

Commission Briefing Paper 4A-07

Implications of Work and Non-Work Travel Patterns on Passenger Travel Demand

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Introduction

This paper is part of a series of briefing papers to be prepared for the National Surface Transportation Policy and Revenue Study Commission authorized in Section 1909 of SAFETEA-LU. The papers are intended to synthesize the state-of-the-practice consensus on the issues that are relevant to the Commission's charge outlined in Section 1909, and will serve as background material in developing the analyses to be presented in the final report of the Commission.

Travel for non-work purposes, including shopping, errands, and social and recreational activities, is growing and can be expected to grow faster than work travel in the next five decades. If current trends in travel continue unabated, non-work travel is expected to grow 70 percent by 2050, compared to 39 percent for work travel.

Reversing a historic trend, travel speeds have started to slow down. Non-work travel and work travel overlap, even during the peak weekday periods, increasing congestion. Currently, half of peak period travel is for non-work purposes, even excluding the stops commuters make. Important transformations that will impact the balance of work and non-work travel include declines in the percent of the population in traditional working ages (16-65), changes in household composition and the effect of the Internet on travel for different purposes.

Background and Key Findings

The forecasts presented here use current travel behavior from the most recent National Household Travel Survey (NHTS) applied to Census forecasts of population. Of course, as society changes, so too travel behavior changes over time—fifty years ago people did not drop their children at daycare and stop at Starbucks on the way to work, or pick up dinner and a movie at a drive-through. Fifty years from now people will travel in new ways. Unlike the U.S. Census, which collects data only on the journey to work, the National Household Travel Survey (NHTS) collects data on travel for all purposes. The NHTS is the only national source of data on trends in travel behavior.

Key Findings Include:

- Important historical trends; the proportionate decline in the working age population, changes in the composition of households, and further spread of metropolitan areas, if continued, will influence the balance between work and non-work travel in the future:
 - As the population ages, non-work travel will continue to grow faster than work travel.
 - Single person households are growing faster than households with children, leading to dispersal of trips among different households.

- Reversing a historic trend toward increasing speed of travel, current trends point to a slowing of average speeds.
- Historic trends show that while work travel has kept pace with the growth in employment, shopping and social/recreational travel has doubled in the last 4 decades.
- If current trends continue, VMT will grow tremendously, perhaps even doubling again by 2050. A healthy and mobile older population, and most importantly the assumption of continued economic expansion will combine to fuel the growth in recreational travel.
- Currently, work and non-work travel intersects during peak travel times, which can lead to congestion. According to the NHTS, half of all vehicle trips made during morning and evening peak periods are for non-work reasons, such as dropping or picking-up kids at school, shopping, or social/recreational purposes. The evening peak period is dominated by non-work travel, with fewer than one out of three trips a commute trip.
- The Internet, while possibly shifting some shopping trips to home delivery of goods, will further stimulate recreational travel as people develop social networks without geographic constraints. Non-work travel, especially shopping and household sustaining errands (such as banking, bill-pay), and for social and recreational reasons (such as sightseeing or dating), are already impacted by the use of the Internet. The effect is complex and may take these two areas of travel (shopping and social/recreational) in different directions.

Historical Trends

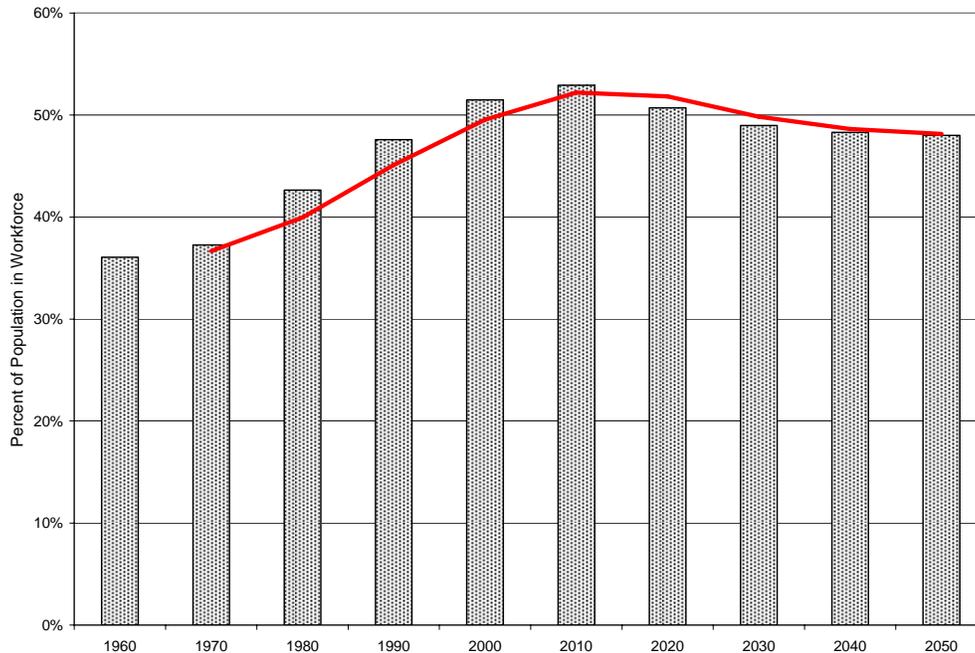
Major demographic shifts are occurring that will profoundly affect the balance of work and non-work travel in the next five decades. Many of these are the subjects of separate papers (aging population, immigration, etc.). Two are outlined here: the change in the proportion of people of working age and the changes in the composition of households.

One fundamental change is the slowing of growth in the working-age population. Figure 1 shows the historical and estimated percent of the population in the workforce, from 1960 to 2050. As Alan Pisarski says, the end of the baby boom is the end of the worker boom.

Commuting in America III notes that the working age share of the population drops sharply after 2010 as the over 65 age group rises from 13 percent to 16 percent in 2020 and to 20 percent of the total population in 2030. The potential impacts of this shift in the proportion of working-age adults in the population are debated widely, but undoubtedly will have a major effect on the amount of added VMT, and the balance of travel between work and non-work purposes.

Looking forward, the shift in the proportion of people of working age (Figure 1) provides a challenge to forecasters. At age 30-54 people are in their peak working years, with work travel at its highest level (21 percent of trips and 27 percent of miles) before it starts to decline. Currently, people aged 30-54 are 75 percent of the population, by 2050 they will be just 61 percent, and between 2000 and 2050 this segment of the population will grow by only 21 percent compared to the nearly tripling of the 75 and older population.

Figure 1 – Percent of the Population in the Workforce, 1960-2050



Source: U.S. Census Bureau Population and Workers, 1960-2000 and current Labor Force Participation by Age and Sex and Population Projections, 2010-2050

If the shift in the proportion of people of working age is met with further mechanization, increased productivity, more part- and flex-time work, amenities to keep older workers employed, and policies which allow more immigrant workers, then the patterns of commuting will change. For example, older Americans may continue to work past traditional retirement age, and older workers currently work closer to home or from their homes, and are more likely to work part-time.

The changing composition of households is another, less obvious demographic shift that will have a substantial impact on work/non-work travel patterns. For instance, over a quarter of all U.S. households are people living alone, and this is the fastest growing segment. In 1960, 61 percent of the households had a father working outside the home, a homemaker mother, and three children. By contrast in 2000, 67 percent of households were not nuclear family, 28 percent were married couples with no children at home, and 26 percent were living alone—the fastest growing segment.

Household size and composition have a major influence on travel. For example, single-person households are more likely to eat out. The shift from traditional nuclear families (two parents and children) to more diverse and smaller households adds to the number of people separately traveling to work, the grocery store, for errands, and to recreational activities. Other changes include households with shared custody of children, senior living developments, and the growth in multi-worker/multi-family households (such as new immigrant households). In 2000, 13 percent of households fell into this category.

The continued development of suburban areas changes the geography and time-of-day patterns of congestion, including peak spreading and weekend congestion. The effect of greater distance between where we are and where we want to go significantly affects our daily lives—there has been an explosion of people who drive alone to work, for instance.

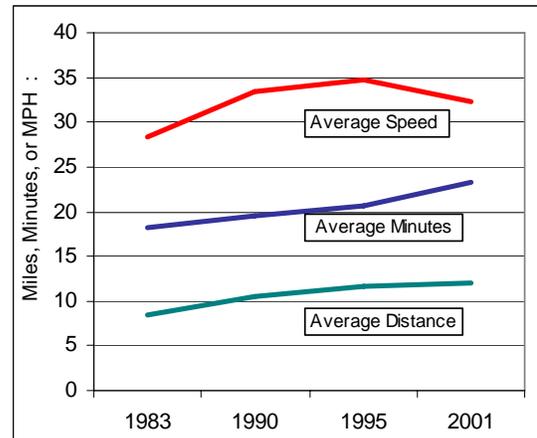
Moving to a private vehicle may have saved travel time in the early days of suburban growth but travel time to work has increased in the last decade in every large metro area. But reversing an historic trend towards faster travel, the estimated speed for all trips is slowing, as shown in Figure 2. The potential impact on the slowing speed of travel, combined with increased travel demand for all purposes, is difficult to forecast.

Trends in Patterns of Work and Non-Work Travel

Travel to work has historically defined peak travel demand, and in turn influenced the design of the transportation infrastructure. Work trips are also critical to transit planning, and help determine the corridors served and the levels of transit service available. And importantly, commuting is a sector of travel that can be affected by policy.

Work as a proportion of all person trips (movement from one location to another) has been steadily declining since 1969, when work trips were about 25 percent of all person trips and nearly a third of all vehicle miles. In 2001, work trips accounted for just over 16 percent of all person trips for the same population (ages 5 and over), and 27 percent of all vehicle miles. If current trends continue, the NHTS

Figure 2 –Trends in Miles, Minutes, and Speed of travel, 1983 to 2001



Source: National Household Travel Survey Data Series

Good-Bye 9-5

At Best Buy's corporate headquarters in Richfield, MN, the company is incubating a new approach that lets employees work anywhere, anytime, pushing flex time to new extremes.

Participating employees can do their work wherever and whenever they want, so long as they get it done. For some employees, the program means they can work at a laptop in bed, shop in the middle of the afternoon, then return to work at night.

After three years of workers slowly shifting over to the program, about two-thirds of the corporate staff at Best Buy is now on 'Results Oriented Work Environment' (ROWE). And the numbers keep rising.

Corporate America has mostly taken a cautious approach to creative work arrangements. More than 20 percent of the corporate workforce telecommutes, but a lot of companies only offer the option to small groups of employees. Perhaps Best Buy's wide-scale foray could help move that along.

- Minnesota Public Radio,
December 11, 2006

This paper represents draft briefing material; any views expressed represent the position of either the Section 1909 Commission

data series shows that travel will increase dramatically, but the increase in work trips will not keep pace with the increase in recreation, errands, and shopping.

However, commuting contributes heavily to the peak period congestion; 85 million workers (two-thirds of all commuters) usually leave for work between 6:00 and 9:00 am, and over 88 percent are in private vehicles. Even as we see more evidence of peak-spreading in response to congestion, currently six out of ten workers are in sales and service, clerical, manufacturing, or similar jobs that may have inflexible start times.

In the next few decades, if the US moves toward a more amenities-driven employment equation, flexibility of work location and start times, coupled with the power of communications technology, has potential effects on miles of travel, congestion, and the time-of-day of travel. A separate commission paper is specifically addressing telecommuting.

The Commute is Becoming More Complex

The typical commute is becoming more complex—for instance, trip chaining is increasing and changing character. Trip chaining has been called a rational response to the burden of time and duties, such as household sustaining activities involving childcare, home-care, and vehicle-care. And the number of workers who stop during the commute is rapidly increasing. Just since 1995, 25 percent more commuters stop for incidental trips during their commutes to or from work, especially workers with the longest commutes.

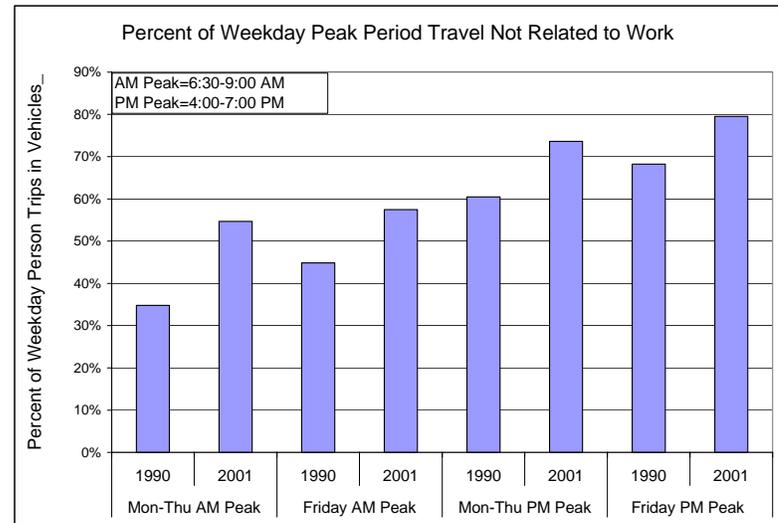
Commuters stop for a variety of reasons, such as to drop children at school or to stop at the grocery store on the way home from work. Real life examples show that the time, location, and frequency of these other trips can be dictated by the work trip as people respond to the pressures of work and home. But the data also show that some of the growth in trip chaining has been to grab a coffee or meal (the Starbucks effect); activities that were previously done at home and would not have generated a trip. The effect on route choice, congestion, and the air-quality impacts of adding these non-work trips into the commute deserves more study.

Non-Work Travel and Work Travel Intersect During the Peak Periods

The growth in travel for shopping, family errands, and social and recreational purposes reflect the busy lives and rising affluence of the traveling public. But many of these non-work trips conflict with commute trips, such as weekend recreational trips that start Friday afternoon. Peak congestion around attractions and leisure spots can be worse than congestion in the city center at rush hour.

This paper represents draft briefing materials that represent the position of either the Section

Figure 3 – Percent of Weekday Peak Period Travel not Related to Work



Currently, more than half of peak period person trips in vehicles are not related to work (see Figure 3). During the weekday peak periods of travel (6:30 am to 9:00 am on weekday mornings, 4:00 to 7:00 pm on weekday afternoons), non-work travel is 44 percent of trips during the am peak travel and 58 percent of trips during the pm peak.

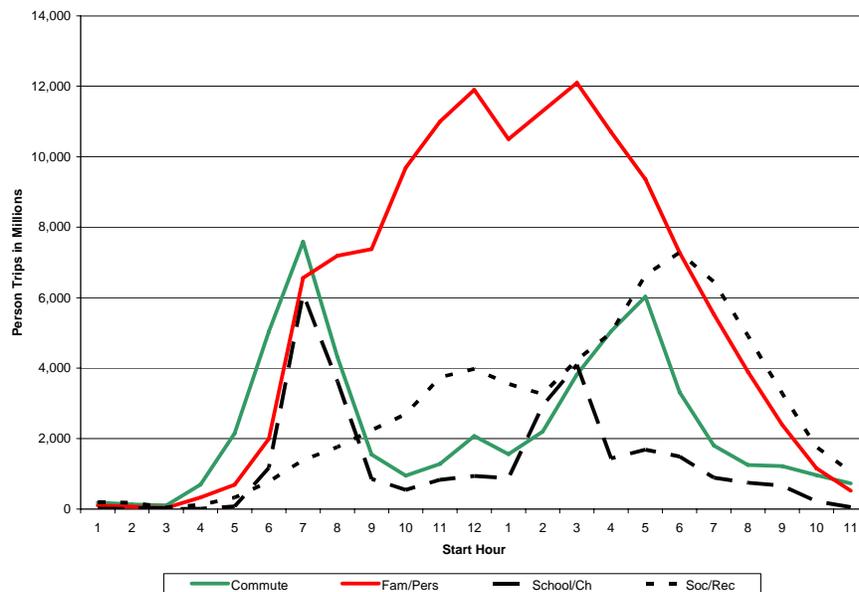
Primarily these non-work trips are to shop, drop or pick-up a passenger, or (especially in the PM) travel for social or recreational purposes, including eating. During the AM peak, shopping and errands (26%), serve passenger (20%) and going to school (10%) are the most common reasons for travel. In the PM peak, shopping and errands (26%), social and recreational including getting a meal (23%) and serve passenger (9%) are the most common reasons.

Midday and Weekend Travel

Since non-work travel has a different time-of-day profile than commuting, the growing segment of travel is on the shoulders of the peak and midday (Figure 4). On an average weekday, the number of trips for family and personal errands, including shopping, are far more numerous than commutes or trips for school from 8 in the morning and on throughout the rest of the day. The mountain of travel during the midday builds to the PM peak, where the commute home, errands, and social/recreational travel all intersect.

In addition, weekend travel is also growing fast. There are over 180 million more (4.2% more) vehicle trips nationwide on Saturday between 1:00 and 2:00 pm than on Wednesday at 5:00 pm (peak hour). This is changing the historical idea of the design peak—for some communities peak vehicle traffic occurs on Saturday afternoon.

Figure 4 – Person trip by Time of Day

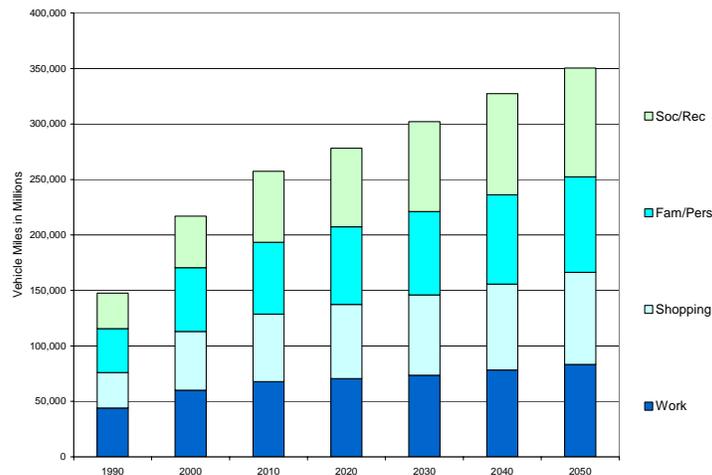


Source: National Household Travel Survey

Forecast of Work and Non-Work Travel Demand

Figure 5 shows the forecast of work and non-work annual vehicle miles from 1990 to 2050, based on current vehicle travel, including auto occupancy, by age and sex and purpose combined with Census population projections. Daily patterns of travel shift with age, especially the miles, purpose, and time of day. By 2050, vehicle miles for shopping are expected to grow 56 percent, family and personal errands 50 percent, and social and recreational travel by 110 percent, if current travel patterns continue. These increases are entirely fueled by the population projection—if baby boomers enjoy better health, wealth, and more active lifestyles, as many researchers suggest, then their travel patterns will surely reflect that.

Figure 5 – Growth in Work and Non-Work Vehicle Miles of Travel, 1990 - 2050



Source: Vehicle miles of travel by age and sex and purpose from NHTS 2001 applied to Census population projections by age and sex

Potential Impacts of Technology on the Non-Work Travel Demand

The impact on travel of such things as telecommuting, teleshopping, and telebanking remains unclear. Now, much of daily household business, correspondence, and entertainment can be accomplished through the Internet. Tasks like buying and sending greeting cards, renting home movies, banking, and purchasing goods and services, which have traditionally generated trips, can be done from the comfort of home. The issue is not whether these technologies will come to replace daily travel. The challenge lies in the ability to foresee how the lifestyles of Americans will change with the Internet as one factor. From analysis conducted with the NHTS data, it seems that trends in shopping and in social/recreational travel may take different paths.

Will new technologies proliferate in an exponential manner as in the case of wireless phone usage, or will growth be steadier and more linear, comparable to that of alternative fueled vehicles?

John S. Miller,
VTRC
Public Roads, 2004

Shopping and Errands

Currently, shopping and errands are aided by on-line gathering of information, which in turn may influence the number, timing, and destination choice of travel. The United States Postal Service survey (HDS) shows that on-line purchases have become more common in the last five years.(2) In 2005 US households received 2,712 million packages, and 863 million of those (31.8 percent) were from Internet orders.

One consequence of online shopping is the shift of travel from the household to commercial delivery vehicles. “More online and telephone ordering by households and businesses creates more diverse sources of product supply and more package delivery”. (3) Commercial VMT, freight and especially light-duty commercial vehicle travel, is increasing at a faster rate than household VMT. Going forward, deliveries of goods and services to the home (e.g. internet shopping, grocery and household goods delivery) may change patterns of residential-based trips to commercial delivery trips.

Overall, distributing e-commerce goods to households is poised to create a huge new demand on the transportation system, and there is concern among the private sector about the ability of the current infrastructure to handle the capacity and speed demands of a virtual marketplace. Until recently, the fastest growing sectors of on-line sales and services came from areas that don't require delivery of a product (financial services, music, games, and software) or small packaged goods that are delivered via existing third-party vehicles (books, computers, and drugs). Future growth may come from consumer demand for more everyday needs—groceries, for instance-- that require a new method of delivery and possibly are more infrastructure-dependent.

American consumers demand flexibility of delivery options for on-line purchases in terms of timed slots and specified delivery days, as well as overall improvement in reliability and reduction in cost. The ability of the local and national transportation systems to accommodate demands of retailers and consumers for fast, flexible, on-time delivery of goods to households, and the potential growth in light-duty truck volumes that may accompany greater home delivery, will become an important policy and planning question in the future in all types of geographic areas.

Recreational Travel

Some researchers believe that computer technology and telecommunications will replace recreational trips, since the vast array of games and on-line communities may encourage people to stay at home rather than recreate away from home.

Historically, enhanced communication with distant people and information about distant places has generally led to more travel not less. Far-flung social networks developed through the Internet may inspire far-flung visits, just as on-line dating sites bring people together across wide geographies. Growing Internet activities to aid recreational activities, in addition to ticket purchase and travel/sightseeing planning, include gaming (e.g. Fantasy Football), on-line communities (MySpace), and individually developed networks through blogs, hobbies, and shared interests.

Conclusions and Policy Implications

Demographic trends, such as greater longevity and the end of the worker boom, the shift to single-person households, the wider social networks engendered by on-line communities; combined with a strong economy, will fuel continued growth in social and recreational travel.

Throughout the next five decades, there will be changes in patterns of commuting in concert with changes in the workforce, and the continued growth in non-work travel. Per capita non-work trip making has grown substantially in the last four decades, and using current rates may understate

the future growth. However, even with current per capita rates, the changes in the composition of the future population of the U.S. will lead to a more than doubling of VMT for non-work travel.

And it could very well be much more than that. As educated and economically stable baby-boomers move through their golden years, they will increase the amount of local, cross-country and foreign travel. As longevity increases well past the expected employment age, and if employers are willing to offer the right amenities, work travel by baby boomers, both in their original careers, and in second careers and volunteer work, will also increase.

Since non-work travel is dispersed, localized, and spread among purposes as well as origins and destinations, policies have focused on the work trip as an area of possible impact. But policies have complex results and sometimes unintended consequences--telecommuters may make more trips during their work-at-home day, and workers may continue to consolidate trips into chains, but not necessarily to save air-quality and reduce fuel consumption, but to multi-task by eating breakfast in traffic rather than at home.

In summary, key trends to look forward to over the next five decades include:

- The proportionate decline in the working age population, and the potential of baby-boomers to work past the traditional retirement years.
- The effect of the decrease in travel speed on the propensity for discretionary travel
- The effect of a different time of day profile for non-work travel—are we headed for all day congestion?
- The new demand on the infrastructure and system use of delivery of goods and services to households.
- The growing social networks engendered by the Internet, in concert with other factors, which may increase local and long-distance social and recreational travel.

If current trends continue, VMT will grow tremendously, perhaps even doubling again by 2050. A healthy and mobile older population, and most importantly the assumption of continued economic expansion will combine to fuel the growth in recreational travel.

One area where policy and education initiatives may have impact is encouraging workers to spread out their start and end times, if they have flex time, and encouraging workplaces to offer flextime if they can. With increased ease of communication, employers may find that telecommuting and flextime adds to productivity.

Only an on-going commitment to collect information on how Americans travel will allow us to predict and respond to changes in travel, instead of react after the fact. We cannot be architects of our future without knowledge, and in this case knowledge comes from current data about how the American people use the transportation system. The NHTS provides the ability to access information about travel and the characteristics of the traveling public. Information like this is key to understanding trends in travel behavior, and anticipating future needs.

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