
# POLICY BRIEF

## Emerging Travel Behavior Insights from 2023 National Surveys

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TOMNET Transportation Center
Teaching Old Models New Tricks

TBD TRAVEL BEHAVIOR AND DEMAND NATIONAL CENTER

# ABOUT

**TOMNET:** The Center for Teaching Old Models New Tricks (TOMNET) is a tier-1 University Transportation Center established in 2016 by the U.S. Department of Transportation (USDOT). TOMNET is dedicated to advancing research on traveler behavior and values, the role of attitudes and preferences in shaping mobility choices, and the application of machine learning and data fusion methods to improve transportation demand forecasting models. The Center's unique mission is to provide deep insights into human attitudes and behaviors and their impact on transportation systems, thereby enhancing the accuracy and value of travel demand forecasting models. TOMNET is led by Arizona State University and includes Georgia Tech, University of South Florida, and University of Washington as consortium members.

**TBD:** The Center for Understanding Future Travel Behavior and Demand (TBD) is a National University Transportation Center established in 2023 by USDOT. TBD's research focuses on understanding evolving travel behaviors driven by technological advances, demographic and cultural shifts, and environmental concerns. TBD is committed to undertaking breakthrough research that will fundamentally re-examine and transform the scientific base for measuring, monitoring, modeling, and managing traveler behavior. The Center initiatives aim to support the design, development, and operation of a people-centric, multimodal, intelligent transportation system that meets the needs of people, institutions, and businesses for generations to come. TBD is led by The University of Texas at Austin and includes Arizona State University, Georgia Tech, University of Washington, University of Michigan, Cal Poly Pomona, City College of New York, and Diné College as consortium members.

In accordance with their missions, the TOMNET-TBD Policy Brief Series aims to inform policymakers, practitioners, academics, and the general public about current and emerging traveler behavior trends and their implications for the future of transportation.

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## Introduction

The U.S. Census conducts three annual surveys that offer transportation analysts valuable insights into travel behaviors and trends: the American Community Survey (ACS), the American Time Use Survey (ATUS), and the Consumer Expenditure Survey (CE). With a multi-decade history, these surveys allow analysts to track changes over time and discern long-term trends. The newly available survey data for 2023 is particularly significant, as it reflects a period when the nation was navigating COVID-19 recovery, alongside other influential factors such as inflation, demographic shifts, concerns about climate change, urban crime, polarized values, and evolving economic conditions. These dynamics, coupled with ongoing changes in transportation technologies and cultural values, make it crucial to review this data to identify emerging "new normal" travel behaviors.

The passage of time has reaffirmed that some COVID-inspired changes in behavior appear resistant to a complete return to pre-COVID conditions. Notably, telework or work-from-home (WFH) has continued at high levels, while travel for socialization and recreation has rebounded aggressively. The resurgence in total vehicle miles traveled (VMT) masks significant changes in travel behavior, particularly for work-related commuting by both personal vehicles and public transit. Before the pandemic, commuting accounted for an estimated 28% of all household-based VMT, about 20% of total VMT, and an even larger share of transit trips. These commutes disproportionately contribute to congestion and its related consequences. Additionally, since they define peak/rush hours, they influence a substantial portion of transportation spending and policy decisions.

This brief reviews the three nationwide surveys (i.e., ACS, ATUS, and CE), with respect to questions that give insight into travel behaviors. The following sections offer a brief exploration of each survey and highlight key findings related to travel behaviors. These results provide crucial insights into shifting commuting patterns, telework trends, and broader changes in travel behaviors to inform future transportation policy and planning.

To provide context on the scope of the data sources used in this policy brief, the American Community Survey (ACS) typically samples around 2 to 3 million people each year, while the Consumer Expenditure Survey (CE) collects data from approximately 5,000 to 7,000 households. The American Time Use Survey (ATUS) includes about 10,000 respondents annually, except in 2003 (the inaugural year), when the sample size was about 20,000. Specific sample sizes for each graph and table are not included to avoid cluttering the visual information. For full details on sample sizes, refer to the respective websites of these data sources.

## American Community Survey

The ACS is an annual Census survey that collects data about U.S. residents. It covers a range of demographic and household characteristics, including commute travel. Due to its large sample size and annual administration, it is instrumental in monitoring trends across different geographies. Table 1 itemizes the key questions most relevant to transportation in the ACS. The survey asks respondents about their "usual" commute trip in the preceding week but does not gather data on other travel purposes. It is also important to note that the pandemic impacted data collection in 2020; experimental data was released but did not meet the statistical standards the Census traditionally applies. Hence, its inclusion (shown in red) should be interpreted with caution. Historical trends indicate that commute mode choices have been changing slowly since the survey was initiated. However, COVID dramatically altered these choices. Prior to COVID, the most significant trends observed were the longstanding decline in carpooling and the recent growth in WFH.

## Table 1. Summary trends in ACS data series between 2005 and 2023

| Attribute | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Household vehicle availability** | | | | | | | | | | | | | | | | | | | |
| 0 vehicle | 8.9% | 8.8% | 8.7% | 8.8% | 8.9% | 9.1% | 9.3% | 9.2% | 9.1% | 9.1% | 8.9% | 8.7% | 8.6% | 8.5% | 8.6% | -- | 8.0% | 8.3% | 8.4% |
| 1 vehicle | 33.1% | 33.2% | 33.1% | 33.4% | 33.7% | 33.8% | 34.1% | 34.1% | 33.9% | 33.7% | 33.5% | 33.2% | 32.7% | 32.5% | 32.4% | -- | 32.9% | 33.2% | 33.3% |
| 2 vehicles | 38.2% | 38.0% | 38.1% | 37.8% | 37.6% | 37.6% | 37.5% | 37.3% | 37.3% | 37.3% | 37.2% | 37.1% | 37.3% | 37.1% | 36.9% | -- | 37.1% | 36.9% | 36.5% |
| 3 or more vehicles | 19.8% | 20.0% | 20.1% | 20.0% | 19.9% | 19.5% | 19.1% | 19.3% | 19.7% | 19.9% | 20.3% | 21.0% | 21.5% | 21.9% | 22.1% | -- | 21.9% | 21.6% | 21.7% |
| **Commute mode choices** | | | | | | | | | | | | | | | | | | | |
| Car, truck, or van -- drove alone | 77.0% | 76.0% | 76.1% | 75.5% | 76.1% | 76.6% | 76.4% | 76.3% | 76.4% | 76.5% | 76.6% | 76.3% | 76.4% | 76.3% | 75.9% | 69.0% | 67.8% | 68.7% | 69.2% |
| Car, truck, or van -- carpooled | 10.7% | 10.7% | 10.4% | 10.7% | 10.0% | 9.7% | 9.7% | 9.7% | 9.4% | 9.2% | 9.0% | 9.0% | 8.9% | 9.0% | 8.9% | 6.9% | 7.8% | 8.6% | 9.0% |
| Public transportation (not taxi) | 4.7% | 4.8% | 4.9% | 5.0% | 5.0% | 4.9% | 5.0% | 5.0% | 5.2% | 5.2% | 5.2% | 5.1% | 5.0% | 4.9% | 5.0% | 3.2% | 2.5% | 3.1% | 3.5% |
| Walked | 2.5% | 2.9% | 2.8% | 2.8% | 2.9% | 2.8% | 2.8% | 2.8% | 2.8% | 2.7% | 2.8% | 2.7% | 2.7% | 2.6% | 2.6% | 4.1% | 2.2% | 2.4% | 2.4% |
| Bicycle | 0.4% | 0.5% | 0.5% | 0.5% | 0.6% | 0.5% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.5% | 0.5% | 0.5% | | 1.9% | 2.0% | 2.0% |
| Other means | 1.2% | 1.2% | 1.2% | 1.3% | 1.2% | 1.2% | 1.2% | 1.2% | 1.3% | 1.2% | 1.2% | 1.2% | 1.3% | 1.3% | 1.4% | | | | |
| *Walk, Bike, Other* | *4.1%* | *4.6%* | *4.5%* | *4.6%* | *4.7%* | *4.5%* | *4.6%* | *4.6%* | *4.7%* | *4.5%* | *4.6%* | *4.5%* | *4.5%* | *4.4%* | *4.5%* | *4.1%* | *4.1%* | *4.4%* | *4.4%* |
| Worked at home | 3.6% | 3.9% | 4.1% | 4.1% | 4.3% | 4.3% | 4.3% | 4.4% | 4.4% | 4.5% | 4.6% | 5.0% | 5.2% | 5.3% | 5.7% | 15.8% | 17.9% | 15.2% | 13.8% |
| **Zero-worker households** | | | | | | | | | | | | | | | | | | | |
| U.S. | 27.0% | 25.8% | 25.8% | 24.5% | 26.3% | 27.2% | 27.5% | 27.3% | 27.0% | 26.9% | 26.8% | 26.6% | 26.5% | 26.5% | 26.3% | -- | 27.4% | 27.4% | 26.0% |
| **Mean travel time to work (min)** | | | | | | | | | | | | | | | | | | | |
| U.S. | 25.1 | 25 | 25.3 | 25.5 | 25.1 | 25.3 | 25.5 | 25.7 | 25.8 | 26.0 | 26.4 | 26.6 | 26.9 | 27.1 | 27.6 | -- | 25.6 | 26.4 | 26.8 |
| **Household connectivity** | | | | | | | | | | | | | | | | | | | |
| With a computer | -- | -- | -- | -- | -- | -- | -- | -- | 83.8% | 85.1% | 86.8% | 89.3% | 90.8% | 91.8% | 92.9% | -- | 95.0% | 95.7% | 96.1% |
| Broadband internet subscription | -- | -- | -- | -- | -- | -- | -- | -- | 73.4% | 75.1% | 76.7% | 81.4% | 83.5% | 85.1% | 86.4% | -- | 90.1% | 91.0% | 92.1% |

Figure 1 reveals the magnitude of the disruption attributable to the impacts of COVID. The 2023 ACS data indicated a decline in the usual WFH workers, but their share still ranks as the second most common mode and is about twice the sum of bike, walk, and transit, and well above the carpool share. Due to its wording, the ACS question, which relies on respondents discerning their "usual" commute mode, has become less meaningful in an era of hybrid work patterns and increasingly variable work schedules. Figure 1 also includes a trend line showing the share of respondents in the ATUS who worked exclusively at home on the survey day. This much higher number in the ATUS captures hybrid workers and occasional telework participants. The line shown reflects the behaviors of 18- to 65-year-old full-time workers, not the total workforce reflected in the ACS data.

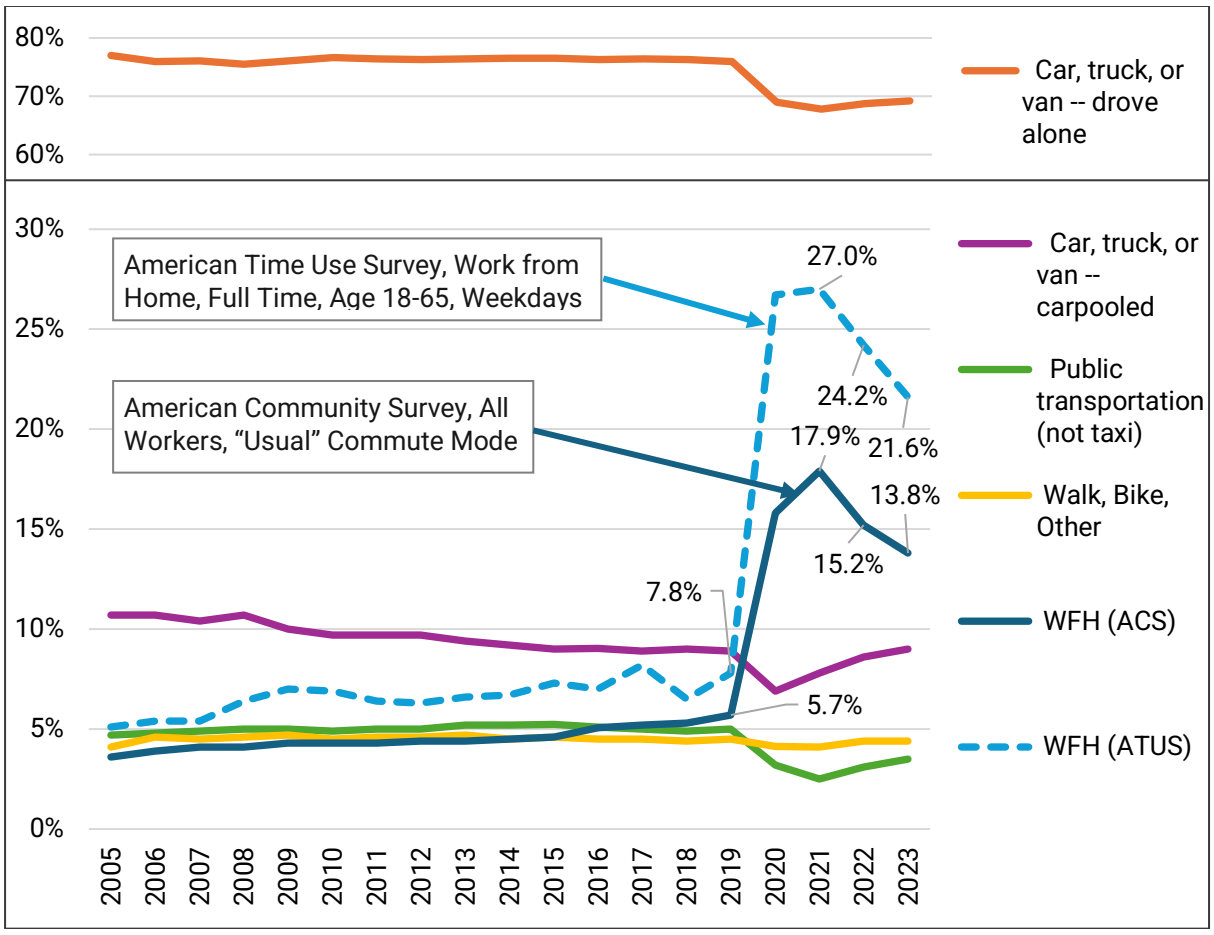


**Figure 1. "Usual" means of commuting (2005-2023)**

The second most significant revelation in the post-COVID ACS is the notable change in the share of zero-vehicle households. The share of households with no vehicles increased from 2021 but remained below pre-COVID levels. This change is illustrated in Figure 2. This data suggests that some households that added vehicles to manage mobility during COVID have since relinquished some of them. Higher fuel and insurance prices, as well as improved transit services, may have played a role.

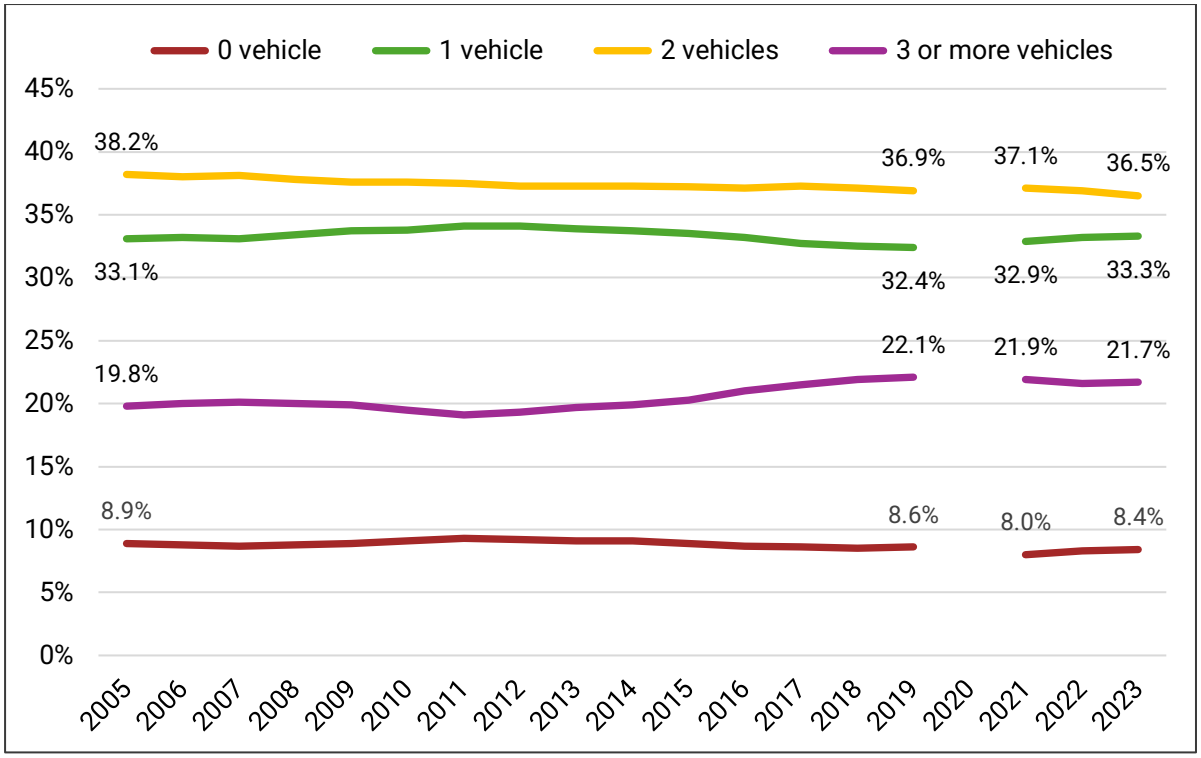


**Figure 2. Household vehicle availability (2005-2023)**

Figure 3 presents the share of zero-worker households, indicating the proportion of households without workers and, therefore, whose travel choices and residential location decisions are not necessarily influenced by commuting. This share, combined with households that have members working from home, suggests that nearly 40% of households had no one commuting on a given workday. Zero-worker household levels are at their lowest since 2008.

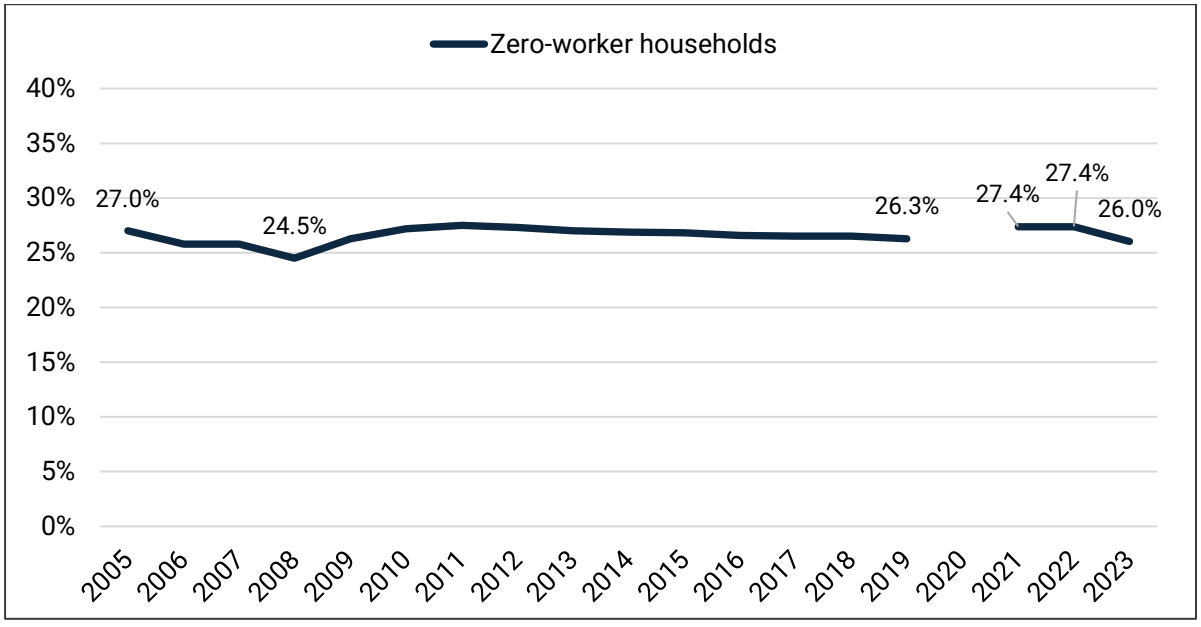


**Figure 3. Percent of zero-worker households (2005-2023)**

Figure 4 shows the trend in mean one-way travel time to work in the ACS data series. The average time declined by 2 minutes in 2021 from 2019, followed by a 0.8-minute increase in 2022 and a 0.4-minute increase in 2023, but it remains below the commute times observed in 2017-2019. The COVID-related fluctuations represent the most significant short-term changes ever recorded in the history of the ACS. It is important to note that these averages do not include the zero-commute time of teleworkers and reflect a combination of changes in congestion levels, the speed of commuters as influenced by their travel routes, mode choices that affect travel speed, and any changes in average trip length that may have occurred. If the zero-minute commute time for WFH workers were included, the average commute would be about 23.5 minutes.

The data aligns with evidence suggesting that those workers with longer trips were more likely to shift to telework, traffic congestion for commuting was lower, and slower modes like transit were less used. The new teleworkers, aside from saving themselves commute time that might have averaged nearly an hour a day, can also be credited for slight reductions in the round-trip commute time for other commuters.

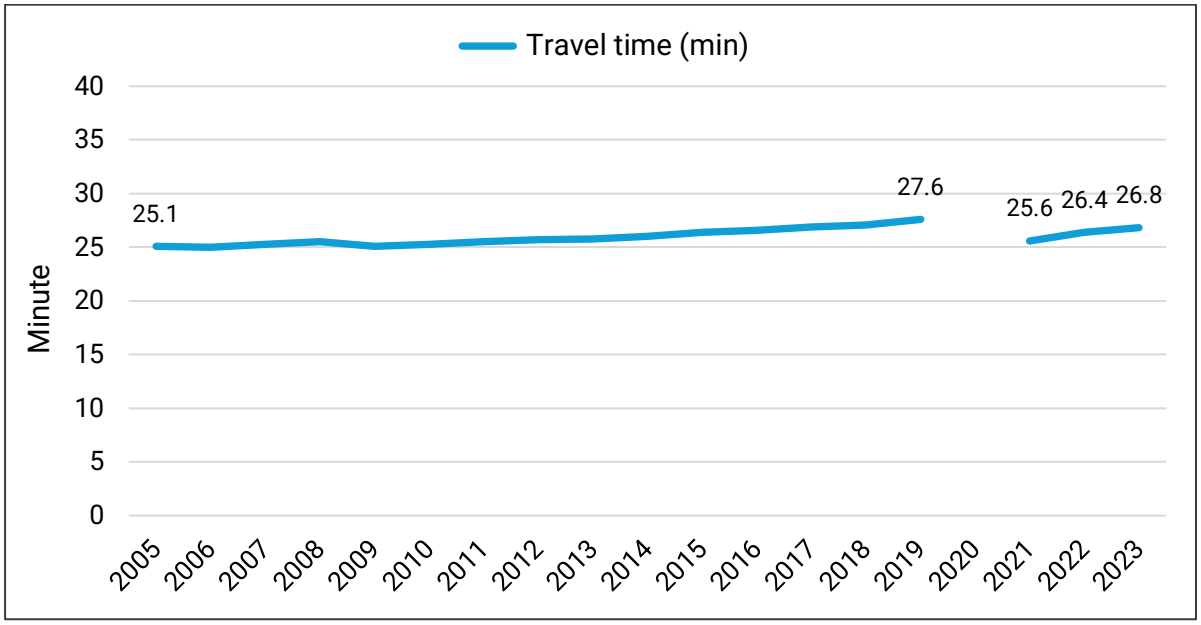


**Figure 4. Mean travel time to work (2005-2023)**

Figure 5 shows the trend in household access to computers and broadband internet subscriptions. Internet access impacts transportation by enabling communication substitutions for travel, such as telework, e-commerce, telemedicine, distance learning, and online banking. It also facilitates access to information for trip planning and payment. This includes activities such as verifying product availability, comparing prices before shopping, or securing ridehailing or other micromobility travel options. According to a study by the PEW Research Center[1], 90% of Americans had smartphones, and another 7% had non-smart cell phones as of 2023.

[1] Pew Research Center, Mobile Fact Sheet, https://www.pewresearch.org/internet/fact-sheet/mobile/.

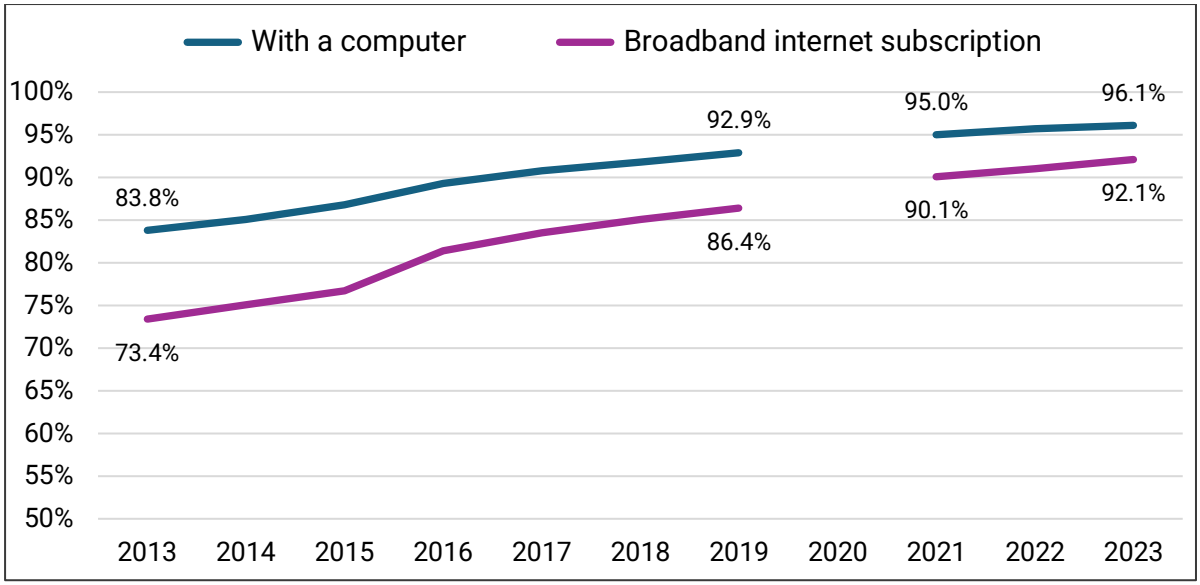


**Figure 5. Household connectivity (2013-2023)**

ACS summary:

- The jump in WFH is the most significant change in commuting since the ACS began. The shift to WFH remains larger than the combined pre-COVID share of biking, walking, and public transit.
- Public transit was most impacted by the rise in WFH practices, with its share decreasing by around 50% from 2019 to 2021, followed by a continuing rebound through 2023 (5% mode share in 2019 → 2.5% in 2021 → 3.1% in 2022 → 3.5% in 2023).
- No-vehicle households remained below pre-COVID levels.
- The no-worker household share remained at 27.4%, the highest level since 2011.
- The average commute time has ticked back up but remains below pre-COVID levels.
- Overall trends are moving closer to pre-COVID levels, but the year-to-year changes are modest and resemble changes observed in pre-COVID periods.

## American Time Use Survey

The ATUS is a federally administered time use survey conducted by the Bureau of Labor Statistics (BLS) annually since 2003. The survey measures how a representative sample of individuals spends their time on the sampled day. It records time spent on activities related to personal care, household maintenance, work, education, shopping, travel, volunteering, errands, telephone calls, and child and elder care. The survey provides detailed information about time spent on these activities, both in-home and out-of-home. It is also important to note that the ATUS does not account for multiple activities within the same time slot, meaning it does not capture multitasking when individuals may engage in primary, secondary, and tertiary activities simultaneously.

The ATUS analysis presented in this section is compiled using the Time Use, Travel, and Telework Dashboard (T3D), an online ATUS-based data dashboard developed and maintained by TOMNET and TBD researchers. The T3D is available at the following link: https://tomnetutc.github.io/t3d/.

The most significant change in time use reported in the ATUS involves teleworking. The ATUS indicated a 7.8% telework share for full-time workers aged 18–65 who were working on their survey day in 2019, 27.0% in 2021, 24.2% in 2022, and 21.6% in 2023. The ACS, which asked workers about their "usual" means of commuting in the prior week, reported telecommuting with a 5.7% share in 2019, jumping to 17.9% in 2021, 15.2% in 2022, and 14.5% in 2023. Figure 1 displays these data. Understanding the difference is critically important, as it represents the distinction between the reported "usual" means of commuting and the actual means used on the survey day, as recorded by the ATUS. Since telework is still an occasional mode for many who telework one or two days per week, their response to the "usual" mode question might not include telework but rather the mode used for most of the week. This tends to undercount the actual average share of telework participation on any given day. This tendency existed before COVID; however, the relationship may shift as the extent of telecommuting stabilizes, depending on how respondents define their usual mode. From 2021 through 2023, the data indicate that telework was higher on average than reported in the ACS. Telecommute rates moderated slightly between 2022 and 2023, reflecting some return-to-work trends in certain industries. This downward trend is supported by the Census Pulse Survey data and the Survey or Working Arrangements and Attitudes data.

Those data sources, which report monthly data, appear to indicate a flattening of WFH trends as of 2024. Interestingly, despite declines in WFH during 2023, the actual work trip rate per capita in 2023 dipped slightly from the 2022 number, as shown in Figure 10. This could be explained by changes in labor force participation. A visual review of the Survey of Working Arrangements and Attitudes data, along with an analysis of the monthly ATUS data, suggests the emergence of some seasonality in WFH behaviors, with higher levels during the summer and around the Christmas holidays—periods when children are out of school and travel and vacations are common.

Figure 6 shows the trend in the daily number of trips per person for individuals aged 15 and older, as derived from ATUS data. This trend direction is consistent with National Household Travel Survey (NHTS) data and overall VMT trends, suggesting a moderation in person trip-making, which can be attributed to communication substitution, demographic trends, and other factors. As of 2023, trip rates remained 18% below 2019 levels, with the pace of recovery from COVID slowing.

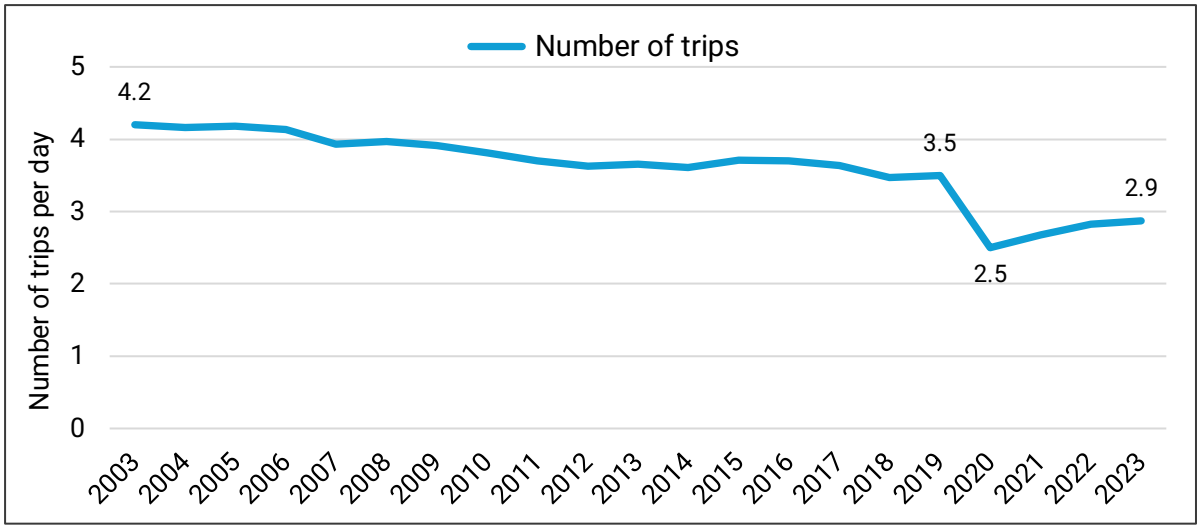


**Figure 6. Daily number of trips per person between 2003 and 2023**

Figure 7 presents the total minutes of daily travel per person as reported by ATUS respondents. This data similarly shows a moderating pace of recovery in travel time expenditures. Travel duration in 2023 was 86% of its 2019 level, while the trip count was 82% of its 2019 level. This suggests longer-duration trips, potentially attributable to longer distances, increased congestion, and/or travel on lower-speed roads.

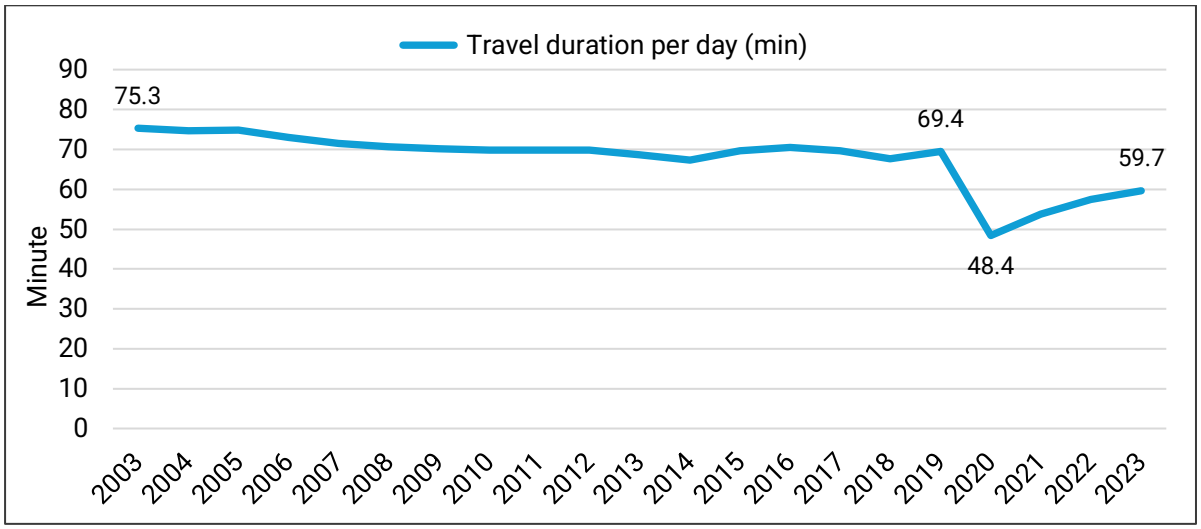


**Figure 7. Daily travel duration per person between 2003 and 2023**

Figure 8 shows the share of the population that was mobile during the survey day, where mobility is defined as making at least one trip away from home. This share trended down very slightly until the COVID-19 pandemic, during which it plummeted to

its lowest point in 2020 due to numerous stay-at-home orders, regulations, and risk avoidance by individuals. The percent of trip-makers on any given day remains significantly below pre-COVID levels (81.4% in 2019 vs. 74.4% in 2023). This sustained decrease may be attributed to the rise in WFH practices, online learning, e-commerce, and an aging population.

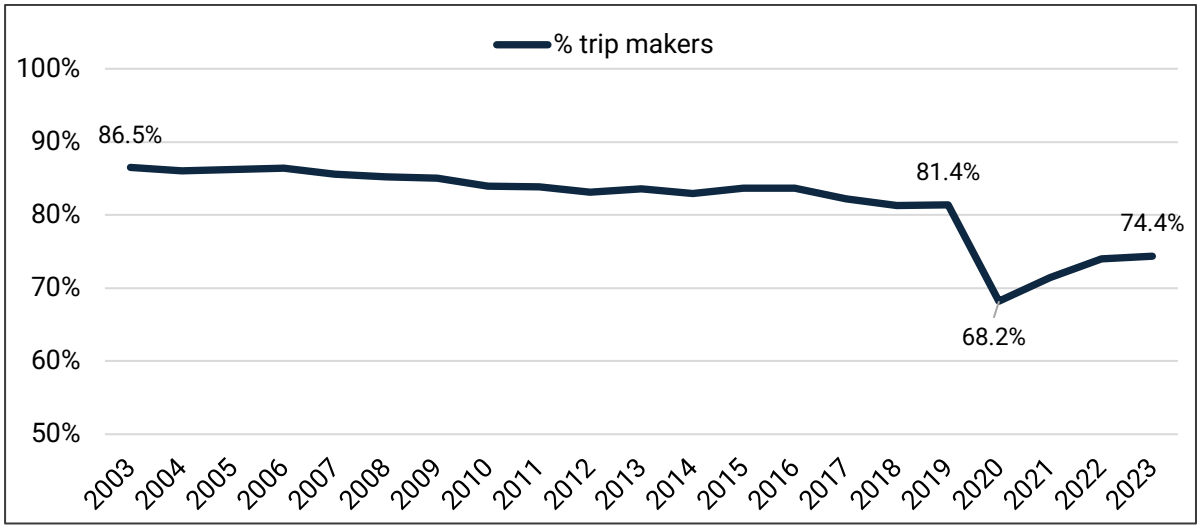


**Figure 8. Percent of trip makers on the survey day between 2003 and 2023**

Figure 9 shows the trend in trip rates by travel mode. These trends, along with those in Figures 10-12, are summarized in Table 2. In the pre-COVID period from 2003 to 2019, walk trips experienced the greatest decline in rate. Bike and transit trip rates remained relatively constant during this period, "unknown" trips increased, and auto trips declined. The 2019 to 2023 trend, impacted by COVID, shows the most significant effect on public transportation, followed by walking.

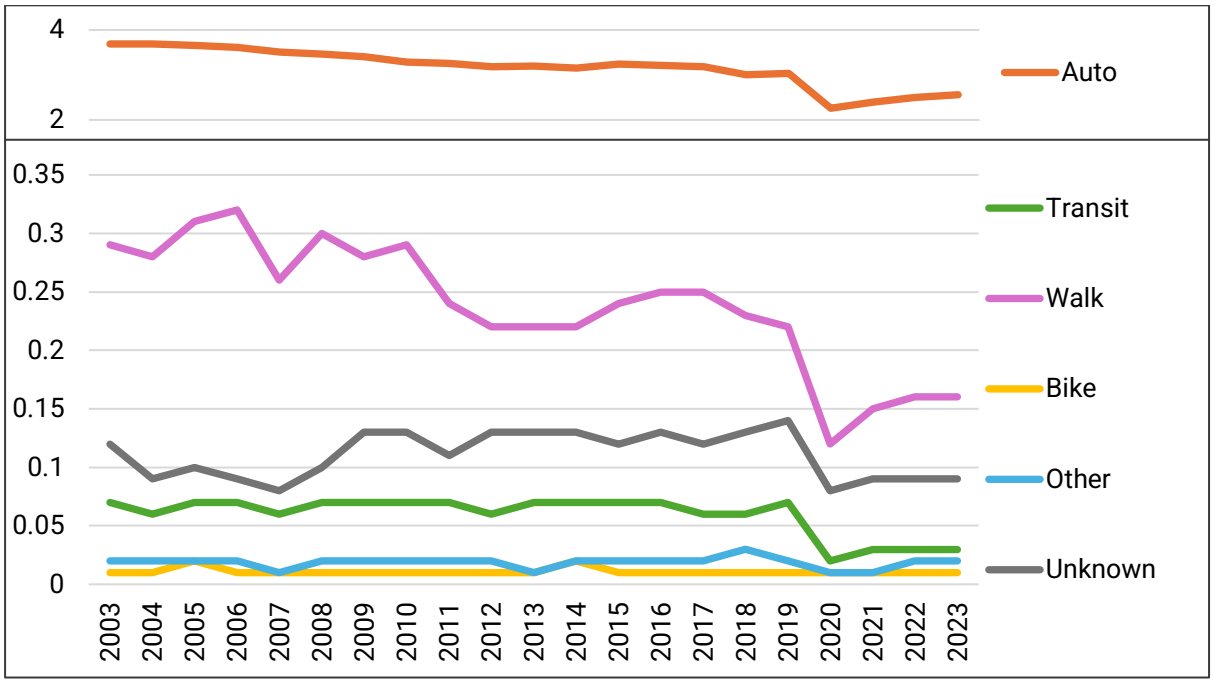


**Figure 9. Daily number of trips by travel mode between 2003 and 2023**

Figure 10 shows the trip rate trend by trip purpose. Throughout the period, all trip rates declined by double-digit percentages, with the exception of recreation, which returned to its 2003 rate by 2023. Pre-COVID declines in trip rates by purpose were most pronounced for education, likely reflecting changes in age demographics, attendance levels, and distance learning opportunities. Child and adult care trips also saw significant declines, again reflecting demographic shifts. The largest declines in trip making since 2019 were for work trips, followed by social trips. Figure 10 also includes return-to-home trips, which constitute approximately 33% of total trips, indicating that most trips from home involve two activities. There has been a slight increase in the return-to-home share, from 32.4% in 2003 to 35.8% in 2023, suggesting a slight decline in trip chaining.

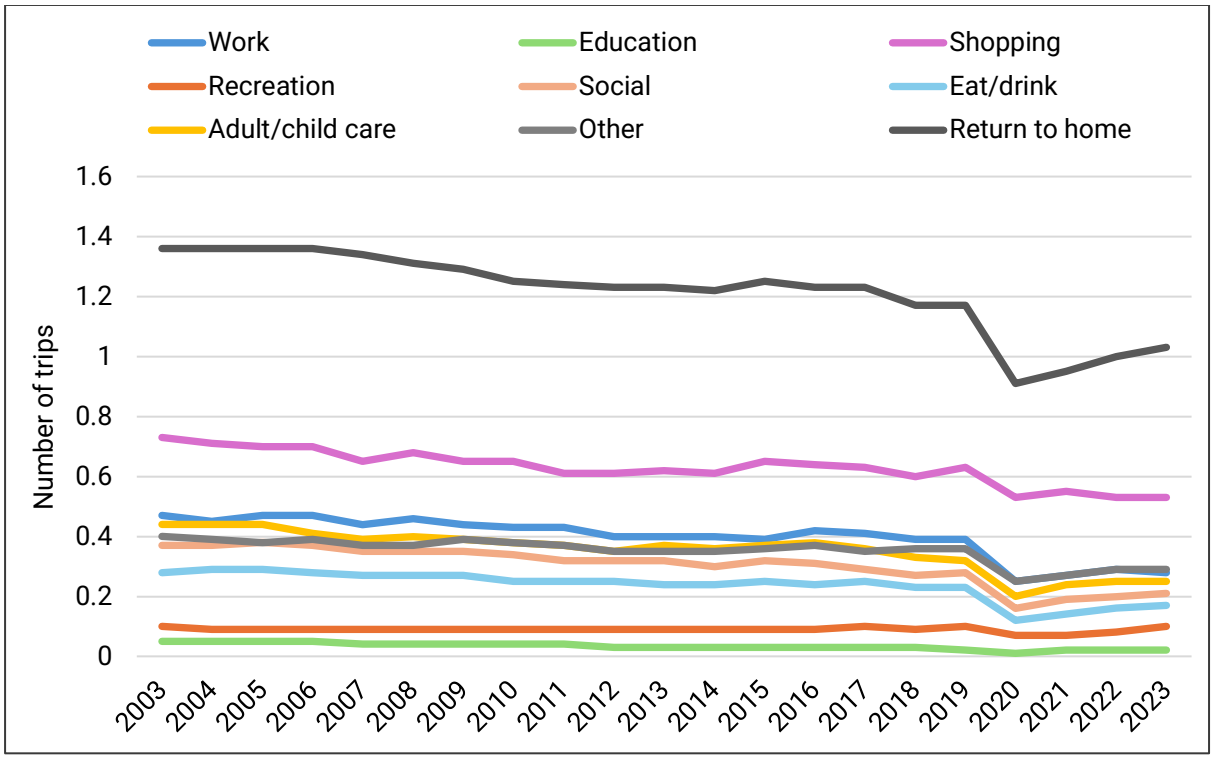


**Figure 10. Daily number of trips by trip purpose between 2003 and 2023**

Figure 11 shows the trend in trip rates by age cohort. All age cohorts showed declines during the reference period. Interestingly, the oldest age cohort experienced the most modest decline in trip rates during this period. This may reflect a cohort of seniors where female members are more likely to be licensed drivers and have greater financial independence than prior generations, as well as a cohort less likely to engage in communication substitution for travel. Post-COVID, the youngest cohort was least impacted in terms of travel, but surprisingly, declines in travel for older adults were more modest than for the middle-aged cohorts.

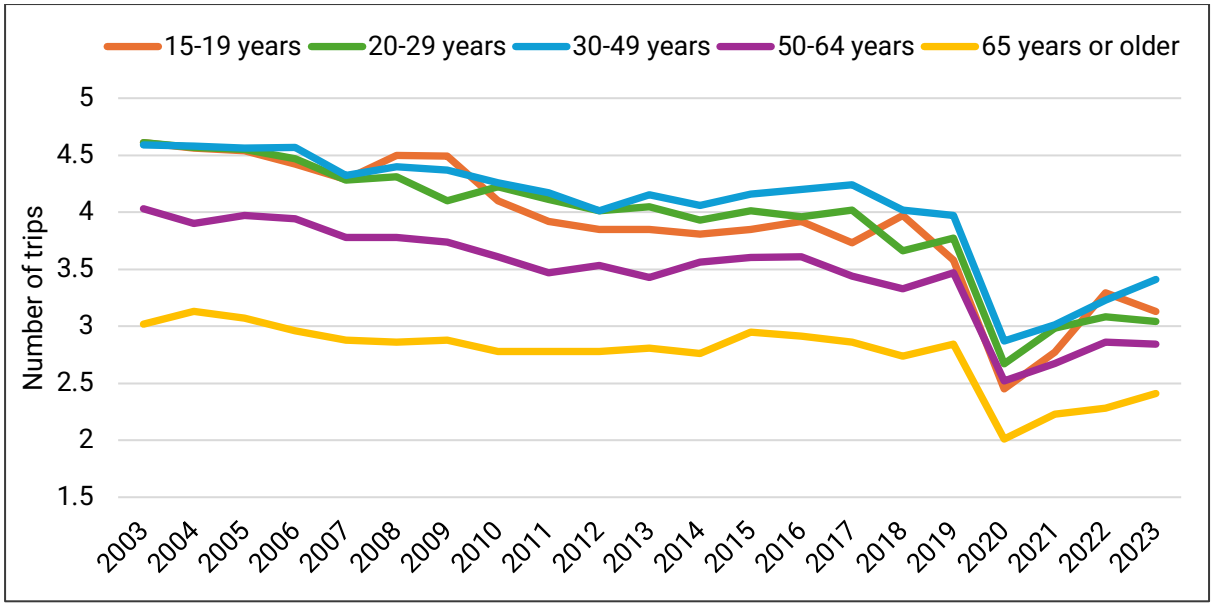


**Figure 11. Daily number of trips by age cohorts between 2003 and 2023**

Figure 12 shows the influence of income on trip rates. The income groups have followed generally consistent trends throughout the history of the ATUS. The highest income group had the lowest rate of decline pre-COVID but had the greatest percentage decline since. The income brackets are not adjusted for inflation.

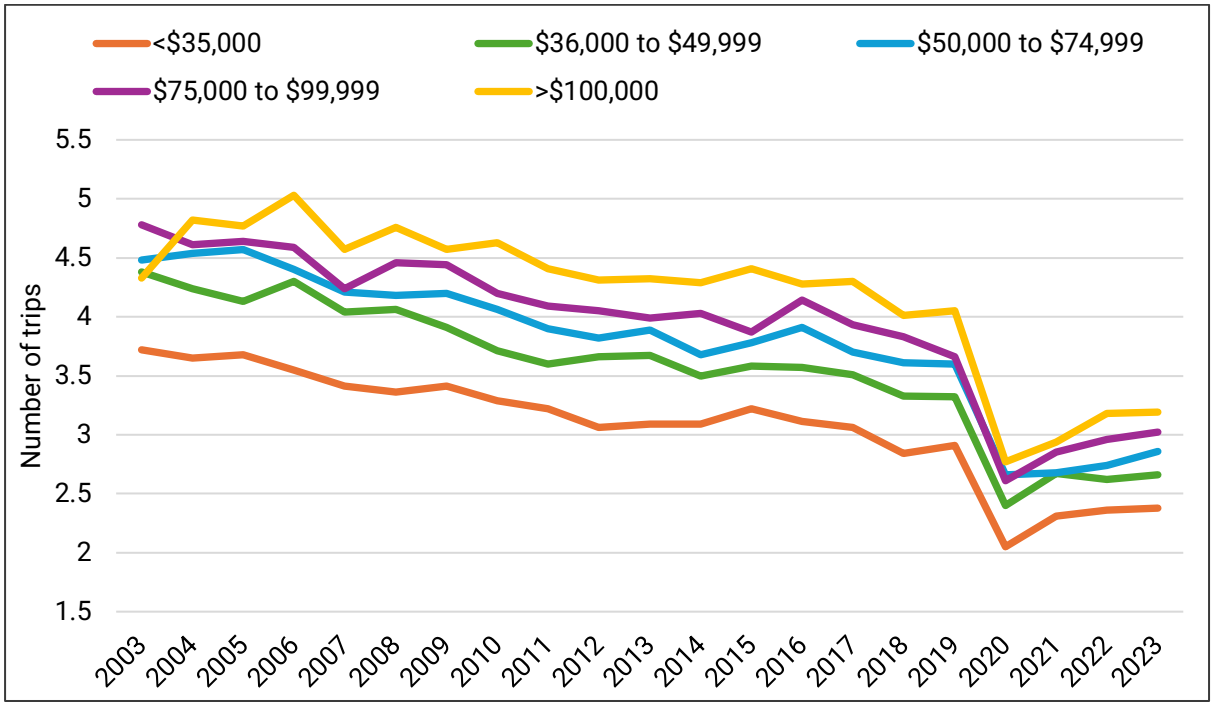


**Figure 12. Daily number of trips by income groups between 2003 and 2023**

Understanding the telework or WFH phenomenon is crucial to predicting future travel demand. The volume of commute trips is critical in defining peak infrastructure needs for both the roadway system and public transportation. Understanding the trend in post-COVID telework shares is key to forecasting future travel demand. The impact of

foregone commutes across various modes of travel (see Figure 1), the distribution of telework across days of the week, variations in telework adoption across various metropolitan areas, changes in central city recoveries, shifts in peaking characteristics associated with telework and more flexible work habits. Emerging data will hopefully indicate how time and money saved by working from home is being redeployed to supplement other travel or how activities previously handled through trip chaining with commutes are carried out.

Understanding the impact of telework at the local level may require insight into factors hypothesized to influence telework participation rates, including the nature of employment, the scale, culture, and size of firms, metro size, commute length and cost, corporate and community culture, urban crime, and economic conditions. We may be approaching a more stable level of WFH share, and many analysts expect a gradual resumption of a slight upward trend as the composition of work activities and types, along with communication capabilities, continue to evolve in ways that favor telework participation.

**Table 2. Summary of ATUS daily trip rates and changes (2003, 2019, and 2023)**

| Attribute | Category | Number of trips | | | % Change | | |
|---|---|---|---|---|---|---|---|
| | | 2003 | 2019 | 2023 | 2003-2019 | 2003-2023 | 2019-2023 |
| Travel mode | Auto | 3.69 | 3.04 | 2.56 | -17.6% | -30.6% | -15.8% |
| | Transit | 0.07 | 0.07 | 0.03 | 0.0% | -57.1% | -57.1% |
| | Walk | 0.29 | 0.22 | 0.16 | -24.1% | -44.8% | -27.3% |
| | Bike | 0.01 | 0.01 | 0.01 | 0.0% | 0.0% | 0.0% |
| | Other | 0.02 | 0.02 | 0.02 | 0.0% | 0.0% | 0.0% |
| | Unknown | 0.12 | 0.14 | 0.09 | 16.7% | -25.0% | -35.7% |
| Trip Purpose | Work | 0.47 | 0.39 | 0.28 | -17.0% | -40.4% | -28.2% |
| | Education | 0.05 | 0.02 | 0.02 | -60.0% | -60.0% | 0.0% |
| | Shopping | 0.73 | 0.63 | 0.53 | -13.7% | -27.4% | -15.9% |
| | Recreation | 0.10 | 0.10 | 0.10 | 0.0% | 0.0% | 0.0% |
| | Social | 0.37 | 0.28 | 0.21 | -24.3% | -43.2% | -25.0% |
| | Eat/drink | 0.28 | 0.23 | 0.17 | -17.9% | -39.3% | -26.1% |
| | Adult/childcare | 0.44 | 0.32 | 0.25 | -27.3% | -43.2% | -21.9% |
| | Other | 0.40 | 0.36 | 0.29 | -10.0% | -27.5% | -19.4% |
| | Return to home | 1.36 | 1.17 | 1.03 | -14.0% | -24.3% | -12.0% |
| Age | 15 to 19 years | 4.61 | 3.58 | 3.13 | -22.3% | -32.1% | -12.6% |
| | 20 to 29 years | 4.61 | 3.77 | 3.04 | -18.2% | -34.1% | -19.4% |
| | 30 to 49 years | 4.59 | 3.97 | 3.41 | -13.5% | -25.7% | -14.1% |
| | 50 to 64 years | 4.03 | 3.47 | 2.84 | -13.9% | -29.5% | -18.2% |
| | 65 years or older | 3.02 | 2.84 | 2.41 | -6.0% | -20.2% | -15.1% |
| Household income | <$35,000 | 3.72 | 2.91 | 2.38 | -21.8% | -36.0% | -18.2% |
| | $35,000 to $49,999 | 4.38 | 3.32 | 2.66 | -24.2% | -39.3% | -19.9% |
| | $50,000 to $74,999 | 4.48 | 3.60 | 2.86 | -19.6% | -36.2% | -20.6% |
| | $75,000 to $99,999 | 4.78 | 3.66 | 3.02 | -23.4% | -36.8% | -17.5% |
| | ≥$100,000 | 4.33 | 4.05 | 3.19 | -6.5% | -26.3% | -21.2% |

## Consumer Expenditure Survey

The CE survey offers insights into expenditures, income, and demographic characteristics of consumers in the United States. CE program data are collected by the Census Bureau for the BLS through two surveys: the Interview Survey for major and/or recurring items and the Diary Survey for more minor or infrequently purchased items. CE data are primarily used to update the relative importance of goods and services in the Consumer Price Index market basket. The CE is the only federal household survey that provides comprehensive information on the full range of consumers' expenditures and incomes. Table 3 presents data on transportation expenditures, outlining the expenditure categories used in the data collection process.

Figure 13 reveals spending levels for major categories of transportation expenditures. Expenditures on transportation increased by 22.6% between 2019 and 2023, virtually identical to the overall increase in expenditures of 22.5%. That increase totaled $2,432 per consumer unit. The rate of increase is above the sum of the consumer price indices for 2020-2023, which was 18.3%. In 2023, increases in vehicle purchases and auto insurance expenditures contributed to the 7.1% overall increase in transportation spending. Interestingly, the trends for fuel expenditures and vehicle expenditures tend to move in opposite directions, suggesting some behavior changes to normalize overall transportation spending.

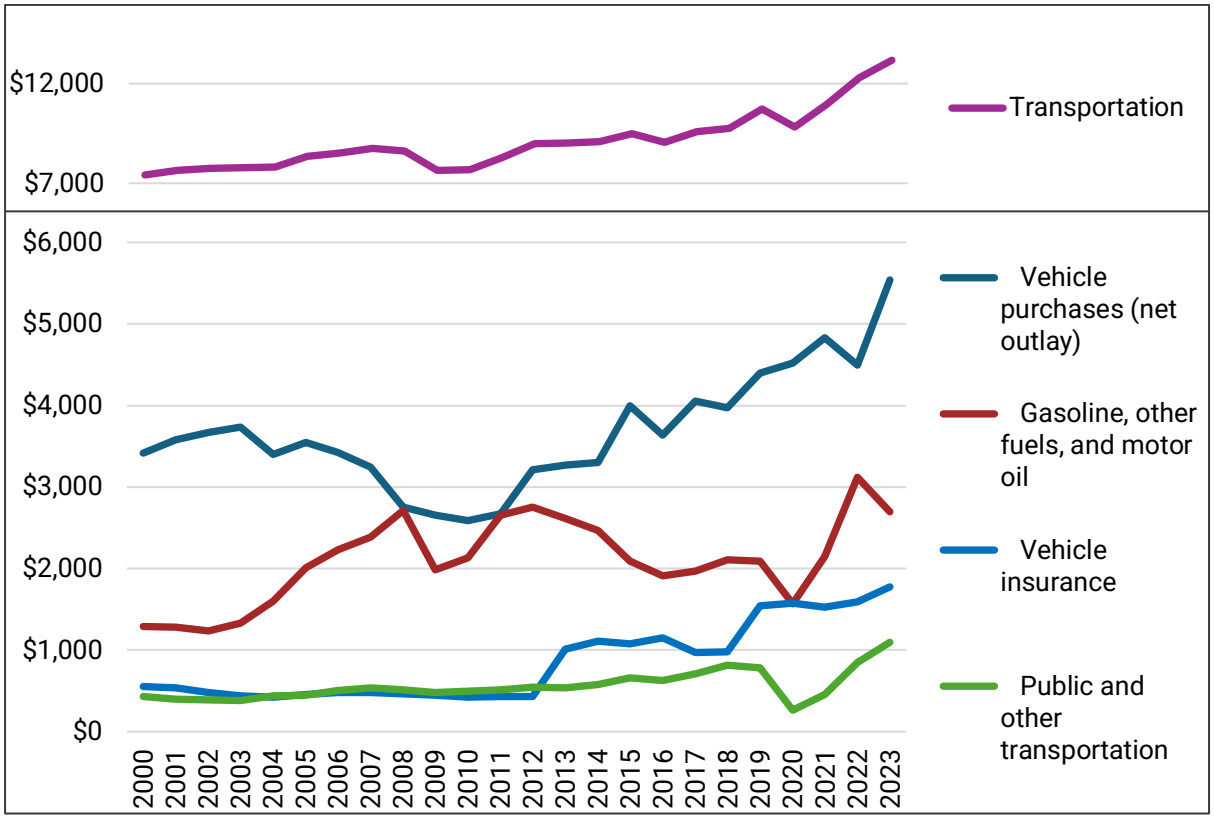


**Figure 13. Consumer expenditures on transportation**

However, as shown in Table 3 and Figure 14, transportation has been a slightly declining share of total household expenditures when reviewed since 2000. Similarly, spending on transportation and housing as a share of total spending, as well as transportation and shelter as a share of total spending, have both remained very stable, with current levels slightly below those in the early years of this century. Shelter is a narrower definition of housing costs, excluding items such as furnishings and utilities.

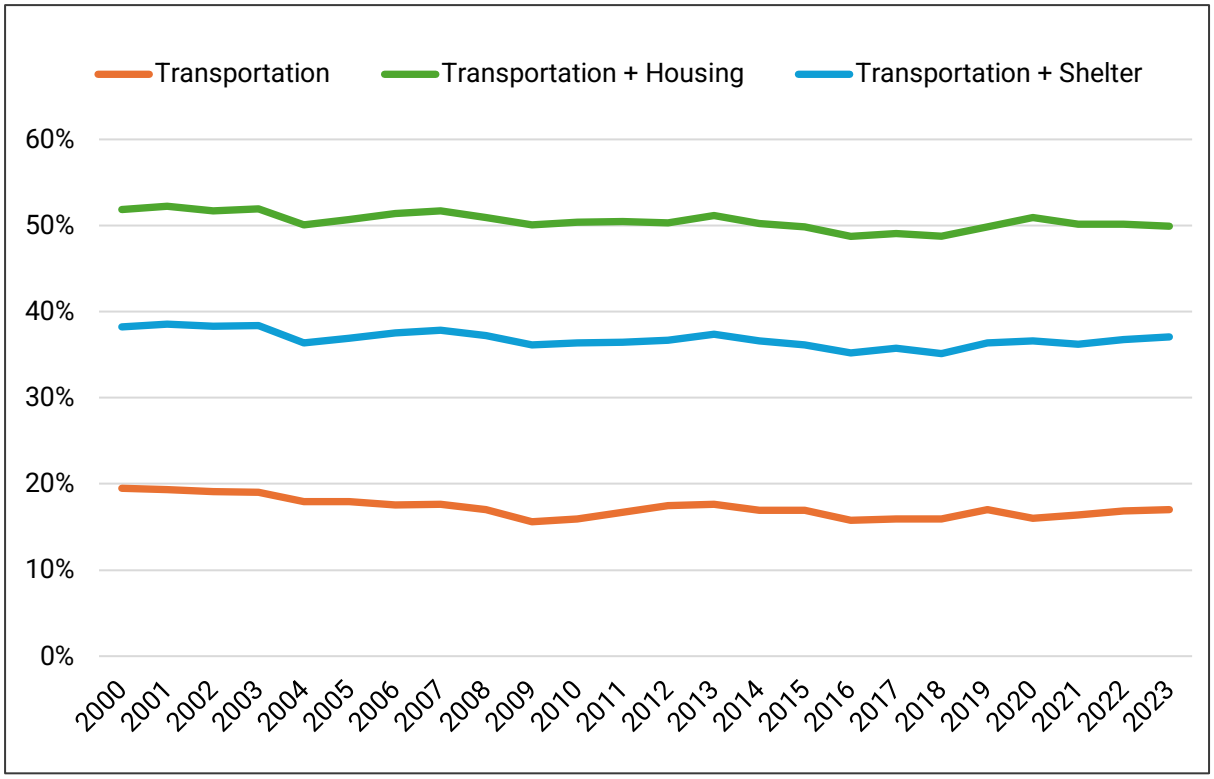


**Figure 14. Shares of expenditures by category**

Figure 15 combines information from the ATUS and the CE survey to provide an overview of the public's expenditure of both money and time on travel. As the figure reveals, there was a modest decline in the American public's investment of time and money in travel during the first decade of the 21st century, followed by a generally stable trend until the COVID-19 pandemic. Time spent on travel declined significantly, while expenditures changed only modestly, reflecting the fixed cost nature of vehicle ownership and operation, which dominates consumer transportation expenditures.

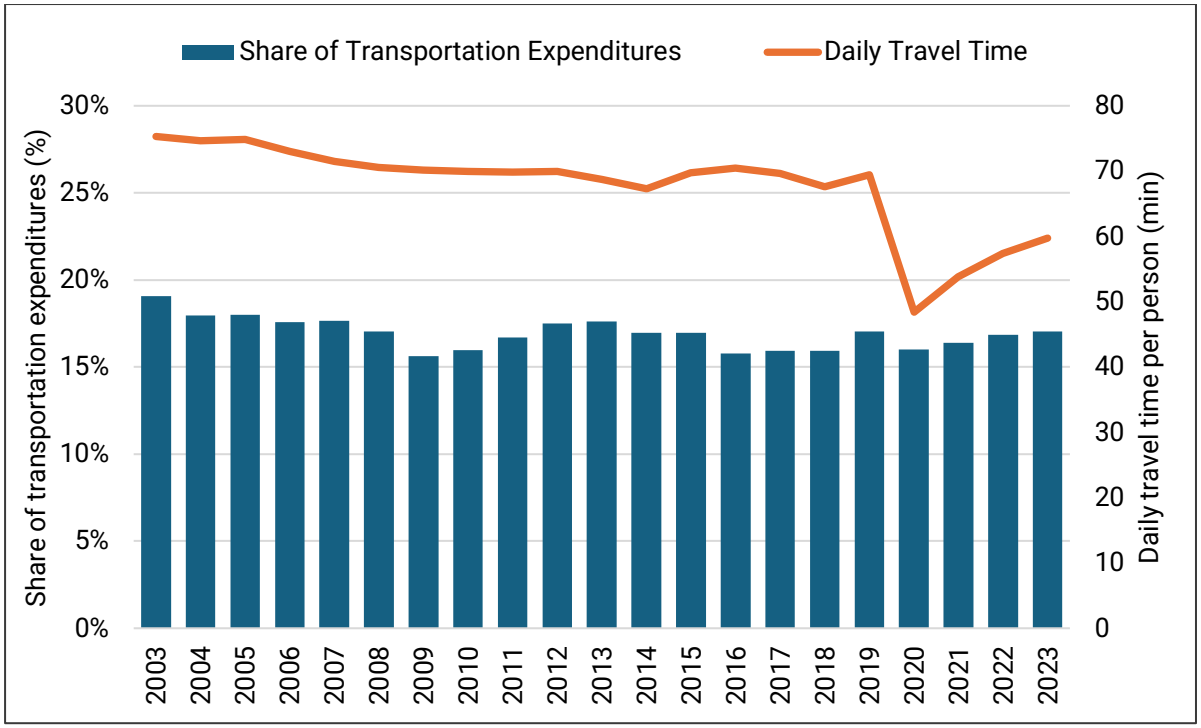


**Figure 15. Time and money investments in travel between 2003 and 2023**

## Table 3. CE Survey summary trends between 2005 and 2023

| Item | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Expenditures in Nominal Dollars ($)** | | | | | | | | | | | | | | | | | | | |
| Total expenditures | 46,409 | 48,400 | 49,638 | 50,486 | 49,067 | 48,109 | 49,705 | 51,442 | 51,100 | 53,495 | 55,978 | 57,311 | 60,060 | 61,224 | 63,036 | 61,334 | 66,928 | 72,967 | 77,280 |
| Housing | 15,167 | 16,366 | 16,920 | 17,109 | 16,895 | 16,557 | 16,803 | 16,887 | 17,148 | 17,798 | 18,409 | 18,886 | 19,884 | 20,091 | 20,679 | 21,409 | 22,624 | 24,298 | 25,436 |
| Shelter | 8,805 | 9,673 | 10,023 | 10,183 | 10,075 | 9,812 | 9,825 | 9,891 | 10,080 | 10,491 | 10,742 | 11,128 | 11,895 | 11,747 | 12,190 | 12,604 | 13,258 | 14,507 | 15,499 |
| Transportation | 8,344 | 8,508 | 8,758 | 8,604 | 7,658 | 7,677 | 8,293 | 8,998 | 9,004 | 9,073 | 9,503 | 9,049 | 9,576 | 9,761 | 10,742 | 9,826 | 10,961 | 12,295 | 13,174 |
| Vehicle purchases (net outlay) | 3,544 | 3,421 | 3,244 | 2,755 | 2,657 | 2,588 | 2,669 | 3,210 | 3,271 | 3,301 | 3,997 | 3,634 | 4,054 | 3,975 | 4,394 | 4,523 | 4,828 | 4,496 | 5,539 |
| Cars and trucks, new | 1,931 | 1,798 | 1,572 | 1,305 | 1,297 | 1,219 | 1,265 | 1,639 | 1,563 | 1,562 | 1,956 | 1,650 | 1,900 | 1,825 | 1,960 | 2,089 | 2,210 | 2,195 | 2,896 |
| Cars and trucks, used | 1,531 | 1,568 | 1,567 | 1,315 | 1,304 | 1,318 | 1,339 | 1,516 | 1,669 | 1,689 | 1,982 | 1,919 | 2,101 | 2,084 | 2,375 | 2,360 | 2,555 | 2,239 | 2,585 |
| Other vehicles | 82 | 54 | 105 | 134 | 55 | 51 | 64 | 56 | 39 | 50 | 59 | 66 | 53 | 66 | 59 | 75 | 63 | 62 | 58 |
| Gasoline, other fuels, and motor oil | 2,013 | 2,227 | 2,384 | 2,715 | 1,986 | 2,132 | 2,655 | 2,756 | 2,611 | 2,468 | 2,090 | 1,909 | 1,968 | 2,109 | 2,094 | 1,568 | 2,148 | 3,120 | 2,694 |
| Other vehicle expenses | 2,339 | 2,355 | 2,592 | 2,621 | 2,536 | 2,464 | 2,454 | 2,490 | 2,584 | 2,723 | 2,756 | 2,884 | 2,842 | 2,859 | 3,474 | 3,471 | 3,534 | 3,834 | 3,845 |
| Vehicle finance charges | 297 | 298 | 305 | 312 | 281 | 243 | 233 | 223 | 204 | 208 | 216 | 226 | 220 | 222 | 252 | 258 | 272 | 295 | 361 |
| Maintenance and repairs | 671 | 688 | 738 | 731 | 733 | 787 | 805 | 814 | 835 | 836 | 837 | 849 | 954 | 890 | 887 | 879 | 975 | 1160 | 975 |
| Vehicle rental, leases, licenses, and other | 458 | 482 | 478 | 465 | 447 | 423 | 433 | 434 | 533 | 567 | 624 | 660 | 700 | 772 | 790 | 758 | 760 | 787 | 734 |
| Vehicle insurance | 913 | 886 | 1,071 | 1,113 | 1,075 | 1,010 | 983 | 1,018 | 1,013 | 1,112 | 1,079 | 1,149 | 967 | 976 | 1,545 | 1,575 | 1,528 | 1,592 | 1,775 |
| Public and other transportation | 448 | 505 | 538 | 513 | 479 | 493 | 516 | 542 | 537 | 581 | 661 | 623 | 712 | 818 | 781 | 263 | 452 | 845 | 1,096 |
| **Shares in Total Household Expenditures (%)** | | | | | | | | | | | | | | | | | | | |
| Transportation | 18.0% | 17.6% | 17.6% | 17.0% | 15.6% | 16.0% | 16.7% | 17.5% | 17.6% | 17.0% | 17.0% | 15.8% | 15.9% | 15.9% | 17.0% | 16.0% | 16.4% | 16.9% | 17.0% |
| Transportation and housing | 50.7% | 51.4% | 51.7% | 50.9% | 50.0% | 50.4% | 50.5% | 50.3% | 51.2% | 50.2% | 49.9% | 48.7% | 49.1% | 48.8% | 49.8% | 50.9% | 50.2% | 50.2% | 50.0% |
| Transportation and shelter | 37.0% | 37.6% | 37.8% | 37.2% | 36.1% | 36.4% | 36.5% | 36.7% | 37.3% | 36.6% | 36.2% | 35.2% | 35.7% | 35.1% | 36.4% | 36.6% | 36.2% | 36.7% | 37.1% |

## Implications for Future Travel Demand

Figure 16 shows two measures of roadway travel demand. The upper line represents a rolling 12-month average of national VMT, as reported by Federal Highway Administration data. In contrast, the lower line shows VMT per capita by simply dividing the total VMT by the estimated population. The data runs through July 2024. As depicted, VMT has been recovering from the pandemic, with the 12-month total now virtually equal to pre-COVID numbers. Per capita VMT has recovered modestly but remains below its historic peak, with a moderate upward slope throughout the COVID recovery years. The year-to-date 2024 data suggests continued growth in travel. The per capita VMT trends assume official Census estimates of the U.S. population, which carry uncertainty, particularly regarding changes in the number of undocumented immigrants residing in the U.S. since the 2020 Census.

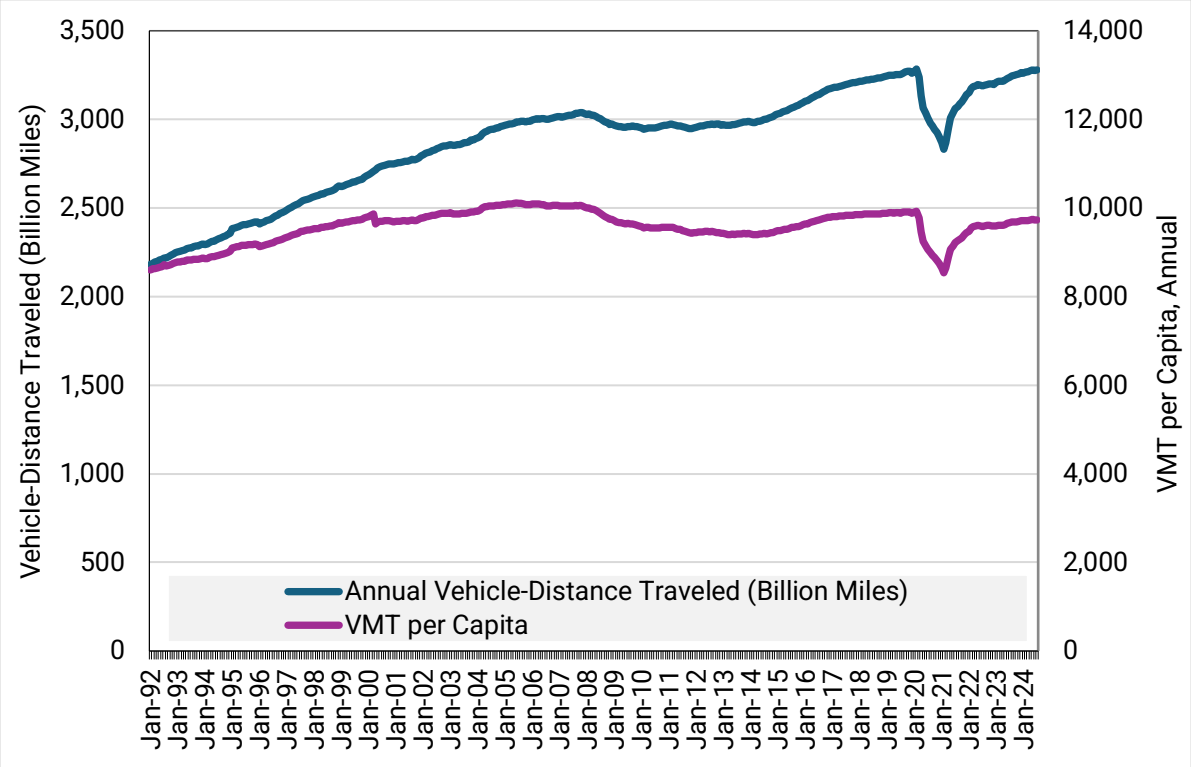


**Figure 16. National VMT trends, moving 12-month total (1992-2024)**

The magnitude of teleworking and other situations where communication is substituted for travel remains the biggest uncertainty in the immediate future regarding travel demand trends. Given that commuting, which constitutes about 20% of total VMT, remains diminished by 10 to 20%, it would have the effect of reducing overall VMT by 2 to 4%. This does not consider secondary impacts such as the potential of telework to shift or redeploy the time and money resources for other activity/travel purposes, accomplish the activities previously linked to commute trips and/or replace the social interaction foregone by telework. While these changes seem modest in total, they are significant when compared to historical changes in travel. In addition, since commuting

defines peak periods and peak infrastructure capacity and service levels, understanding these trends becomes more crucial with respect to defining infrastructure and service needs and productivity. Similarly, the emerging evidence indicates very different behaviors with respect to telework adoption across geography (in terms of both the home and work end of commute trips) and socio-demographic groups which has significant implications for travel demand. As is becoming increasingly evident, the impact of telework on public transportation – particularly modes and services targeted toward longer-distance commute trips to office destinations – carries profound long-term implications on transportation policy and investment.

Figures 17 and 18 depict the relationship between the growth in VMT and the growth in lane miles of infrastructure for the two major roadway functional classifications in the U.S. As the trends indicate, in general, the supply of lane miles has kept pace with the growth in demand, particularly since around 2010. Before that time, arterial volumes grew considerably more rapidly than lane miles. While this might suggest stabilizing congestion levels, changes in the geographic distribution of demand can still result in increased congestion, as growth and declines in travel across different areas can lead to some infrastructure experiencing declining use, while some others become increasingly congested.

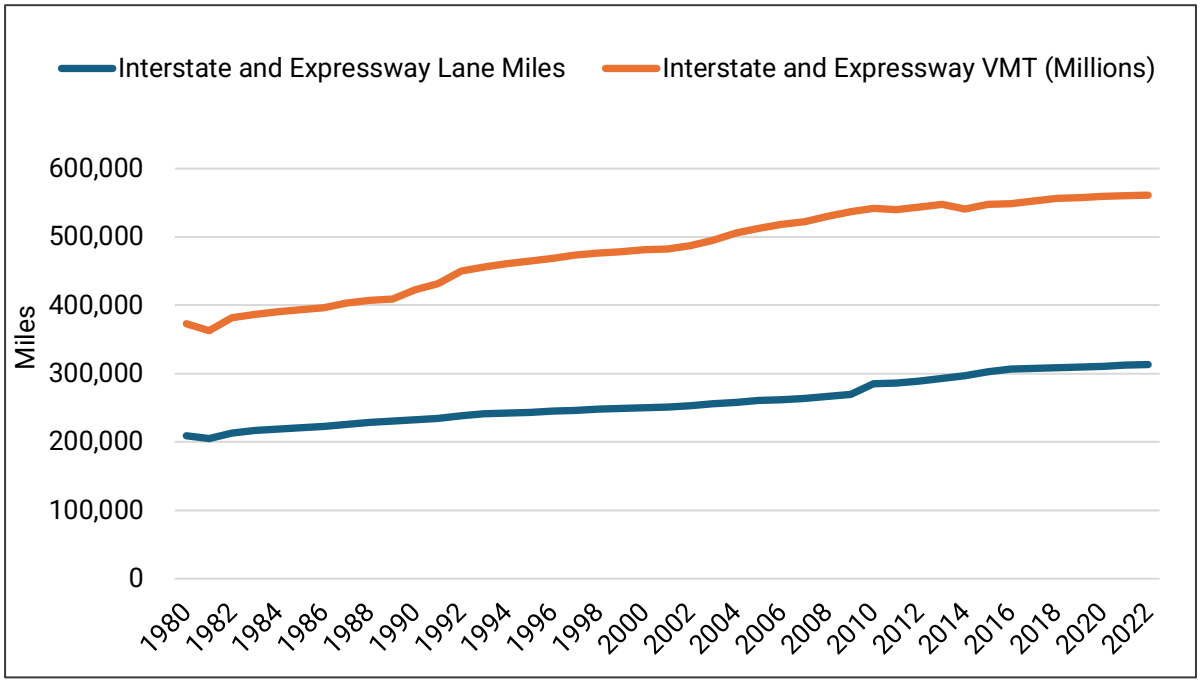


**Figure 17. Expressway and interstate trends (1980-2022)**

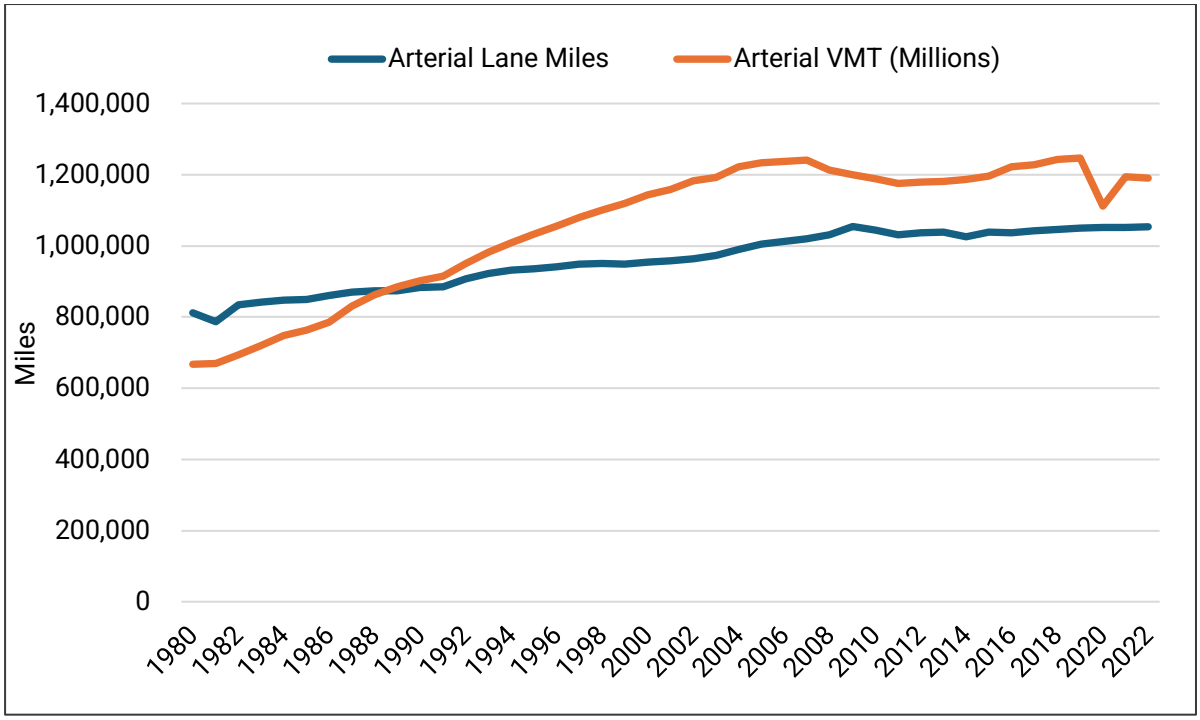


**Figure 18. Arterial trends (1980-2022)**

An additional aspect impacting the trend in VMT is the mode choice for long-distance travel, particularly the choice between flying and driving for longer trips. As Figure 19 shows, passenger miles of air travel have grown faster than population growth for an extended period of time and may be partially responsible for the moderation in per capita VMT, despite economic growth.

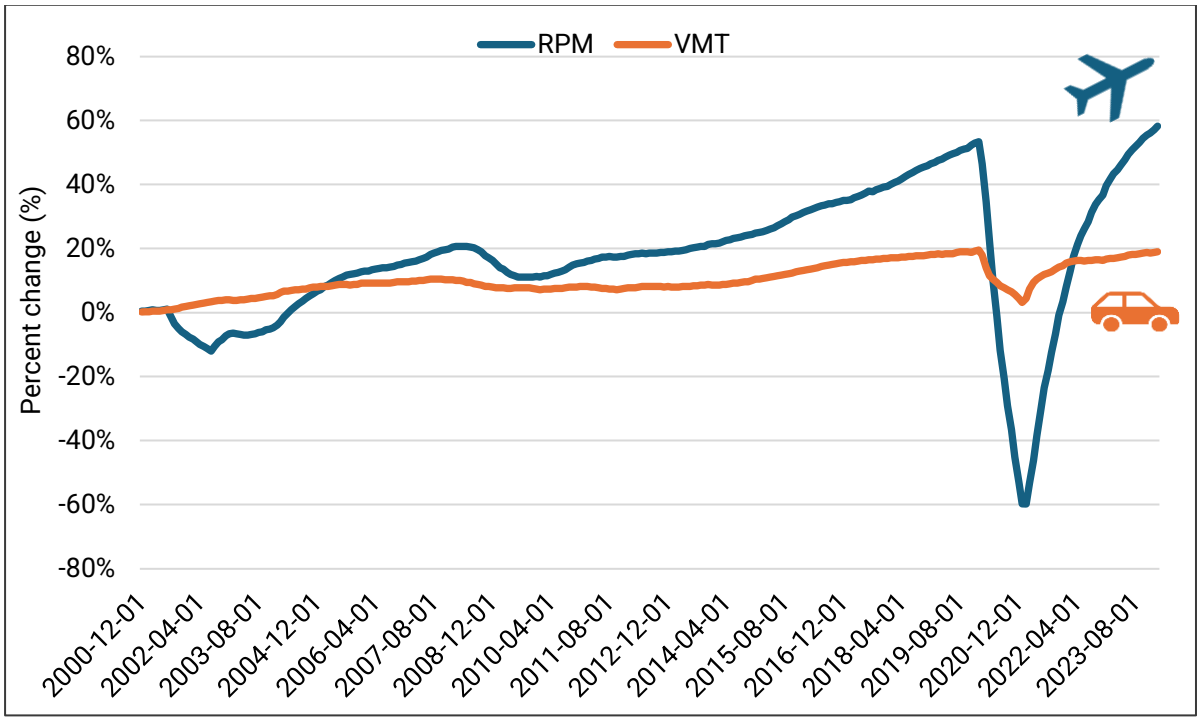


**Figure 19. Airline revenue passenger miles (RPM) versus VMT (2000-2023)**

While Figures 17 and 18 reported trends in the demand and supply of roadway transportation capacity, Figure 20 provides insight into the demand and supply of public transportation services. This monthly data, through July 2024, is from the National Transit Data program. The measure of passenger trips per revenue vehicle mile of service declined steadily from 2.82 in 2002 to 2.04 in February 2020, before dropping during COVID to a low of 0.92 in March 2021 and then recovering to 1.65 by July 2024.

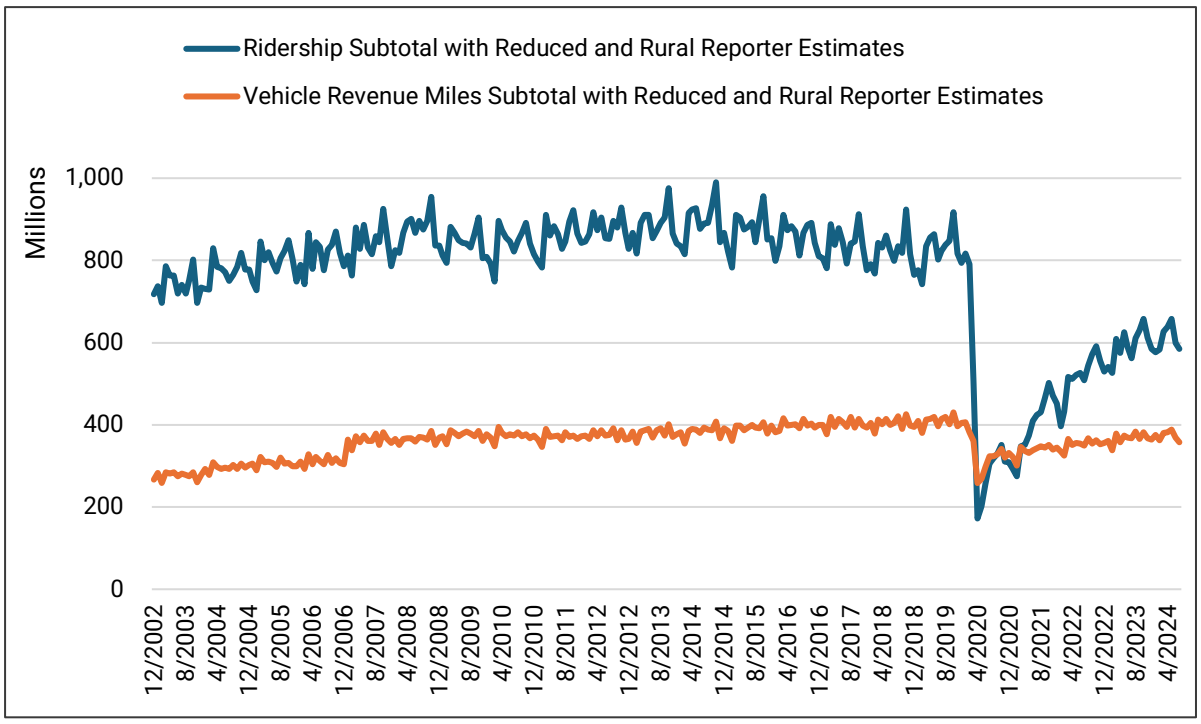


**Figure 20. Monthly ridership and revenue vehicle miles trends (2002-2024)**

***Summary comments***

Both the private sector and public agencies have directed significant resources toward monitoring and understanding the transportation impacts of COVID. While this information is being assembled and disseminated, much remains to be done to establish a sound understanding of the path forward. Post-COVID travel behaviors have not yet stabilized, with in-office work participation levels continuing to change and other adaptations occurring simultaneously. Confounding factors that complicate the picture include fuel prices, the remaining extent of "catch-up" or "revenge" travel to make up for foregone travel during COVID, increasing crime rates impacting certain travel modes and locations, evidence of shifting residential location patterns, and other considerations. These complexities make it even more challenging to fully understand emerging travel behaviors with enough confidence to offer reliable longer-term forecasts.

What is most clear is that the pace of change in travel behaviors has been unprecedented and uncertain. A host of other factors, such as the pace of electrification,

the scale of onshoring manufacturing, the rate of immigration, the continued substitution of virtual connections for in-person activities, the reliance on and logistic efficiency of delivery services and mobility-as-a-service (MaaS) options, the adoption of micromobility travel options such as e-bikes, e-scooters, and inevitably pod-sized mini vehicles and the pace and scale of meaningful deployment of autonomous services, all suggest a highly dynamic future for travel behavior. Additionally, the state of the economy, which has avoided a recession for an extended period and may face challenges from high accumulated deficits or other natural or manmade disruptions, may impact travel levels.

There is currently no compelling basis to anticipate a resurgence in per capita VMT growth. This suggests that any future changes will likely mirror population shifts unless significant changes occur in economic conditions.