence of society on a car, which is fueled by increasing real incomes and low density suburban development. As a result, studies show that women are more likely to work very close to home whatever their income, and to link their commute with trips to school or child care centers or shopping, and most importantly, to drive whatever their income. Research indicates that the more complex their childcare obligations, the more likely women are to drive to work alone. Moreover, the car better addresses the security concerns which many women have.

Research indicates that working women with children are particularly dependent on the car because it is the best—and perhaps only—way to balance the child care and domestic responsibilities they retain when they enter the paid labor force given societal constraints—inadequate child and eldercare, limited housing options, segregated labor markets, poor transportation options for children, inaccessible services in the suburban areas in which over 70% of all jobs are located, and unsafe alternative modes.

The literature suggests, that as more women join the labor force, their travel is coming to resemble men's in important ways, while becoming very different in other ways. As women seek jobs outside the home, increase their income, and obtain licenses (and not necessarily in that order) they drive longer and use the car for more of their trips, just as men in the paid labor force have traditionally done. However, because their work responsibilities are added to their childcare and domestic responsibilities they also exhibit markedly different patterns than working fathers. Moreover, their use of the car, while affected by household income, is clearly also strongly related to these complex responsibilities.

Overall Travel Patterns

The NPTS data confirm many of the patterns seen in the literature on women's travel; the data clearly show that the changes in travel have been the greatest among women. In the last two decades our society has seen a significant increase in the role of the auto—coupled with the declining use of transit and carpooling. Between 1969 and 1990 the number of miles travelled by car increased 82% while the number of cars increased 128%[113]. The use of carpools dropped substantially—the average number of people in a car falling 15%—and transit ridership plummeted across the board—for men and women, for Afro-Americans and Hispanics, for the poor as well as for the elderly[114].

From 1969-90, women's share of transit dropped twice as fast as that of men[115]. The number of miles driven by males increased 46% between 1969 and 1990, but those driven by all women increased 76%—and more than doubled among women between 16-34, that is, those entering the labor force[116]. Only among those over 55 did men experience greater increases in miles driven than women.

The NPTS data also show wide differences in the basic travel patterns of men and women. Overall, women 16-64 in both urban and rural areas made more person trips per day than men. However, women made shorter trips; men travelled 27% more person miles than comparable women in urban areas and 16% more in rural areas. Men made more vehicle trips than comparable women and, in both urban and rural areas, covered 60% more vehicle miles.

The NPTS data show that neither having a job nor having a driving license fully explained the differences between the sexes. Both were associated with a) increased travel for men and women and b) reduced differences between the sexes in travel patterns. However most differences between men and women still remained although the gap narrowed. Both men and women with a license and/or a job travelled substantially more than those without but having either or both had a more profound impact on women's travel. Urban women with a license made 76% more person trips and travelled 191% more person miles than women without a license but the difference in men's rates was nowhere near as large.

Household income also had a major impact on travel and helped explain some of the differences between the sexes—but again gaps in travel patterns remained among otherwise comparable men and women. While both men and women's tripmaking increased as household income increased, at all but one income level women made more person trips than men and the gap widened as household income went up. Conversely, at all but the lowest income level men made more vehicle trips than comparable women. The gap in person mile and vehicle mile rates between men and women tended to increase as income increased.

As expected, household income and mode choice were related for both sexes. However, in urban areas, women drove for more of their trips than comparable men at very low incomes, very high incomes, and in some income groupings between—and use of the car was disproportionately greater among women at the *lowest* income levels. Low income women in urban areas were even more dependent than men on the car for the work trip; women were more likely to use a car for their commute than comparable at incomes below $25,000 and the differences in other categories were small.

In rural areas, where dependence on the car is greater, women at income levels under $40,000 took more of their trips in a private vehicle than comparable men and the differences were the greatest at the lowest incomes. For example, rural women 16-64 with incomes under $10,000 took 91% of all trips in a private vehicle compared to 81% of those of comparable men.

Transit use was inversely related to income but the rate of change was different for men and women. Men in urban areas were more likely to use transit for all their trips than comparable women at low incomes and high incomes. However, low income women were more dependent on transit for the work trip.

As expected, distance to work increased as income increased but disproportionately more for men so that the gap between the sexes widened. Women 16-64 in both urban and rural areas worked closer to home than men from households with comparable incomes—although the gap was wider in rural areas.

A combination of worker status and income was linked to travel behavior but, again, differentially for men and women. Working women 16-64 in urban areas made more person trips than comparable men in every income category. Moreover, women who were workers made substantially more person trips than women who were not in all but the highest income category but the differences between working and non-working men were not nearly as great. In addition, the mileage increase associated with having a job was higher for women in each income category.

A combination of license holding and income failed to explain all of the differences in the travel patterns of comparable men and women. Moreover, although increasing income was strongly linked to increasing rates of travel for people *with* licenses, it had far less impact on the trip rates of non-licensed people, and particularly women without licenses.

In summary, traditional travel variables—household income, license-holding, employment—do more to explain the differences among women and among men than they do to explain the differences *between* comparable men and women. The higher person trip rates of women persist through every traditional analysis, as generally does the shorter distances and fewer private vehicle trips. The one major exception: the travel patterns of people from households with low incomes.

The NPTS data repeatedly demonstrate unexpected behavior and choices by low income people, and particularly low income women. Low income people of both sexes in urban areas and low income women in rural areas worked further from home than comparable people from households making more, sometimes substantially more, money. At the very lowest income levels women workers travelled further than comparable male workers. These findings may support the hypothesis that low income people, but mostly women, face employment opportunities which are located in different parts of the metropolitan region.

Overall, these patterns strongly suggest that women are affected by variables other than, or in addition to, household income or license holding. It appears that either these variables do not affect the travel patterns of men or they do so to a far lesser degree.

The Impact of Children

The NPTS data clearly show that the presence of children impacts both men and women but again in different ways. Having children had profound impact on the trip rates of women and almost no impact on the travel patterns of men—unless they were single parents. Married fathers always made fewer trips than comparable married women, with the largest gap when the youngest child was 6-15.

Men with children made *fewer* vehicle trips and travelled *fewer* miles than comparable men without children and the distance they travelled held constant regardless of the age of their youngest child. Conversely, the distance travelled by women was much more responsive to both having children and to changes in the age of their children. Married women with children made more person and vehicle trips than comparable married women without children although they also travelled fewer miles.

These differences were not explained by income. Married male parents almost always made fewer trips than comparable female parents. Nor did household income differences explain differences in mileage or vehicle trips; relatively independent of income, married women who were parents travelled less and made fewer vehicle trips than comparable male parents.

Marital status also had strong impact on the travel patterns of women with children. Single female parents made more trips than comparable married women at almost every income level and travelled more person miles than married mothers with children under six. Moreover, once their youngest children were school-age, single mothers also made more vehicle trips than comparable married mothers.

As in previous analyses, very low income households acted differently; low income parents, but generally the mothers, travelled further and more often than comparable parents and more than with those with higher incomes.

All of these findings strongly support the contention that women who are mothers make more trips because of their family obligations but travel less distance because of their desire to stay closer to home. Single mothers, lacking in-home help with their children, make more trips than married mothers—but they stay even closer to home (perhaps because they know they are the only back-up their children have). These findings also support previous work which found that the age of the youngest child may make some difference in the travel patterns of male parents but strongly impacts female parents, and single female parents even more so.

The Intersection of Race and Ethnicity

There were sometimes major variations in travel patterns by race and ethnicity; in general men and women in the same group were more similar than were either all men or all women. White men travelled more than all other men while White women travelled more than all other women; White men took more person and vehicle trips than other men, travelling 73% longer than Black men and 64% more than men from Other Races (Non-White, Non-Black). The gap between Whites and others was so large that occasionally White women travelled more than men in another group.

White men made the longest commute trip as did White women in both urban and rural areas although the gap among the sexes was even greater in rural areas. White men drove 10% more miles than Hispanic men (of any race) and 22% more miles than Black men; these patterns held true even when controlling for employment status. Interestingly, while all men drove more than all comparable women, the gap between the sexes was *largest* among Whites. White women, however, always drove more than women of any other races.

Although the private vehicle was the mode for the majority of trips of all people, there were major differences among the groupings. White men drove for substantially more of their trips than any other ethnic or racial grouping. White women drove for more of their trips than other women, but the differences between women were not quite as large. However, both White and Black women took more of their trips in a private car than comparable men, a surprising finding.

However, once disaggregated by background, all women did not take more person trips than all men. Hispanic women and those from Other Races made fewer trips than comparable men. The differences between Hispanic men and women on all indicators of travel were two to three times greater than the differences between the sexes in any other grouping.

Having a job explained many of the racial and ethnic differences but some still persisted. Hispanic male workers in urban areas travel substantially more than comparable Hispanic women; however, the situation is reversed in rural areas where Hispanic women travelled more than comparable men.

There were large differences in the license status of women. While over 90% of all White women 16-64 were licensed only 71% of Black women and 66% of Hispanic women were. Having a license substantially increased total trip making for all women but White women were the most impacted and Hispanic women the least. In fact, the gap between Hispanic men and women was consistently larger than that seen in any other group, independent of income, license holding, or employment status.

White single mothers take substantially more trips than comparable mothers and Hispanic single mothers generally take far fewer trips than other type of single parent. Hispanic married women are also different from comparable women; they take fewer trips than other women—except when they have very young children when their trip rate is second only to Whites.

Other Research

These findings raise as many questions as they answer. The first is whether the differences between *comparable* men and women and among women will continue and if they do what variables will be the most important. Clearly licensing and employment impact the travel behavior of woman; as even more women get jobs or licenses we would expect to see more trip making and greater use of the car. However, the other variables driving women's travel behavior are harder to predict; having children seems associated with more person trips but fewer miles than comparable men, perhaps based in an emotional need to stay close to home, or the inability to run a household with time lost to long commutes or trips. Use of the car and trip making goes up as income rises, but income is not a good predictor of the travel behavior of various women.

While more sophisticated quantitative analysis could be done on the data, it is not clear that much would be accomplished. So many of the key variables are highly correlated to begin with; race is highly correlated with income and income with access to a car and single parent status to income, etc. Thus it may be difficult to untangle the skeins with more mathematical exercises. Moreover, there are serious sample size problems when disaggregating the data by multiple variables. Clearly there is a need to conduct quantitative analyses which simultaneously examine the combined impact of various traditional and less than traditional variables, identifying the most influential variable(s) from a host of highly correlated variables.

It would be extremely useful to have both panel studies and longitudinal studies to better understand why women make the travel choices they do (and the employment and childcare decisions that create their travel patterns) and how these choices change over time in response to the birth of children or children entering school or a change in marital status. It is very tempting to use the NPTS data to conclude what happens to, for example, women as they have children, by comparing women who do and do not, but these are, of course, cross-sectional data describing different women.

Second, the data clearly show that *household income* is a good but flawed indicator of travel behavior, especially when it comes to understanding the dynamics of women's travel. With the growth of two worker households we need a better indicator of the joint impact of personal and total household income on all the major indicators of travel behavior, from work trip mode to total miles travelled. Some observers have noted that the failure of household income as a predictor of women's behavior (except in the coarsest sense) only means that we should be using personal income instead—that regardless of total joint resources a working women rationally makes transportation choices based only on the personal income she derives from working (*ie* not driving far for a low paying job regardless of her partner's income).

But using personal income would create substantial problems as well since it's unlikely that families divide resources exactly according to each adult's monetary contribution to the household; for example, a working women may take the one household car in order to meet her childcare and domestic responsibilities even if she has the lower paying job.

While there is some evidence that personal income is a better indicator of women's travel behavior, this seems a researchable question. It seems more likely that women—or their families— make their travel decisions based on *some mixture* of their personal income and their access to family resources. And that may be the most true for married women with children. Moreover, three out of ten women in American today make more than their husbands and it would interesting to see if their decisions are made in the same way as the other 70% of American families.

Third, it would be unconscionable to ignore the very disturbing patterns of those with very low incomes. The NPTS data clearly show that people, and generally women, who earn below a poverty wage are often travelling further or more than those better off—and disproportionately in the most expensive

travel mode, the car. The literature suggests that these patterns may result from differences in specialized labor markets and the need for single parents to handle all family obligations themselves (lacking a resident partner). Unfortunately that is only an educated guess because we can't really tell from these data.

In fact, data describing sub-regional labor markets are scare. There are only limited empirical studies of the spatial implications of fragmented labor markets *at the local level.* Current economic studies of these issues are useless for transportation planners because the spatial focus is at the metropolitan level—which ignores (or assumes away) the fact that people do not have equal access to all jobs or job locations within a metropolitan area (or the ability or inclination to move to do so).

In order to make intelligent and equitable transportation investment and financing policies we ought to know what creates these anomalies among the poor. It would be extremely useful to know why poor workers are making what may be real sacrifices to travel as they do—whether the cause is segregated housing markets preventing them from moving near their jobs,or the need to remain close to family networks (for child and eldercare while working, for example), or the lack of adequate services near the job, or...

Fourth, it is important to document changes in male parents' travel behavior over time in response to domestic obligations—and the resulting impact on women's travel patterns. Critics have often charged that we are not discussing women's travel patterns and needs but *family* patterns and needs; as more men assume a larger role in their children's lives, men's travel may change as well. While most time-budget and other analyses do not find that men have made such major changes in their lives, it would be useful to see if changes are occurring which will lighten the domestic and childcare burden which appears to create such variations in women's travel.

Fifth, it is important to evaluate the policy implications of these findings, in both the short and long term. If we accept that women's travel patterns are different from men's largely or only partly because they are balancing home and work in a way that men do not, we need to consider the impact of pending transportation control programs (to be developed to respond to ISTEA and Clean Air Act Amendment mandates). It is not at all clear that working women, particularly those who are mothers, can easily change their travel patterns or drop their dependence on the car in response to parking controls, road pricing, or heavy taxation.

Notes

[1]U.S. Bureau of the Census, *Households, Families, and Children: A Thirty Year Perspective,* by Terry Lugaila, Current Population Reports, P23-181, Washington. DC: GPO, 1992, p. 27.

[2]*Households, Families, and Children,* p. 53.

[3]*Households, Families, and Children,* p. 28.

[4]*Households, Families, and Children,* p. 43.

[5]U.S. Department of Commerce, *Women in the American Economy,* by Cynthia M. Taeuber and Victor Valdisera, Current Population Reports, Series P-23, No. 146, Washington, DC: 1986, p. 9.

[6]*Households, Families, and Children,* p. 28.

[7]*Households, Families, and Children,* p. 29.

[8]National Council of Jewish Women, *The Experience of Childbearing Women in the Workplace; The Impact of Family Friendly Policies and Practices,* for the Women's Bureau, U.S. Department of Labor, February 1993, p. 1.

[9]Maureen O'Connell, "Maternity leave arrangements, 1961-1985," paper presented at the Annual Meeting of the American Statistical Association, Washington, DC, 1989.

[10]*Women in the American Economy,* p. 9.

[11]*Women in the American Economy,* p. 9.

[12]*Households, Families, and Children,* p. 36.

[13]*Households, Families, and Children,* p. 37.

[14]*Households, Families, and Children,* p. 39.

[15]U.S. Census, *Who's Minding the Kids? Child Care Arrangements: Fall 1988* (Data from the Survey of Income and Program Participation), by Martin O'Connell and Amara Bachu, Current Population Reports, P70-30, Washington, DC: GPO, 1992, p. 4.

[16]U.S. Bureau of the Census, *Who's Minding the Kids?* , p. 5.

[17]U.S. Bureau of the Census, *Who's Minding the Kids?,* p. 9.

[18]U.S. Bureau of the Census, *Who's Minding the Kids?,* p.9.

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[49]Commuter Transportation Services, *State of the Commute Report,* 1992, Los Angeles California, p. 14.

[50]*Ibid,* p. 46.

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[53]Sandra Rosenbloom, *The Transportation Patterns and Needs of Salaried Mothers; A Comparative Assessment,* Final Report to the Gender Roles Program, The Rockefeller Foundation, Feb. 1988, 97 pp.

[54]Although some people object to the use of the term "mode" to define the chauffeuring done by a mother for her children (since the actual mode is a private vehicle), it is a useful term which conveys easily the burden born by these women (rather than their cars).

[55]Sandra Rosenbloom, *The Transportation Problems of Single Mothers in France and the United States, op. cit.*

[56]Lidia P. Kostyniuk, et al, "Mobility of Single Parents; What Do the Trip Records Show," *Journal of Specialized Transportation Planning and Practice,* Vol 3, no. 3, 1989, pp. 207-218.

[57]Ibipo Johnston-Anumonwo, "Journey to Work: A Comparison of Characteristics of Single and Married Parents," *Journal of Specialized Transportation Planning and Practice,* Vol 3, no. 3, 1989, pp 219-246.

[58]*Ibid,* p. 19.

[59]Brent M. Rutherford, and Gerda R. Wekerle, "Single Parents in the Suburbs; Journey to Work and Access to Transportation," *Journal of Specialized Transportation Planning and Practice,* Vol 3, no. 3, 1989, pp 277-294.

[60]Sandra Rosenbloom, "The Transportation Needs of Single Salaried Mothers: A Critical Analysis," *Specialized Transportation Planning and Practice,* vol. 3, no. 3, 1989, pp. 247-276.

[61]A *Household* consists of all people who occupy a housing unit; it can include both related and unrelated people who live and eat together (although not group quarters). Families are groups of two or more persons, one of whom is the head of the household—or householder—who are related by birth or marriage or adoption and who live together. Finally *family households* are households

maintained by a family as just defined.

[62]U.S. Bureau of the Census, *Money Income of Households, Families, and Persons in the United States: 1991*, Current Population Reports, Series P-60, no. 180, Washington. DC: GPO, 1992, p. xiii.

[63]U.S. Bureau of the Census, *Money Income of Households*, p. xii.

[64]U.S. Bureau of the Census, *Money Income of Households*, p. xii.

[65]U.S. Bureau of the Census, *Households, Families, and Children*, p. 44.

[66]U.S. Bureau of the Census, *Households, Families, and Children*, p. 30.

[67]U.S. Bureau of the Census, *Households, Families, and Children*, p. 33.

[68]U. S. Bureau of the Census, *Households, Families, and Children*, p. 32.

[69]A family household headed by a woman without a spouse could include a mother and adult daughter or two siblings as well as a women and her small children.

[70]U.S.Department of Commerce, *Income, Poverty, and Wealth in the United States: A Chart Book*, Current Population Reports, Consumer Income, Series P-60, No. 179, by Leatha Lamison-White, July 1992, p. 6.

[71]U.S.Department of Commerce, *Income, Poverty, and Wealth*, p. 7.

[72]U.S.Department of Commerce, *Income, Poverty, and Wealth*, p. 8.

[73]U.S.Department of Commerce, *Income, Poverty, and Wealth*, p. 16.

[74]U.S.Department of Commerce, *Income, Poverty, and Wealth*, p. 16.

[75]U.S.Department of Commerce, *Income, Poverty, and Wealth*, p. 17.

[76]U.S.Department of Commerce, *Income, Poverty, and Wealth*, p. 17.

[77]U.S.Department of Commerce, *Income, Poverty, and Wealth*, p. 18.

[78]Sandra Rosenbloom, "The Transportation Needs of Single Salaried Mothers": 1989, pp. 249.

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[92]Rosenbloom, "The Transportation Needs of Single Salaried Mothers;"*op. cit.*

[93]Sandra Rosenbloom and Elizabeth Burns, *Do Environmental Measures and Travel Reduction Programs Hurt Working Women?*

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[95]*Ibid,* p. 19.

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[112]The racial and Hispanic data in the 1990 NPTS are organized separately because Hispanics can be of any race. This Table, and subsequent ones, present data originally analyzed separately and shown together for ease of understanding. It is important to recognize the columns are not mutually exclusive because each of the racial categories can include people who are of Hispanic origin.

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[114]U.S. Department of Transportation, Federal Highway Administration, *Travel Behavior Issues in the 90's,* by Alan Pisarski, July 1992, p. 24.

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