Commuting in America 2013
The National Report on Commuting Patterns and Trends

Brief 11. Commuting Departure Time and Trip Time

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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.

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Commuting Departure Time and Trip Time

This brief is the eleventh in a series describing commuting in America. This body of work, sponsored by the 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 (www.transportation.org). Accompanying data tables and an Executive Summary complete the body of information known as *Commuting in America 2013* (CIA 2013).

One of the important characteristics of commuting is the fact that it is a relatively high-frequency trip taken by travelers at similar times. Transportation professionals and others often refer to this resulting pattern as rush-hour or peak-period travel. Historically, commuting to and from work has defined these peak travel periods, which traditionally take place during weekday mornings and evenings as the workforce travels to and from their places of employment. These peak periods for travel define the transportation infrastructure and service needs for roads and transit systems. Understanding these peak periods and the distribution of commuting over time is important to transportation planning and forecasting.

The length of time spent traveling to work is another important measure of commuting. The commute trip length in time is impacted by the trip length in distance and the trip speed. Thus, this measure reflects workers’ decisions related to residential and workplace location, as well as their travel mode choice and the congestion levels they encounter in their travels. With work being such an important trip, measures of commute travel time are a significant indicator of the public’s value of time for commuting to work. This brief provides quantitative data regarding work-trip departure times and trip travel times.

**Commuting Departure Time**

As a general rule, one would expect the distribution of travel by time of departure for work to be a substantially stable attribute of work travel. Most places of employment have hours of operation that shape work start and end times for employees. The occupational and industrial structure of the nation’s economy determines work schedules for large shares of the population; individual workers then shape their individual travel around such factors as trip distance, anticipated congestion/travel speed, their risk tolerance for on-time arrival, the availability of travel modes (auto availability or transit schedules), and coordination of...
household travel activities (dropping off spouse, taking kids to school, running errands, etc.). The composite impact of these factors is the resultant distribution of travel departure times for the trip from home to work.

Figure 11-1 shows the travel departure time distribution based on data collected in the 2011 American Community Survey (ACS). Note that respondents were asked what time they departed for work at their primary job (for multi-job holders). This distribution will be similar, but not identical, to a distribution of time spent commuting to work. Recognizing that the mean trip length is approximately 25 minutes, the peak roadway volumes of commuters will occur approximately one half hour later than the distribution in Figure 11-1. In the recession period that dominates recent empirical data, the sharp losses in home construction and manufacturing may have affected that departure time distribution to some extent.

The distribution in Figure 11-1 is very similar to one derived from 2000 census long-form data, with some slight increases in early morning shares.1 The major exception is the 7:00–8:00 a.m. period, which is the major travel period. Surprisingly, the amount of travel in that period declined by a substantial amount, approximately 1.7 million commuters over the 12-year period; it was the only period showing fewer commuters than in 2000. Overall, commuter counts increased by approximately 7 million, or nearly 6 percent. Figure 11-2 shows the change in work trip departures by time period. It is not clear what the basis is for the 7:00 a.m.–8:00 a.m. drop of roughly 5 percent is. It may reflect changes in the nature of employment types, which can influence start times, or it may be a reflection of higher congestion levels forcing earlier start times or other non-work traffic absorbing the peak capacity and, in effect, forcing commuters into earlier or later departure times to have tolerable travel times. There may be important regional differences that affect the scale of the shift. Such a shift in the peak-period commute, absent offsetting changes in non-work travel, could have substantial effect on peak-period congestion.

**Long and Short Commutes**

To gain insight into the impact of commuting on individuals, analysis frequently uses thresholds of 20, 60, and 90 minutes as useful for descriptive analysis. Looking at time of departure by those reaching work in under 20 minutes and over 60 minutes, one sees the expected pattern—lower percentages for those traveling under 20 minutes in the early morning hours and higher percentages for those traveling over 60 minutes. Figure 11-3 displays the pattern. It is in the later morning hours that the percentage with commutes under 20 minutes becomes substantial.

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1 The census long-form survey was conducted in April each decade whereas American Community Surveys are conducted throughout the year. It is not expected that this would impact the trip departure times, but that hypothesis has not been tested.
**Figure 11-1.** Distribution of Workers by Trip Departure Times  
*Source: ACS 2011*  

**Figure 11-2.** Distribution of Numbers of Workers by Trip Departure Times, 2000, 2011  
*Source: 2000 Census, ACS 2011*

**Figure 11-3.** Long and Short Trips by Time of Departure, 2011  
*Source: ACS 2011*
This follows the same pattern seen in the year 2000 statistics, as shown in Figure 11-4. The patterns exhibit remarkable stability, with some small declines in shares of workers reaching work in under 20 minutes.

![Figure 11-4. Shares of Long and Short Trips by Time of Departure, 2000 and 2011](source: 2000 Census, ACS 2011)

**Work Trip Departure and Gender**

Rather similar stability is manifested in the data when differentiated by the gender of workers. Figure 11-5 depicts the pattern of time of departure for males and females.

![Figure 11-5. Work Trip Time of Departure by Gender](source: ACS 2011)

The noteworthy factor is that males predominate in the early hours. A crossover point is reached between 7:00 and 7:30 a.m., after which females are in the majority until the evening hours. Differences may be the result of different trip lengths, involvement in different industry classes (that have different start times), different impacts on trip timing related
to parenting responsibilities (getting children off to school), and/or differences in travel location relative to congestion levels. If one uses the percentage leaving for work before 6:30 a.m. as the metric for Time Left Home, a surprising difference arises: almost 27 percent of all male workers leave before 6:30 a.m. but only 15 percent of females do. In absolute terms, there are 19 million males out before that time, exactly double the 9.5 million females who are early commuters. Different participation in various industries with different traditional start times may explain part of this difference.

Figure 11-6. Modal Shares by Work Trip Departure Time
Source: ACS 2011

**Work Trip Departure and Mode**

The overall question of commute mode used is more related to when the traveler left home than might be expected. Figure 11-6 displays this relationship. It is clear that the private vehicle is dominant in the early morning hours and tapers off in the later parts of the early morning commuting period, starting around 8:00 a.m. This is the period that shows a sharp
drop-off in commuters starting their travel, roughly half as compared to the 7:00–8:00 a.m. period, and then volumes drop even more sharply to a third or quarter of that before noon. The figure can mislead in this way. For example, the 11:00 a.m.–Noon travel period, in which walking to work and transit are so strong, represents about 5 million travelers in total, compared to 35 million in the peak 7:00–8:00 a.m. hour. From the graphic, it can be seen that all the alternative modes do not reach 10 percent of travel in the early a.m. periods until 8:00 a.m. Then, the alternatives jump a bit, surpassing 15 percent of travel in the 11:00 a.m.–Noon travel period. This represents an increase in use of alternative modes. In 2000, they did not reach 8 percent before 8:00 a.m.; in 2011, several early periods before 8:00 a.m. reached almost 9 percent. After 8:00 a.m., alternative modes have a greater share also, reaching above 15 percent in the later morning period. No period was above 14 percent in 2000. The strong role of walking in these periods is apparent. Part-time work might be a factor here, as may be the decline in carpooling share (see Brief 10).

Figure 11-7 provides a distribution of departure time for carpools. Note the dominance of the two-person carpool and the sharp dip in the early morning hours starting between 7:00 and 8:00 a.m. Many two-person carpools today are household pools, consisting of work travelers from the same household. These do not include what might be labeled a carpool in some statistical presentations—a parent dropping off a child or parent at school or an older adult center on the way to work. Importantly, it appears from past data that the declines in two-person carpools, which accounts for 77 percent of the overall decline in carpools, was proportionate to its share of overall pooling, so no significant change in proportions among pool size occurred.
If overall private vehicle use, both driving alone and carpooling, is compared to other alternatives for the early hours, it can be seen how important those early hours are related to vehicles. Figure 11-8 shows the share of driving alone to work before 6:30 a.m., at 21.3 percent of all driving alone to work, up from 19.3 percent in 2000. Notably, the importance of the early morning hours increases sharply with the size of the carpool group, rising to 42.4 percent in the seven-person or more carpool/vanpool. This is down from the 47.4 percent observed in 2000. There may be a number of reasons for the earlier departure of large carpool groups: they can take longer to assemble, so earlier starts would be required; they tend to develop around longer-distance trips in which the cost and reduced stress more than offset the time costs of forming a carpool/vanpool group; and many are formed to serve construction and factory work often at remote locations where higher pay levels warrant longer trips. Softness in these employment categories may also explain the decline in share of the large pools.

Figure 11-8. Trend in Drive Alone and Pool Travel before 6:30 a.m. by Size of Carpool
Source: Census 2000, ACS 2011

Work Trip Departure and Race/Ethnicity
Table 11-1 reviews commuting departure time in relationship to race/ethnicity of commuters. The departure time is influenced by the nature of employment, the distance traveled, the means or mode of travel chosen, and perhaps some cultural or other effects. Overall, Table 11–1 shows the shares of departures before 6:30 a.m. The group with the least orientation to early morning travel is the Asian Non-Hispanic group, with only a bit more than 15 percent of workers leaving before 6:30 a.m. This group also exhibits high percentages—roughly double the other groups—between 9:00–10:00 a.m. The Black Non-Hispanic population has the next lowest early morning travel, although, at over 23 percent, it is appreciably higher than Asian Non-Hispanic shares. The overall White Non-Hispanic population is only slightly greater than the Black Non-Hispanic population group, at 24 percent. The
group with the earliest orientation to work travel are Hispanics, with well over 28 percent in the before-6:30 a.m. time group.

Historically agriculture, construction, and manufacturing jobs tend to have early start times. Traditional white-collar and service workers often have standard 8-to-5 or 9-to-5 work schedules with retail, hospitality, and other services more inclined to have later start times. The propensity of different race/ethnic groups to have disproportionate representation in certain employment categories coupled with job housing location patterns which influence commute trip lengths, ultimately impact the distributing of commute start time for race/ethnicity categories.

**Table 11-1. Departures Before 6:30 a.m. for Selected Races and Ethnicity**

<table>
<thead>
<tr>
<th>Group</th>
<th>Percent with Departure Before 6:30 a.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Non-Hispanic</td>
<td>24.2%</td>
</tr>
<tr>
<td>Black Non-Hispanic</td>
<td>23.2%</td>
</tr>
<tr>
<td>Asian Non-Hispanic</td>
<td>15.2%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>28.5%</td>
</tr>
</tbody>
</table>

Source: ACS 2011

**Work Trip Departure and Age**

Commuter departure time by the age of workers is portrayed in Figure 11-9. Of particular note are the late-in-the-day work times for the 16–24 age group. More than 30 percent of workers in that group start work after noon, suggesting that these are school-schedule influenced start times and likely part-time work. Some significant effect of this is also seen in the 25–34 age group. The broader picture indicates that workers’ departures tend to start earlier as age increases up to about 55 then they increase. Figure 11-9 also includes “work-at-home,” which increases significantly with age. This may be a combination of the tendency of those working at home to continue in the workforce beyond traditional retirement age and the prospect of some share of individuals who have retired from a career who work in consulting or another capacity from home in their later years.

Figure 11-10 shows the relationship between commuting departure time and the hours worked per week. Not surprisingly, those who work limited hours tend to start much later in the day, with about half starting after 9:00 a.m. Following this reasoning, those working longer hours are more likely to have early starts. Working at home is more common for both short and long working hours than is the case for more traditional work durations. The dominant work hours are

*Work at home is most common in the very short and very long work-week categories.*
**Figure 11-9.** Time Left Home by Age of Worker  
*Source: ACS 2011*

**Figure 11-10.** Time Left Home by Hours Worked  
*Source: ACS 2011*
those in the 33–40-hour category, with more than half of all workers. The 41–48 and 49–56 categories are very similar in their time-left-home characteristics, with a slightly greater tendency for earlier starts with increasing hours of work. These three groups account for 70 percent of all workers.

**Commuting in America 2013: The National Report on Commuting Patterns and Trends**

Commuter Travel Time

One of the key barometers of commuting is the amount of time people spend traveling to work. This section examines current trends in travel times among workers and further disaggregates those trends into their important attributes that reveal something about travel time patterns and the nature of the various factors that go into those travel times.

**Average Travel Time to Work**

The average travel time to work for those who commute to an employment location was 25.5 minutes in 2011, exactly what it was in 2000. After years of substantial increases in travel times, averaging 1–2 minutes of increase per decade, as seen in Figure 11-11, the first years of the new century have seen effective stasis. Average travel times did not change at all from 2000 to 2011, with annual variations in the period bounded by a half-minute range from 25 to 25.5 minutes. Since the decennial census in 2000, there has been a change in the survey that reports travel times (to the annual ACS), which might be cause for some question about trends, except the ACS, as shown in the inset to Figure 11-11, exhibits stability.

2 Historically, the *Commuting in America* series has reported on years ending in zero because of the decennial census. CIA3 for the first time broached annual estimates from the ACS. In the new series of briefs, only ACS data can be used to report current statistics. Generally, the most recent year’s information is preferred; therefore, the year reported here typically is 2011. The 2010 ACS is used, however, when trend uniformity over decades is desirable.

3 There was conjecture in 2000 about the accuracy of the 1990 travel time value because of data entry procedures cutting off the highest reported travel times at 99 minutes. For a fuller discussion, see *Commuting in America III*, page 101. This brief adopts the higher estimated figure.
over the 2005–2011 period in which it has operated, with variations of less than half a minute. This plateauing of commute travel time is generally attributed to moderating congestion levels associated with softening overall travel demand and, specifically, slowing growth in workforce size. Other considerations such as workplace household location decisions also factor into the resultant commute travel time.

![Travel Time Trends](image)

**Figure 11-11.** Travel Time Trends  
*Source: Census, ACS*

As a further observation, to assure sufficient observations for reliable statistics, the Census Bureau accumulates the annual ACS data in averages over a period of years. In the case of travel times, the five-year average from 2007 to 2011 is 25.4 minutes, reinforcing the stability observed.

Geographical variations are shown in Table 11-2. The table offers some insight into the degree of variation in travel time by different units of geography based on worker’s place of residence. Again, as seen in other briefs, the Northeast stands out as different, with average travel times about 3 minutes greater than the national average. As in 2000, all regions are below the national average, except for the Northeast. Even at the national scale, New York can affect the averages. The Midwest average is about 2 minutes less than the national average, whereas the South and West are almost identical to each other and the national average. The differences between metro and non-metro areas stand out, at almost 4 minutes difference. The differences between central cities and suburbs, at 2 minutes, are less marked. Shorter
than 20 minutes), long (more than 60 minutes), and extreme commutes (those greater than 90 minutes) are shown in Table 11-2 for the four geographic regions. Not surprisingly, the Northeast has significantly higher shares of long and extreme commutes.

### Table 11-2. Average Travel Time by Geography

<table>
<thead>
<tr>
<th>Region</th>
<th>Average Travel Time (mins)</th>
<th>Variation from National Average</th>
<th>Percent &lt; 20 Minutes</th>
<th>Percent &gt; 60 Minutes</th>
<th>Percent &gt; 90 Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>25.4</td>
<td>—</td>
<td>43.8%</td>
<td>8.1%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Northeast</td>
<td>28.6</td>
<td>3.1</td>
<td>38.6%</td>
<td>12.2%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Midwest</td>
<td>23.4</td>
<td>-2.1</td>
<td>47.7%</td>
<td>6.1%</td>
<td>1.9%</td>
</tr>
<tr>
<td>South</td>
<td>25.3</td>
<td>-0.2</td>
<td>42.7%</td>
<td>7.3%</td>
<td>2.3%</td>
</tr>
<tr>
<td>West</td>
<td>25.3</td>
<td>-0.2</td>
<td>43.7%</td>
<td>8.1%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Metro Areas</td>
<td>25.9</td>
<td>0.4</td>
<td>41.6%</td>
<td>8.2%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Central Cities</td>
<td>24.5</td>
<td>-1.0</td>
<td>45.9%</td>
<td>7.7%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Suburbs</td>
<td>26.5</td>
<td>1.0</td>
<td>40.1%</td>
<td>8.4%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Non-metro Areas</td>
<td>22.2</td>
<td>-3.3</td>
<td>56.4%</td>
<td>6.4%</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Source: 2011, 5-Year ACS

U.S. states are distributed according to their 2010 average travel times in Figure 11-12. There are 37 states below the national average, with only 13 states and Washington, DC over the average. These may be attributable to states with low populations versus high; or low population densities versus high. In general, large metropolitan agglomerations, with a propensity for greater congestion, longer commute possibilities (larger metro areas), and greater transit use, tend to have higher travel times. There are 8 states with under 20 minutes of average travel time, which is roughly 5 minutes below the average, and 3 states above 30 minutes.

Overall, there are 28 states within the range of 22.8 to 27.8 minutes—10 percent of the national average—indicating the high degree of homogeneity in the national system.

Figure 11-12 also shows the changes in commute times from 1990 and 2000. Looking at the long-term trend, the picture that emerged in 2000 still pertains. When the states are ranked by their travel time in 1990, as in Figure 11-12, and the two subsequent decades are depicted, the picture of relative stability between 2000 and 2010 is reinforced. Perhaps more pertinent than the average picture between decades is that 26 states (and DC) saw reductions in their travel times from 2000 to 2010, and 24 realized increases. Most of the shifts were minor; only one state reached a one-minute increase.
Figure 11-12. U.S. Average Travel Times by State, 1990, 2000, 2010

Source: Census, ACS
Travel Time Distributions

A better sense of travel times can be gleaned from addressing the overall distribution of travel in discrete time intervals. Figure 11-13 makes that point. It is appropriate here to recognize the inherent weaknesses in this kind of data reporting. Respondents have a tendency to express their travel times in round numbers (30 minutes rather than 27 or 33); this is clear from the chart. However, these data can still prove effective as the share of persons citing 20-minute versus 15-minute shifts.

Figure 11-13. Total Travel Time Distribution
Source: Census, ACS 2011

This brief continues the earlier CIA concepts of looking at those who commuted for under 20 minutes and those who commuted more than an hour as measures of the more extreme ends of the time spectrum of travel. This is to overcome the problem of using averages to convey travel times. Most would agree that a 20-minute commute is a reasonable amount of time to spend traveling to work; at some relatively recent past point in time (around 2000), about half of the work population got to work in about that amount of time. Today, many states (19) are still in the range of half of workers making it to work in 20 minutes or less. These are largely low-population, low-density states. This is particularly true when those who worked at home are added to the group. Figure 11-14 makes that point clear. Today, about 44 percent of the population makes it to work in less than 20 minutes, compared to 47 percent in 2000. On a regional basis, the Midwest is at 48 percent in the under-20-minutes category, and the Northeast at the other end.
of the spectrum, at 39 percent; both the South and West are close to the national average, at 43 and 44 percent, respectively.

On the other end of the spectrum is the 60 minutes or longer commute time. While still relatively rare—only 8.1 percent of commuters take 60 minutes or longer to reach their workplace—commutes over 60 minutes constitute 25.5 percent of all commuting time. Six states are at or over 10 percent, and two are very close, and all are high-population-density states. In 2000, the Bureau of the Census began the use of the notion of “extreme commutes,” referring to those with over 90-minute commutes. In 2010, that group was at 2.4 percent. One of the attributes of the period is the stabilization of very long trips. Both 2000 and 2011 showed 8 percent over 60 minutes, and the share over 90 minutes actually declined from the 2000 value of 2.8 percent. Much of this stability appears to be attributable to the set of demographic and economic conditions that resulted in declines in overall roadway travel, hence lessening congestion. The Northeast, again, is divergent, with more than 12 percent traveling over 60 minutes and almost 4 percent traveling over 90 minutes, whereas the Midwest is at almost exactly half of those values.

Interestingly, there are two states that stand out as having both characteristics. Wyoming and West Virginia have a binary distribution of travel—that is, largely rural populations that have very low travel times, with 73 and 47 percent under 20 minutes, respectively, but with 6.1 and 9.9 percent over 60 minutes, respectively. Such a pattern is typically the product of a rural population generally traveling short distances to local jobs but a small share of the population traveling long distances to job opportunities in distant job centers. The case of West Virginia includes commuting to the Washington and Pittsburgh areas, both now reaching the West Virginia border and parts of Ohio.

Comparing commuters traveling under 20 minutes in the years 2000 and 2010, all states have a smaller share under 20 minutes today than they did in 2000. The 60-minute trend lines are more balanced, with little change apparent. Roughly half of the states saw growth and half saw declines. Virginia was the only state that saw a significant increase, from 8.4 to 9.9 percent, in the percentage over 60 minutes.
Figure 11-14. Workers with Travel Times under 20 Minutes and over 60 Minutes by State

Source: Census, ACS
Travel Times by Demographic Strata

Age and Gender

Another way to review travel time is to examine the distributions by various segments of the population. One of the key factors about travel times is the distinction between males and females, as shown in Figure 11-15. Females are more prominent at the lower end of the scale of travel times and actually are in the majority for travel times up to 20 minutes and exceeding their overall share of the commuting ranks (47.2 percent) up to 30 minutes. The male share in each travel time class increases and becomes dominant in the high travel time categories. In the higher ranges, above an hour, the male share exceeds 60 percent of the travel. Overall, females are 48.5 percent below 20 minutes, in contrast to the 43.1 percent of males. At the other end of the travel time spectrum, only 6.3 percent of females travel more than 60 minutes compared to 9.2 percent of males.

Figure 11-15. Shares of Travel Time Classes by Gender

Source: Census, ACS 2011

This is further explained by Figure 11-16, which cross-classifies the travel time information by gender with age. The already-stated prevalence of females over males in the under-20-minutes group is clear. Moreover, it is clear at every age grouping. Similarly, the greater share of males in the over-60-minutes classification is again clear at all age categories. The powerful point made here is that the younger and older workers (often those with shorter work schedules) tend to have more short trips and fewer long trips.

Only 6.3% of females travel more than 60 minutes to work, compared to 9.2% of males.
Another key point that helps construct the gender comparison is that females have a slightly higher share of working at home than males, 4.4 versus 4.2 percent, respectively.

Figure 11-16. Age and Gender Patterns for Travel Times under 20 and over 60 Minutes
Source: Census, ACS 2011

Income
The following discussion addresses the relationship between household incomes and travel times. It is critical to recognize that the treatment uses household incomes rather than the individual incomes of each worker due to data availability. The 72 percent of households that have workers, not surprisingly, tend to be in the higher income segment of households in the population. Two-thirds of workers live in households with other workers. Both personal income as it impacts the value of one's time and household income as it influences auto availability and value of time likely play a role in influencing a commuter's willingness to expend time on commuting. Similarly, household wealth or assets independent of income are also likely to influence commuting behaviors. It is clear from Figure 11-17 that higher-income households tend to dominate in the longer-trip groupings. Working at home is an exception to the long-distance characteristics of higher-income workers, with among the highest-income components of any time group.
Figure 11-17. Income Distribution by Travel Time Segment

Source: Census, ACS 2011
Figure 11-18 makes the patterns more clear by showing the travel time distribution by income class. With the exception of working at home, as incomes rise, so do travel times. This characteristic is discussed further in a subsequent section.

Some might be surprised that high-income people who presumably have the option to live closer to work are in the high-travel-time group. A number of factors are at play here, not the least of which is that high-income workers are more free to choose where they would like to live and may opt to live in areas that are attractive to them for a number of reasons, not just that they are close to work. Other practical factors also apply. Higher-income jobs will often tend to be highly specialized and thus more scarce and selective, so one might expect to have to travel a longer distance to find a suitable employment opportunity for a high income. Similarly, higher-income individuals have the opportunity to afford housing in select locations. Moreover, when there are multiple workers in the household, it is unlikely that each can optimize his/her work trip. Thus, in general, one would expect longer-distance commutes for higher-income workers. Numerous other factors, however, such as housing availability/affordability, also influence commute patterns and trip length and can confound clear relationships between trip length and income.

Looking at the groups that commute under 20 minutes and over 60 minutes, shown in Figure 11-18, lends support to these factors. The low-income-household end of the spectrum is where the highest proportion of those traveling under 20 minutes is found. A low-end-income job is more likely to be ubiquitous. One does not need to travel far in terms of
travel cost and time to a lower-paying job (e.g., entry-level retail or service) when alternative job opportunities are located nearby. Similarly, the over-60-minute grouping grows with income.

The hours worked per week influences both the household income and time available for commuting. When the 20- and 60-minute criteria are applied, it can be seen that the number of hours worked strongly affects the share of commutes under 20 minutes, as shown in Figure 11-19. It is not surprising that those working limited hours tend to have short trips. Much of this group includes younger and older workers with activities other than full employment, such as education. What may be unexpected is that those with long work hours also travel long distances to work.

Notable in this pattern is the smaller shares under 20 minutes across all hours-worked categories, but particularly in the lower hours-worked ranges, compared to reporting for the year 2000. Declines in the range of 4–7 percent have been observed. Part of the explanation for this decline may lie in workers accepting fewer hours at work or being willing to travel farther for a job with fewer hours in a difficult job market. More than one third of commuters with under 20-minute commutes work less than 25 hours a week. No such significant shift is observed in the over 60-minute distribution.

In some cases in CIA3, travel under 20 minutes included working at home. The comparisons here have been adjusted to assure comparable statistics.

Figure 11-19. Commutes under 20 and over 60 Minutes by Hours Worked
Source: Census, ACS 2011

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4 In some cases in CIA3, travel under 20 minutes included working at home. The comparisons here have been adjusted to assure comparable statistics.
Race and Ethnicity

A stratification of the work force by race and ethnicity provides useful information, more as a comparative value rather than as a guide to forecasting or estimating travel behavior. What the data indicate, as shown in Table 11-3, is that the White Non-Hispanic work force has the highest percentage of workers that commute under 20 minutes (45 percent) and the lowest percentage commuting over 60 minutes (7.4 percent). By comparison, Hispanics are at 40.5 and 9.2 percent, respectively. What is notable is that African-American Non-Hispanics and Asian-Non-Hispansics have very low percentages in the under-20-minutes category and very high percentages in the over-60-minutes category; they are very similar to each other despite the fact that their income and job characteristics are sharply different. Part of this may be due to both groups having higher-than-average transit use tendencies.

Table 11-3. Shares of Travel Times under 20 Minutes and over 60 Minutes by Racial and Ethnic Group

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percent &lt; 20 Minutes</th>
<th>Percent &gt; 60 Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Non-Hispanic</td>
<td>45.1%</td>
<td>7.4%</td>
</tr>
<tr>
<td>African American Non-Hispanic</td>
<td>38.3%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Asian Non-Hispanic</td>
<td>35.7%</td>
<td>10.9%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>40.5%</td>
<td>9.2%</td>
</tr>
</tbody>
</table>

Source: Census, ACS 2011

In terms of trend, the Hispanic patterns show diminished percentages under 20 minutes—40.5 percent in 2011 compared to 44 percent in 2000—but very similar percentages in the over-60-minutes category. Adjusting the Non-Hispanic categories for comparability with 2000 exhibits similar declines in the percentages under 20 minutes in all racial/ethnic groups. Again, only limited variation is observed in the over-60-minutes category in these groups.

Travel Time and Mode

A rather self-evident but still important distinction in travel time is the difference among modes of travel. Table 11-4 presents the 20-year trend in travel times by detailed mode used to travel. Generally, travel times increased, particularly in the first decade of the 20-year period. Unfortunately, data are not available to disaggregate the effect of longer trip distance from changes in travel speed. Other factors such as changes in transit service availability (which can affect travel time) and shifts between modes for trip types can also influence the composite speed. Carpool findings are inconsistent, with less regular travel time variation between carpool size groups, particularly smaller increases in the larger pools than in past decades.

Note that the ACS employs a definition that accepts the mode used for most of the trip as the marker of the mode employed, so travel times for a mode, particularly transit modes, reflect the composite travel times of all the modes involved in a work trip.
Table 11-4. Trend in Average Travel Time by Mode (mins)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Car, truck, or van</td>
<td>—</td>
<td>24.68</td>
<td>24.64</td>
<td>-0.04</td>
</tr>
<tr>
<td>Drove alone</td>
<td>21.1</td>
<td>24.06</td>
<td>24.19</td>
<td>0.13</td>
</tr>
<tr>
<td>2-person carpool</td>
<td>23.99</td>
<td>27.06</td>
<td>26.78</td>
<td>-0.28</td>
</tr>
<tr>
<td>3-person carpool</td>
<td>28.62</td>
<td>30.93</td>
<td>31.01</td>
<td>0.08</td>
</tr>
<tr>
<td>4-person carpool</td>
<td>—</td>
<td>34.07</td>
<td>34.63</td>
<td>0.56</td>
</tr>
<tr>
<td>4+ person carpool</td>
<td>34.8</td>
<td>37.67</td>
<td>36.10</td>
<td>-1.57</td>
</tr>
<tr>
<td>5 or 6-person carpool</td>
<td>—</td>
<td>38.84</td>
<td>36.60</td>
<td>-2.24</td>
</tr>
<tr>
<td>7+ carpool</td>
<td>—</td>
<td>47.34</td>
<td>38.89</td>
<td>-8.45</td>
</tr>
<tr>
<td>Bus or trolley bus</td>
<td>37.98</td>
<td>45.88</td>
<td>45.08</td>
<td>-0.80</td>
</tr>
<tr>
<td>Subway</td>
<td>44.92</td>
<td>47.78</td>
<td>46.40</td>
<td>-1.38</td>
</tr>
<tr>
<td>Streetcar or trolley car</td>
<td>—</td>
<td>43.88</td>
<td>40.28</td>
<td>-3.60</td>
</tr>
<tr>
<td>Subway or elevated</td>
<td>—</td>
<td>47.92</td>
<td>46.60</td>
<td>-1.32</td>
</tr>
<tr>
<td>Railroad</td>
<td>58.53</td>
<td>70.64</td>
<td>69.41</td>
<td>-1.23</td>
</tr>
<tr>
<td>Ferryboat</td>
<td>58.37</td>
<td>65.66</td>
<td>65.12</td>
<td>-0.54</td>
</tr>
<tr>
<td>Taxicab</td>
<td>17.2</td>
<td>20.13</td>
<td>18.57</td>
<td>-1.56</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>22.53</td>
<td>21.66</td>
<td>22.34</td>
<td>0.68</td>
</tr>
<tr>
<td>Bike and walk (combined)</td>
<td>10.91</td>
<td>12.4</td>
<td>12.97</td>
<td>0.57</td>
</tr>
<tr>
<td>Bicycle</td>
<td>—</td>
<td>18.55</td>
<td>19.26</td>
<td>0.71</td>
</tr>
<tr>
<td>Walked</td>
<td>—</td>
<td>11.6</td>
<td>11.73</td>
<td>0.13</td>
</tr>
<tr>
<td>Other method</td>
<td>—</td>
<td>—</td>
<td>34.00</td>
<td>—</td>
</tr>
<tr>
<td>All</td>
<td>22.38</td>
<td>25.54</td>
<td>25.55</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Source: Census, ACS

This also may reflect the shifts in occupations. The effect on carpools is that the historical pattern of adding 3–5 minutes as each worker is added to a carpool is not as strong as in past observations, especially in the larger pools. This could be due to more reliance on assembling poolers in a common area or the prevalence of cell phones to more closely coordinate group assembly.

Figure 11-20 goes beyond the averages to consider the distributions among modes by travel time segment. The substantial distinctions in the distribution are most apparent among transit modes. Transit’s share of the market is greatest in the 90–120-minute time market segment, in which transit modes comprise more than 35 percent of commutes. Bike, walk, and taxi exhibit very strong elements in the shorter travel time groupings, as might

Commute times are distinctly different across modes. Average times increase with vehicle occupancy for carpools and are noticeably higher for transit.
be expected. The overall private vehicle category, because of its dominant scale, largely defines—and thus mirrors—the overall total travel time distribution (note that the vertical scale of Figure 11-20 starts at the 60 percent level).

To gain a better sense of scale, the 20- and 60-minute criteria are applied to the modes in Figure 11-21. Here, too, the private vehicle, including motorcycles, is comparable to the national picture, with more than 40 percent under 20 minutes and about 8 percent over 60 minutes. Noteworthy is the very low percentage that is under 20 minutes and the very high percentage that is over 60 minutes in all of the transit modes. The modes that exhibit greater-than-average shares under 20 minutes are, as expected, walking, biking, and taxicab, all at or above 60 percent. Note that it is only in the above-60-minutes category in which private vehicles are not more than 80 percent of travel, recalling that these time classes account for only about 8 percent of travel.

**Role of Trip Distance**

Variations in work travel time over long periods can be a function of many things, but one of the most important is the changes in work-trip distances. Census Bureau data, which are the major source of information in work travel, do not include distances to work. Figure 11-22 shows the National Household Travel Survey (NHTS) trend in average trip lengths over most of the history of the NHTS for the modes that are statistically reportable. As expected, the modes using powered vehicles have roughly similar trip distances. The walk trip length has increased slightly over 20 years but has hovered close to one mile for the last decade of observation.

If distances are growing at the same time as average travel times, the effect may simply mean that speeds are changing—even improving—and/or there has been a shift from slower modes. This, in fact, was the national trend for the period between 1983 and 1995 as distances and travel times increased but at rates such that average speeds actually improved, as shown in Figure 11-23. Further, these data indicate that after 1995, trip lengths stabilized as travel times continued to increase, resulting in a decline in computed average speeds. According to the NHTS calculations,
Figure 11-20. Travel Time Distribution by Mode
Source: Census, ACS

Figure 11-21. Under 20 Min and over 60 Min by Mode of Transportation to Work
Source: Census, ACS 2011
average speeds reached a peak of 35 mph in 1995, a level not seen since 1977, but have since declined to 32 mph in 2001 and further declined to 27–28 mph in 2009, a decline of 7–8 miles per hour. As is typical, this is reflected in similar statistics for private vehicles, which did a little better than the overall average in 2009, at 29 mph. Transit exhibited declines in miles per hour similar to that of the average, declining from 18 to below 12 mph. This represents a very sharp percentage decline in transit of about 37 percent contrasted to the average of about 20 percent for all modes.\(^6\)

\[\text{Figure 11-22. NHTS Trends in Trip Distance for Selected Modes} \]

\[\text{Source: NHTS} \]

\(^6\) Given the relatively small share of travel represented by transit, the confidence ranges around these speed estimates are very broad.
Disentangling the various factors that affect overall commuting speed can be challenging and confusing. There are subtle shifts between modes, changes in trip length, changes in the operating speed on the individual links of the transportation system, and overall changes in average system speed as the volume of commuting travel on given links of the transportation network shifts. In the 1980s and 1990s, there was something of a paradox as travelers experienced increasing congestion on the facilities they use for commuting, yet the overall average commuting speed was increasing. This paradox is explained by the fact that continued suburbanization and shifting commuting patterns resulted in greater shares of commuting being on higher functionally-classified facilities (freeways instead of local collector or arterial roads) and growing demand on exurban, circumferential, or cross-town facilities, which historically have been less congested than radial links to the central business district. This dispersion of commute travel onto higher-speed links of the transportation network more than offset the continued deterioration of travel speeds on older links. The removal of the federal restrictions on freeway speeds above 55 mph in the late 1980s may have contributed to somewhat faster travel speeds for suburban and exurban freeway commuters. Additionally, there were ongoing shifts from lower speed modes of travel to higher speed modes. However, as networks reach full capacity, there are fewer opportunities for shifts in commuting patterns to offset slower speeds on congested facilities and declines in private vehicle alternatives have ended or reversed. More recently, the pause in demand growth associated with the weaker economy has resulted in less congestion and higher speeds during the past few years beyond those shown in Figure 11-23.

Figure 11-23. National Average Commuting Trip Distance, Travel Time, and Speeds
Source: NHTS
Summary

Commuting travel time is perhaps the single most-referenced attribute of commuting that impacts the public’s and policymakers’ perceptions of the state of commuting in America. Individuals can recall their personal experiences and those of family members, friends, and colleagues and relate to the consequence of time spent commuting. Travel time “cost” has been central to our understanding and modeling of travel behavior. Transportation planners use travel time cost as the most common metric for describing the health of the transportation system in an urban area. Multi-decade data indicate that commuting times, on average, change relatively slowly as individuals have a variety of strategies to adapt to increasing travel. Changes in workforce size, combined with commuter decisions on workplace location, residential location, mode preference, and departure time, are among the factors that influence commute times. In addition to the factors that influence the demand for commuting, the supply of transportation capacity and its performance (speed) interact with the travel demand factors to lead to the resulting system performance and average commute time. Subsequent briefs explore aspects of commute time in the context of some of these considerations.

An outgrowth of commuting time is the trip departure time of individuals. Commute trip departure patterns are influenced by commute time but also by travel-time reliability—how much extra time do commuters need to add to their departure time to ensure on-time arrival with an acceptable probability of delay? Aggregate data again indicate the relative stability in commute departure times. The most pronounced change is an increase in very early morning departures associated with growth in extreme commutes.

Time “cost” has been central to our understanding and modeling of travel behavior and is the most common metric used to describe the health of the transportation system in an urban area. Multi-decade data indicate that commuting times, on average, change relatively slowly as individuals have a variety of strategies to adapt to increasing travel.
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**