NATIONAL CENTER FOR UNDERSTANDING FUTURE
TRAVEL BEHAVIOR AND DEMAND

Final Project Report

Emerging Travel Behavior Insights From National Surveys and Count Data

BY

Steven Polzin
Email: sepolzin@asu.edu

Irfan Batur
Email: ibatur@asu.edu

Ram M. Pendyala
Email: Ram.Pendyala@asu.edu

School of Sustainable Engineering and the Built Environment
Arizona State University
660 S College Ave, Tempe, AZ 85281

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16. Abstract

The early 21st century to the present is a pivotal era in the study of travel behavior and time use. This two-decade period has witnessed not only incremental adjustments but also transformative shifts in how individuals allocate their time across various activities and make travel-related decisions within their time and monetary constraints. These shifts are not isolated phenomena; they are deeply intertwined with broader, multidimensional changes driven by factors such as the widespread adoption of Internet and Communication Technologies (leading to innovations in mobility services and online substitutes for many in-person activities) and shifts in demographics and cultural norms. Overall, this period of change holds profound implications for transportation planning and policy development. This multi-stage project aims to navigate this complex terrain to shed light on the trends in time, travel, transit, telework, and treasure (T5) during this period. The project primarily utilizes data from the American Community Survey (ACS), the American Time Use Survey (ATUS), and the Consumer Expenditure Survey (CES), along with insights from field counts and travel estimates, to analyze these trends. Understanding these trends is crucial for effectively addressing current and future challenges and seizing opportunities in transportation management, economic resilience, and societal wellbeing.

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EXECUTIVE SUMMARY

The early 21st century to the present is a pivotal era in the study of travel behavior and time use. This two-decade period has witnessed not only incremental adjustments but also transformative shifts in how individuals allocate their time across various activities and make travel-related decisions within their time and monetary constraints. These shifts are not isolated phenomena; they are deeply intertwined with broader, multidimensional changes driven by factors such as the widespread adoption of Internet and Communication Technologies (leading to innovations in mobility services and online substitutes for many in-person activities) and shifts in demographics and cultural norms. Overall, this period of change holds profound implications for transportation planning and policy development. This multi-stage project aims to navigate this complex terrain to shed light on the trends in time, travel, transit, telework, and treasure (T5) during this period. The project primarily utilizes data from the American Community Survey (ACS), the American Time Use Survey (ATUS), and the Consumer Expenditure Survey (CES), along with insights from field counts and travel estimates, to analyze these trends. Understanding these trends is crucial for effectively addressing current and future challenges and seizing opportunities in transportation management, economic resilience, and societal wellbeing.

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. This data can be complemented with descriptive and count data about our transportation system and its use. The newly available survey data for 2024 provides insight into what the "new normal" post-COVID might look like. 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 data frequently to identify emerging "new normal" travel behaviors.

The passage of time has reaffirmed that some COVID-inspired changes in behavior are resistant to a complete return to pre-COVID conditions. Notably, telework or work-from-home (WFH) arrangements have continued at high levels, while travel for socialization and recreation has rebounded rapidly. The recovery in total vehicle miles traveled (VMT) masks significant changes in travel behavior, particularly for work-related commuting, which is undertaken 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 commute patterns define peak/rush hours, they influence a substantial portion of transportation spending and policy decisions.

This brief reviews three nationwide surveys (i.e., ACS, ATUS, and CE) with respect to questions that give insight into travel behaviors. Note that the section on consumer expenditures is not updated to include 2024 data, as delays have postponed the release of that federal data. When that CE data is released, this report will be updated.

The following sections offer a brief exploration of each survey and highlight key findings related to travel behaviors. That is followed by information on descriptions of service and facility supply and use. These results provide crucial insights into shifting commuting patterns, telework trends, and broader changes in travel behaviors that can inform future transportation policy and planning.

AMERICAN COMMUNITY SURVEY

The American Community Survey (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 were released but did not meet the statistical standards the Census traditionally applies; hence, their 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.

Figure 1 reveals the magnitude of the disruption attributable to the impacts of COVID. The 2024 ACS data indicated a decline in the usual WFH workers, but their share still ranks as the second most common mode and is well over twice the sum of bike, walk, and transit, and well above the carpool share. Due to the wording of the ACS question, which relies on respondents discerning their "usual" commute mode last week, it has become less meaningful in an era of hybrid work patterns and increasingly variable work schedules. To provide context for comparing the week-level ACS measure with day-level work-from-home patterns, 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 higher number in the ATUS captures hybrid workers and occasional telework participants. The line shown reflects the behaviors of 18- to 65-year-old workers. The ATUS data are analyzed in greater detail later in this report.

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, as might have increases in new zero-vehicle immigrant households.

Table 1. Key Transportation-Related Questions in the American Community Survey (ACS), 2005–2024

Attribute	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
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%	8.5%
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%	33.2%
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%	36.3%
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%	22.0%
Commute mode choice																				
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%	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%	9.2%
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%	3.7%
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%	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%	2.1%
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%*	*4.5%*
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%	13.3%
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%	26.1%
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	27.2
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%	96.6%
Broadband internet subscription	--	--	--	--	--	--	--	--	73.4%	75.1%	76.7%	81.4%	83.5%	85.1%	86.4%	--	90.1%	91.0%	92.1%	93.2%

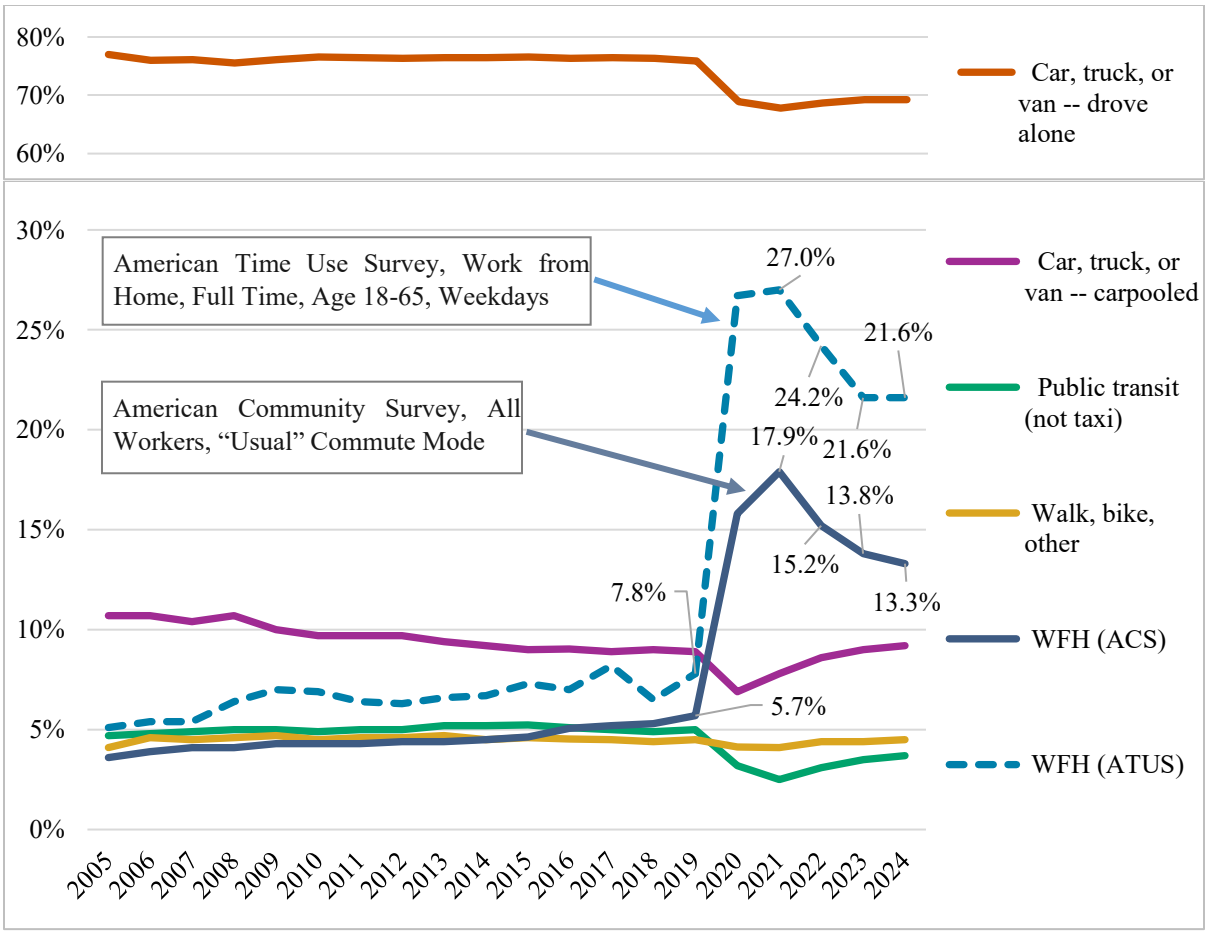

Figure 1. "Usual" Means of Commuting (2005-2024)

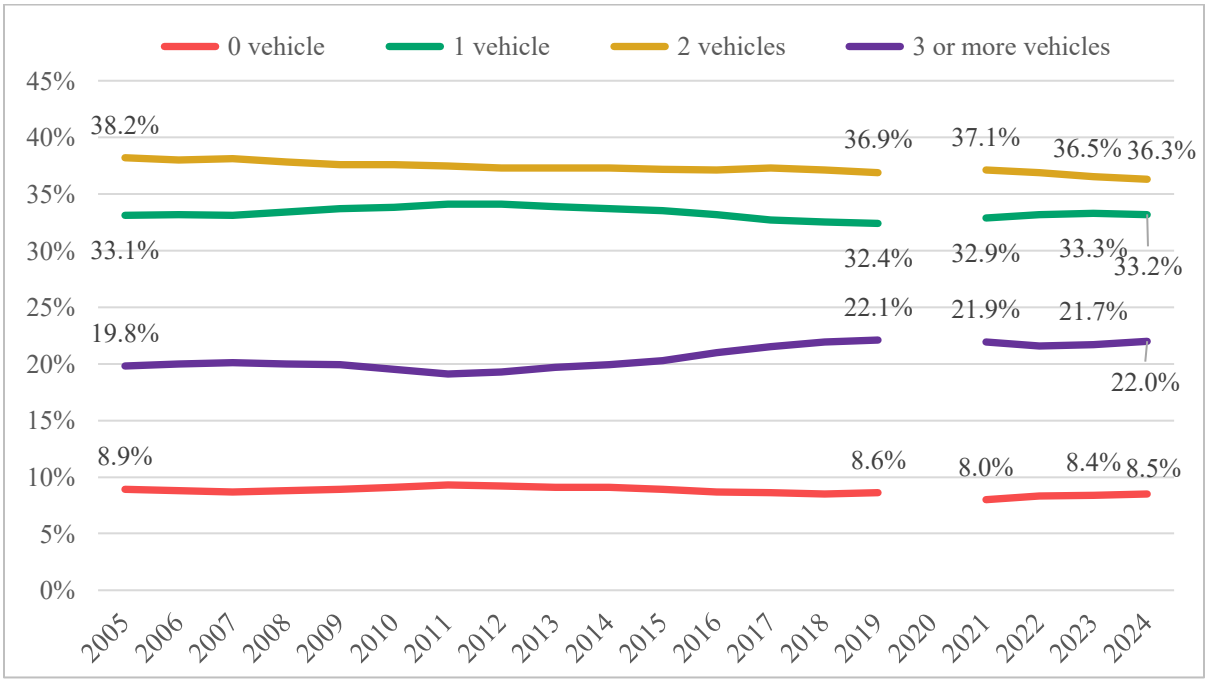

Figure 2. Household Vehicle Availability (2005-2024)

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 have no one commuting on a given workday. Zero-worker household levels are near their lowest levels since 2008.

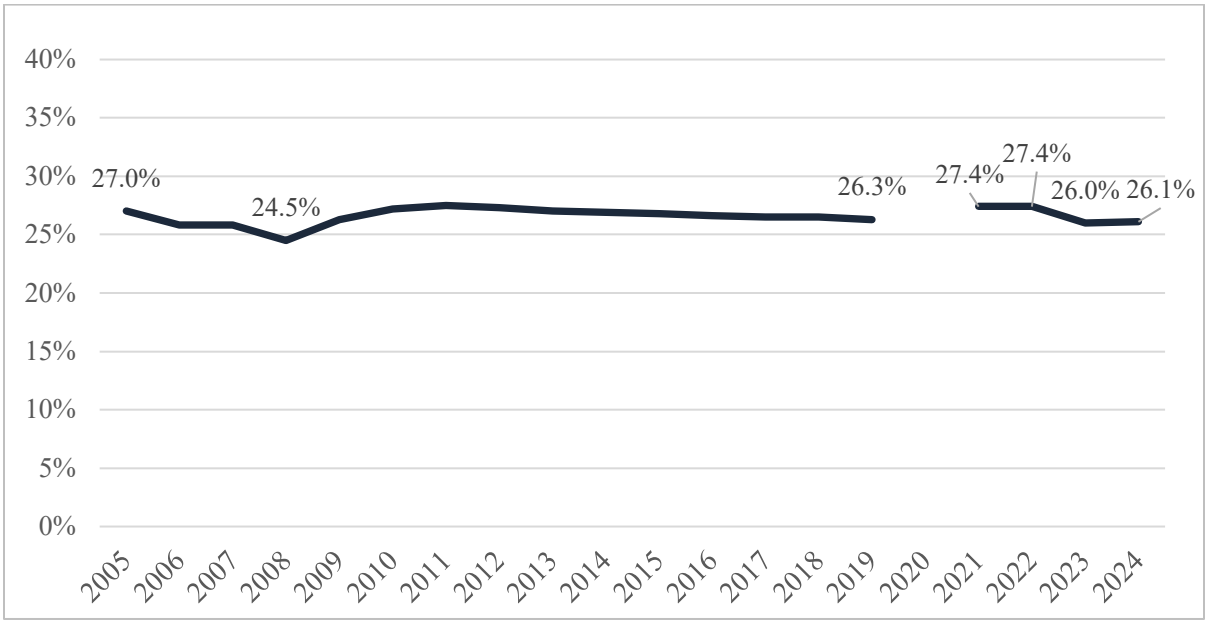

Figure 3. Percent of Zero-Worker Households (2005-2024)

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, and a 0.4-minute increase in 2024, but remains slightly 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 work access time would be about 23.6 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 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], 91% of Americans had smartphones, and another 7% had non-smart cell phones as of 2024. Both ACS and PEW data show continuing growth in communications connectivity.

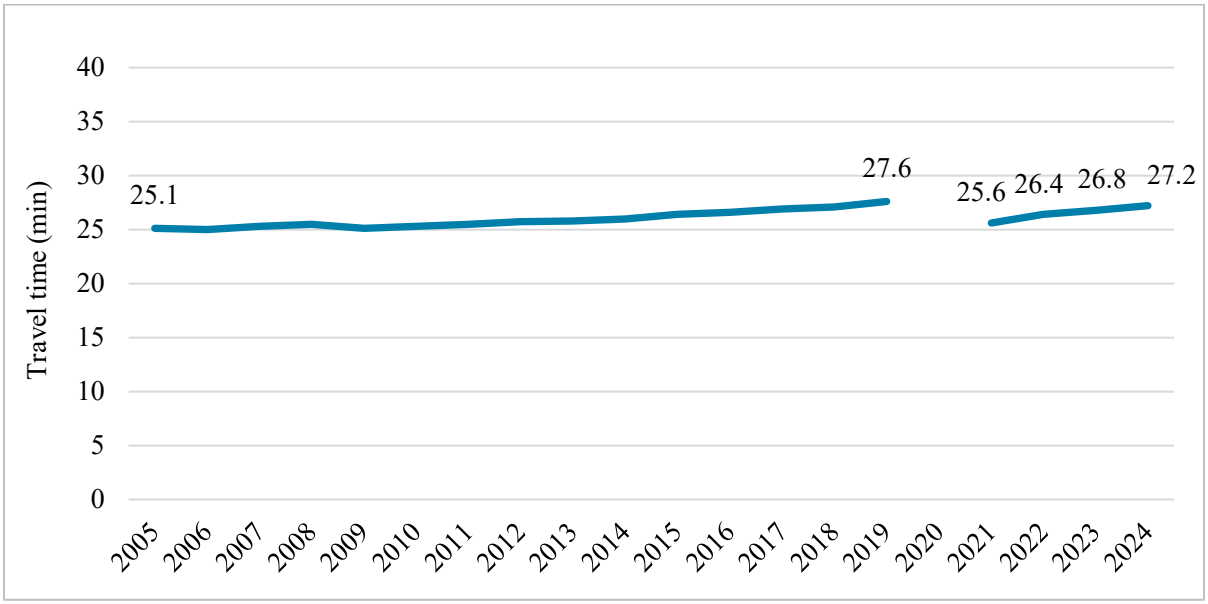

Figure 4. Mean Travel Time to Work (2005-2024)

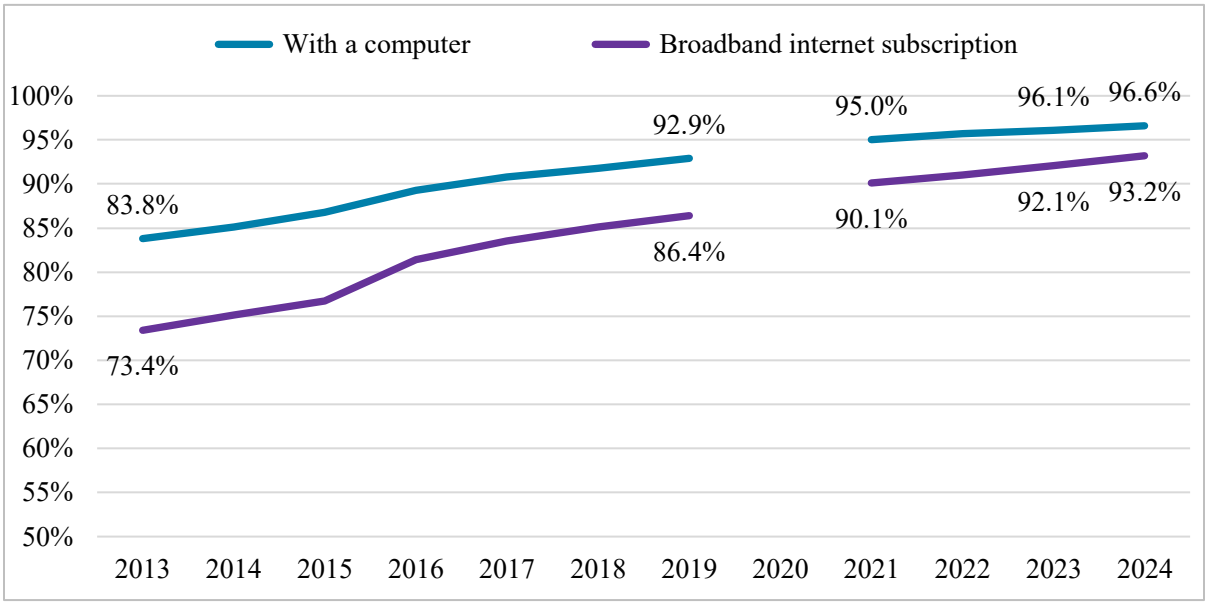

Figure 5. Household Connectivity (2013-2024)

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

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. The return to the office trend has gained attention, suggesting continued declines in work from home as a usual mode for 2025 and 2026. However, there is strong support for work-from-home participation, and its share is likely to remain well above pre-COVID levels.
- 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→ 3.7 in 2024).
- No-vehicle households remained below pre-COVID levels.
- The no-worker household share remains near its highest level since 2011.
- The average commute time continues to tick back up but remains below pre-COVID levels.
- Overall trends are moving closer to pre-COVID levels, but the year-to-year changes are more modest, as one would expect absent a critical change.

AMERICAN TIME USE SURVEY

The American Time Use Survey (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. Notably, 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% WFH share for full-time workers who were working on the survey day in 2019, 27.0% in 2020, 26.3% in 2021, 23.5% in 2022, 21.6% in 2023, and 20.1% in 2024. For all workers who were working on their survey day, 9.1% worked from home in 2019, 25.0% in 2020, 24.7% in 2021, 22.6% in 2022, 20.2% in 2023, and 19.6% in 2024. 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, 14.5% in 2023, and 13.3% in 2024. 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 2024, the data indicate that telework was higher on average than reported in the ACS. Telecommute rates moderated slightly between 2022 and 2024, 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, but some softening in 2025 as many employers are encouraging or mandating more in-office work. Despite declines in WFH during 2023 and 2024, the actual work trip rate per capita in 2023 dipped slightly from the 2022 number, remaining stable in 2024, as shown later in this report (see Figure 10). This could be partially explained by changes in labor force participation. A visual review of the Survey or 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 is consistent with National Household Travel Survey (NHTS) data and overall VMT trends, indicating a moderation in person trip-making, which can be attributed to communication substitution, demographic trends, and other factors. As of 2024, trip rates remained 18% below 2019 levels and over 30 percent below 2003 levels, with the pace of recovery from COVID slowing.

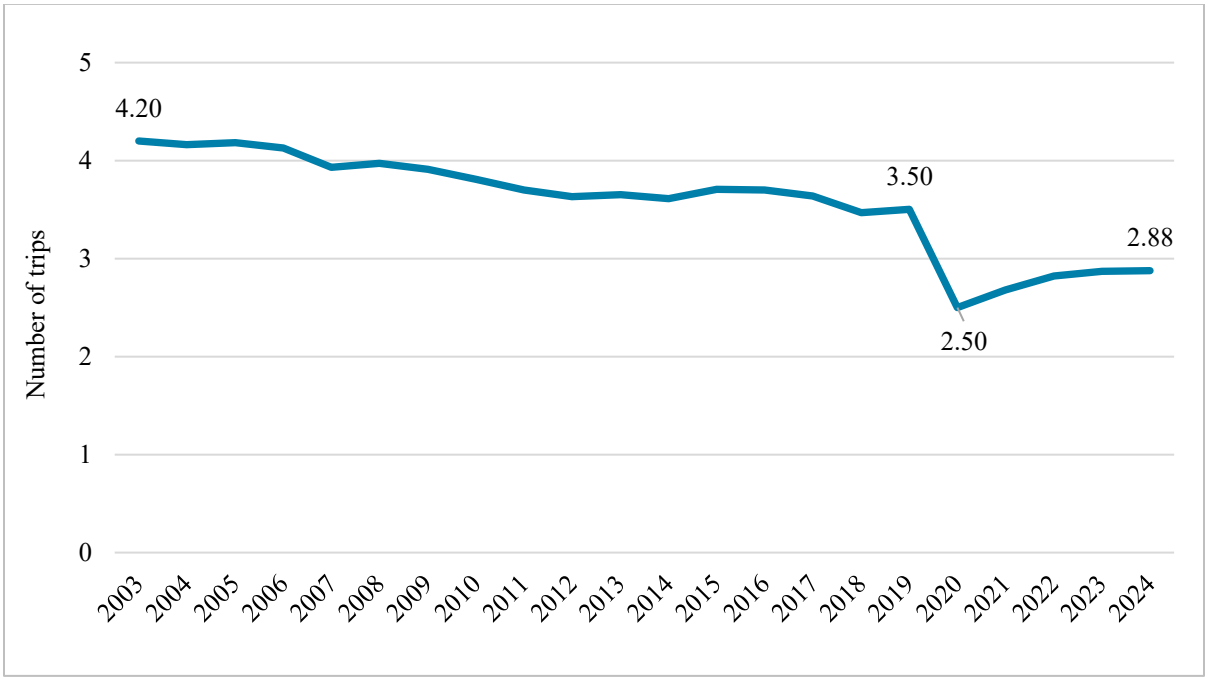

Figure 6. Daily Number of Trips per Person (2003-2024)

Figure 7 presents the total minutes of daily travel per person as reported by ATUS respondents. This data similarly shows a moderate pace of recovery in travel time expenditures. Travel duration in 2024 was 88% of its 2019 level, while the trip count was 82% of its 2019 level. This suggests increasing longer-duration trips, potentially attributable to some combination of longer distances, increased congestion, and/or travel on lower-speed modes or roads.

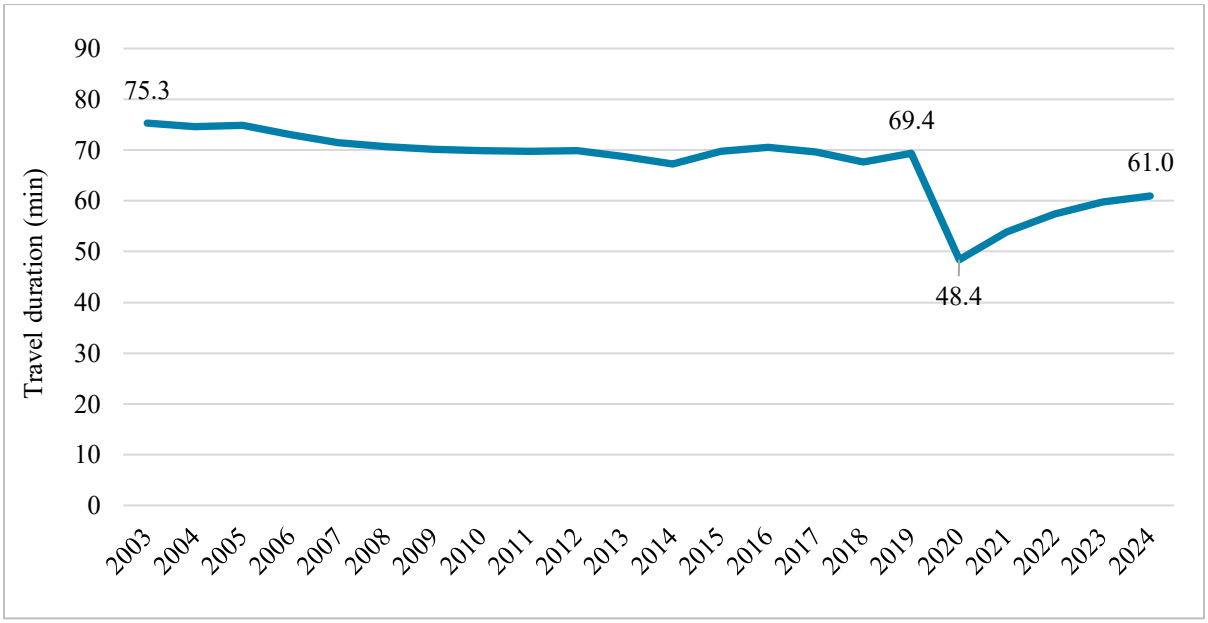

Figure 7. Daily Travel Duration per Person (2003-2024)

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 percentage of trip-makers on any given day remains significantly below pre-COVID levels (81.4% in 2019 vs. 75.6% in 2024). This sustained decrease may be attributed to the rise in WFH practices, online learning, e-commerce, and an aging population, among other factors.

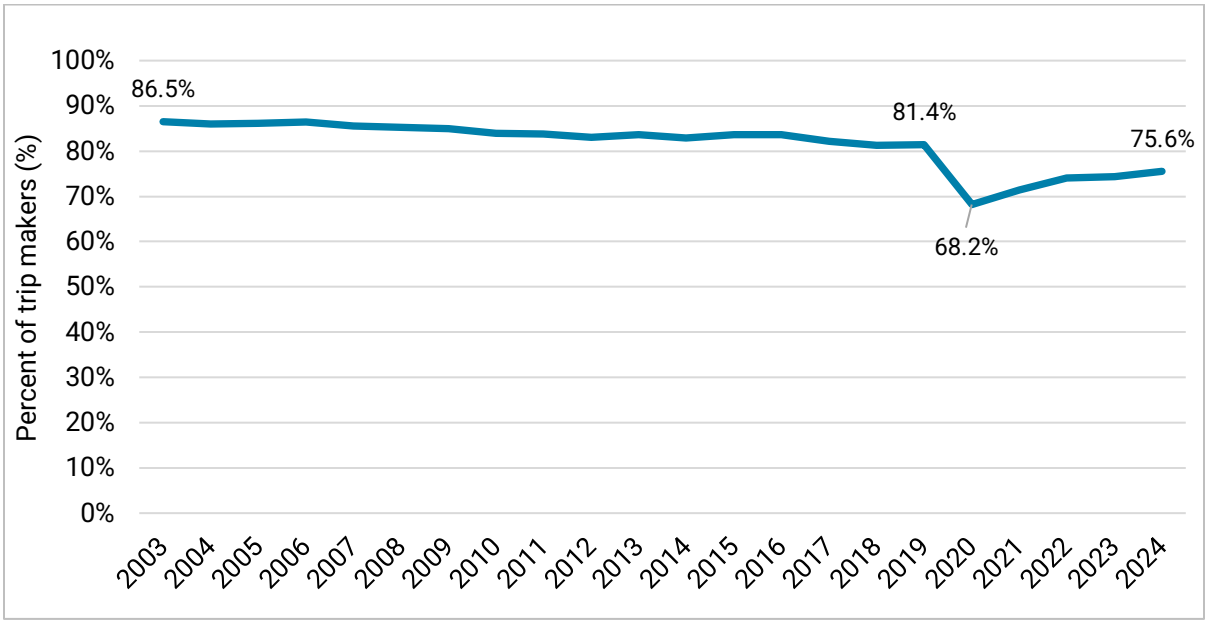

Figure 8. Percent of Trip-makers on the Survey Day (2003-2024)

Figure 9 shows the trend in trip rates by travel mode. These trends, along with those in Figure 10, Figure 11, and Figure 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 2024 trend, impacted by COVID, shows the most significant effect on public transportation and walking.

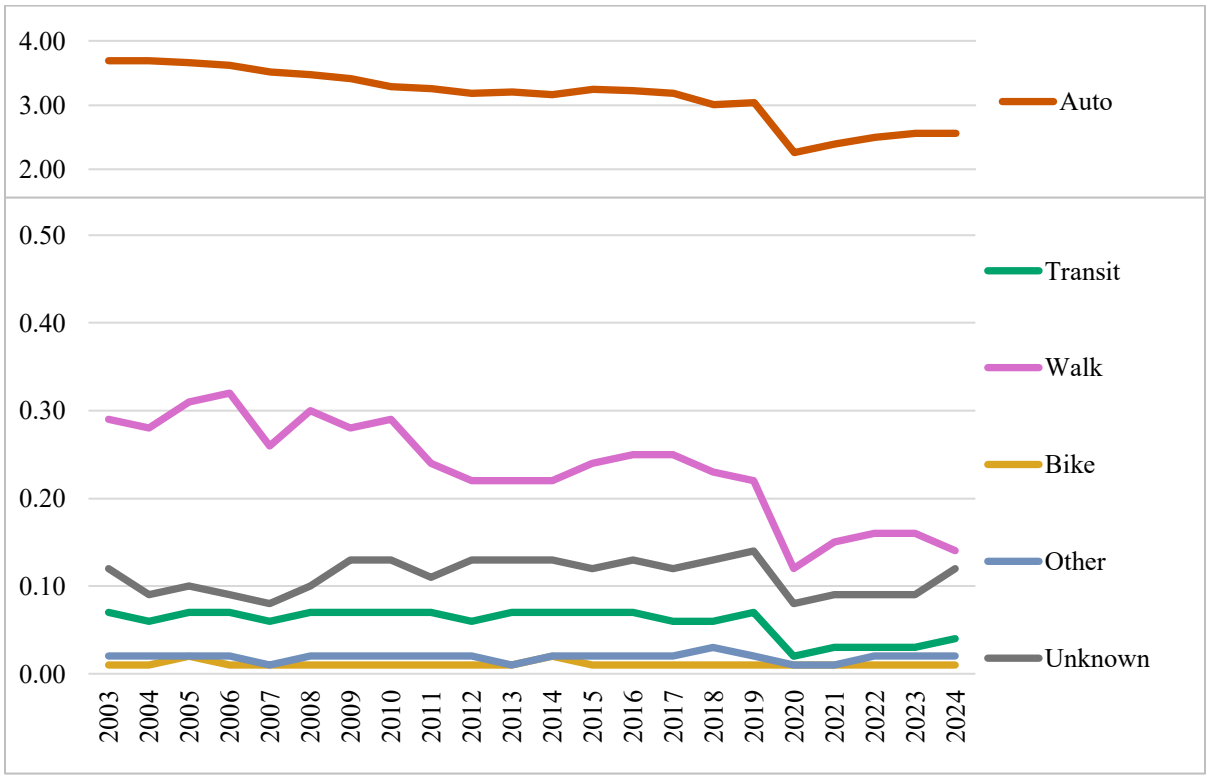

Figure 9. Daily Number of Trips by Travel Mode (2003-2024)

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 but dipped slightly in 2024. 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 shopping and work trips, followed by social trips. Figure 10 excludes return-to-home trips, which constitute approximately 36% of total trips, indicating that, on average, there are about 1.5 activities per trip from home. There has been a slight increase in the return-to-home share, from 32.4% in 2003 to 35.6% in 2023, suggesting a slight decline in trip chaining.

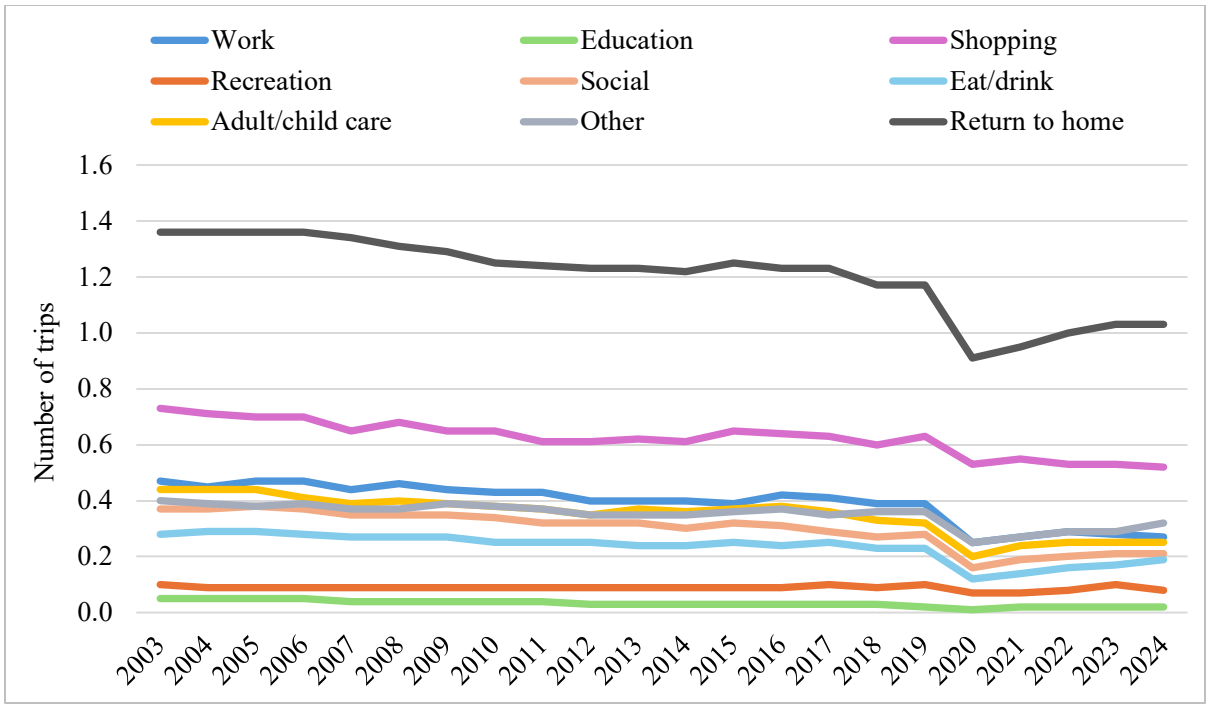

Figure 10. Daily Number of Trips by Trip Purpose (2003-2024)

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. Interestingly, both the youngest and oldest cohorts showed slight trip declines in 2024.

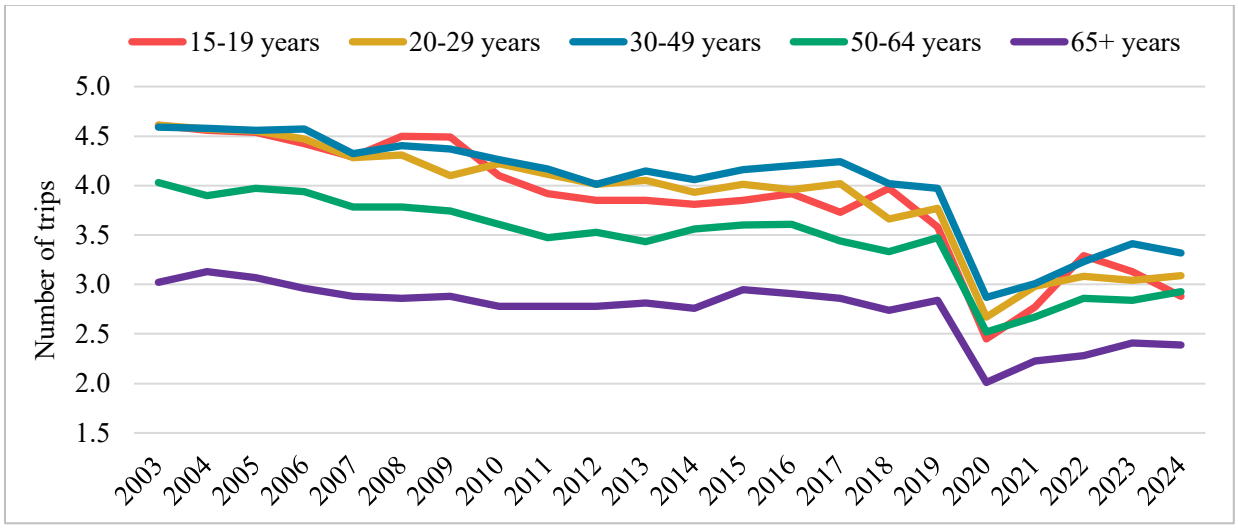

Figure 11. Daily Number of Trips by Age Cohorts (2003-2024)

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.

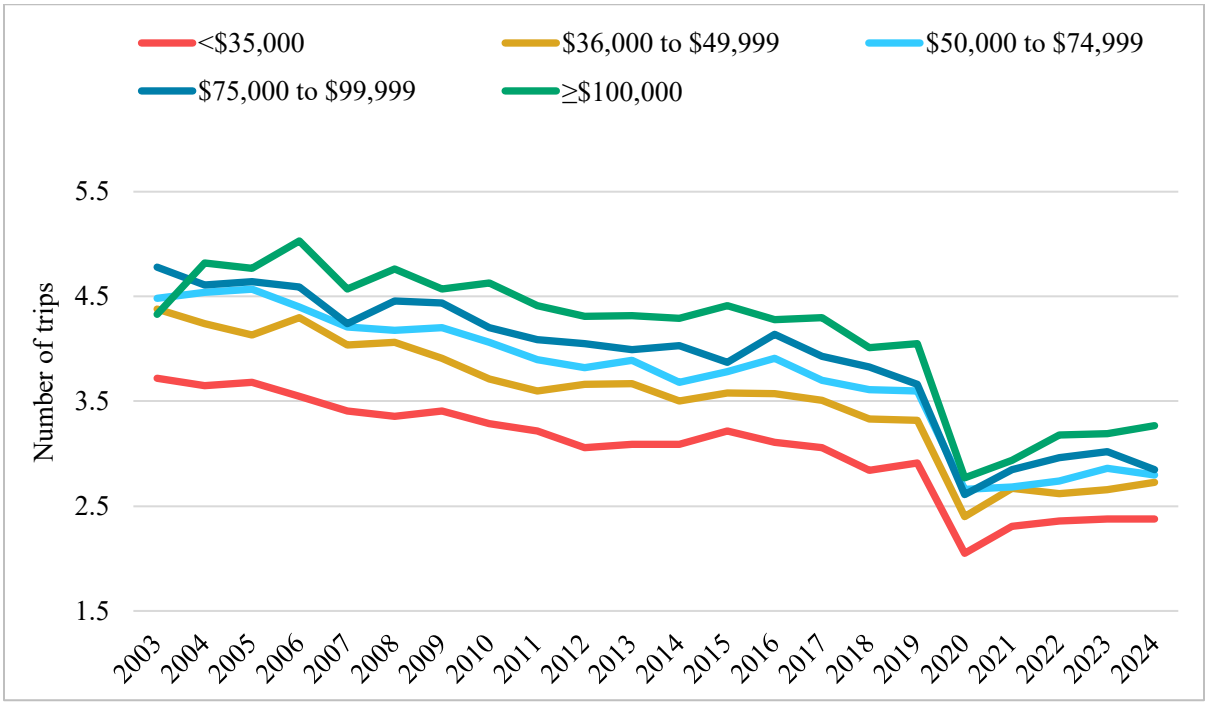

Figure 12. Daily Number of Trips by Income Groups (2003-2024)

Regarding travel differences by gender, Figure 13 and Figure 14 present both trip rates and travel time duration by gender. As these figures reveal, trip rates are now virtually identical and follow parallel declines through the pre-COVID period. Trip duration, however, remained longer for males.

Figure 15 through Figure 18 expand on the analysis of trip rate changes for various other metrics. As these figures revealed, declines were consistent in their downward slope across all the variables. In virtually every case, the relative trip rates between categories for each variable remained roughly consistent, suggesting that no single category or trait explains the downward decline, but rather the behavior change was pervasive, almost irrespective of context. The percentage change analysis displayed in Table 2, following the referenced figures, reveals the relative changes.

If one hypothesizes that communication substitution for travel is a substantial factor in the declining trip rates, the data on market penetration of communication capabilities revealed in Figure 5, as reported in the American Community Survey, lend credence to this hypothesis.

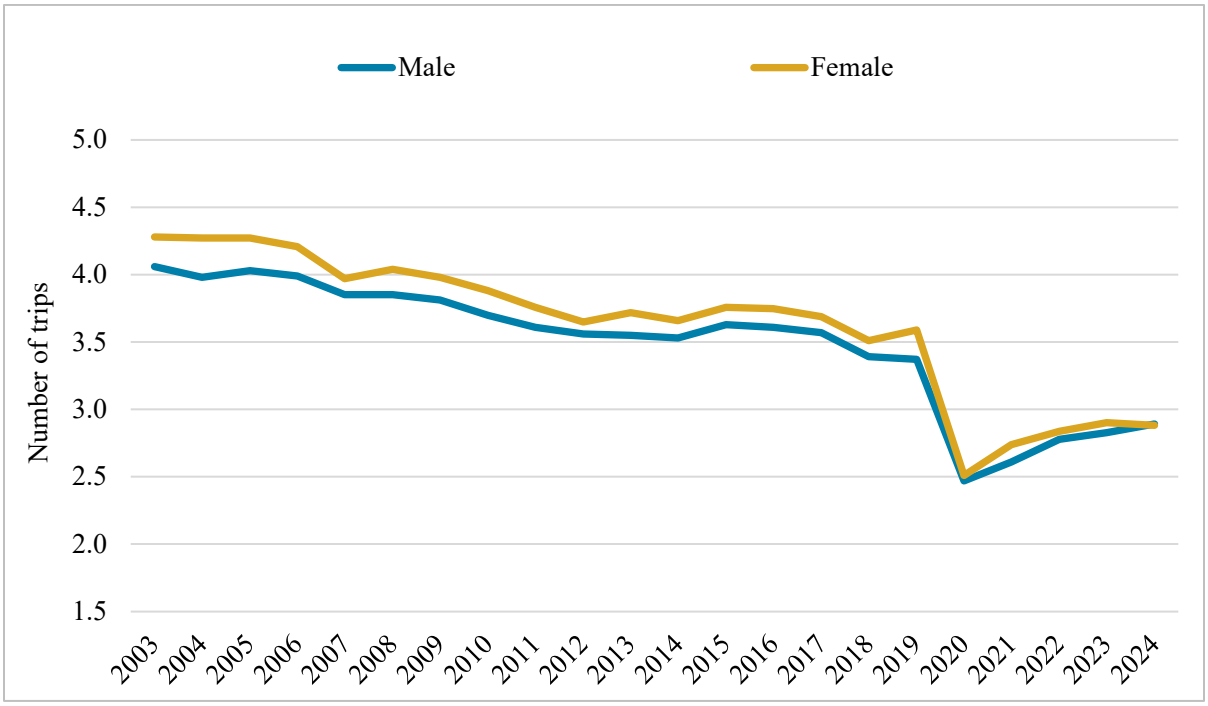

Figure 13. Daily Number of Trips by Gender (2003-2024)

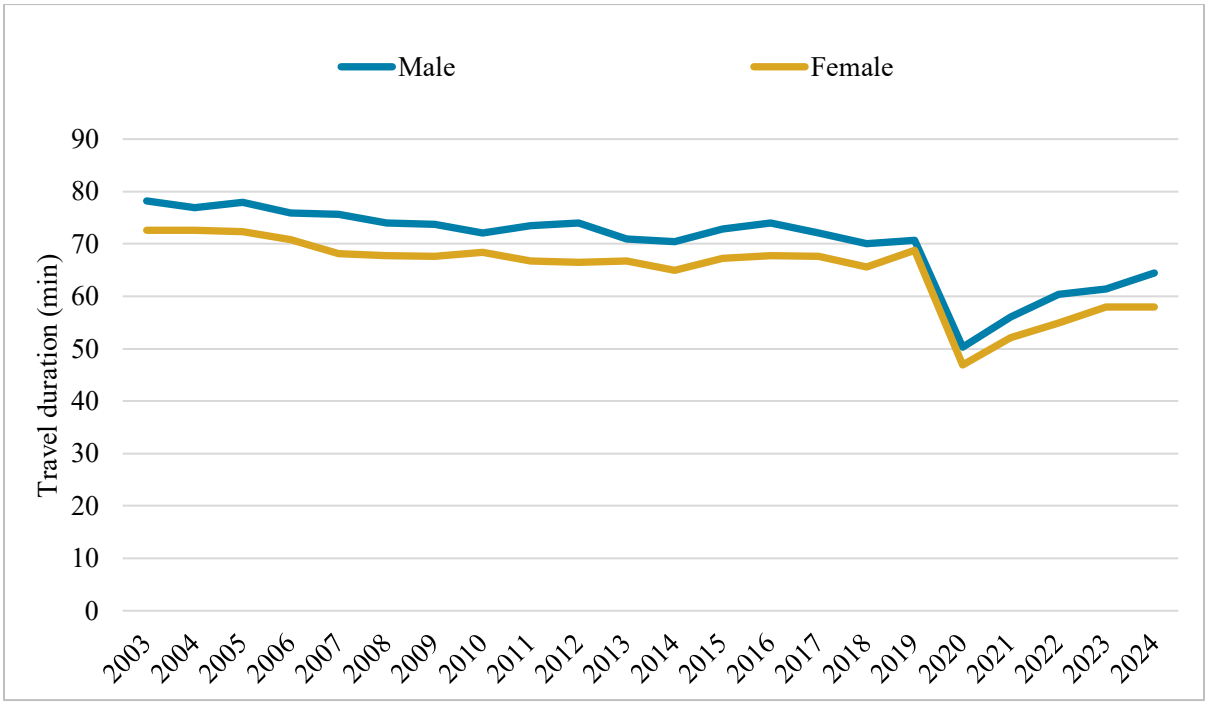

Figure 14. Daily Travel Duration by Gender (2003-2024)

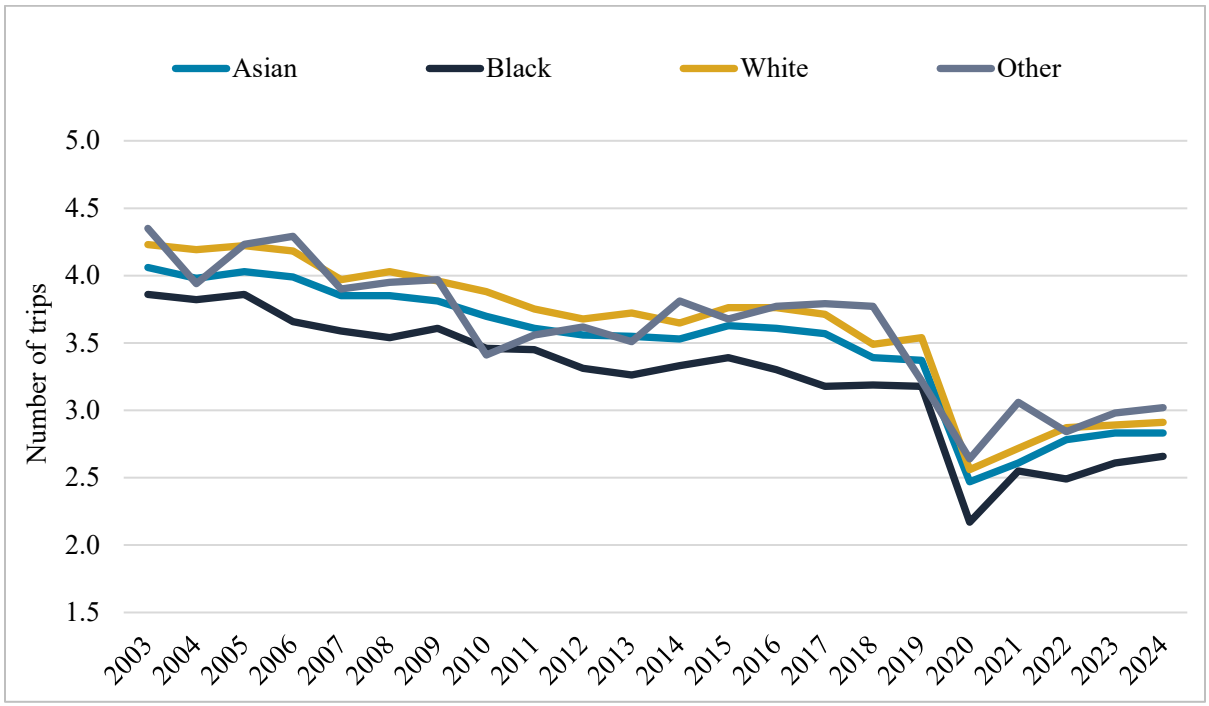

Figure 15. Daily Number of Trips by Race (2003-2024)

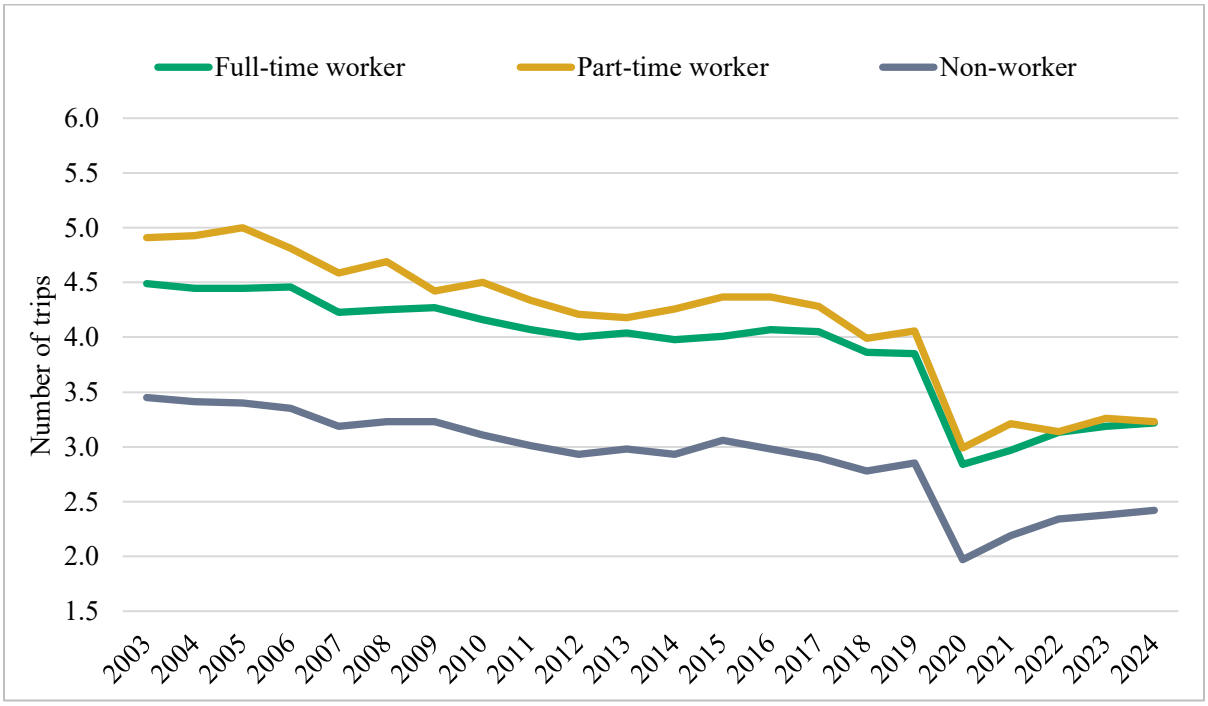

Figure 16. Daily Number of Trips by Worker Status (2003-2024)

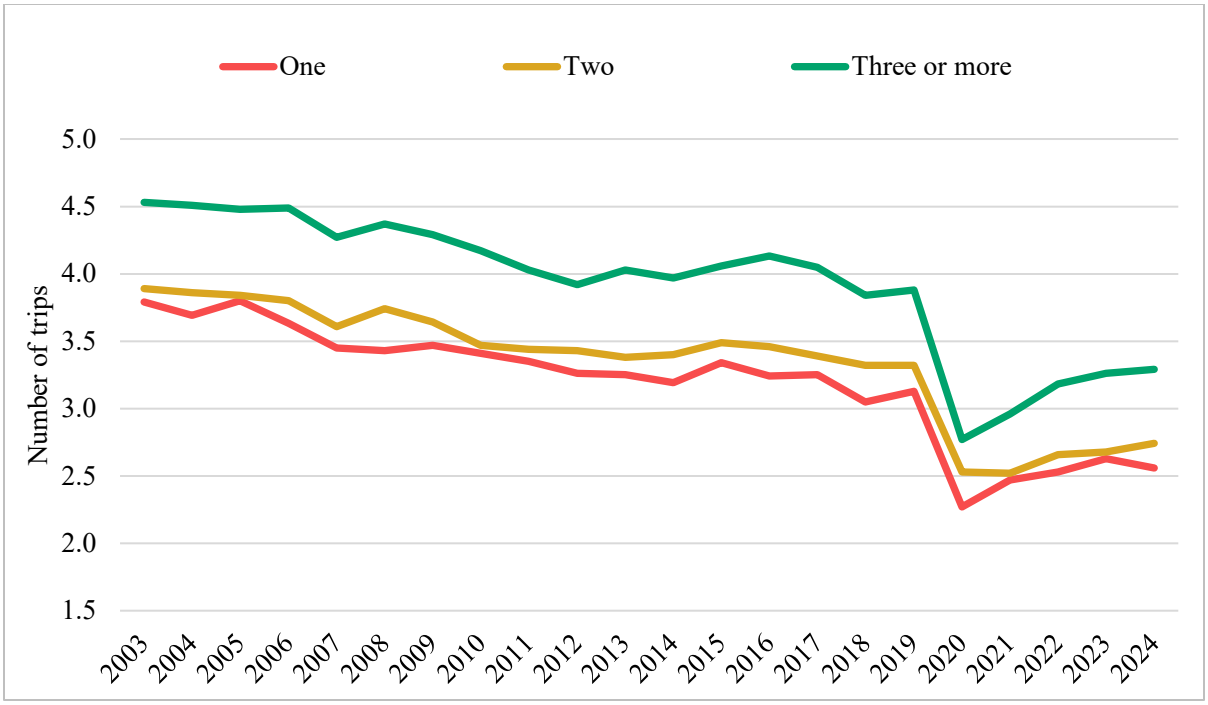

Figure 17. Daily Number of Trips by Household Size (2003-2024)

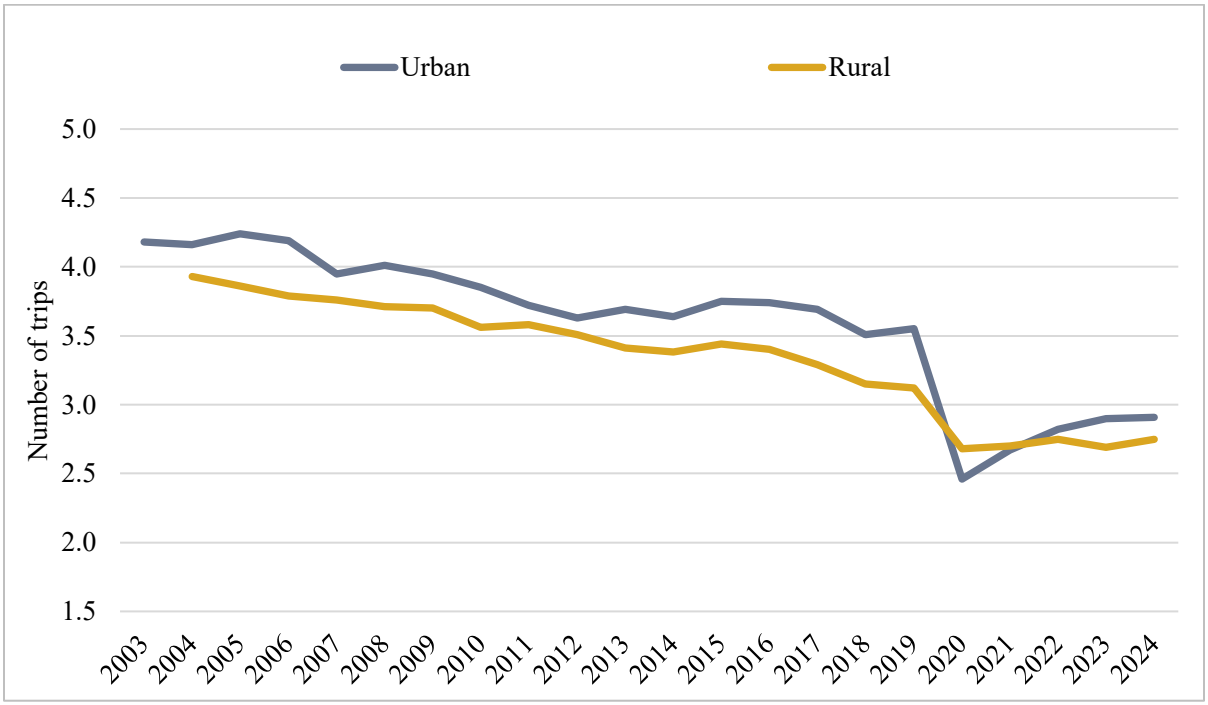

Figure 18. Daily Number of Trips by Household Location (2003-2024)

Table 2. Summary of ATUS Daily Trip Rates and Changes (2003, 2019, and 2024)

Attribute	Category	Number of trips			% Change		
		2003	2019	2024	2003-2019	2003-2024	2019-2024
All trips		4.20	3.50	2.88	-16.7%	-31.4%	-17.7%
Travel mode	Auto	3.69	3.04	2.56	-17.6%	-30.6%	-15.8%
	Transit	0.07	0.07	0.04	0.0%	-42.9%	-42.9%
	Walk	0.29	0.22	0.14	-24.1%	-51.7%	-36.4%
	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	0.12	16.7%	0.0%	-14.3%
Trip purpose	Work	0.47	0.39	0.27	-17.0%	-42.6%	-30.8%
	Education	0.05	0.02	0.02	-60.0%	-60.0%	0.0%
	Shopping	0.73	0.63	0.52	-13.7%	-28.8%	-17.5%
	Recreation	0.1	0.1	0.08	0.0%	-20.0%	-20.0%
	Social	0.37	0.28	0.21	-24.3%	-43.2%	-25.0%
	Eat/drink	0.28	0.23	0.19	-17.9%	-32.1%	-17.4%
	Adult/child care	0.44	0.32	0.25	-27.3%	-43.2%	-21.9%
	Other	0.4	0.36	0.32	-10.0%	-20.0%	-11.1%
	Return to home	1.36	1.17	1.03	-14.0%	-24.3%	-12.0%
Age	15 to 19 years	4.61	3.58	2.88	-22.3%	-37.5%	-19.6%
	20 to 29 years	4.61	3.77	3.09	-18.2%	-33.0%	-18.0%
	30 to 49 years	4.59	3.97	3.32	-13.5%	-27.7%	-16.4%
	50 to 64 years	4.03	3.47	2.93	-13.9%	-27.3%	-15.6%
	65 years or older	3.02	2.84	2.39	-6.0%	-20.9%	-15.8%
Household income	<$35,000	3.72	2.91	2.32	-21.8%	-37.6%	-20.3%
	$35,000 to $49,999	4.38	3.32	2.73	-24.2%	-37.7%	-17.8%
	$50,000 to $74,999	4.48	3.6	2.8	-19.6%	-37.5%	-22.2%
	$75,000 to $99,999	4.78	3.66	2.85	-23.4%	-40.4%	-22.1%
	≥$100,000	4.33	4.05	3.27	-6.5%	-24.5%	-19.3%
Gender	Male	4.06	3.37	2.89	-17.0%	-28.8%	-14.2%
	Female	4.28	3.59	2.88	-16.1%	-32.7%	-19.8%
Race	Asian	4.06	3.37	2.89	-17.0%	-28.8%	-14.2%
	Black	3.86	3.18	2.66	-17.6%	-31.1%	-16.4%
	White	4.23	3.54	2.91	-16.3%	-31.2%	-17.8%
	Other	4.35	3.22	3.02	-26.0%	-30.6%	-6.2%
Employment	Full time worker	4.49	3.85	3.22	-14.3%	-28.3%	-16.4%
	Part time worker	4.91	4.06	3.23	-17.3%	-34.2%	-20.4%
	Non-worker	3.45	2.85	2.42	-17.4%	-29.9%	-15.1%
Household size	One	3.79	3.13	2.56	-17.4%	-32.5%	-18.2%
	Two	3.89	3.32	2.74	-14.7%	-29.6%	-17.5%
	Three or More	4.53	3.88	3.29	-14.3%	-27.4%	-15.2%
Household location	Urban	4.18	3.55	2.91	-15.1%	-30.4%	-18.0%
	Rural	3.93	3.12	2.75	-20.6%	-30.0%	-11.9%

VIRTUAL VERSUS PHYSICAL ACTIVITY PARTICIPATION

While traditional travel demand forecasting can address changes in trip rates associated with changes in demographics as well as geographic distribution characteristics, there is little in the way of robust capabilities to forecast changes in trip-making that may be associated with ongoing changes in communication capabilities and propensities across the population segments. Indeed, traditional simplistic processes of thinking about travel in terms of trip generation, mode choice, trip distribution, and path assignment might better be characterized as a decision about virtual or physical activity participation, mode choice, trip distribution, and path assignment. Alternatively, one might think of the four-step process with the first step, mode choice, including virtual connections as a choice alone with the traditional auto driver, passenger, public transit, etc. In either case, there is a need to rethink travel demand forecasting in a way that captures the changing propensity to carry out activities in person by traveling, in person by communicating, or by procuring the activity such that it is carried out by a service provider.

One can anticipate continuing enhancements in communication capabilities with better software, better hardware, ever more ubiquitous engagement by individuals, businesses and service providers, and better fulfillment capabilities such as faster and lower cost delivery times, that do not require individuals to travel. The aging out of technology-resistant population cohorts may further enhance virtual activity participation, as could increases in travel costs or heightened sensitivities to travel's externalities.

Understanding the teleworking or WFH phenomenon is crucial to being able to predict future travel demand, particularly for peak periods and for public transit that is highly reliant on commute trips. The volume of commute trips is critical in defining peak infrastructure needs for both the roadway system and public transportation. 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, are among the issues that need monitoring. For example, emerging data is beginning to reveal how time and money saved by working from home is being redeployed to supplement other travel and 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 long-term 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 facilitate telework participation.

CONSUMER EXPENDITURE SURVEY

***Disclaimer**: Due to delays in the release of the 2024 Consumer Expenditure data, this section is limited to information through 2023 and will be revised once the 2024 data become available.*

The Consumer Expenditure (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 19 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.

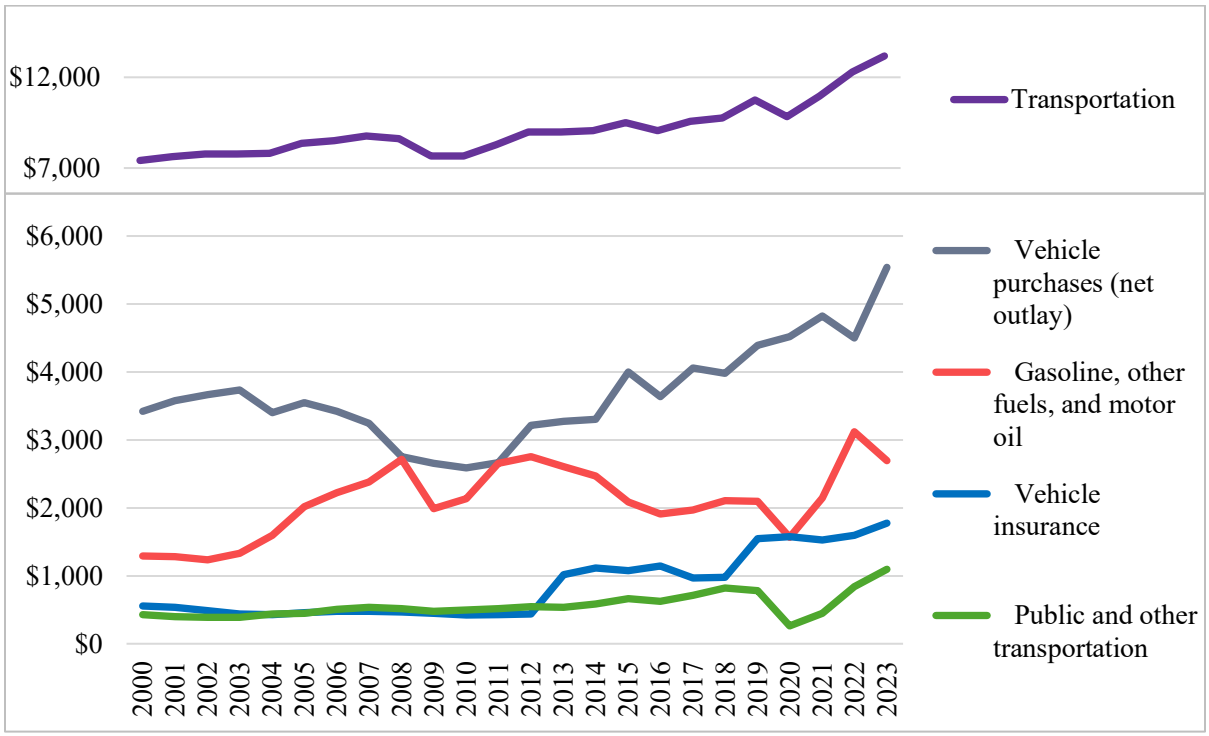

Figure 19. Consumer Expenditures on Transportation (1984-2023)

However, as shown in Table 3 and Figure 20, 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.

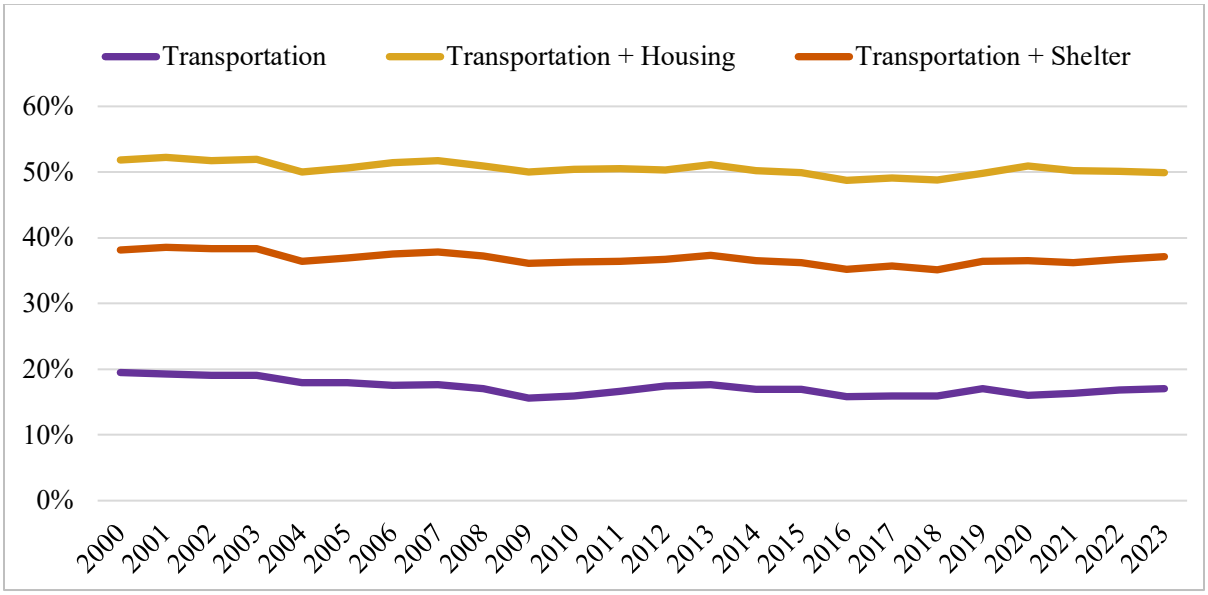

Figure 20. Shares of Expenditures by Category (2000-2023)

Figure 21 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.

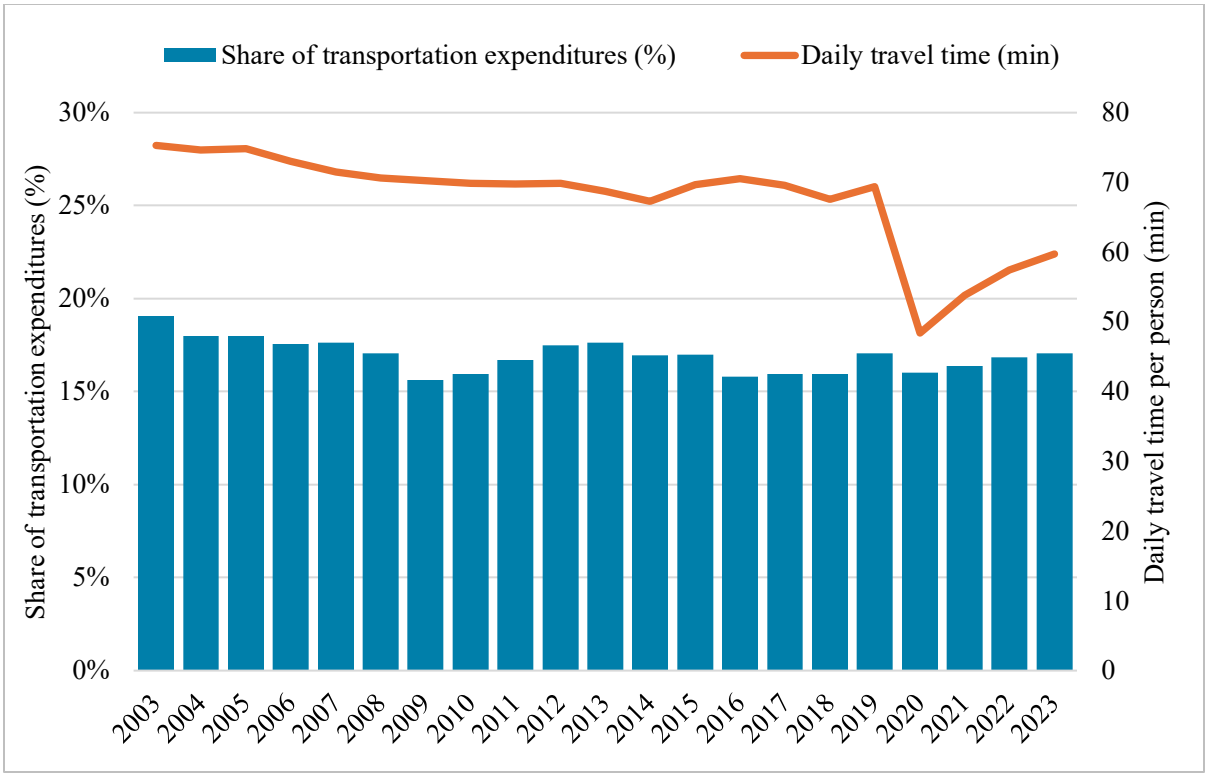

Figure 21. Time and Money Investments in Travel (2003-2023)

Table 3. CE Survey Summary Trends (2005-2023)

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%

INSIGHTS FROM COUNT DATA

The prior sections of this report explored survey data gathered from individuals and their households. In analyzing travel behavior, count data, which is data gathered from field counts and estimations of travel, can help with the interpretation of survey-based data.

Figure **22** through Figure 24 below show total vehicle travel, the US population, and vehicle miles of travel (VMT) per capita, and explore count data for vehicle travel. VMT, as reported by the Federal Highway Administration from data gathered by the states, provides a count of vehicles and their traveled distance. In each graph, the 60-year period from 1945 to 2005 is marked, and the annualized rate of change is shown.

This 60-year period is characterized by rapid growth in travel and travel per capita. It occurred during an era where there was strong growth in vehicle ownership, female labor force participation, the large baby boom generation reaching peak productivity and travel ages, and strong suburbanization trends, as well as rapid growth in Southern and Western areas characterized by lower population densities and sprawling development. During this period, population growth was also relatively consistent, averaging 1.23% per year. The rather pronounced break in trend occurred in the 2005-2007 time frame. Stronger growth returned after the Great Recession, but the COVID pandemic dramatically influenced changes over the next few years. Reviews of monthly VMT data in 2024 and 2025 suggest more stable VMT levels.

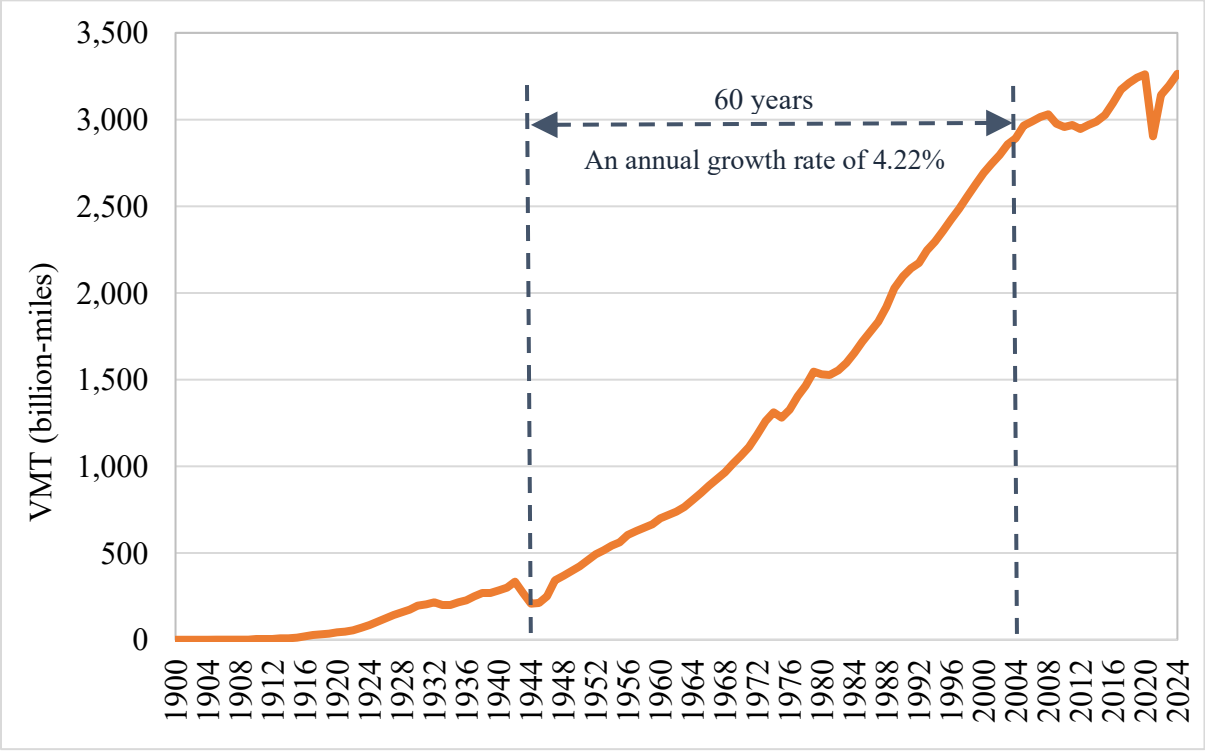

Figure 22. U.S. Vehicle Miles of Travel (1900-2024)

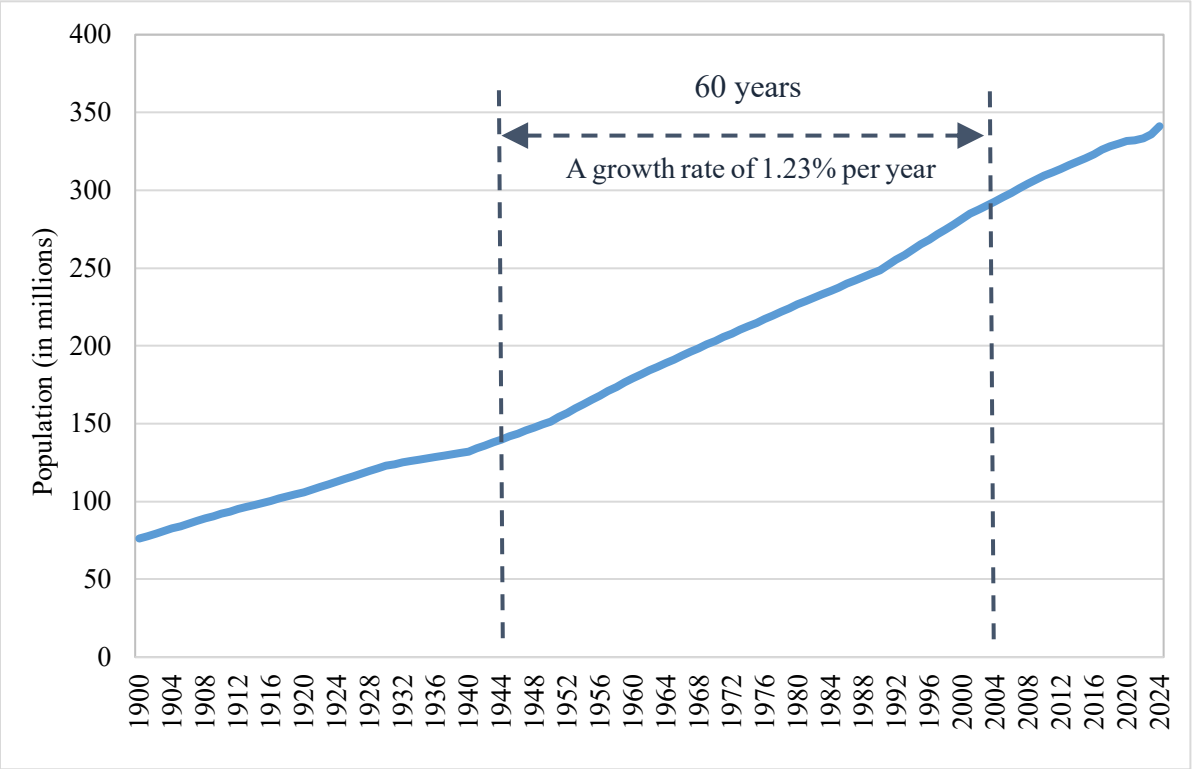

Figure 23. U.S. Population (1900-2024)

Figure 24. U.S. Per Capita Vehicle Miles of Travel (1900-2024) shows the per capita VMT in the U.S. This is derived from taking the total VMT of all vehicle types and dividing it by the total population. It is also important to note that 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.

The strong break in trend in approximately 2005 signals a period where VMT per capita was below or at its peak level in 2005. Is this pronounced change from the prior 60-year period confirmatory of the observations regarding declining per capita trip-making and travel duration as reported in the American Time Use Survey (ATUS) data, as well as the National Household Travel Survey (NHTS) data? While direct comparisons are not possible due to the inclusion of non-household travel in total VMT, one can certainly affirm the meaningful change in travel behavior.

While the playing out of the prior referenced trends is part of the answer, the emergence of enhanced communication capabilities and the opportunities to substitute communications and information exchange for in-person travel provide compelling evidence of their role in reduced per capita trip-making.

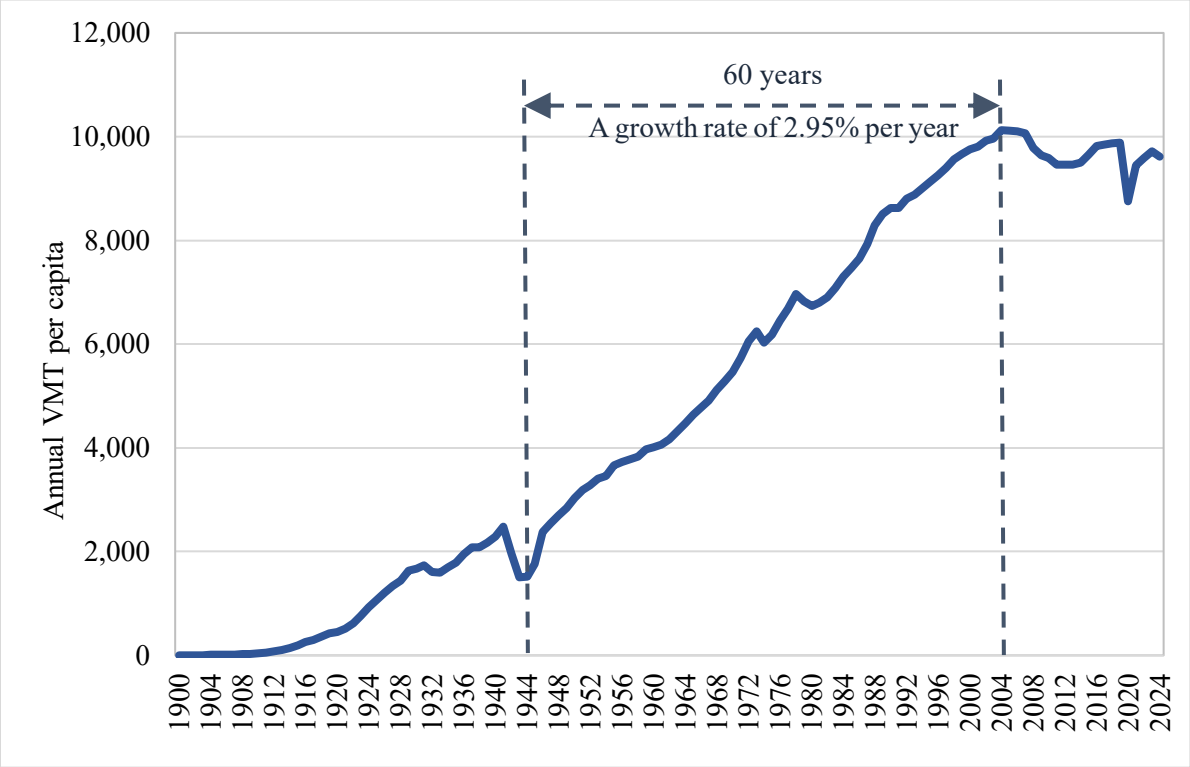

Figure 24. U.S. Per Capita Vehicle Miles of Travel (1900-2024)

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 teleworking 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 teleworking. 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 have 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.

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 25, based on data

from the Federal Reserve Research Division, shows, revenue passenger miles of air travel has grown substantially faster than population growth and roadway vehicle travel for an extended period of time and may be partially responsible for the moderation in per capita VMT as some long distance travel has shifted to air travel as pricing and discount carrier options have expanded.

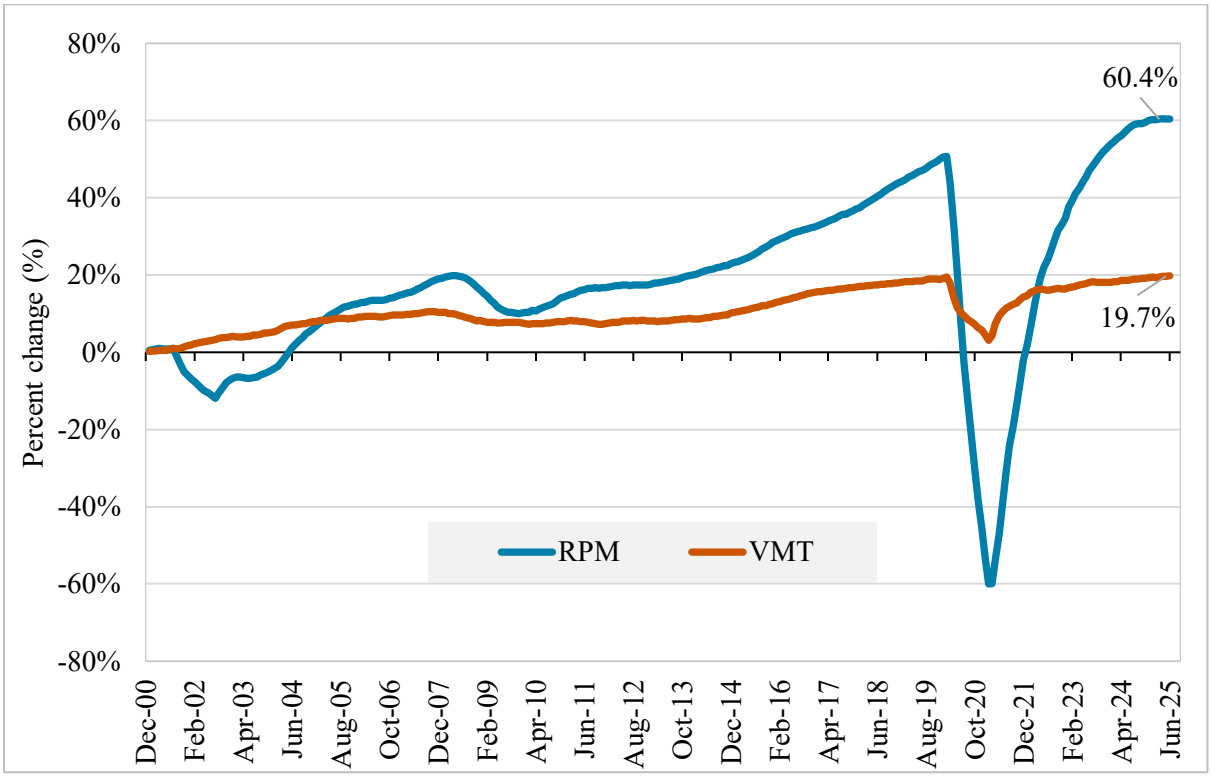

Figure 25. Airline Revenue Passenger Miles (RPM) Versus VMT (2000-2025)

Table 4 and Figure 26, based on data from the Federal Highway Administration, depict the relationship between the percent change in growth in VMT and the percent change in lane miles of roadway for the U.S. This gives insight into the relative rate of change in roadway supply versus roadway demand. As the graphic displays, there is a dramatic change in the relative slopes for these two trends beginning in approximately 2005. While this might suggest stabilizing congestion levels, it is important to note that 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 become increasingly congested.

Table 4. Trends in U.S. VMT and Roadway Lane Miles

Attribute	1980-2005	2005-2024
Percent change in Lane Miles (LM)	5.2%	6.8%
Percent change in VMT	97.0%	8.9%
Percent change in VMT/Percent change in LM	18.45	1.31

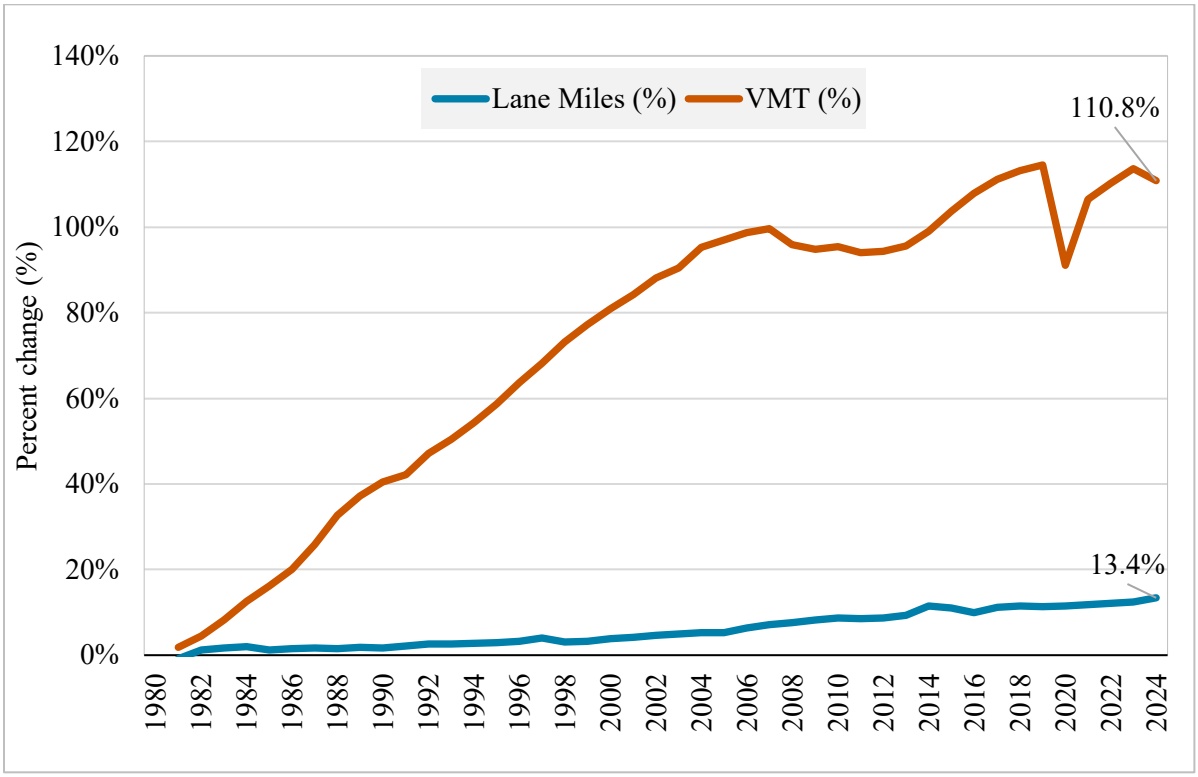

Figure 26. Growth Trend for Percent Change in VMT and Lane Miles (1980-2024)

It is clear that the pace of expanding infrastructure has kept much more closely aligned with growth in demand over the past approximately two decades, primarily a result of slowing growth but also partially attributed to a relatively more rapid increase in lane miles of capacity.

Table 5 and Figure 27 provide 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. Note here that revenue vehicle mile is a term used in the transit industry to measure the total miles a vehicle travels while in revenue service (i.e., it is available to the public for carrying passengers).

Table 5. Recovery in Public Transit Ridership and Service Levels

Attribute	Recovery (%)	
	August 2025 vs. August 2019	August 2025 vs. August 2015
Annual passenger trips	80.2%	75.0%
Revenue miles of service	95.4%	99.7%

Transit ridership over the recent 12-month period is approximately 80% of the pre-COVID levels and about 25% below the prior mid-decade peak in the 2014-2015 era. Revenue miles of service are nearly identical to the mid-decade level and 95% of the pre-COVID numbers. While COVID and telework are frequently cited causes of lower transit ridership, it's important to remember that overall trip making by household members is now approximately 30% below levels recorded in the 2003 American Time Use Survey.

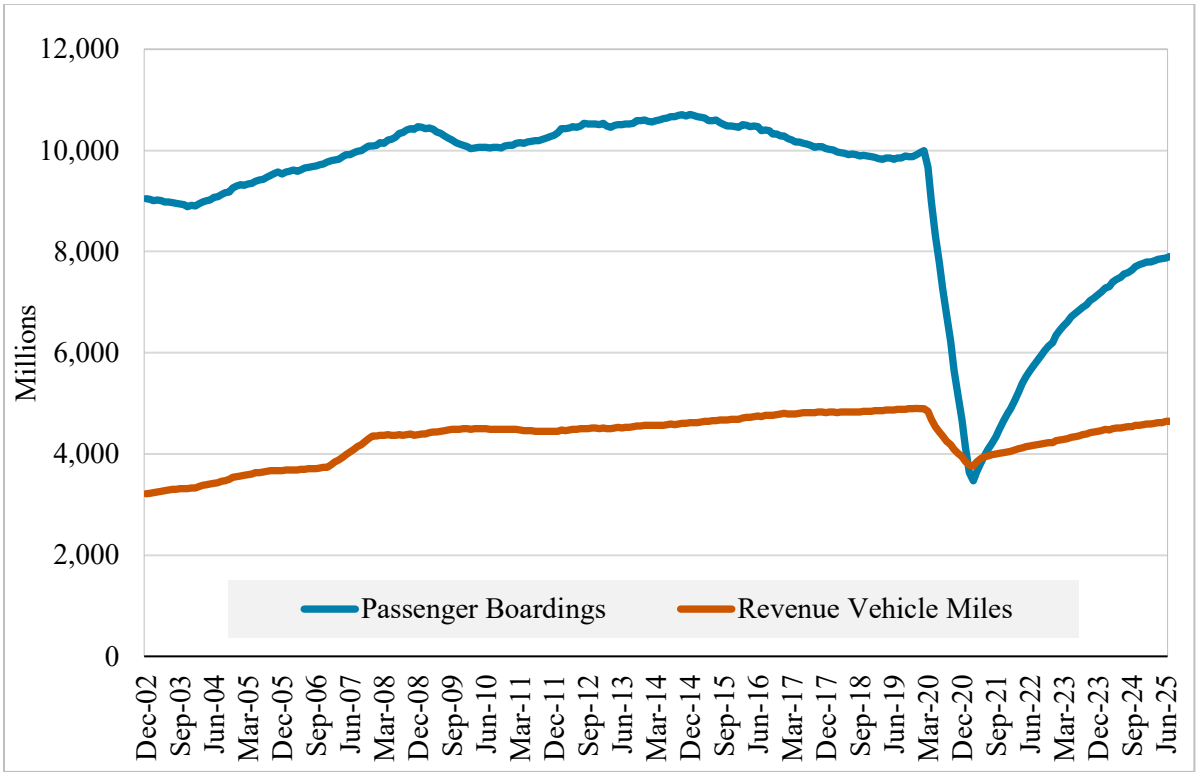

Figure 27. Rolling Annual Public Transit Ridership and Revenue Vehicle Service Mile Trends (2002-June 2025)

IMPLICATIONS

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 analyzed 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. These complexities make it very challenging to fully understand emerging travel behaviors and conditions with enough confidence to offer reliable longer-term forecasts.

What is most clear is that the pace of change in travel behavior has more recently been unprecedented and uncertain. A host of other factors will influence future travel demand:

- the pace of electrification,
- fuel/travel prices,
- shifting migration and residential location patterns,
- changing supply chains and the scale of onshoring of manufacturing capacities,
- adoption of micromobility travel options such as e-bikes, e-scooters, and inevitably pod-sized mini vehicles
- the pace and scale of meaningful deployment of autonomous services,
- the reliance on and logistic efficiency of delivery services and mobility-as-a-service (MaaS) options,
- continued advances and enhancements in virtual activity participation and product and service delivery,
- population growth or possibly decline, and its redistribution across geography,
- crime rates and/or safety considerations impacting certain travel modes and locations, and,
- the competitiveness of air travel.

These considerations suggest a highly dynamic future for travel. Additionally, broader economic, political, and technological trends may influence the path forward; for example, changing tourism levels, enhancing productivity through the deployment of AI, stresses in the economy as domestic and global debt levels challenge economic conditions, and multiple other known and unknown considerations.

There is currently no compelling basis to anticipate a resurgence in per capita VMT growth and reasonable hypotheses that continuing technology enhancements and demographic trends will soften demand levels. Future demand changes will likely mirror population and economic activity shifts unless significant changes occur with respect to one or more of the enumerated considerations that can impact travel.

We are currently in a very different era with respect to transportation than was the case during the referenced 1945-2005 period, and planning and policy actions should be cognizant of and responsive to this emerging new normal.