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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Brief 13. Transit Commuting

This brief is the 13th 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).

As noted in Brief 12, the auto boom appears to have completed its rapid growth cycle and has stabilized at very high levels, remaining the dominant mode. However, in the past decade or so, there are signs of auto commuting retrenchment and evidence that transit has increased as a commute mode. This brief presents data describing transit commuting trends and relationships. It should be noted that transit use, which hovers at around a 5 percent share for commuting, is more challenging to comprehensively analyze with statistically-significant data due to its modest share and the constraints of sample size in both American Community Survey (ACS) and National Household Travel Survey (NHTS) data sources. Thus, some of the geographic and socio-demographic richness available for private vehicle commuting, particularly for smaller geographies, is more limited in the case of public transportation.

Transit Commuting—Geographic Patterns and Trends

Table 13-1 shows the trend in transit commuting over the past three decades.

Table 13-1. Summary of Long-Term Trends in Transit Commuting in the U.S.

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(000)</td>
<td>%</td>
<td>(000)</td>
<td>%</td>
</tr>
<tr>
<td>Total Workers</td>
<td>96,617</td>
<td>100.0%</td>
<td>115,070</td>
<td>100.0%</td>
</tr>
<tr>
<td>Transit Commuters</td>
<td>6,008</td>
<td>6.22%</td>
<td>5,889</td>
<td>5.12%</td>
</tr>
</tbody>
</table>

Source: Census, ACS 2010
From 1980 to 2010, transit commuting first declined from more than 6 million daily commuters and 6.22 percent of the workforce to 5.87 million and 4.58 percent of the workforce in 2000 before resuming growth to 6.77 million, slightly less than 5 percent of the workforce, in 2010.

The data indicate a trend reversal in both levels of transit commuting and transit commuting mode share. Based on decennial data, absolute transit commuting hit a low in 2000, as did transit mode share. Between 2000 and 2010 transit commuters increased 900,000 or over 15 percent. However, the constraint of decennial data potentially distorts the actual inflection point in transit commuting trends. To provide additional insight on these trends, both household travel survey data and individual year ACS data were reviewed and are displayed in Figure 13-1.

**Figure 13-1. Long-Term Trend in Transit Mode Share**

*Note:* Data from NHTS 2009 are plotted for 2008 since majority of data collection occurred in 2008.

*Source:* Census, ACS, NHTS series

Figure 13-1 reveals several facts regarding transit mode share trends. The longer-term trend going back to 1970 shows moderating declines in transit mode share by decade through 2000. The ACS, shown for 2005 through 2012, indicates mode share levels above the 2000 levels and with growth interrupted by some fluctuations. The NHTS data series provides additional reference points for 1990, 1995, 2001, and 2008. These data confirm the general level and direction of mode share trends, but also include additional relevant information for public transportation. The NHTS is unique in that it asks questions about workers’ “usual mode” in the prior week, a query consistent with the U.S. Census and ACS data. However, it also gathers information on the “actual” mode for the travel survey day. In the case of public transportation, analysis of these differences indicates that “usual” transit...
Travelers tend to use other modes of travel for a significant share of their commuting. In practical terms, this means that some “usual” transit commuters may use a household vehicle when available or in circumstances where, for example, they have a commitment after work, need to carry large items, or otherwise choose an alternative mode on some days. Other “usual” transit commuters ride with others, walk, bike, or use other options when conditions allow. Mode loyalty, as measured over the prior three NHTS surveys, indicates “usual” transit commuters actually take transit approximately 70 percent of the time for their commute, but part of that shortage is offset by other “usual” mode commuters who used transit on their surveyed travel day.  

Figure 13-2 shows the total transit ridership trend as measured by passenger counts over the past several years. These data are for all trip purposes, not just work, but they provide an additional indication of the overall trend of transit use and give some insight into the trend reversal on ridership. The data suggest a ridership trend direction change in approximately 1996. Both the decennial census data and the irregularly-sampled NHTS data bridge this inflection point.

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1 For additional discussion of “actual” versus “usual” mode, see Brief 10.
Figure 13-2. Annual Total Transit Ridership Trends

Note: The American Public Transit Association (APTA) and the National Transit Data (NTD) program each gather ridership data from transit properties. There are subtle variations in reporting related to which systems report for each entity. In both cases, a transit trip refers to a traveler boarding a transit vehicle; often, travelers board multiple vehicles to complete a trip from an origin to a destination and, accordingly, are counted as making multiple transit trips.


For many commuting modes of travel, the opportunity to use a mode is relatively ubiquitous. For example, a roadway network and relatively high auto availability result in an auto commuting option for most travelers. Similarly, bike and walk travel options as well as carpooling are a relatively pervasive opportunity should travelers choose to avail themselves or be in situations where those are viable options. Transit, on the other hand, is not nearly as universally available with many commuters not having transit service at the home and/or employment destination. The quality of service in terms of the hours of operation, frequency of service, speed, and cost also vary depending on both local policies and investments as influenced by local market conditions and community priorities. Thus, many commuters may not be able to choose transit commuting absent a home and or job location change. Accordingly, the geographic variation in transit commuting shares is much larger, reflecting differences in transit availability and competitiveness in the particular geography. Figure 13-3 presents a trend of commuting mode share by region for the ACS reported transit sub-modes.

Transit use for commuting appears to have been increasing since approximately the mid-1990s. The various data suggest transit’s commuting mode share also has been increasing slightly.
Figure 13-3 Transit Commuting by Region and Transit Sub-Mode by Region

Source: ACS 2010

Figure 13-3 shows the strong variation in transit commuting by region of the country. In particular, approximately half of total transit commuting occurs in the Northeast, and this region alone has the vast majority of subway or elevated commuting and railroad commuting. This is reflective of the availability of those options in that region and in the intensiveness of activities served by transit there.

As indicated in Figure 13-4, the transit mode share trends changed very little over the 20-year time period. Of the 50 states plus the District of Columbia, 25 had declining mode shares and 26 had increasing shares. The largest increases were in states with high transit use, including the District of Columbia at +2.75 percent, New York at +2.69 percent, and New Jersey at +2.05 percent. The largest declines were –1.4 percent for Louisiana, –1.3 percent for Illinois, –0.9 percent for Pennsylvania, and –1.1 percent for Idaho. Part of the reason these changes are modest and not more strongly positive is that this time period bridged the low point in transit use in the mid-1990s. Note that industry data indicate that the supply of transit service increased approximately 60 percent between 1990 and 2010.²

² 2012 Public Transportation Fact Book, Appendix A: Historical Table 8, Vehicle Total Miles Operated by Mode, showed a 68 percent increase between 1990 and 2010, and Table 10, Vehicle Total Hours Operated by Mode, showed a 55 percent increase between 1990 and 2010.
Figure 13-4. Twenty-Year Trend in Public Transit Share of Commuting by State
Source: Census, ACS 2010
Figure 13-5 shows the 20-year trend in public transit mode share among larger metropolitan areas. In many ways, this trend verifies the state data trend. For the vast majority of metropolitan areas, there were minor fluctuations in public transit commuting mode share over the 20-year period represented by the 1990, 2000, and 2010 data. New York, Washington, San Francisco, Boston, Portland, Los Angeles, and Las Vegas showed noticeable increases in transit mode share. Among the larger cities, Chicago, Philadelphia, Pittsburgh, New Orleans, and Milwaukee were unable to maintain their 1990 transit mode share.

With the exception of Illinois, strong transit markets tended to increase market share from 1990 to 2010. The vast majority of states showed modest changes.
Figure 13-5. Twenty-Year Trend Public Transit Shares among Metropolitan Areas with 1+ Million Population

Note: Uses 1990 CMSA definitions. In 2010, the West Palm Beach metro area was merged with the Miami metro area.
Source: Census, ACS 2010

Figure 13-6 shows public transit mode share by metro group size. Including carpool and work-at-home travel options, the relatively large variation of transit mode share as a function of metro area size is clearly apparent. Not only do large metropolitan areas tend to have a concentration of population with socio-demographic characteristics that are correlated with transit use but, perhaps most important, these are areas where the quality and quantity of transit service increases public transit’s competitiveness. In addition, these are areas
where traffic, parking, congestion, and other factors make automobile commuting less attractive.

**Figure 13-6.** Public Transit Share by Metro Size Group (In Thousands)

*Source: Census, ACS 2010*

Table 13-2 shows the metro areas with the largest gains and largest losses in 2000–2010. The top and bottom 15 metro areas are shown. Positive increases are larger and generally occur in larger cities than do the declines.

**Table 13-2.** Metro Areas with Major Changes in Public Transit Share, 2000–2010

<table>
<thead>
<tr>
<th>Gaining Share</th>
<th>Difference in Percentage Points, 2000–2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>6.55</td>
</tr>
<tr>
<td>San Francisco</td>
<td>5.27</td>
</tr>
<tr>
<td>Washington, DC</td>
<td>4.83</td>
</tr>
<tr>
<td>Boston</td>
<td>2.97</td>
</tr>
<tr>
<td>Seattle</td>
<td>1.88</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>1.55</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>0.95</td>
</tr>
<tr>
<td>Grand Rapids</td>
<td>0.75</td>
</tr>
<tr>
<td>Charlotte</td>
<td>0.72</td>
</tr>
<tr>
<td>Greensboro</td>
<td>0.50</td>
</tr>
<tr>
<td>Portland</td>
<td>0.49</td>
</tr>
<tr>
<td>Buffalo</td>
<td>0.44</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>0.42</td>
</tr>
<tr>
<td>St. Louis</td>
<td>0.32</td>
</tr>
<tr>
<td>Tampa</td>
<td>0.31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Losing Share</th>
<th>Difference in Percentage Points, 2000–2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Las Vegas</td>
<td>-0.20</td>
</tr>
<tr>
<td>Miami</td>
<td>-0.28</td>
</tr>
<tr>
<td>Louisville</td>
<td>-0.30</td>
</tr>
<tr>
<td>Indianapolis</td>
<td>-0.34</td>
</tr>
<tr>
<td>Jacksonville</td>
<td>-0.35</td>
</tr>
<tr>
<td>Dallas</td>
<td>-0.39</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>-0.50</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>-0.51</td>
</tr>
<tr>
<td>Columbus</td>
<td>-0.54</td>
</tr>
<tr>
<td>Raleigh</td>
<td>-0.62</td>
</tr>
<tr>
<td>Memphis</td>
<td>-0.67</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>-0.75</td>
</tr>
<tr>
<td>San Antonio</td>
<td>-0.77</td>
</tr>
<tr>
<td>Houston</td>
<td>-0.84</td>
</tr>
<tr>
<td>New Orleans</td>
<td>-2.09</td>
</tr>
</tbody>
</table>

*Source: Census, ACS 2010*
For perspective, consider the following facts based on 2010 American Community Survey commuting data:

- The New York metropolitan area accounts for 39 percent of the nation’s reported public transit commuters.
- Public transportation serves more than 30 percent of commuters in the New York metropolitan area.
- The next highest number of public transit commuters is in the Chicago metropolitan area, but that number is less than 1/5 as many as in New York.
- Los Angeles, San Francisco, Boston, and Washington, DC, round out the top six metropolitan areas for public transit commuting, containing more than 65 percent of the nation’s public transit commuters.

While there is a strong concentration of transit use in some of the largest metropolitan areas as is confirmed in Figure 13-5 and Table 13-2, there is also significant variation in use across areas and over time within areas that might otherwise be considered similar. Fully exploring the causes of these variations, including changes in the quality and amount of service and the changes in demographic, economic, and cultural/policy conditions in each metropolitan area might be helpful research to understand activities that are supportive of growth in transit commuting.

**Demographic Factors**

The propensity to use transit is related to a host of factors, including many socio-demographic factors such as income, gender, race/ethnicity, age, origin of birth, vehicle availability, and household characteristics. Several of these factors are discussed in Brief 10.

- Table 10-4, Modal Shares by Gender, shows a transit commuting mode share of 5.29 percent for females and 4.63 percent for males, indicating slightly greater transit use among females.
- Table 10-5, Mode Shares by Age Group, documents the greater tendency for transit use among younger workers: those ages 16–34 have a 6.1 percent commute mode share versus 4.5 percent for ages 35–54 and 4 percent for ages 55+.
- Table 10-6, Mode Shares and Changes by Mode for Young Workers, 2000 and 2010, indicates an increase in public transit mode share for those ages 16–34, from 5.4 percent in 2000 to 6.1 percent in 2010.
• Table 10-7, Mode Shares by Race and Ethnicity, indicates 2.9 percent commuting mode shares for White respondents, 7.8 percent for Hispanic, 10.4 percent for Asian, 10.9 percent for Black, and 3.0 percent for American Indian.

Figure 13-7 shows the comparison between transit and auto commuting mode shares by the year of entry into the U.S. for immigrants. It is difficult to assess to what extent the shifts in mode are a product of assimilation or attributable to aging-based changes in travel behavior of the immigrant population.

![Figure 13-7. Trend in Mode Use with Time in America](source: ACS 2010)

Demographic discussions of transit use often focus on the relationship between income and commuting mode. In exploring these data, a few observations are important. The available data provide household income, not commuter income; thus, household income may or may not be a good indicator of the ability of commuters to financially avail themselves of other opportunities for travel such as purchasing and operating an automobile. Second, these data are for commuters. The fact that an individual is commuting means that he/she is gainfully employed and has an income derived from work. Income distributions for transit commuters will not be the same as those for all transit travelers, as many transit users may not be commuters and may have a lower average household income distribution than do commuters.

Figure 13-8 indicates the income distribution by public transportation sub-mode for commuters. In interpreting the chart, it is important to recognize that the income categories used in the ACS data reporting are larger in higher income categories; thus, the number of
Commuters per $5,000 income increment remains relatively similar at approximately 170,000 commuters through the $60,000 income range and then starts to dampen for bus and trolley bus commuters. Bus and trolley bus also have the largest total number of commuters.

Figure 13-8. Transit Commuters by Household Income Category

Source: ACS 2010

Figure 13-8 also indicates the comparative growth in commuters at higher income levels for railroad (commuter rail) services and, to a lesser extent, for subway and elevated services. This phenomenon, well recognized in public transportation, is indicative of higher-income white-collar workers taking advantage of commuter rail and subway services serving concentrations of these workers, who often are in downtown jobs in those larger urban areas in which commuter rail and subway or elevated services exist.

Figure 13-9 presents the transit mode share data for each sub-mode and the total. The downward sloping curve for bus and trolley bus is partially offset by the upward sloping mode shares for subway or elevated and railroad. The transit mode share for incomes below approximately $50,000 and above $150,000 is greater than the overall average of 4.9 percent, with the mode share for households in the middle range being below the average.

Auto availability is closely related to income. Figure 13-10 shows the household auto availability situation relative to household workers for those workers commuting by transit. A total of 36 percent of transit commuters come from households with zero cars available. An additional 29 percent come from households with one or two or more workers than there are cars in the household. A total of 35 percent of transit commuters come from households where there are at least as many vehicles as workers, suggesting high auto
availability. Thus, auto availability is a factor for 65 percent of transit commuters. In some of the strongest transit markets, anecdotal and other evidence indicates that some commuters are zero-car households by choice, as the cost and hassles associated with owning and maintaining a car and the availability and quality of transit and other travel options create a logical decision to forgo auto ownership for some households. There are no estimates at the national level of the share of zero-car households that have made that decision based on other factors than financial constraints.

**Figure 13-9.** Transit Commuter Mode Shares by Household Income Category  
*Source: ACS 2010*

**Figure 13-10.** Transit Commuting by Household Car Availability  
*Source: 2009 NHTS*
Unfortunately, data are not available to enable cross-tabulations of socio-demographic variables with transit service availability. It is critical to remember that transit is not ubiquitous, which impacts the resultant transit use for socio-demographic groups.

**Further Public Transit Detail**

Another factor influencing the attractiveness of public transportation is the travel time required to complete a commute trip via public transportation. Much commuting occurs during the peak periods, when transit service is at its best. However, accessing and egressing transit service, waiting for a vehicle, perhaps transferring, and typically traveling in a vehicle that stops quite frequently for other passengers to board and alight results in transit service generally taking longer than auto travel. Figure 13-11 provides the trip duration distribution for transit trips versus drive-alone auto. As shown, 36.2 percent of transit trips exceed 60 minutes, whereas only 6.3 percent of drive-alone trips exceed that travel time.

![Figure 13-11. Trip Duration Distribution, Transit versus Drive Alone](source: 2012 ACS)

Figure 13-12 provides a longer-term trend for non-single-occupant vehicle commuting. This figure provides perspective between transit commuters and other commuter categories (also shown as Figure 10-5). This figure also reveals the relative trend in bus or trolley bus transit versus subway or elevated and railroad transit.
Summary

The past decade has been particularly encouraging for transit commuting, with the number of transit commuters now exceeding the level that existed in 1980. These trends are coincident with a number of contributing factors, including significant increases in the total number of commuters, increased transit supply, high fuel prices, and generally positive socio-demographic trends conducive to public transportation use. Much of that commuting growth has been on rail systems, which have been the focus of significant transit investment over the past several decades. These systems, which generally operate considerably faster than bus services, are attracting some commuters from higher-income households. Transit commuting trends, while positive, are relatively modest at the national level. Changes in transit commuting are more modest in absolute terms than are changes in carpooling and work-at-home.
Transit commuting remains most common in households with limited vehicle availability; however, transit has significant penetration in higher-income households, with relatively strong performance of rail modes in those households. Transit commuting continues to be considerably slower than auto-based commuting, resulting in a significant share of transit trips—36 percent—taking longer than 60 minutes. The growth in transit commuting has been enabled and encouraged by significant increases in transit service, with service, as measured by revenue vehicle miles or hours, growing at a rate several times faster than ridership.

As noted, the propensity to use public transportation varies significantly across geography, partly because of significant differences in transit service availability and quality of service. Socio-demographic characteristics of the area partially explain the propensity to use transit. This disparity in transit use appears to be increasing, with many of the stronger transit markets showing continued growth while weaker markets remain stagnant or are declining. These differences in use may be reflecting the presence of some threshold level of service availability as a prerequisite for strong transit growth beyond a core market of persons who use transit based on necessity. Growth in transit commuting, often during peak periods, when systems approach capacity, is ultimately dependent upon peak-period service availability.

Changes in technology—real-time information systems and the ability to work on tablets and smartphones while commuting via transit, more convenient fare payment mechanisms, growth in newer options such as bus rapid transit, growth in transit-oriented development, and other factors—may also influence transit commuting trends going forward. Employment and residential development trends also are important to future transit use trends.

In addition, as noted in this brief, commuting is only one reason for using transit. Transit use for school, special events, healthcare, personal business, social recreation activities, shopping, and other activities is increasingly being accommodated as transit has recognized the importance of serving the diversity of travel purposes that create economic activity and impact residents’ quality of life. While commuting will remain an important market for transit, the data suggest that work trip commuting no longer constitutes the majority of transit travel.
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