Brief 16. The Evolving Role of Commuting
About the AASHTO Census Transportation Planning Products Program
Established by the American Association of State Highway and Transportation Officials (AASHTO) and the U.S. Department of Transportation (U.S. DOT), the AASHTO Census Transportation Planning Products Program (CTPP) compiles census data on demographic characteristics, home and work locations, and journey-to-work travel flows to assist with a variety of state, regional, and local transportation policy and planning efforts. CTPP also supports corridor and project studies, environmental analyses, and emergency operations management.

In 1990, 2000, and again in 2006, AASHTO partnered with all of the states on pooled-fund projects to support the development of special census products and data tabulations for transportation. These census transportation data packages have proved invaluable in understanding characteristics about where people live and work, their journey-to-work commuting patterns, and the modes they use for getting to work. In 2012, the CTPP was established as an ongoing technical service program of AASHTO.

CTPP provides a number of primary services:

- **Special Data Tabulation from the U.S. Census Bureau**—CTPP oversees the specification, purchase, and delivery of this special tabulation designed by and for transportation planners.
- **Outreach and Training**—The CTPP team provides training on data and data issues in many formats, from live briefings and presentations to hands-on, full-day courses. The team has also created a number of electronic sources of training, from e-learning to recorded webinars to downloadable presentations.
- **Technical Support**—CTPP provides limited direct technical support for solving data issues; the program also maintains a robust listserv where many issues are discussed, dissected, and resolved by the CTPP community.
- **Research**—CTPP staff and board members routinely generate problem statements to solicit research on data issues; additionally, CTPP has funded its own research efforts. Total research generated or funded by the current CTPP since 2006 is in excess of $1 million.

**Staff**
- Penelope Weinberger, CTPP Program Manager
- Matt Hardy, Program Director, Policy and Planning
- Jim Tymon, Chief Operating Officer/Director of Policy and Management

**Project Team**
- Steven E. Polzin, Co-Author, Center for Urban Transportation Research, University of South Florida
- Alan E. Pisarski, Co-Author, Consultant, Falls Church, Virginia
- Bruce Spear, Data Expert, Cambridge Systematics, Inc.
- Liang Long, Data Expert, Cambridge Systematics, Inc.
- Nancy McGuckin, Data Expert, Travel Behavior Analyst

**Contact**
Penelope Weinberger, e-mail: pweinberger@aashto.org, phone: 202-624-3556; or CTPPinfo@aashto.org

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Brief 16. The Evolving Role of Commuting

This brief is the sixteenth in a series describing commuting in America. This body of work, sponsored by American Association of State Highway and Transportation Officials (AASHTO) and carried out in conjunction with a National Cooperative Highway Research Program (NCHRP) project that provided supporting data, builds on three prior *Commuting in America* documents that were issued over the past three decades. Unlike the prior reports that were single volumes, this effort consists of a series of briefs, each of which addresses a critical aspect of commuting in America. These briefs, taken together, comprise a comprehensive summary of American commuting. The briefs are disseminated through the AASHTO website (traveltrends.transportation.org). Accompanying data tables and an Executive Summary complete the body of information known as *Commuting in America 2013* (CIA 2013).

**Background**

As has been the practice in past versions of the Commuting in America series, this brief further considers the meanings of the data presented in the previous briefs. Unlike the prior briefs, this one is more subjective in nature, with the authors interpreting the data on commuting in terms of relative significance and implications for transportation planning and policy. Depending upon their knowledge of transportation and their geographic context and perspective, readers may have differing priorities and interpretations from those developed by the authors based on a national overview. While acknowledging the differences in perspectives, the mandate has been that each brief be objective and state only what the facts support, without bias toward or advocacy of any particular viewpoint, to assure objectivity. This brief presents to readers the authors’ interpretations of possible directions that overall commuting behaviors may take. The views expressed here are those of the authors and do not necessarily reflect the views of AASHTO, its members, or its staff.

The closing chapter of CIA3 left readers with a series of questions and statements that were seen as keys to the future of commuting. The intent of this sixteenth brief of *Commuting in America 2013* is to assess what findings from the current research merit attention now and going forward. A central concern in interpreting commuting trends is the major challenge of discriminating between cyclical effects that are a product of the present state of the economy and those that are longer-term structural changes.
effects that are a product of the present state of the economy and those that are longer-term structural changes.

This brief is organized into sections that generally follow the flow of the previous briefs in the series: significant observations are identified and briefly described, then their implications and anticipated impacts going forward are discussed. The 16 briefs in the overall series include the following:

1. Commuting in America 2013 Overview
2. The Role of Commuting in Overall Travel
3. Population and Worker Trends
4. Population and Worker Dynamics
5. The Nature and Pattern of Jobs
6. Job Dynamics
7. Vehicle and Transit Availability
8. Consumer Spending on Transportation
9. How Commuting Influences Travel
10. Commuting Mode Choice
11. Commuting Departure Time and Trip Time
12. Auto Commuting
13. Transit Commuting
14. Bicycling and Walk Commuting
15. Commuting Flow Patterns
16. The Evolving Role of Commuting

The Extent and Pattern of Commuting

Briefs 2 through 6 and Brief 15 address factors that determine the magnitude and geography of commuting and put them in perspective with total travel. The absolute volume of commuting trips is driven by population growth and labor force participation. The impacts on the transportation system are further influenced by trip length and trip mode. Driven by population and worker growth, commuting continues to grow in absolute terms. However, the pace of growth in the workforce has slowed significantly from prior decades, where population growth, population age profile impacts, and female labor force participation trends resulted in far more rapid growth in commuters in both absolute and percentage terms. Figure 16-1 (previously presented as Figure 3-3 from Brief 3) summarizes the composite effect of population and labor force participation changes at the national level to paint a picture of the demands placed on transportation systems by decade due to the growth in commuters.

The declining workforce growth over the past two decades and projections of continuing declines indicate a much diminished role of commuter growth in shaping future transportation needs.
The trend of slowing growth in the commuter workforce has been correctly forecast and underway for some time. Underlying this slower growth are a number of specific trends of interest:

- Population growth continues to decline, at the rate of 0.7 percent per year at this time.
- U.S. Census Bureau projections of population in the working age group 18–64 show a sharp decline over the next 20 years—approximately 6 million new potential workers from 2015 to 2030, in sharp contrast to 26 million in the period 2000 to 2012.
- There has been a surge in the population over age 65; two-thirds of the change from 2011 to 2012 was in the 65–74 year age group.

Coupled with these national trends are a host of considerations that will influence the distribution of employment across geography and the consequent local impacts.

In CIA3, demographic patterns were clear enough to identify potentially severe reductions in growth in the working age population. Current trends and projections make for an even more dire sense of the future, exacerbated by the economic conditions of the period. Labor force projections, released by the Bureau of Labor Statistics (BLS) in December 2013, indicate that the labor force grew by 16.8 million from 1992 to 2002 but only by 10.1 million from 2002 to 2012, a very sharp decline. Projections are that growth will decline further, with an increase of only 8.5 million from 2012 to 2022, about half that of the 1992–2002 decade. Two-thirds of that increase will be in the 55+ age groups. Thus, we can expect to see a substantially aging workforce, a loss of almost 3 million young workers in the 16–24 age group, and a gain of fewer than 2 million in the 25–54 age group, the main

**Figure 16-1. Worker Increase Trends by Decade**

*Source: U.S. Census Bureau*
labor-force age group. The total increase in the 55+ age group will be almost 9.4 million.

Figure 16-2 shows the shares of labor force increase by age group from 2012 to 2022 based on BLS projections.

![Figure 16-2. Labor Force Growth by Age Group, 2012–2022](image)


Of note is that these projections were developed during a period in which immigrant worker arrivals dropped substantially and births to Hispanic immigrants decreased. It is unclear whether the levels of immigration or fertility levels will ever return to the scale seen before the economic decline.

Approximately half of national population growth by 2050 is predicted to be from international immigrants, which creates greater uncertainty in workforce forecasts. Domestic immigration policy, foreign emigration policy, and social/economic conditions here and abroad will influence future immigration levels to the U.S. With greater uncertainty regarding economic opportunity in the U.S. and rapidly-improving economic opportunities in much of the developing world, historical immigration motivations may be changing. Additionally, significant changes in current resident workforce participation trends fuel uncertainty about future commuting levels in local areas. Prospects for continuing changes in traditional retirement patterns may bolster workforce levels, but growing disability ranks and changing safety net influences such as retirement program structure and funding and health care cost and availability may affect labor force participation. Chronic unemployment or underemployment in certain market segments may continue to alter traditional labor force participation levels. Adoption of technology advances may lead to more automation of jobs and/or different skill requirements and job locations.
Most questions regarding future commuting demand posed in CIA3 projected relative prosperity into the future as a fundamental determinant of future trends. That implicit presumption merits reflection in light of a growing recognition that the “new normal” may be different than the historical economic trends. Projections of malaise then may be as erroneous as projecting automatic growing wealth was 10 years ago. The combined consequences of demographic and economic conditions ultimately will shape the future workforce and its commuting behavior.

Regardless of how these phenomena play out, the boom in commuting growth is behind us, at least at the national level, but perhaps not so for all locations. There is no foreseeable prospect for a surge in workers, in absolute numbers or percentage terms, as seen in past decades. This slower growth in demand for commute travel reduces the challenge for transportation planners and operators and suggests that commuter growth will remain important but perhaps be less of a factor impacting national transportation needs in the future.

Acknowledging the more modest national forecast of growth in commuters absent significant changes in immigration and/or fertility, there remain myriad considerations that will impact the commuting volumes and patterns in a given geography. The following were among the questions relevant to local commuting volumes raised in CIA3:

- Will population growth shift toward the lower end of the metropolitan size spectrum?
- Will the public find the new higher-density communities to be attractive alternative lifestyles?
- Will greater suburban job/worker balance occur, or will there be stabilization at present levels?

The longer-term trends in population redistribution to the South and West may have moderated, as in the recent past we have witnessed the lowest levels of population redistribution in our recorded history. This has been a product of declines in job opportunities and the inability to sell or buy housing. These factors also have sharply impeded the ability of workers to seek out new job opportunities occurring elsewhere in the country and may have prolonged economic distress.
Figure 16-3 shows the shift in the U.S. mean center of population to the west and south. Of particular interest is the fact that population growth has been very disparate across geography. As noted in Brief 4, between 2000 and 2010, of the 3,143 counties in the U.S., 1,095 had declining population and 1,058 grew slowly, accounting for only 10 percent of national population growth; the remaining 990 counties were responsible for 90 percent of the population growth in the decade. Thus, the transportation challenges of commuting are likely to be disparate across geography.

**Figure 16-3. U.S. Mean Center of Population, 1790–2010**


In addition to geographic shifts of population and employment in response to quality-of-life and economic opportunities, transportation impacts of commuting also are influenced significantly by the distribution of employment and population within metropolitan areas.

Between 2000 and 2010, of the 3,143 counties in the U.S., 1,095 had declining population and 1,058 grew slowly, accounting for only 10% of the national population growth; the remaining 990 counties were responsible for 90% of the population growth in the decade. Thus, the transportation challenges of commuting are likely to be very disparate across geography.
geographies. Brief 5 reported on the geographic orientation of population, workers, and jobs with respect to metropolitan area geography. As noted in Figure 16-4, central cities continued to have a surplus of jobs relative to workers; however, less than 30 percent of all jobs are in central cities.

Figure 16-4. Distribution of Jobs, Workers, and Population by Area Type

Source: Summary of 2010 ACS data

Earlier briefs have shown that the members of the labor force most likely to move are those lacking jobs. Brief 4 noted that about 11 percent of the labor-force-age population move each year. About 12 percent of those who are employed move in a year, but those who are unemployed move at the rate of 19 percent per year. However, it also has been noted that significant moves between metropolitan regions and between states slowed significantly during the recession and its aftermath. In the longer run, when jobs become more plentiful and finding skilled employees becomes the issue (which is already showing signs of becoming a problem), many “footloose” establishments will be pressured to go where the workers are or where the workers might like to be. This might be university-based metros or other areas that are attractive places to reside with low housing costs and attractive natural or cultural amenities.

Looking ahead, commuting patterns—and, specifically, commuting trip lengths—will be affected by the locational preferences for future employment and residential development as well as a host of other factors such as congestion levels, fuel costs, etc. Significant shares of employment have gravitated away from central city downtowns—in effect, following population dispersion to the suburbs and outlying areas. Access to customers and workers weigh significantly in these location decisions. Looking ahead, many economic and other considerations will, no doubt, influence future employment location patterns. Trends to watch include the following:
Growth and Development Patterns Change

The dynamics of growth and development can be both unpredictable and surprising. For example, in 1920, Cleveland was the fifth-largest city in the U.S., and shortly after Cleveland Hopkins Airport was the busiest U.S. airport as propeller craft refueled for cross-country trips. The Cleveland Metropolitan area was the fastest-growing metropolitan area for several decades in the 1900s. After the middle of the last century, Northeastern Ohio’s economic development agency letterhead boasted that Cleveland was located within 500 miles of three-quarters of the population of North America.

Ten years ago, few people predicted either the explosion of job growth in North Dakota and West Texas or the slowdown in growth in California. Looking ahead, ubiquitous transportation networks and increased economic significance of non-place-based employment in services and information may result in less dependence on natural resources and freight accessibility as a driving factor for growth. Quality of life, governance, cost of living, caliber of workforce, and other factors may more prominently shape future trends in growth.

- Will transit-oriented development or other transportation initiatives targeting economic development significantly impact commuting patterns?
- Will greater information/knowledge-based employment, and hence, not geographic place-anchored employment, result in quality-of-life considerations influence population and employment growth patterns, to favor growth in locations with attractive quality-of-life and livability features?
- Will the resurgence in domestic energy production and perhaps a renaissance in manufacturing influence future growth patterns?
- Will housing and transportation affordability influence settlement patterns both across and within urban areas?
- Will value and culture preferences of a diverse population, now that more generations are removed from the era of significant rural roots, continue to favor the mix of urban, suburban, small town, and rural settlement patterns that currently exist?
- Will the economic scale of various activities from big-box stores and retail developments to corporate offices favor high degrees of concentration versus dispersion?
- Have communication technologies or other factors mitigated some of the agglomeration benefits of central city location or large concentrations of employment?
• Will development regulations, environmental factors, climate, water availability, and financing considerations influence employment location patterns?
• Will transportation capacity, congestion levels, and mode choice options influence location choices; if so, in which directions?
• Will other technological breakthroughs such as 3-D printing, drone deliveries of materials, off-the-grid energy sourcing, or other innovations impact location decisions for employers?

Future commuting patterns are highly influenced by current fixed assets of business, residential, and transportation infrastructure that significantly constrain the pace of change in household and employment location patterns. Over time, there can be shifts influenced both by location decisions for new employment and residential locations as well as some redistribution of the home and work linkages between the existing housing and employment locations. A multitude of factors, including transportation, will influence those decisions. Incremental growth, inevitably a combination of intensification and new development, also will alter those patterns. The forecasts of more moderate growth on top of a larger fixed base of transportation and land use infrastructure preclude dramatic changes in commute patterns. Higher variable travel costs resulting from a decade of fuel cost increases and worsening congestion might suggest dampened enthusiasm for longer-distance commutes. Housing affordability, the prospect of partial telecommuting in lieu of travel, cell phones, and in-vehicle amenities such as enhanced audio systems and other considerations may mitigate angst most associated with longer commute times and/or distances.

The ongoing evolution of downtowns as destinations for work–live–play environments may diminish stereotypical suburb-to-city commute patterns, and these revitalized downtowns, including those beyond the historic central city, may provide attractive choices for persons who favor that lifestyle. This trend, like many others, may be constrained to areas with the critical mass of conditions that make these environments successful.
Commuter Behavior

Briefs 7 through 14 describe factors that influence commuting and explore commuting behavior with respect to modal travel choices. Changes in the economy, demographics, and technology are resulting in changes in travel behavior in ways that are different than in the last half of the 20th century. Commuting behaviors including the temporal distribution of travel and mode choice are influenced by many considerations that are impacted by technology, economics, culture, government policy, and other factors. Questions regarding future commuting behaviors that were identified in CIA3 include the following:

- Will immigrants join the typical patterns of vehicle ownership in travel behavior, or will new patterns emerge?
- Will racial and ethnic minorities fully join the mainstream car-owning classes?
- Will technological fixes continue to be effective in responding to environmental concerns?
- Will telecommunications and the growth in working at home take the edge off commuting problems in many areas?
- Will ITS technologies begin to assert an influence on travel times or other factors of commuting?
- Will aging commuters generate shifts in the style of commuting?

Additional questions building on contemporary trends can be added to that list including:

- Will the growing availability of travel options such as car/bike sharing, bicycle-supporting infrastructure, and improved public transportation availability influence commuting?
- Will evolving technologies such as smart phone-based apps for just-in-time transit information, dynamic carpool formations, trip planning, convenient electronic billing for tolls, parking,
transit, shared vehicle use, and other factors impact commuting choices?
• Will changes in transportation cost structures, such as the prospect of shared vehicle ownership, where travel costs shift from high fixed and low variable costs to lower fixed and higher variable costs, alter commuting mode choice?
• Will observed differences in travel of millennials be sustained if the economy improves and as those cohorts age?
• Is there a risk that America’s relatively low energy costs and energy taxes will revert toward levels in other developed countries and dampen travel demand?
• What influence will the introduction of automated vehicles have on location decisions, auto ownership levels, roles of transit agencies, and adoption of bicycling and walking?
• Will changes in traditional work schedule or work arrangements, such as more part-time, more multi-job situations, more job sharing, more flexible shifts, etc., impact commuting?
• Will transportation infrastructure and service investment—or the lack thereof—impact congestion, mode availability, safety, or other factors sufficiently to change overall commuting trends?
• Will continuation of the income growth disparity that has been witnessed in the past few decades affect overall commuting patterns?
• Are there fundamental generational differences in culture and values that will result in changing commuting patterns as new generations enter and pass through the working age cohorts?

While these questions are both old and new and have pertinence to the characteristics shaping commuting in the future, some have been overwhelmed by economic realities and have lost their power to solely shape patterns when examined in the light of the present economic context.
The presence of myriad factors influencing future trends minimizes the prospect of any single factor having dramatic influence. Some observations are appropriate:

- Commuting behaviors have been shown to be sensitive to economic conditions. Low income can constrain auto ownership, precluding the choice of the most popular commuting mode. A key technological change that has opened auto ownership to lower income groups has been the increased longevity of the average vehicle today, with average vehicle age over 11 years. Previous briefs have documented the sharp decline in arrivals of immigrants and the arresting of increases in vehicle acquisition and use by low-income segments of the immigrant, minority, and general populations. The recent recession resulted in reduced vehicle ownership levels, which, if sustained or heightened, could produce more meaningful shifts in commuting mode. Irrespective of the overall economic trends, the affordability of travel choices for the lowest-income workers could be impacted if disparate income growth trends persist.

- Knowledgeable experts have predicted significant travel impacts associated with the prospects of very high-priced and/or limited vehicle fuel availability. Some have gone so far as to predict the demise of the suburbs and radical transformations in urban development patterns in response to the prospect of fuel prices approaching those in Europe. Currently, domestic energy production increases, coupled with meaningful changes in vehicle fuel efficiency and vehicle dependency on petroleum-based fuels, appear to be moderating the expectations that energy pricing and availability will dramatically impact future commuting behaviors.

- Technology, particularly telecommunications capabilities to support working from anywhere, is increasingly available with higher quality and at lower costs. These trends, in conjunction with an aging workforce attempting to stay in the labor force via independent approaches after job losses and retirement, have contributed to greater work-at-home participation and enabled schedule flexibility for some workers. The future trend in working at home will benefit from better data, particularly a structured typology of work-at-home. More analysis could be placed on a growing list of tasks that enables technology to substitute for some trips (e.g., telemedicine).
Technology also influences the convenience, reliability, safety, and environmental impacts of the various modes of travel. This can influence the relative modal attractiveness, which can subsequently influence commuting demands. However, the composite impact of these trends is difficult to disentangle. For example, real-time transit information and convenient transit trip planning, as well as smart phone or Wi-Fi connectivity during travel, can make the transit and ridesharing trips more attractive. Alternatively, in-vehicle navigation, oral communication via cell phone, lessened pollution, better fuel efficiency, and better safety for auto travel due to technology improvements can similarly provide benefits in auto travel attractiveness. Evolving capabilities for dynamic carpooling and the presence of convenient short-term car/bike rentals and sharing opportunities are among other technology-enabled changes in travel choices that can impact commuting.

At the extreme, the prospect of autonomous or connected vehicles—concepts that currently are receiving a great deal of attention—could more dramatically influence commuting travel. The rapid evolution of smart vehicle technologies holds the potential for dramatic changes in the nature of travel. Recent reporting by federal agencies, as well as AASHTO and research institutions, provides the basis for believing that we are entering a new era in vehicular transportation, comparable to the period when air-bags, seat belts, and other safety devices became ubiquitous. The very clear first benefits of these technologies will be in the safety of drivers and passengers. These new technologies could dramatically alter the travel landscape by fundamentally changing the nature of travel costs through
shared ownership of vehicles. The lines between public and private transit/transportation could be blurred if a variety of transportation delivery schemes and vehicle sizes targeting different markets are enabled by autonomous vehicles. These technologies also have the prospect of impacting travel time/congestion by changing the capacities of transportation travel ways. It is premature to predict the magnitude and timing of commuting changes that might result from the evolution toward autonomous or connected vehicles; however, the long planning lead times and lengthy amortization lifecycles of transportation infrastructure merit paying attention to the rapidly-evolving technology for connected or autonomous vehicles.

The Importance of Commuting

In light of the current volume of commuting and the expectations going forward, as well as the nature of commuting as influenced by various factors impacting its pattern and mode, it is important to reflect on the importance of commuting to overall travel demand in the future. The evidence suggests that the importance of commuting, as characterized by the extent of travel that consists of commuters, is not likely to change dramatically. As noted above, the growth in the workforce is expected to be far more modest than historically has been the case. Also, there is evidence that the changes in mode share trends will be different than that of the last half-century, in which the auto's dominance became preeminent. CIA3 indicated that it was likely that many of the alternatives to the single-occupant vehicle had reached levels of irreducible minimums in the early years of the new century. That seems to have proven out in the present period. Going forward, auto's share is mathematically unable to increase as in the past, and there is some evidence that an increase in use of alternative modes may result in modest declines in the share of auto use over time. However, current land-use patterns and infrastructure investments preclude rapid change in the overall modal mix. The collective consequences suggest continued significant reliance on auto commuting at the national level.
Over the past several decades, the decline in commuting as a share of all roadway volumes was attributable primarily to the rapid increase in overall travel associated with high workforce participation and growing dependence on additional travel to take advantage of services and consumption, both financially-enabled and temporally-necessitated, for households with multiple workers working outside the home. This growth in travel reflects both specialization of activities and services (e.g., a visit to the family doctor, who refers you to a specialist, who sends you to a scanning center, a lab, a rehab center, a pharmacist; rather than picking up a gallon of paint at the hardware store and painting the living room, a decorator visits your home and provides advice on colors, contractors visit and provide estimates, and the painters arrive and paint the living room). This trend, enabled by multi-worker households and high labor force participation, may have played itself out. Both recent economic constraints and the ability to substitute communications in lieu of travel for some activities have resulted in a dampening of non-work travel. Going forward, scenarios can be envisioned that might modestly alter relative growth of commuting versus non-commuting travel; however, there is no evidence of a significant new phenomenon that would result in dramatic changes in the relative importance of commuting in the volume of travel.

An additional component of the overall effect of commuting on the transportation system results from the length of the commute trip (versus the number of trips). Over time, the average commute trip has lengthened modestly in association with faster means of travel. This lengthening has been coincident with suburbanization trends and the growing use of single-occupant vehicle commuting and reliance on high-speed facilities (freeways and rail transit) for a growing share of commuting travel. Trip times have been growing by 1–2 minutes per decade until recently, when they appear to have stabilized. Looking ahead, there are several forces at play that could influence future commute length in both time and distance. The exhaustion of historical trends in rapid growth in travel, compounded with the recent recession, has moderated travel demand to the point where roadway congestion is not at the peak levels experienced just after the middle of the last decade. Should economic conditions improve, more travel by an ever-larger population being accommodated on slowly-expanding transportation system infrastructure would inevitably experience heightened congestion and slower travel. However, one can also envision continued
slowing of travel demand growth associated with substitution of communications for travel and perhaps aided by economic stress or environmental sensitivities, further dampening travel. Again, conditions can vary significantly between individual metropolitan areas.

The other factor affecting travel distance is the geographic orientation of employment and residential areas. Commuters’ propensity to travel given distances to satisfy their employment aspirations and residential location preferences, particularly given that most workers live in households with other workers, makes locating near work problematic. One could argue that increased longer-distance commuting would be expected in an environment where jobs are scarce and people are willing to travel farther to find an acceptable job, or any job. What confounded that reality during the recession was that the job losses were typically in those industries that tended to have longer commutes, e.g., factory work and construction.

The recession, of course, was more about job losses than about job opportunities in distant locations. Consequently, any tendency toward workers being willing to make longer work trips to find work was offset by the greater-than-average declines in the industries cited earlier.

Another factor that requires consideration is the extensive growth in our largest metropolitan areas. Growing specialization in skills and in job requirements at the higher end of the skill spectrum will tend to attract high-skill employers to very large clusters of skilled workers. This would appear to be a long-term trend that will be resilient into the future as jobs become increasingly specialized. In geographic terms, the increasing size and scale of metro areas increases the potential, if not the probability, for long-distance work trips. It is possible today to have a 50-mile commute and remain within the same metropolitan region. Brief 15 documented the continuing growth in the percentages of workers working outside their residence county.
As employment has followed population in the trend of suburbanization, changes in overall commute-trip orientation are unlikely to contribute to significant lengthening of work trips. However, several other factors may play into overall trends. Housing costs also tend to influence trip length as the workforce seeks to find affordable housing subject to tolerable commute-distance trade-offs. With slow income growth and high housing costs in some locations, such as parts of California and the Northeast, the solution has been lengthening commutes. Similarly, some households are locked into their current residential locations due to underwater mortgages, high property sale/purchase transaction costs, and non-portable property tax discounts. Individuals unable to find competitive employment opportunities closer to home in a tight economy may be contributing to the growth in long-distance commuting. Others have speculated that the opportunity to telecommute, at least part-time, and to use flexible work schedules might be contributing to commuter’s willingness to tolerate more lengthy commutes. Similarly, the ability to conduct business and/or pleasure with cell phone capabilities and to use vehicle technology that offers such amenities as navigation, traffic information, and quality audio entertainment might minimize the disutility of lengthy travel. Countervailing factors might include growth in core city residential opportunities; growth in households without children, which may minimize the motivation for suburban residential preferences; growth in suburban employment, further minimizing geographic disparity in job–housing balance; greater regulatory sensitivity to housing affordability; and the development of managed lanes and long-distance transit commute services that might enable faster long-commute distances. The composite effect of these factors is unknown but is unlikely to produce more than modest incremental changes in commute trip lengths.

One of the key changes over the last decades of the 20th century was the shift in trade-offs between travel cost and the value of time. The centerpiece of transportation
decision-making in recent decades has been about the value of time. In the recent recession and its aftermath, there has been some shifting back towards the financial cost of travel as an important factor, simply because of the lack of income growth. However, if costs were a major consideration, significant increases in carpooling might be expected, but that has not materialized beyond some signs of the arresting of further decline, again for reasons beyond simple cost factors. This could include losses of carpool related to construction and manufacturing, which are heavily carpool oriented, or simply the continued dispersion of population and employment minimizing the prospect of convenient pooling. A great deal of public policy thinking is keyed to the value of time and the trade-offs people are willing to make to respond to their perceived value of time.

Another key factor is the trade-offs between commuting costs and housing costs. If commuting costs plus housing costs are taken as a joint cost, then some trade-offs become more clear. Brief 8 indicated that a useful average statistic for the sum of transportation and housing costs has ranged around 50 percent of total household expenditures over the years, with center cities having lower transportation costs and much higher housing costs in contrast to fringe areas, where housing costs were lower and afforded more house per dollar but had higher transportation costs. Traditionally, groups in the early life cycle stages of household formation opted to accept higher transportation costs in exchange for lower housing costs and affordable mortgages that provided the amenities desired—in effect, exchanging their extra travel time for lower mortgage payments. Whether that pattern will persist into the future or exhibit modified behaviors will be a key to future commuting behavior. Job growth in traditional suburbs will be an important factor in defining these outcomes. It has been noted that both job growth in the suburbs and population growth in city centers tend to move the job/worker ratios in both areas toward one.
Summary
In spite of some rather significant changes in demographics, the economy, technology, and the culture and values of residents, commuting behaviors have changed modestly. The very fact that commuting behaviors are affected by a large number of factors in sometimes competing and sometimes complementary ways that are not fully understood has resulted in actual changes in travel behavior with respect to commuting that are quite modest. It may be the hallmark of this period that, instead of a few dominant trends that define the future of commuting, the coming decade will be influenced by a myriad of sometimes conflicting pressures, making for varying and countervailing changes. The extent of fixed infrastructure in housing, employment, and transportation mitigates against dramatic changes in commuting behavior. There is a great tendency for the present to persist into the future despite forces of change. In addition, fundamental elements of human behavior—for example, how people value time, residential preferences, and employment aspirations and opportunities—remain relatively consistent over time, particularly at the national level.

In several ways, the past decade has seen the most dramatic changes in historical trends influencing travel that have been witnessed in a couple of generations. The demographic changes are quite pronounced:

- baby boomers at or nearing the end of their working lives
- a multi-decade diverse flood of immigrants entrenched in the U.S. workforce
- a population more urban and less rural
- shifts in population to the West and South
- a growing disconnect between historically-important physical attributes of a place (access to minerals, agricultural land, natural resources, waterways, etc.) and the location of employment and population, as knowledge and service industries comprise a larger share of the economy and have greater location discretion

America may be in the most dramatic era of socioeconomic change in a century. In addition to these demographic trends, the economy has changed, with impacts on commuting. These include a stressed economy with slow employment growth, concerns about limited upward mobility, increased polarization in income—particularly at the household level, prospects for low-skilled workers being replaced by technology, and growing personal and government debt levels. This is coupled with a growing recognition that mobility is critical to enabling economic opportunity and capturing the benefits of economies of scale and agglomeration.
Figure 16-5 characterizes the major influences on commuting. Commuting in the last half of the 20th century was dominated by three key trends:

1. the distinct demographic phenomenon of the large baby-boom generation coupled with culture and value changes, leading to extensive female labor force participation;
2. economic and technology trends that enabled widespread auto ownership and the growth in single-occupant vehicle commuting; and
3. the suburbanization boom, enabled by the factors noted above.

**Figure 16-5. Fundamental Factors Influencing Commuting**

These distinct and significant trends have given way to an era that is, at present, best characterized by a multitude of factors that exert some degree of influence on commuting, but with more variability across contexts and greater uncertainty as to the magnitude and duration of consequences and their influence on commuting. Associated with each circle in Figure 16-5 are several issues whose uncertainty has been acknowledged in both professional and popular media.

Uncertainty at all levels of government regarding transportation funding will impact the availability and

It may be the hallmark of this period that instead of a few dominant factors that define the future of commuting, the coming decade will be influenced by a myriad of sometimes conflicting pressures, making for varying and countervailing changes.
performance of travel options. The availability and competitiveness of public transit, the performance of the roadway system, and the viability of other options remain uncertain, with no clear picture of future investment.

Development trends and potential changes in preferences—for example, millennial and retiring baby boomer settlement preferences—could alter geographic settlement and travel patterns. Growing domestic energy production, the prospect of strengthening manufacturing competitiveness, and the dynamic growth and locational flexibility of knowledge-based industries can influence development patterns. Even climate, or man-made or other natural events can influence development patterns.

Uncertainty on labor force participation, immigration, and migration will impact national and local workforce growth. The rate and distribution of growth are subject to uncertainty.

The growth rate of the new economy and the distribution of income will impact overall demands for travel, including commuting. Economic conditions also influence location decisions and the mode choice for commuting.

Similarly, technology is changing at a record pace. In a multitude of ways, this is directly impacting transportation, from significant changes in the environmental impacts, safety, and energy consumption of transportation to the growing substitution of communications for transportation and the prospect that technology will enable autonomous vehicle operation, fundamentally changing the cost, performance, and impact profile of transportation modes. Technology changes can influence the relative appeal of various modes for commuting and all travel purposes by increasing the knowledge of alternative choices, changing the convenience and cost of travel for various modes, mitigating the onerousness of the time spent traveling, and reducing the angst and uncertainty of travel schedule determination and direction finding. New materials and technology can improve the accessibility of various modes for able-bodied and disadvantaged travelers, change the aesthetics of various modes, and impact how they can be integrated into communities. New propulsion technologies, new fuels, and new materials can alter the relative environmental and energy impact of the modes, perhaps altering their relative attractiveness and cost.
Simultaneously, there is some evidence that fundamental values of the public might be changing in ways that can impact travel. For example, sensitivity to environmental impacts, safety, physical activity, and aesthetics may have different importance than in the past. Perhaps even more important, changes in values that influence household composition and residential location preferences as well as time-use preferences can influence travel, including commuting.

One consequence of these composite changes—in spite of the fact that the aggregate change in commuting remains quite modest to date—is that there can be much greater variation in commuting behaviors across places. National measures of commuting remain relevant to understanding travel and policy formation, but an appreciation for the variation in travel and, hence, the variation in transportation needs across places is critically important as we move into the future. We may be at a point where the variation in conditions and transportation needs and preferences across places will require different transportation strategies and investments. This might suggest more flexibility in both planning and investment strategies to best meet local transportation needs. Differences in rates of growth, fundamental geographic conditions and development patterns, socio-demographic and cultural conditions, and existing transportation infrastructure networks might be significantly different and merit different planning processes and different investment strategies across different states or metropolitan areas. The portfolio of infrastructure investments and services might vary substantially across areas based on both their market conditions and their policy preferences and priorities.
The State of Transportation Data and Knowledge

This series of briefs has been dependent on numerous sources of data, as referenced in Brief 1. Of particular note is that this was the first Commuting in America analysis to take advantage of the annual American Community Survey (ACS) data resource. In general, numerous data sources have been integrated in an effort to discern a comprehensive picture of commuting. These data are adequate to provide a rich description of national commuting trends and are sufficient to shed insight on variations across state and metropolitan area geography. However, the nature of the data and sample sizes often are not sufficient to enable a comprehensive analysis of variations in travel behavior at smaller geographic scales. Similarly, they are insufficient to fully account for the level of service/availability of travel options and the influence of the built environment or natural environment on travel behavior. The substantial changes in geographic population distributions and jurisdictional/locational classification of population often challenge the structures and definitions employed to describe metropolitan phenomena. This seriously challenges the ability to properly convey what geographic changes are occurring and interpret their significance.

This analysis also reaffirms, in the perspective of the authors, the weaknesses of the transportation planning professions’ understanding of travel behavior. The theory and knowledge of travel behavior is not sufficiently well-developed to confidently predict how travel behaviors might respond to the myriad potential scenarios of future conditions. In particular, changes in values, the introduction of new technologies, changing economic conditions, and other factors result in significant uncertainty in future travel behavior.
While uncertainty about the future is not unique to transportation, its significance could be more important in the future, as the magnitudes of change and variation in behaviors across places appear to be growing while the degrees of freedom to respond appear to be economically constrained. Furthermore, uncertainty about the future introduces risks when the lead time for transportation project implementation has become very long and many investments depend upon a half century or more of heavy utilization to amortize often massive investments. Collectively, these conditions favor strategies and investments that offer quicker responses to evident needs, incremental deployment of investments subject to feedback on market response, and flexibility to accommodate evolving technologies and market conditions.

Hopefully, the changing demographics, economic conditions, technologies, and values and cultures that are making predicting the future uncertain will also produce unanticipated strategies and technologies to address the inevitable transportation challenges.
Commuting in America 2013 Briefs Series

The CIA 2013 series will include the briefs listed below as well as a CIA 2013 Executive Summary and supporting data files, all available at the CIA 2013 website traveltrends.transportation.org. The website also includes a glossary of terms, documentation of data sources, and additional resources. The series of briefs included in CIA 2013 are:

1. **Overview**—establishes institutional context, objectives, importance, data sources, and products to be produced.

2. **The Role of Commuting in Overall Travel**—presents national trend data on the relative role of commuting in overall person travel; explores commuting as a share of trips, miles of travel, and travel time at the national level.

3. **Population and Worker Trends**—provides very basic and key national demographic data.

4. **Population and Worker Dynamics**—focuses on the dynamics of the population and workforce, including data on migration, immigration, and differential rates of growth.

5. **The Nature and Pattern of Jobs**—defines employment and describes it in terms of its temporal, geographic, and other features.

6. **Job Dynamics**—looks at trends as they relate to jobs, including work at home, full-time versus part-time, job mobility, and changes in the nature and distribution of job types.

7. **Vehicle and Transit Availability**—reports on vehicle ownership and licensure levels and the availability of transit services. It also references factors influencing the availability of bike, walk, and carpool commute options.

8. **Consumer Spending on Transportation**—reports on various trends related to household spending on transportation.

9. **How Commuting Influences Travel**—explores how commuting travel influences overall travel trends temporally and geographically.

10. **Commuting Mode Choice**—provides a summary of mode choice for commuting (including work at home).

11. **Commuting Departure Time and Trip Time**—reports descriptive information on travel time and time left home, including national and selected additional data for metro area sizes.

12. **Auto Commuting**—addresses trends in privately-owned vehicle (POV) and shared-ride commuting.

13. **Transit Commuting**—addresses transit commuting.

14. **Bicycling and Walking Commuting**—addresses bicycling and walking as commuting modes.

15. **Commuting Flow Patterns**—addresses commuting flow patterns for metro area geographic classifications.

16. **The Evolving Role of Commuting**—synthesizes and interprets materials developed in the prior briefs to paint a picture of the current role of commuting in overall travel and evolving trends to watch going forward.

ES. **CIA 2013 Executive Summary**