COMMUTING IN AMERICA III

The Third National Report on Commuting Patterns and Trends

NCHRP REPORT 550
National Cooperative Highway Research Program

TCRP REPORT 110
Transit Cooperative Research Program

TRANSPORTATION RESEARCH BOARD
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Alan E. Pisarski

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Subject Areas
Planning and Administration; Public Transit; and
Highway Operations, Capacity, and Traffic Control

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The highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association, and it receives the full cooperation and support of the Federal Highway Administration of the U.S. Department of Transportation.

The Transportation Research Board (TRB) of the National Academies was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. TRB is uniquely suited for this purpose as it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; and its relationship to the National Academies ensures objectivity.

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The need for TCRP was originally identified in a 1987 TRB report, *Research for Public Transit: New Directions,* based on a study sponsored by the Urban Mass Transportation Administration—now the Federal Transit Administration (FTA). A report by the American Public Transportation Association (APTA), *Transportation 2000*, also recognized the need for local, problem-solving research.

Established under FTA sponsorship in July 1992, TCRP was authorized as part of the Intermodal Surface Transportation Efficiency Act of 1991. In 1992, a memorandum agreement outlining TCRP operating procedures was executed by the three cooperating organizations: FTA; The National Academies, acting through the Transportation Research Board (TRB); and the Transit Development Corporation, Inc. (TDC), a nonprofit educational and research organization established by APTA. TDC is responsible for forming the independent governing board, designated as the TCRP Oversight and Project Selection (TOPS) Committee.

Research problem statements for TCRP are solicited periodically but may be submitted to TRB by anyone at any time. It is the responsibility of the TOPS Committee to formulate the research program by identifying the highest priority projects.

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The members of the technical panel selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and while they have been accepted as appropriate by the technical panel, they are not necessarily those of the TRB, the National Research Council, AASHTO, the TDC, or the FHWA and the FTA of the U.S. Department of Transportation.

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A document like this requires many hands and minds coming together. Many deserve recognition for their efforts to help make *Commuting in America III* a success. The project panel assembled for this effort was the dream team for anyone taking on this kind of study task. My thanks go to all of them. They were very helpful at every opportunity. I wish that I could have pursued all the vistas that they opened for me. Their chair, Secretary Deb Miller of Kansas DOT, was always available to help and to guide, despite her very weighty duties.

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There also was a team assembled by the TRB Urban Data Committee, which was led by Charles Purvis, and later Ed Christopher, that produced really remarkable datasets regarding downtown CBD commuting and transit corridor commuting that are unique and from which all will benefit.

In terms of putting the document together, TRB's Cooperative Research Programs Publications Office hand-picked and supervised the resources needed to bring the report from manuscript to its final form. The document has been importantly improved by editor Cathy Frye who really did bring a fresh eye to the massive drafts I had compiled and did it with grace and good humor.

The sponsors of my work—NCHRP and TCRP—deserve special thanks. Overall thanks go to Executive Director Bob Skinner and the TRB, who were unstinting in their assistance. The team of Crawford Jencks and Christopher Jenks, managers of NCHRP and TCRP, respectively, and Bob Reilly, director of TRB's Cooperative Research Programs, provided both support and encouragement during the hard sledding.

Finally, special thanks go to John Horsley who insisted that there would be a *Commuting in America III,* supported it vigorously from its inception, and assured that AASHTO, as it had with the predecessor documents, would provide the leadership to make it a success.

Alan E. Pisarski

Foreword

Commuting in America III provides a snapshot view of commuting patterns and trends derived principally from an analysis of the 2000 decennial U.S. census and will be a valuable resource for those interested in public policy, planning, research, and education. This is the third report in this series authored by Alan E. Pisarski, transportation consultant, over the last 20 years. His first two reports, published in 1987 and 1996 along with decennial census data dating back to 1960, also have afforded Mr. Pisarski the opportunity for evaluations of patterns and trends over time. A full appreciation of commuting (the journey-to-work trip) requires an understanding of population and worker trends, the demographics of a changing population and households, vehicle availability, modal usage, travel times, congestion, and work locations—all covered by *Commuting in America III*. Previous *Commuting in America* reports presented an objective base for policy discussions of commuting-related issues. This third edition is expected to do the same.

Representatives of the American Association of State Highway and Transportation Officials (AASHTO) and the American Public Transportation Association (APTA) initiated the idea of support for this third version of *Commuting in America* through the National Cooperative Highway Research Program (NCHRP) and the Transit Cooperative Research Program (TCRP)—programs managed by the Transportation Research Board of the National Academies. Mr. Pisarski conducted work under the joint sponsorship of NCHRP Project 20-24(34) and TCRP Project J-6 Task 55. Mr. Pisarski was assisted by MacroSys Research and Technology in assembling the necessary data. Guidance and reviews of draft material were provided by a joint NCHRP and TCRP project panel, identified elsewhere in the report.

Through AASHTO's pooled fund process, the Census Bureau provides special data tabulations related to the journey to work to participating states and metropolitan planning organizations. From these special tabulations, which comprise the Census Transportation Planning Package (CTPP), Mr. Pisarski is supplied with national summaries. For *Commuting in America III,* the supporting tabular information developed by the U.S. Census Bureau is available on the U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics' website at www.transtats.bts.gov/DataIndex.asp for those interested in pursuing the findings and the characteristics of commuting in more depth. The summary tables can be found under "Census Transportation Planning Package (CTPP) 2000." These data are a valuable resource and should be fully utilized.

Business and government leaders and others involved in public policy and planning will find *Commuting in America III* a vital resource for making

decisions affecting the provision of transportation facilities and services. Decision makers involved in land use and social issues will benefit from a review of the report as well.

Academics will want to use *Commuting in America III* as a resource document in developing and teaching classes on transportation planning and engineering and in research. The snapshot views of commuting patterns and trends over the years based on census data provide illustrative examples of the evolution of the United States and the impact of transportation on its citizens and vice versa.

Curious commuters will be interested in comparing one's daily work trip to that of others. Commuting is an activity—an event—that many experience on a regular basis. It consumes time and effort; it is central to how one goes about business and plans personal time.

And lastly, Mr. Pisarski provides commentary on the future of census data available for analyzing commuting patterns and trends. The decennial system of the "long-form questionnaire" as the fundamental source for commuting data will be replaced by an annual sampling process called the American Community Survey (ACS). Some early results from this process have been included by Mr. Pisarski in his analyses.

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Contents

Contents

Executive Summary

Commuting in America III examines current commuting patterns in light of longstanding trends and emerging factors that affect commuting every day. The Census Bureau's 2000 decennial census and its predecessor long-form surveys in the 1990, 1980, 1970, and 1960 decennial censuses form the primary information source for this and the two previous *Commuting in America* reports. Such detailed, geographically comprehensive data on commuting patterns provide uniform nationwide demographic information associated with work travel and are consistent with most other national sources. One common finding in the 20-year *Commuting in America* series is that the nature of commuting continues to evolve and to challenge us.

In the 1970s, the arrival of the baby boom generation on the work scene changed the entire dynamic of commuting trends. This change was compounded by the major surge of women into the workforce, which produced a permanent change in American commuting. In the 1980s, those patterns broadened and solidified to reveal that the dominant story remained the boom in jobs supporting the job needs of the baby boomers, the boom in suburbanization and commuting from suburb to suburb, and the boom in vehicle ownership and commuting based on the private vehicle. The 1990s, while not seeing an end to those patterns, began to exhibit emerging patterns that indicated greater variability in the trends than previously encountered. These shifts in patterns made the national trend less of a template for individual local trends than it had been in the past.

Based on examination of the underlying factors that govern trends, a new pattern also grew in prominence to reveal a series of dichotomies. There are noticeable differences in commuters who

- Live in areas under or over 5 million inhabitants,
- Are under or over 55 years old,
- Commute less or more than 20 minutes, and
- Leave for work before or after 8 a.m.

Examining these natural breakpoints in the continuum of travel produces an insightful understanding of the trends. The persistence or discontinuation of previously noted patterns, as well as the acknowledgment of a series of surprises, also provides insights as described here.

THE SURPRISES OF CENSUS 2000

To address these issues, understanding must have a foundation in the demographic, economic, and social trends affecting America over the years. Any discussion of current American demography must begin by recognizing that Census 2000 revealed

- A population increase that was far greater than expected;
- An immigration bubble; and
- A simultaneous, unexpected decrease in the number of new workers added in the decade.

Population Increase

A very simple but reliable approach to understanding the nation's population growth and its projections into the future that served well for the last half of the past century was that roughly 25 million persons were added each decade from 1950-1990 and about 25 million per decade were expected to be added out to 2050—thus 100 years of very stable, predictable growth.

When the Census 2000 results were announced, instead of about 25 million in the period from 1990-2000, the census showed an increase of about 33 million, reaching a total population over 281 million. The 30-year decline in the rate of population growth as the baby boom waned took a sharp reversal in the 1990s and returned to the growth rates of the 1970s.

Immigration Bubble

The cause of the unexpected bubble was greater than anticipated immigration. Immigration matters greatly to commuting, changing both its scale and scope because immigrants are very often instant additions to the workforce. The foreign-born population arriving in the 1990s was particularly concentrated in the 25-45 age group.[1] Only 29% of the native population was in this group but 44% of immigrants were in that range. Thus, a shift in population due to immigration has an immediate impact on the number of workers and their commuting. In this case, the size of the age group from

[1] Throughout this report, numbers in a range go to, but do not include, the ending number in the range.

16-65, the main working age group, reached a level in 2000 that had not been expected until 2003.

Unexpected Worker Decrease

Despite the sharp increase in population, worker growth reported by the decennial census was sharply lower than past decades—13 million versus more than 18 million in each of the previous decades. This sharp decline in the number and the rate of growth in workers in the 1990s comes as another demographic surprise. Some decline, certainly in percentage terms, was expected.[2] However, many are hard-pressed to understand the sharper than expected declines, particularly given the larger than expected increases in immigrants that are largely of working age. Table ES-1 shows the growth patterns over the baby boom era in both workers and population.

[2] *Commuting in America II* noted that 1990 would be seen as the turning point that signaled the end of the worker boom.

TABLE ES-1 Worker and Population Increase, 1950-2000

Year	Total Workers (Millions)	Worker Increase (Millions)	Worker Increase (%)	Population Increase (%)
1950	58.9	N/A	N/A	N/A
1960	65.8	6.9	11.7	18.5
1970	78.6	12.8	19.5	13.3
1980	96.7	18.1	23.0	11.4
1990	115.1	18.4	19.2	9.7
2000	128.3	13.2	11.5	13.2
Overall Change		**69.4**	**117.8**	**86.0**

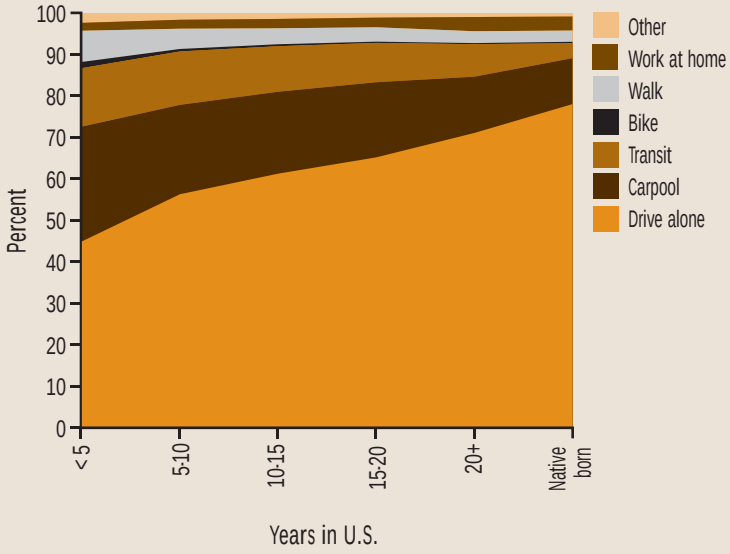
The Impact of Immigration

The two major demographic forces affecting commuting are the declining influence of the baby boom generation and the simultaneous advent of a large immigrant population joining the labor force. Among those who arrived in the U.S. within the 5 years just prior to Census 2000, 80.5% were of working age in the 16-65 age group; less than 3% were over 65.

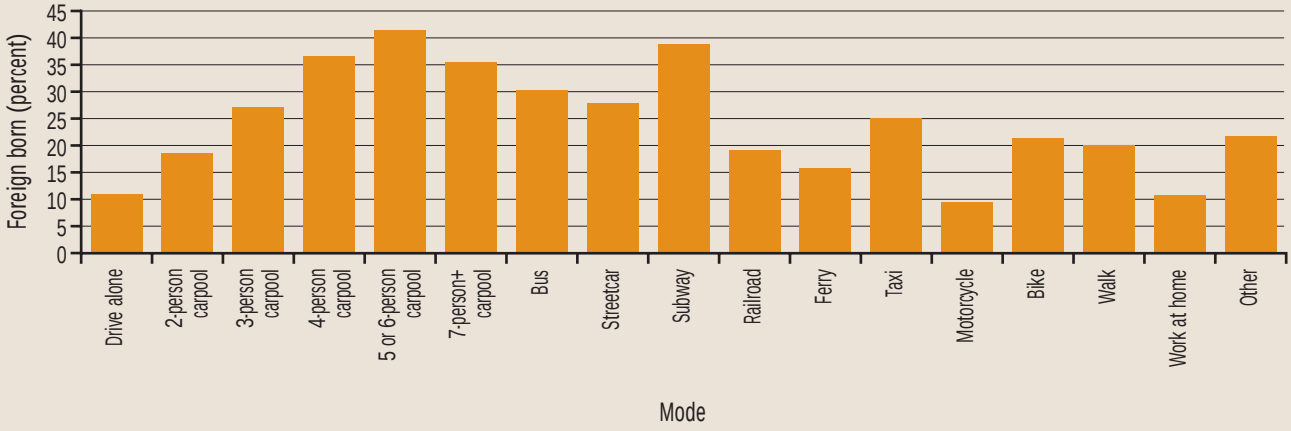
Although immigrants still constitute less than 14% of all workers, their role in most non–single occupant vehicle (SOV) modes of transportation are far greater. Immigrants constitute almost 20% of two-person carpools and more than 40% of large carpools. In particular, Hispanic immigrants are strongly oriented to carpooling and are largely responsible for this mode's resurgence. As shown in the figure below detailing modal usage by the total foreign-born population in the nation, immigrants also play substantial roles in transit, walking, and bicycling.

These modal patterns change with increased years of U.S. residency as shown in the figure to the right. This is consistent with transit's historical role of introducing immigrant workers into the workforce and the nation's economic mainstream.

Modal Usage by Immigrants by Years in the United States



The Foreign Born as a Share of Modal Usage



THE 5-MILLION MARK

Suburbanization Patterns

Suburbanization has influenced commuting throughout the twentieth century, especially in the latter half of the century. Figure ES-1, which depicts the pattern since 1950, indicates that half of the nation's population is now in suburbs. Of the 128 million commuters in 2000, 65 million were suburban residents, with roughly 35 million in central cities, and the remaining 29 million in nonmetropolitan areas.

Changes in geographic definitions from census to census tend to muddy appreciation of what is happening. If the census data are restructured so that year 2000 data are tallied using those metropolitan definitions that were in place in 1980, the results illustrate the strong but hidden pull of rural areas. Close inspection reveals that about one-third of "metropolitan" population growth has been in rural counties on the fringe of metropolitan areas that, when they reach certain commuting characteristics, become part of the defined metropolitan area. In fact, in the 1990s there was a net migration flow out of metropolitan areas to rural areas. This expansion of the size of metropolitan areas has substantial repercussions for commuting and travel times.

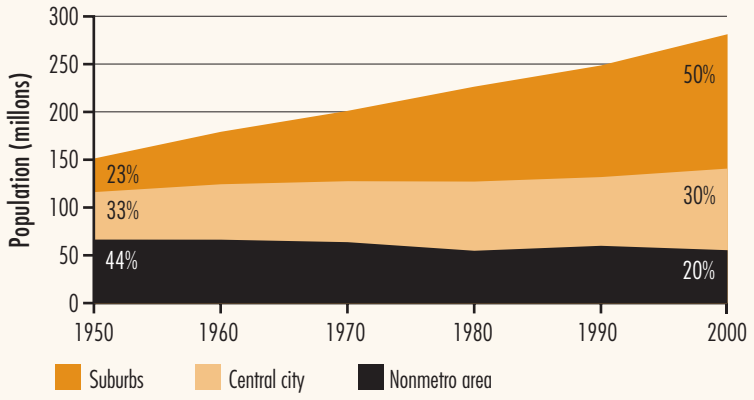
Emerging Megalopolitan Areas

Areas over 5 million in population added over 8 million inhabitants between 1990 and 2000, for a growth rate of just under 11%, slightly below the national rate. As of Census 2000, there were nine[3] areas of the nation over 5 million in population, not five as in 1990, and the 1990 figure used as a base for growth reflects that new base. In fact, the population as presented in 1990 for the five areas over 5 million was under 52 million. So, for the purposes of transportation analysis, the key number is that the population living in metropolitan areas over 5 million grew by over 32 million, or about 60% growth—8 million in change in the same area over 10 years and 24 million as a result of shifts of areas into the 5 million category. A contributing factor was the decision to merge the Washington, D.C. and Baltimore metropolitan areas together, thus creating a new area over 5 million. Preliminary estimates, as of June 2005, put the count at 12 mega-metropolitan areas over 5 million with over 100 million population, or one-third of the nation. The areas added are Miami, Atlanta, and Houston. These 12 areas constitute a major part of the commuting focus, particularly when congestion is a primary concern.

A related point is that as of 2000 there were 50 metropolitan areas identified as over 1 million in population (contrasted to 39 in 1990). Their population was over 162 million, contrasted to about 124 million in 1990, a dramatic increase. More than 40 counties were added to the top 50 metropolitan areas between 1990 and 2000. Most of these metropolitan areas are predominantly suburban with a tendency for greater suburban shares with increasing metropolitan size. In 2005, preliminary estimates of areas over 1 million put the number at 53.

[3] The nine areas over 5 million in population according to Census 2000 were New York; Los Angeles; Chicago; Washington, D.C.-Baltimore; San Francisco; Philadelphia; Boston; Detroit; and Dallas-Fort Worth.

FIGURE ES-1 Long-Term Population Trends by Major Geographic Groupings

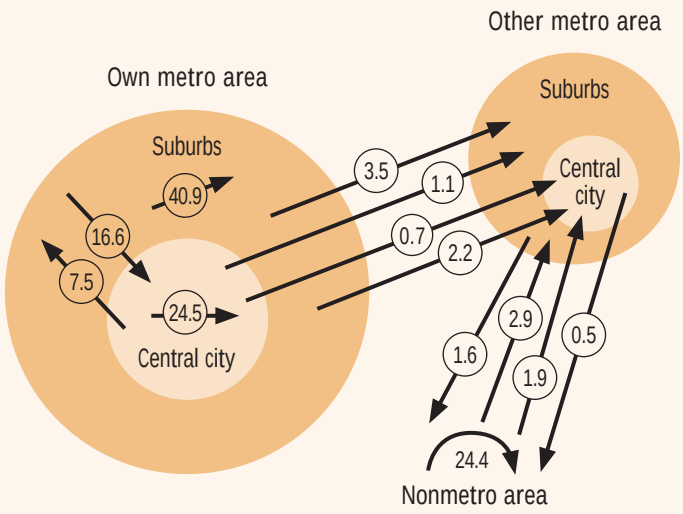


Note: Standard census geography used.

Shifts in Metropolitan Flows

From 1990-2000, about 64% of the growth in metropolitan commuting was in flows from suburb to suburb. Commuting from suburb to suburb rose in share from 44% of all metropolitan commuting in 1990 to 46% in 2000. The next largest growth area was the "reverse commute" from central city to suburbs, which had almost 20% of the growth in commuting and rose in share from 8% in 1990 to 9% in 2000. The "traditional commute" from the suburbs to the central city obtained only 14% of the growth and dropped in share from 20% in 1990 to 19% in 2000. Commuting from central city to central city saw only 3% of the decade's growth, which resulted in a fall from over 28% share of all metropolitan commuting in 1990 to 26% in 2000. Thus, suburban destinations received 83% of the growth while central cities obtained the remaining 17%.

FIGURE ES-2 Metropolitan Flow Map (Millions of Commuters)

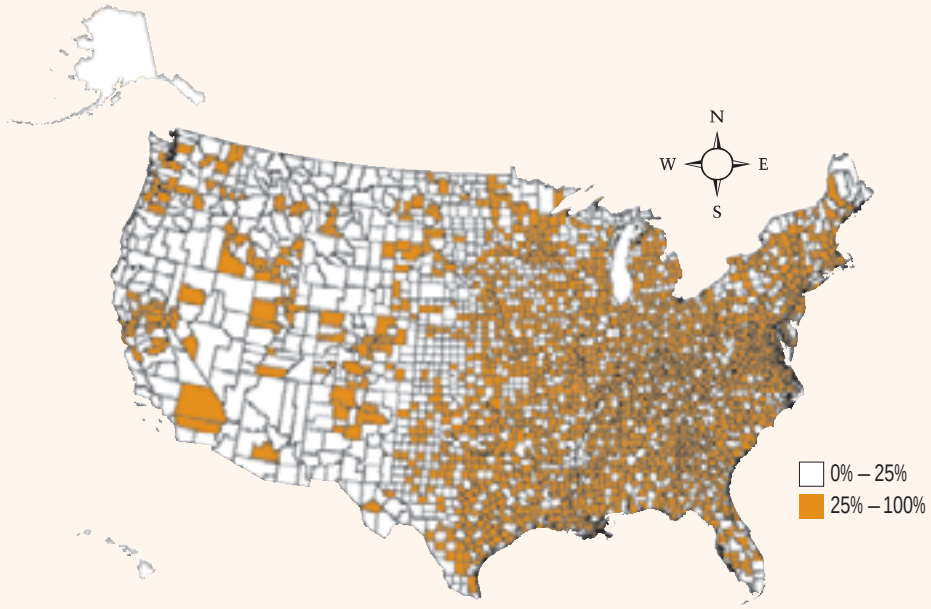


About 94 million commuters, 73% of all commuters, work within their county of residence. That leaves more than 34 million who are "exported" each day from their home county to work, compared to an estimated 20 million in 1980, approximately an 85% increase in that period, and more than three-and-one-half times the number in 1960. Roughly half of all the workers added between 1990 and 2000 worked outside of their county of residence. The tendency to work within one's home county declines as the size of the metropolitan area increases. This is probably linked, at least partially, to the expansion in areas over 5 million in population mentioned earlier.

Outbound flows to other metropolitan areas and to nonmetropolitan areas, about 5.4% of all commuting in 1980, rose to over 7.5% in 1990 and reached 8.3% in 2000 (using 1980 geography). Intermetropolitan commuting increased at a rate almost three times that of internal metropolitan growth. Figure ES-2 displays the pattern of commuting around metro-politan areas, showing the flows in millions between the main geographic areas. Note that at almost 41 million, the dominant flow is from suburb to suburb, whereas intracity flows are less than 25 million.

This surge seems to go beyond the expected suburbanization of workers and their jobs—and the consequent dominance of circumferential commuting. As shown in Figure ES-3, U.S. counties with greater than 25% of their workers leaving their county of residence to work include most of the counties that make up the Eastern Seaboard and Midwest. In the West, where county sizes are larger, the pattern, although less apparent, is also moving toward more intercounty flows.

FIGURE ES-3 Counties with More Than 25 Percent Commuting Outside the County



Significant Mode Use Pattern Changes

The SOV commuter increase, although substantial and an increase in share, was less than total worker growth. This can be attributed to carpooling, which reversed 30 years of decline and showed small but real growth, not enough to hold share but an increase nonetheless. Transit gained in some areas, lost in others, with a trivial net loss across the nation that was one-fifth that of the previous decade. Work at home increased in share and number while walking continued its 20-year decline.

Perhaps the most significant factor is the decline in overall scale, in both the number of workers added and the number of those who drove alone. The difference is between 22 million new solo drivers added in the 1980s, a 35% increase, and about 12 million added in the 1990s, about a 15% increase. Figure ES-4 shows the broad national trend by mode over 20 years. This is supported by Table ES-2, which presents the more detailed statistical reporting for each decade, as well as the overall net changes for the period.[4] Note that the small changes in carpooling and transit shown can obscure significant regional swings as discussed next.

The local pattern was the national pattern in the 1980s. All of that changed for the 1990s. In 2000, regional patterns are the key to the commuting story in many respects. Even at the broad scale of Figure ES-5 it is clear; the values shown are the percentage increase or decrease in total users for the decade. While driving alone grew everywhere, it grew at very different levels and rates. Carpooling grew in two regions—the South and the West—but declined in

[4] In tables throughout this report, numbers may not add due to rounding.

FIGURE ES-4 Modal Trends Summary, 1980-2000

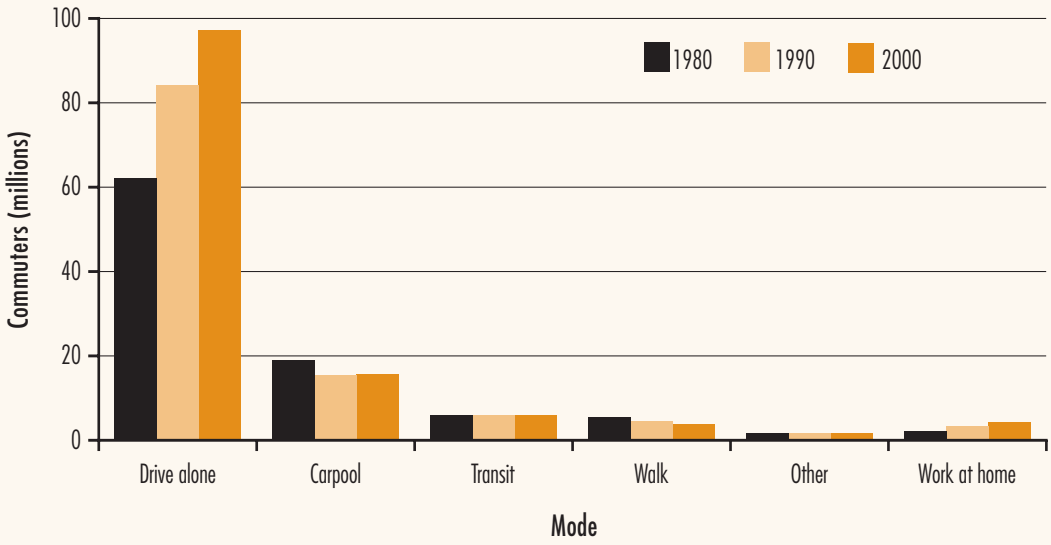


TABLE ES-2 Long-Term Modal Usage Trends (Thousands)

	1980		1990		2000		20-Year Change
Mode	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**
Drive alone	62,193	64.37	84,215	73.19	97,102	75.70	34,909
Carpool	19,065	19.73	15,378	13.36	15,634	12.19	-3,431
Transit	6,008	6.22	5,889	5.12	5,869	4.58	-139
Taxi	167	0.17	179	0.16	200	0.16	33
Motorcycle	419	0.43	237	0.21	142	0.11	-277
Bike	468	0.48	467	0.41	488	0.38	20
Other	703	0.73	809	0.70	901	0.70	198
Walk	5,413	5.60	4,489	3.90	3,759	2.93	-1,654
Work at home	2,180	2.25	3,406	2.96	4,184	3.26	2,004
Total workers	**96,616**	**100.00**	**115,069**	**100.00**	**128,279**	**100.00**	**31,663**

THE CASE OF TRANSIT

National statistics and trends concerning commuting are not necessarily representative of the experience in individual communities, or even entire regions. This can be true of carpooling, bicycling, walking, and—particularly—public transportation. Mode selection is a function of trip patterns, demographics, and service availability. The choice of transit is subject to the timing, routing, quality, and costs of service. The vast differences in transit availability across the nation are reflected in uneven transit mode selection.

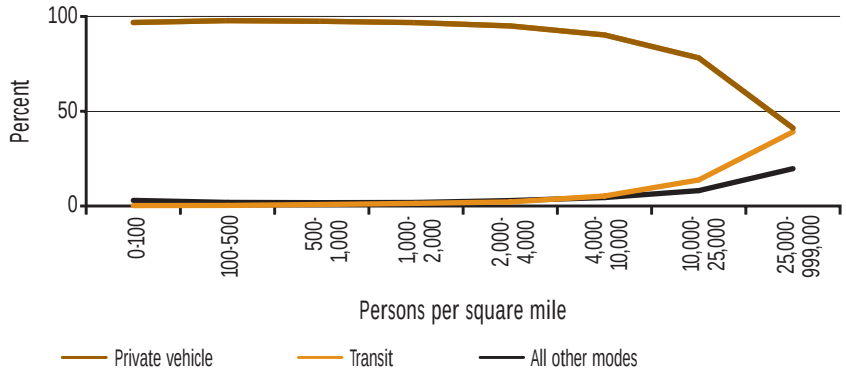
Transit is more prevalent in densely populated areas, such as in downtowns and along the well-served transit corridors of the 12 mega-metropolitan areas with population over 5 million where mitigating congestion is a primary concern. Particularly in these densely populated areas, transit use grows well beyond the national average as metropolitan area size increases. The figure (top right) shows the strong influence of population density on transit ridership.

Commuting patterns in these areas are notably different from the national pattern and reveal modal usage that is heavily reliant on transit. A more detailed view of the significant effect of metropolitan size on modal usage shows average transit share in areas over 5 million is at about 11.5% overall and, as shown in the figure (bottom right), 23% of central city commuting where services are extensive. Overall, almost 73% of national transit usage occurred in areas over 5 million in 2000. With the recent additions of Miami, Atlanta, and Houston, transit's share would decline. Between 1985 and 2004, total passenger trips on transit (for both nonwork and work purposes) increased.

Transit use also tends to increase when employment densities are high. Using San Francisco as an example shows that when focused on the city center or on specific rail corridors to the center, transit shares become substantial. In the San Francisco metropolitan area a tremendous proportion of the region's transit users, roughly two-thirds, have a destination in San Francisco County. Transit's share of total commuting in the Bay Area was at just about 9.7%, but slightly over 36% of all workers commute to San Francisco jobs by public transportation with the Alameda to San Francisco Corridor flow at 51% of all workers on transit; Contra Costa to San Francisco with almost 48%; Marin to San Francisco at 30%, and Santa Clara to San Francisco at 23%. Excluding San Francisco, the transit share in the region was 3.7%.

Just as vehicle users do not drive unless there are roads, transit users cannot ride unless service is provided. It should be noted that a considerable increase in transit supply is coming. Under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) there will be an extensive number of new start projects.

The Impact of Density on Modal Usage



Note: Densities were calculated at the Census tract level.

Transit Shares by Metropolitan Area Size and Ring

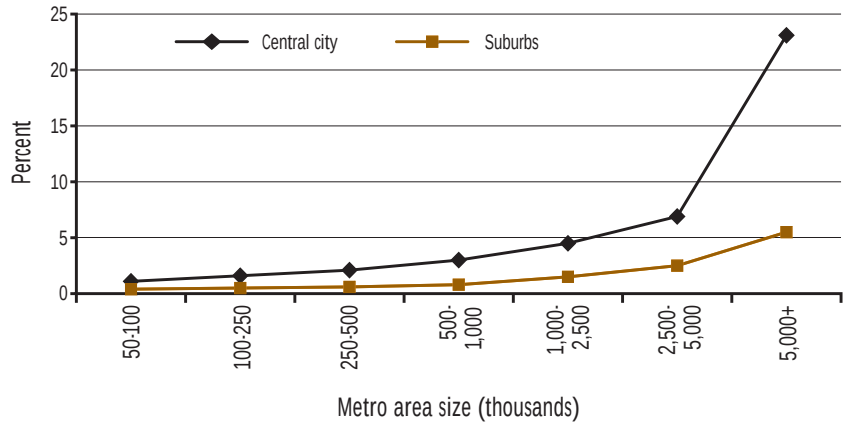
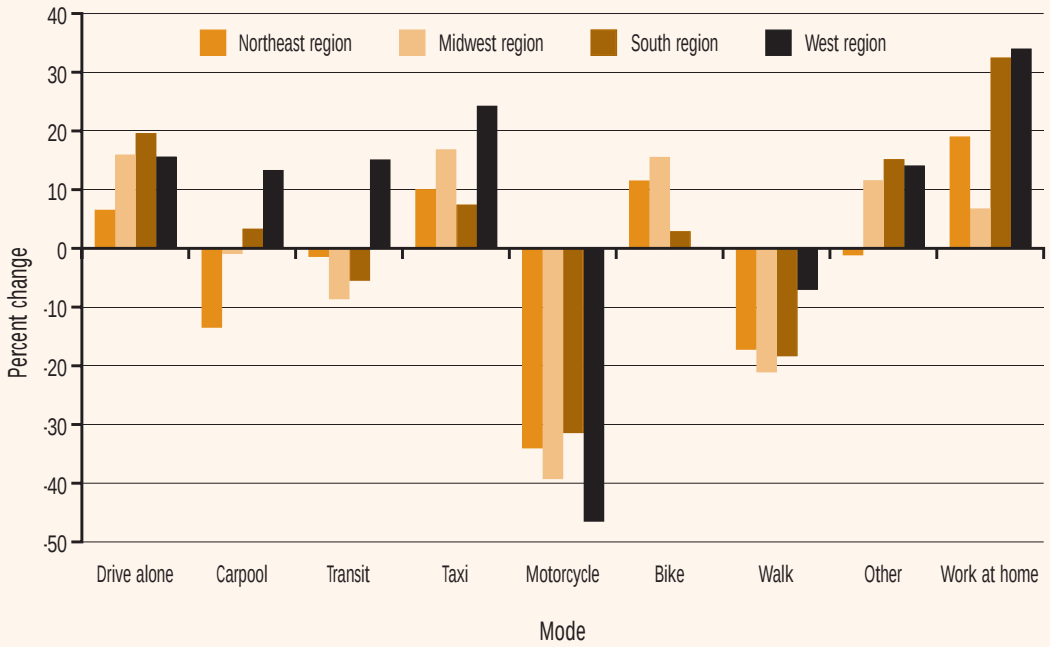


FIGURE ES-5 Percent Change in Modal Shares by U.S. Region, 1990-2000



the Northeast and Midwest. Transit showed growth in the West, but declines in the other regions. Walking to work continued its uniform decline everywhere and working at home continued its uniform growth.

A review of state-level modal trends reveals some dramatic changes—not just changes from the previous decade but from the entire period since 1960 in which the census has collected these data—as follows:

- Driving alone
  - Solo drivers had a share over 80% in 14 states.
  - Most states (33) had between 70% and 80% solo drivers.
  - Michigan had the highest SOV share at over 83%.
  - New York is in a class by itself with the lowest share, 56%.
  - Other states below 70% are Hawaii and Alaska (also D.C. and Puerto Rico).
  - Five states added more than 5 percentage points, including North Dakota at over 6 (Puerto Rico was almost 7).
  - Another 28 states gained between 2 and 5 percentage points. Only two states declined (very slightly) in share: Oregon dropped two-tenths of a percent and Washington six-tenths.
  - California and Arizona were close to holding share constant.
  - Many changes appear to be in geographic clusters as noted in the earlier discussion of changes to Census regions.
  - A lot of this change is a result of shifts between driving alone and carpooling.
- Carpooling
  - All states except Hawaii (19%) are between 9% and 15% share.
  - Only six states—Montana, Idaho, Alaska, South Dakota, Arizona, and Washington—all west of the Mississippi, gained in share.
  - All gains were minor with Washington just over one-half percentage point.
  - Big volume gainers were the high-growth states: Texas almost 200,000; Arizona over 100,000; California, Colorado, Georgia, Florida, and Washington over 50,000; and Nevada just under 50,000.
  - Alabama, Virginia, and West Virginia dropped more than 3 percentage points and states around them—Pennsylvania, Maryland, South Carolina, North Carolina, and Missouri—lost more than 2 percentage points.
  - Clustering of changes in the Mid-Atlantic States shows Pennsylvania lost over 100,000 while Virginia, Maryland, and New Jersey lost over 50,000.
- Transit
  - Transit shares were relatively stable in most states (within 1 percentage point of their 1990 shares).
  - There are 10 states plus Puerto Rico that exceed the national average transit share.
  - New York (24% share) and Washington, D.C. (33% share) are two significant transit users.
  - Transit share otherwise ranges between just below 10% (New Jersey) to below 1% (17 states).
  - Of the 13 states that posted gains, only Nevada gained more than 1 percentage point.

- Of the 37 states that lost share, 34 lost less than 1 percentage point.
- Volume increases show 8 states gained over 10,000 users; 6 gained between 1,000-10,000; and 10 gained less than 1,000.
- Volume losses show 5 states (plus D.C. and Puerto Rico) lost over 10,000; 19 lost between 1,000-10,000; and 3 lost less than 1,000.
- Gains tended to be in the West and losses in the East.

There are now 23 metropolitan areas over 1 million that have an SOV share of 80% or above; the remainder are in the range of 70% to 80%, with the sole exceptions of San Francisco (68.1%) and New York (56.3%). Although driving alone to work continued to increase through 2004, there were signs of stabilization occurring in the 1990s as growth rates slackened. Looking at the 10 metropolitan areas that were most or least oriented to driving alone suggests that there may be an upper limit—some kind of saturation—being reached. Most of the gains in SOV share occurred in the 1990s, with far less significant differences between 1990 and 2000. Moreover, whereas there was almost no case where 1980 and 1990 shares were very much alike, that is more true than not in the 1990s.

Most significantly, there are five metropolitan areas where SOV shares actually declined from 1990, whereas there were none in the period from 1980-1990. All of the losses were quite small, under 1 percentage point, with the exception of Seattle with a decline of about 1.5 percentage points. Those with declines of less than 1 percentage point were San Francisco, Phoenix, Portland, and Atlanta (the only area not in the West). Four other areas—Los Angeles, Dallas-Fort Worth, Sacramento, and Las Vegas—effectively held shares constant. Another five—Denver, Tampa, Salt Lake City, West Palm Beach, and New York—held SOV gains to less than 1 percentage point.

All of these changes seem quite small, as will most of the other modal changes observed among the top 50 metropolitan areas. The fact that changes, whether positive or negative, tend to be small is of interest because this suggests a long-expected stabilization of trends.

The national commuting patterns in the new century, which have been detailed annually since 2000 as part of the Census Bureau's American Community Survey (ACS), are shown in Table ES-3. This table, which provides data from the 2000 Census for comparison, shows that in some ways commuting patterns are more reminiscent of the 1980s than the 1990s with declines in non-SOV modes. Given the limited increases in workforce in the early years of the decade, the shifts are relatively minor.

TABLE ES-3 Recent Mode Share Trends, 2000-2004

Mode	Census 2000 128,279,228*	2000 ACS 127,731,766*	2001 ACS 128,244,898*	2002 ACS 128,617,952*	2003 ACS 129,141,982*	2004 ACS 130,832,187*
	Percent					
Private vehicle	87.88	87.51	87.58	87.81	88.20	87.76
Drive alone	75.70	76.29	76.84	77.42	77.76	77.68
Carpool	12.19	11.22	10.74	10.39	10.44	10.08
Transit	4.57	5.19	5.07	4.96	4.82	4.57
Bus	2.50	2.81	2.79	2.71	2.63	2.48
Streetcar	0.06	0.07	0.06	0.06	0.06	0.07
Subway	1.47	1.57	1.51	1.45	1.44	1.47
Railroad	0.51	0.55	0.54	0.56	0.53	0.53
Ferry	0.03	0.04	0.04	0.04	0.04	0.03
Taxi	0.16	0.16	0.13	0.14	0.12	0.12
Motorcycle	0.11	0.12	0.12	0.11	0.11	0.15
Bike	0.38	0.44	0.42	0.36	0.37	0.37
Walk	2.93	2.68	2.55	2.48	2.27	2.38
Other	0.70	0.85	0.87	0.82	0.72	0.81
Work at home	3.26	3.21	3.38	3.46	3.50	3.84
All	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

*Total workers
Note: ACS excludes group quarters population.

FIGURE ES-6 Age Distribution of Workers Age 55 and Older

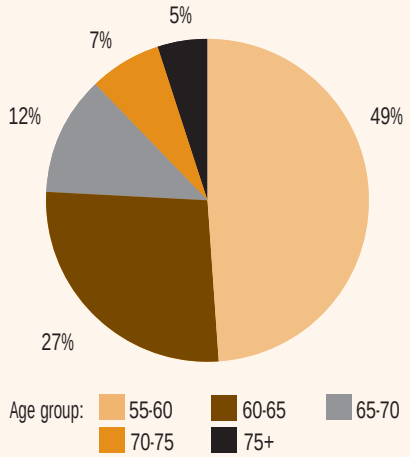
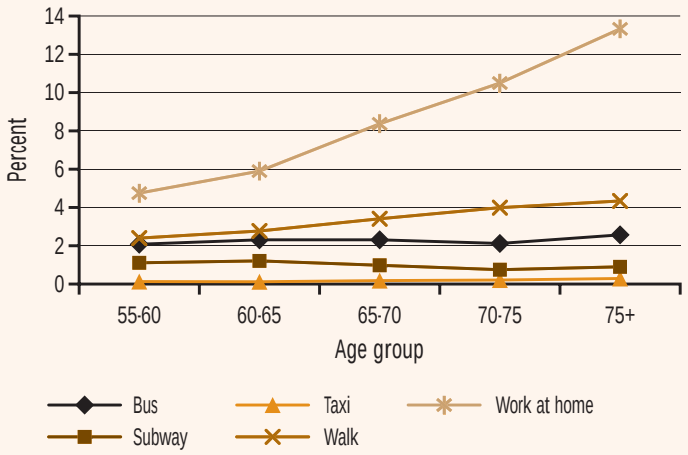


TABLE ES-4 Workers and Nonworkers Age 55 and Older

Age Group	Population Age 55+ (No.)	Workers Age 55+ (No.)	Workers Age 55+ (%)
55-60	13,311,624	8,443,988	63.43
60-65	10,776,487	4,747,536	44.05
65-70	9,240,140	2,068,272	22.38
70-75	8,945,204	1,246,434	13.93
75+	16,758,059	947,673	5.66
55+	59,031,514	17,453,903	29.57

FIGURE ES-7 Detailed Modal Usage for Workers Age 55 and Older



THE OVER-55 MARK

The Importance of Workers Over 55

The oldest of the baby boomers are around age 60 and by 2010 will begin turning 65. At present, the workforce can be almost perfectly divided into four equal-sized age groups: 16-30; 30-40; 40-50; and 50 and older. However, as shown in Figure ES-6, half of all the workers 55 and older are in the 55-60 age group. Many of these workers will retire in the coming years, but we have already seen sharp increases in the older worker population and could see even more. The key point, and one to monitor carefully in the future, is that in 2000 only 3.3% of workers were over 65, not much greater than the 3% registered for 1990. The population at work among those over 65 rose by roughly 750,000 from 3.5 million in 1990 to 4.25 million in 2000, with about half of the growth coming from those age 75 and older. The number of workers over 65 rose by over 21% in the period while the population in that group only rose about 12%. As that group's share of the population increases sharply after 2010, a key question for commuting will be the extent to which persons in that age group continue to work. Note that in Table ES-4 the share of workers drops sharply with age. The big question is whether that pattern will persist in the age groups just now reaching retirement age.

Up to the present, the labor force effects of these changes have been mild but will sharply shift later in this decade. The share of those of working age has remained stable at just below 65% (64% for women and 65% for men) for the last decade. According to interim Census Bureau projections prepared in 2004, the working age share drops sharply after 2010 as the over-65 group rises from 13% to 16% in 2020 and to 20% by 2030.

The modal usage of the worker population over age 55 shows that as the older worker ages, there is a significant shift away from the SOV (from about 80% to 68%), slight gains in carpooling, and major shifts to walking and working at home, as shown in Figure ES-7. These shifts in modal usage seem to be a product of changes in job attributes (such as work hours, job location, and occupational mix) as much as shifts in mode preference. The detailed treatment of transit in the figure shows that bus travel gains somewhat as workers age and other transit modes tend toward minor losses in shares.

THE 20-MINUTE MARK

Census 2000 observed a national average travel time of 25.5 minutes. This represented a 3-minute increase in travel times over those measured in 1990—a substantial change given that the change

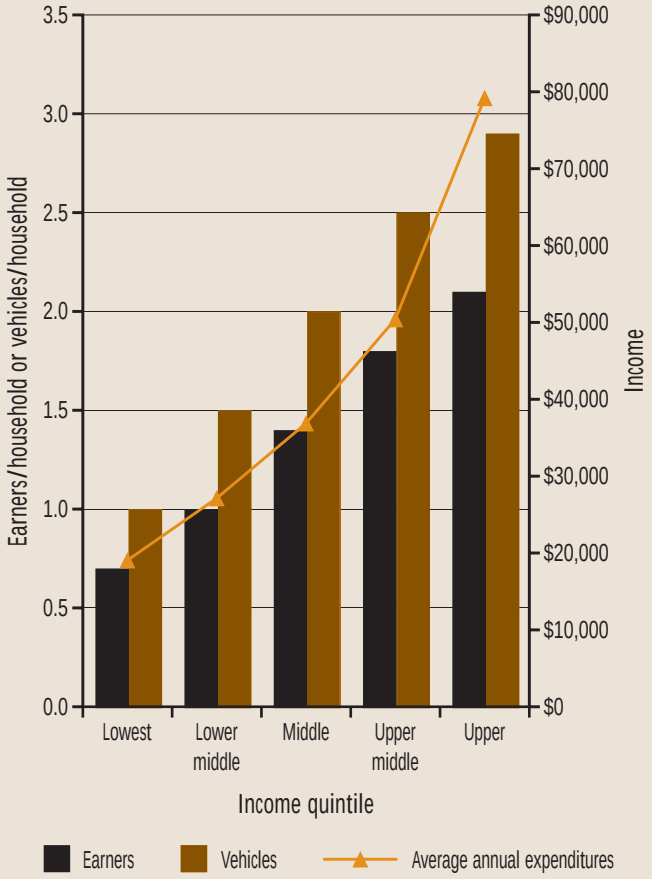
Vehicle Ownership

Incomes, expenditures, earners, and vehicles per household are all strongly interrelated, as shown in the figure below (left). Household incomes in America are often the product of the number of workers in the household. The highest income households average three times as many workers as the lowest income households, indicating how closely commuting and income are interrelated. Roughly 70% of the workers in America live in households with at least one other worker; 24 million workers live in households of three or more workers. This affects their options and choices in commuting behavior in many ways.

Perhaps the most obvious factor to consider when examining vehicle ownership trends is household income. At the threshold of $25,000 per household, households without vehicles drop below 10% of households and continue to decline thereafter. Above $35,000 per year in household income, the predominance of the one-vehicle household shifts to two vehicles, and remains at that level up to the highest levels of income. There are high-income households without vehicles; roughly 4% of zero-vehicle households have incomes above $100,000 per year. The relationship between workers and vehicles is illustrated in the table below. There are about 5 million workers in households with no vehicles available and another 18 million with more workers than vehicles.

Perhaps the most significant statistical change to come out of Census 2000 was the sharp drop in the percentage of African-American households without vehicles. The following figure (below right), shows the decline from over 31% of households with no vehicles down to below 24%. This is still considerably higher than other minority groups but represents an important part of the continuing suburbanization of the African-American population. All other racial and ethnic groups also saw significant declines. African-American households in nonmetropolitan areas continue to have 20% of households without vehicles, more than twice any other group. These trends will have significant long-term impact on national patterns.

Linkage among Incomes, Earners, Vehicles, and Expenditures



Workers and Vehicles

Vehicle Status in Worker Households	Workers (Thousands)
No vehicles	5,267
More workers than vehicles	18,024
Equal workers and vehicles	70,962
More vehicles than workers	50,914
Total	**145,167**

Trends in Zero-Vehicle Households by Race and Ethnicity, 1900-2000

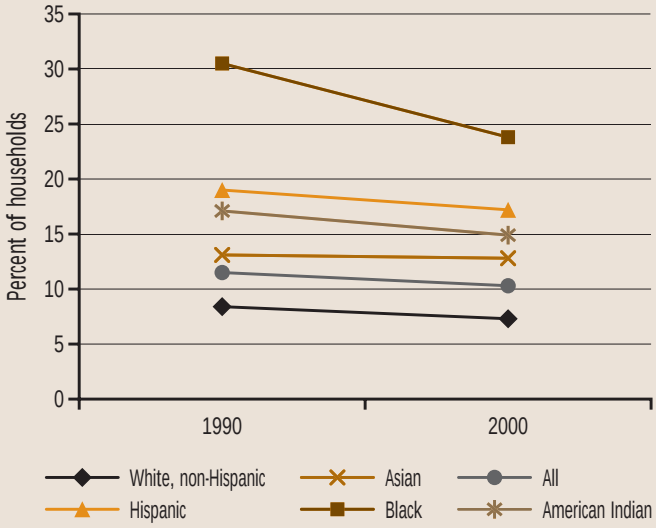


FIGURE ES-8 National Travel Time Trend, 1980-2000

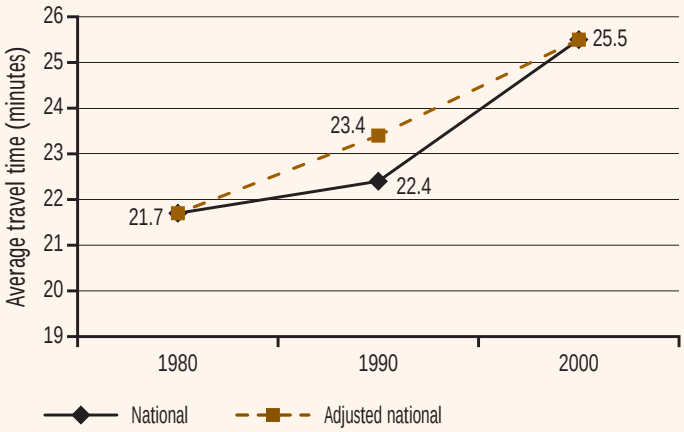
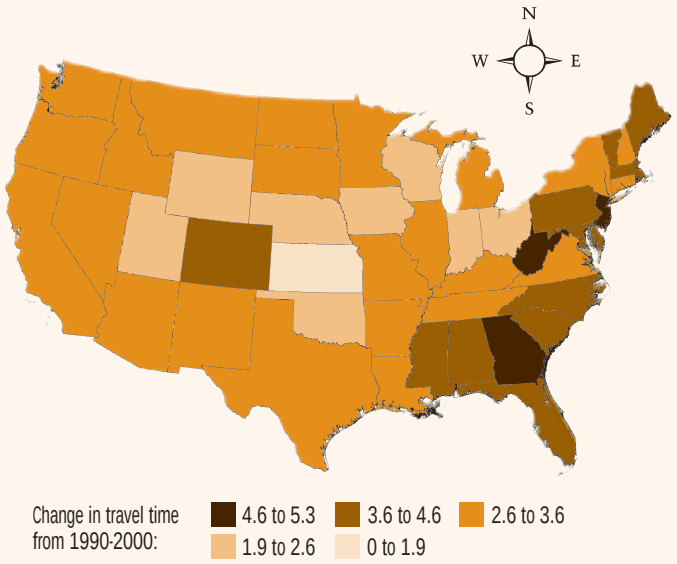


TABLE ES-5 Average Travel Times by Broad Geographic Areas

Area	Average Travel Time (Minutes)	Less Than 20 Minutes (%)	More Than 60 Minutes (%)
United States	25.54	47.01	7.98
Northeast region	27.31	44.49	11.08
Midwest region	22.38	53.46	5.79
South region	24.93	47.20	7.11
West region	24.62	49.12	7.86
In metro area	26.14	44.48	8.13
In central city of metro area	24.82	48.70	7.67
In suburb of metro area	26.89	42.07	8.39
In nonmetro area	22.90	58.09	7.29

FIGURE ES-9 Change in Travel Times by State, 1990-2000



Note: Map uses the 3-minute average national change statistics. Data not available for Alaska; Hawaii change equals 2.3.

from 1980-1990 was on the order of a 40-second increase. A necessary upward adjustment to the 1990 data (to compensate for truncated data that understated travel times) indicates that the more valid increase was on the order of 2 minutes, not 3, putting 1990 at an estimated 23.4 minutes. The 20-year trend is shown in Figure ES-8, which displays both the 1990 reported national figure and an adjusted figure. Averages have shifted little as of 2004.

A perhaps more useful measure of travel time effects, used extensively here, is the percentage of workers commuting less than 20 minutes and the percentage commuting more than 60 minutes. The performance measure employed here is whether 50% of workers get to work in under 20 minutes and whether 10% or more of workers take more than 60 minutes. These statistics are designed to capture the nominal, as well as the more arduous, commute.

Table ES-5 shows these values for a select group of geographic areas. Note that the national average is sharply affected by the high values in the Northeast (and that by New York). The rest of the nation is all below 25 minutes with the Midwest closer to 22 minutes. The percentage under 20 minutes tells the story more fully. The national average in 1990 was just above 50% but has now dropped below that level; only the Midwest is still above 50%. Note also that nonmetropolitan areas are well above 50%. If the performance measure of having more than 10% of workers commuting over 60 minutes is applied, only the Northeast fails that test.

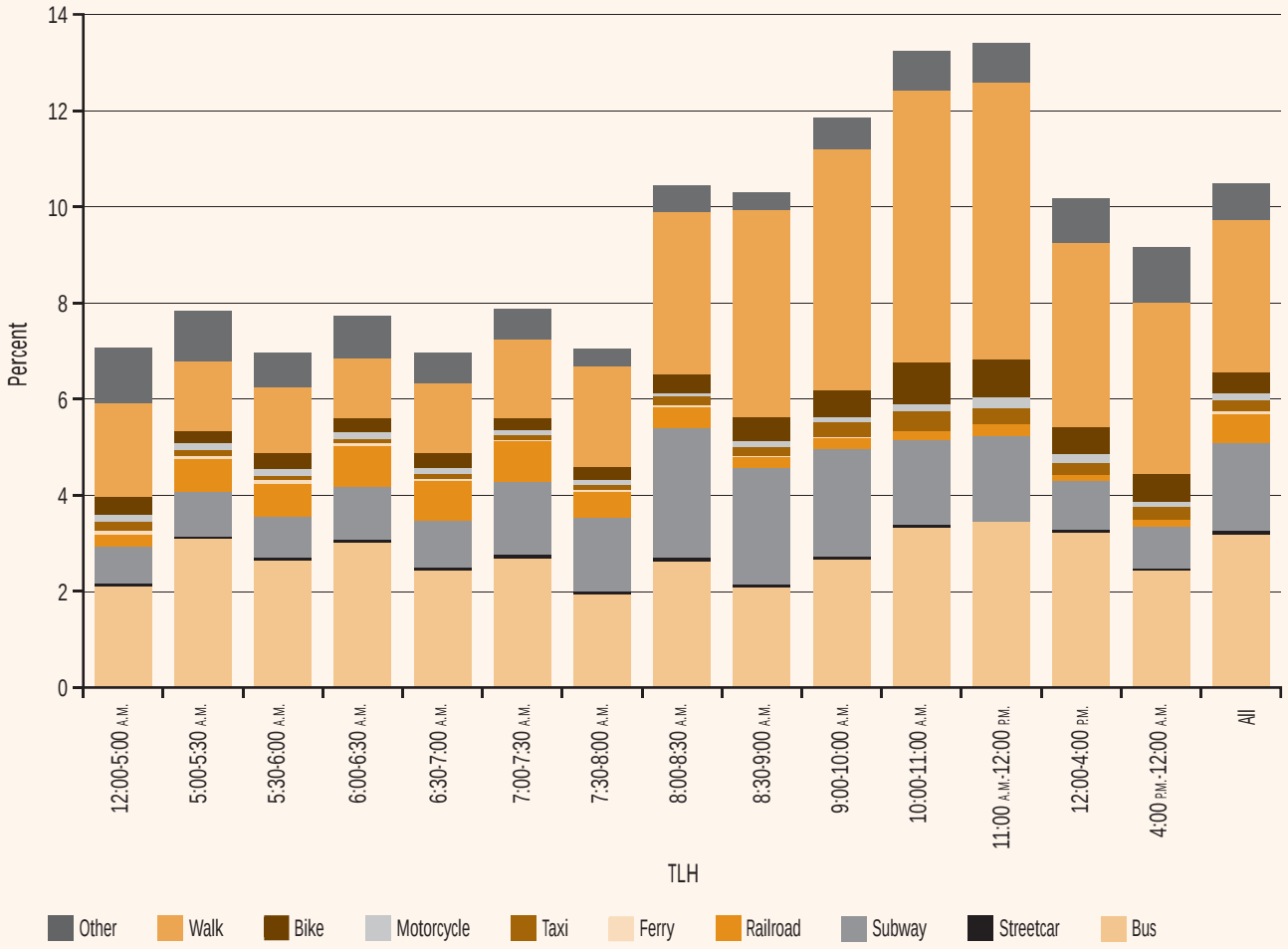
Figure ES-9 shows the change in travel times by state between the 1990 and 2000 censuses. Only Kansas was below a 2-minute increase in the period.

Avoiding the Peak Period

There are strong indications of shifts away from the peak period. Overall, the peak period from 6-9 a.m. had a 64% share of all work travel in 2000, down from a 67% share in 1990. A quick summary statistic is that while off-peak travelers constituted about one-third of all commuters in 1990, they were responsible for just about half of the growth from 1990-2000. Those starting for work before 5 a.m. were only 2.4% of travel in 1990 but gained over 11% of the commuter growth from 1990-2000. Those starting the journey to work from 5:00-6:30 a.m., which had constituted under 15% of travel, gained about 25% of the growth in the decade. On the other side of the peak, the start times from 9-11 a.m., which were under 7% of travel in 1990, gained over 12% of the growth.

A very high percentage of people starting out early are those with very long commutes; over 10%

FIGURE ES-10 Modal Usage by Time Left Home (TLH), Excluding Private Vehicles



starting before 5 a.m. and over 8% of those starting between 5-6 a.m. have a commute greater than 60 minutes. This drops to just above 5% in the 6-7 a.m. time period and then stabilizes at around 3% for the rest of the day.

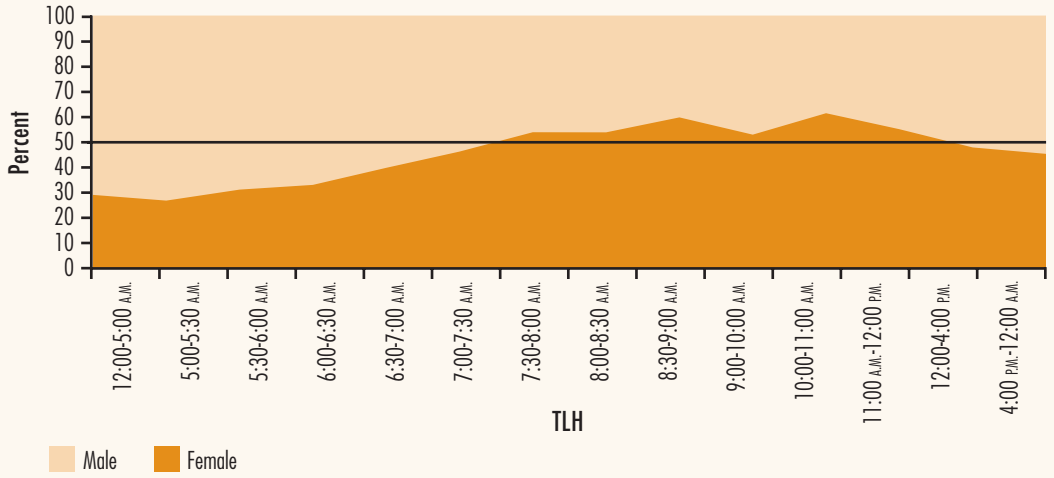
Early and late starts can be the product of many things: new distant home locations, trip chaining of other activities before work, and changing start times in employment (e.g., the shift to service-oriented jobs may be shifting travel to later time periods; newer working hours such as the 4/10 or 9/80 work-hour schedule[5] also could be exerting an influence). On the other hand, there are limits to how far people can shift their times of travel as a response to congestion. It is clear that the degree of flexibility in the starting times of jobs is limited and this may be another case where the commuter is nearing the end of one of the degrees of freedom available as a coping strategy.

THE 8 A.M. MARK

The dominance of the private vehicle, whether used by a single occupant driving alone or in carpools, is illustrated sharply when examined by the times people leave home for work. From midnight to 8 a.m., the private vehicle accounts for roughly 92% of all work travel; and in the 12 hours from noon to midnight it constitutes roughly 90% of travel. The impact of walking (in particular), transit, and other alternatives has its influence in the time period from 8 a.m. until noon where alternative shares rise as high as 13% for parts of the period. This rather remarkable pattern is shown in Figure ES-10.

[5] Workers on a 4/10 schedule work four 10-hour days to make a 40-hour work week. Workers on a 9/80 schedule work nine 9-hour days during a 2-week period.

FIGURE ES-11 Male–Female Commuting Distribution by Time of Day



Note: Excludes work at home.

A key attribute of start times is the sharp differences between the times at which men and women leave home. Figure ES-11 shows that women constitute a rather small share of early morning travelers and it is not until 7:30 a.m. that they reach about half of travel, but then they constitute the majority throughout the remainder of the morning, even though men comprise almost 54% of all out-of-home workers.

EVOLVING AND EMERGING PATTERNS

In 1996, *Commuting in America II* identified 10 patterns to watch in the future. None of the 10 has run its course to date and it will be some time before these patterns are fully played out. Such broad themes as immigration, an aging workforce, and changing lifestyles are perhaps unfolding in new ways in this decade but will remain significant considerations. In addition to trends observed over the last 10 years, there are new patterns to watch as well. These include

- Who and where will the workers be?
- Will long distance commuting continue to expand?
- Will the role of the work trip decline, grow, or change?
- Will the value of time in an affluent society be the major force guiding commuting decisions?
- Will the value of mobility in our society be recognized?

Each of these areas of concern will bear watching over the coming years, especially if the ACS, which provides annual reporting, replaces the decennial census as planned and becomes the only source of journey-to-work data from the Census Bureau. Although the process of getting to and from work everyday would seem rather mundane, experience has shown that the patterns continue to change, challenging both commuters and public policy.