Transportation Heartbeat of America Survey Wave 1: Findings and Recommendations

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ABSTRACT
In the rapidly evolving travel environment in the United States, an investigation into changes in attitudes, lifestyles, and travel behaviors is critical to predict and proactively shape future behavioral responses. Accordingly, in this research, we track behaviors, choices, and travel trends of individuals residing in the United States, through a major multi-university, multi-year survey data collection effort that integrates a panel survey component with a cross-sectional survey component. The first wave of the survey, conducted from October 2024 through January 2025 includes detailed coverage of attitudes regarding transportation and mobility, current transportation behaviors at the time of each wave, values and preferences regarding transportation development and economic investments in transportation infrastructure, knowledge and intentions regarding potential future transportation technologies, and specific preferences and behaviors regarding electric vehicles and online activity participation. Results from the first wave of data collection provide important insights to help planners and policymakers navigate the changing landscape of transportation in the United States.

Keywords: Panel survey, transportation attitudes, travel behavior, online participation, travel satisfaction

1. INTRODUCTION

1.1 Background and Motivation

The landscape of transportation demand is undergoing rapid transformation, driven by factors such as the growth in information and communication technologies, the increasing prevalence of on-demand transportation services, growing environmental concerns, and disruptions to regular routines and lifestyle changes brought about by the COVID-19 pandemic. In such an evolving travel environment, an investigation into changes in attitudes, lifestyles, and, ultimately, travel behaviors is valuable to predict and proactively shape future behavioral responses, as well as for effective transportation planning and policy-making at the intersection of environmental goals, equity concerns, and technological advancement. In this context, understanding the broad range of perspectives and behaviors that influence transportation outcomes across the country, as well as how these behaviors may continue to evolve in the coming years in response to transportation environment changes, takes center stage. Accordingly, in this research, we track behaviors, choices, and travel trends over time of individuals residing in the United States (U.S.), through a major multi-university, multi-year survey data collection effort that integrates a **panel survey** component with a **cross-sectional** survey component. The first wave of this survey (which we label as the Transportation Heartbeat of America "THA" survey) was collected between October 2024 and January 2025, capturing detailed information about respondents' travel behaviors, attitudes toward new technologies, environmental preferences, and satisfaction with current transportation systems, among a variety of other topics. This first wave provides the foundation for the panel component as respondents will be tracked over the next four years.

Additionally, a unique aspect of our survey effort is that it will also include a component that tracks the "pulse" of U.S. businesses and employers regarding employer-provided transportation benefits, work-from-home options offered to employees, and the use of e-commerce and delivery platforms to reach customers. This employer perspective-oriented component is intended to provide important insights into how businesses are responding to these same changes in the transportation and social environment as well as insights into growing market segments providing e-commerce options and service deliveries. In short, the THA survey will provide deep insights on the future of transportation in the U.S. and beyond. In this paper, we focus on the survey component related to individuals and households, focusing on the results of the recently conducted first wave of data collection.

1.2 Objectives and Contributions

The THA survey will provide an important lens through which to evaluate alternative transportation planning pathways and establish transportation priorities. While the survey instrument will evolve over the remaining waves of data collection, we next provide an initial overview of the types of information and research questions that drove the first wave of data collection. First, in a fast-changing technological landscape affecting travel patterns, a focus on in-person and online activity participation has implications for the growth and travel impacts of remote work, as well as telehealth, e-banking, e-learning, and e-commerce. Second, with the

growth of on-demand modes and micromobility options along with evolution in vehicle technologies, investigation into vehicle ownership and mode choices can inform policy strategies to grapple with issues of safety, congestion, and sustainability. Third, an examination of transportation well-being and accessibility concerns informs equity policies, revealing specific reasons why many individuals continue to face significant mobility challenges even as new transportation modes and modalities of activities participation become available for others. Such an understanding can help direct new transportation technologies to address (rather than exacerbate) longstanding transportation inequities. Fourth, the survey offers urban planners a window into how the public conceptualizes transportation funding and spending, including perspectives on gas tax, mileage-based fees, congestion pricing, and vehicle registration fees. Funding considerations are becoming important as vehicles get more fuel-efficient, and as electric vehicles see more penetration in the vehicle market. This is particularly so, given recent attempts to implement mileage-based fees and congestion pricing strategies that, however, have faced significant challenges. Fifth, we consider knowledge and attitudes about the future of transportation, including planned changes to existing transportation patterns as well as feelings about longer-term developments in transportation technologies that can help guide the efficient and equitable integration of maturing mobility technologies into existing transportation operations. Finally, while an examination of each of the above aspects of transportation behavior at a single point in time would be valuable on its own, the ability to track changes in these attitudes and perceptions will provide added insights for urban/transportation planning. After all, attitudes and preferences are not static; rather, they are influenced by changing social and economic conditions, knowledge about future innovations, and individual circumstances.

The remainder of the report is organized as follows. Section 2 describes the design and administration of the first wave of the THA survey. Section 3 presents a summary of the results of the first wave of data collection, focusing on (1) telework and commuting behaviors, (2) vehicle ownership and travel mode choices, (3) online shopping and deliveries, (4) emerging and future technologies, (5) transportation funding, and (6) transportation satisfaction and well-being. Finally, Section 4 summarizes the important findings from this report.

2. SURVEY DESIGN AND ADMINISTRATION

2.1 Survey Approach

As discussed in the previous section, to assess the impacts of rapidly changing conditions on travel attitudes and behaviors, the THA survey will employ a combination of panel and cross-sectional methods. This combination will track, for a subset of sampled individuals and households, attitudes and behaviors across four waves of data collection (the "panel" component), as well as incorporate fresh individuals/households in each wave of data collection (the "cross-sectional component). The first wave of data collection occurred from October 2024 through January 2025 and includes 8,212 complete responses. Subsequent waves will be undertaken during the fall of each subsequent year until (and including) 2027. The combination of panel and cross-sectional components is intended to provide a large sample of unique individuals (no more than one individual from a

household) over the course of the four waves of survey data collection. The plan for the longitudinal component is to have a sample size of about 500 individuals participate continuously in at least three successive waves and another 500 individuals to participate in all four waves. Newly recruited individuals will comprise the cross-sectional component for each future wave.

2.2 Survey Administration

The first wave of the THA survey was administered using the Qualtrics survey platform. Participant recruitment was conducted through a Qualtrics opinion panel and incorporated a quota-based sampling approach to provide a reasonable sample size in each of multiple demographic subgroups (race, ethnicity, age, gender, education, and household income) and geographically defined residence areas (urban/rural residence, and residence in each of nine U.S. census divisions). Eligible participants included all individuals currently residing in the United States aged 18 years or older. Multiple attention checks and quality control measures were employed to ensure response quality. Two attention questions were included, embedded within blocks of Likert scale response questions within the survey requesting that participants selected a specific choice to show that they were paying attention. Additionally, several consistency checks were employed to ensure response reliability. Finally, a timing cutoff of 10 minutes was applied to remove low quality responses (the median response time in the final sample was 18.15 minutes).

Table 1 presents descriptive statistics for the household characteristics used for the quotas in each of the nine U.S. census divisions compared with the estimates for each division from the 2023 American Community Survey (ACS) 5-year estimates (for individuals age 18 or older). While there are some small discrepancies between the survey demographics and ACS estimates, the survey generally well representative of the national population in terms of these demographic variables.

Table 1: Distribution of Quota Variables Compared to American Community Survey Estimates

	New England		Middle Atlantic		East North Central		West North Central		South Atlantic		East South Central		West South Central		Mountain		Pacific		Total	
	THA	ACS	THA	ACS	THA	ACS	THA	ACS	THA	ACS	THA	ACS	THA	ACS	THA	ACS	THA	ACS	THA	ACS
Location																				
Urban	84.1	88.8	89.2	93.4	81.8	82.0	72.4	70.4	89.4	89.5	67.1	68.9	84.4	84.9	86.7	84.1	91.0	94.7	83.8	86.3
Rural	15.9	11.2	10.8	6.6	18.2	18.0	27.6	29.6	10.6	10.5	32.9	31.1	15.6	15.1	13.3	15.9	9.0	5.3	16.2	13.7
Gender																				
Male	45.7	48.6	45.4	48.6	47.6	49.2	46.3	49.6	46.8	48.5	43.2	48.6	46.3	49.3	45.7	49.9	49.7	49.6	46.5	49.1
Female	54.3	51.4	54.6	51.4	52.4	50.8	53.7	50.4	53.2	51.5	56.8	51.4	53.7	50.7	54.3	50.1	50.3	50.4	53.5	50.9
Age																				
18-24	14.6	11.9	12.9	11.8	12.7	12	15.8	12.3	13.9	11.7	13.4	12.2	14.5	13.1	14.5	12.5	13.1	12.1	13.8	12.1
25-44	31.9	31.5	33.4	33.1	33.5	32.5	33.9	33.3	31.0	32.3	36.9	32.3	36.6	35.9	34.6	35.0	36.3	36.0	34.2	33.7
45-64	33.2	33.8	32.6	33.1	32.7	33.3	30.6	32.1	33.9	33.1	31.7	33.3	30.2	31.9	29.6	30.9	31.7	31.8	31.9	32.6
65+	20.3	22.8	21.1	22	21.1	22.2	19.7	22.3	21.2	22.9	18.0	22.2	18.7	19.1	21.3	21.6	18.9	20.1	20.1	21.6
Education																				
High school or less	29.6	32.9	33.7	37.5	34.7	37.6	32.1	34.1	32.5	35.9	35.3	42.0	35.7	39.7	29.5	33.1	31.6	34.4	33.0	36.5
Some college	24.9	23.7	24.4	23.3	30.7	29.0	32.5	31.2	29.3	27.7	31.8	29.2	30.4	28.3	33.1	31.3	29.9	28.4	29.5	27.9
Bachelor's degree or higher	45.5	43.4	41.9	39.2	34.6	33.4	35.4	34.7	38.2	36.4	32.9	28.8	33.9	32	37.4	35.6	38.5	37.2	37.5	35.6
Race																				
White	69.7	73.5	63.3	61.2	74.8	72.6	70.1	78.5	59.9	58.1	67.8	70.0	57.1	53.7	63.6	66.5	48.9	47.3	63.2	61.6
Black	13.6	7.2	14.5	14.4	11.6	12.9	14.2	7.7	22.2	23.6	19.0	20.9	16.0	16.6	13.1	4.5	8.9	5.8	14.8	13.8
Other	16.7	19.3	22.2	24.4	13.6	14.5	15.7	13.8	17.9	18.3	13.2	9.1	26.9	29.7	23.3	29.0	42.2	46.9	22.0	24.6
Ethnicity																				
Hispanic/Latino	17.0	11.9	17.4	16.5	10.7	9.3	15.1	7.2	16.5	15.4	12.4	5.4	30.0	30.6	23.7	24.9	32.0	32.5	19.8	18.7
Non-Hispanic/Latino	83.0	88.1	82.6	83.5	89.3	90.7	84.9	92.8	83.5	84.6	87.6	94.6	70.0	69.4	76.3	75.1	68.0	67.5	80.2	81.3
HH Income																				
Less than $50,000	33.5	31.2	36.7	34.4	39.8	38.2	38.8	36.9	38.2	37.8	49.8	45.2	44.1	40.4	38.2	35.1	32.8	30.4	39.0	36.4
$50,000 to $99,999	28.4	26.7	29.4	27.7	32.3	31.2	33.0	31.9	31.8	29.9	28.6	30.2	29.9	29.8	33.2	31.1	29.4	27.6	30.6	29.5
$100,000 or more	38.1	42.1	33.9	37.9	27.9	30.6	28.2	31.2	30.0	32.3	21.6	24.6	26.0	29.8	28.6	33.8	37.8	42.0	30.4	34.1

2.3 Wave 1 Survey Content

The initial survey wave includes detailed coverage of attitudes regarding transportation and mobility, current transportation behaviors at the time of each wave, values and preferences regarding transportation development and economic investments in transportation infrastructure, knowledge and intentions regarding potential future transportation technologies, and specific preferences and behaviors regarding online activity participation. The structure of the survey sections is shown in Figure 1. The elicitation mechanisms include a combination of Likert scale questions (with varying numbers of ordinal categories), single- and multiselect multiple choice questions, and open-response questions.

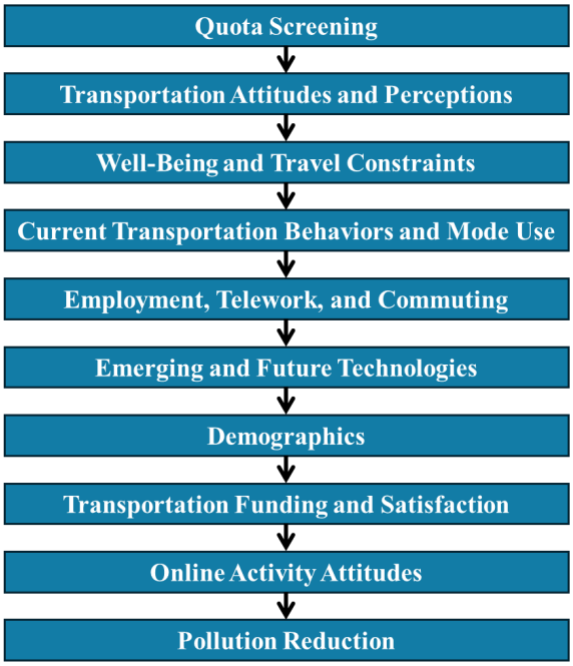

Figure 1: THA Survey Content

3. THA WAVE 1 RESULTS AND DISCUSSION

3.1 Telework and Commuting Behaviors

We find that 56.5% of respondents were currently employed at the time of the survey, aligning well with the 59.8% in the 2023 American Community Survey 5-year estimates. Of these, the majority (80.3%) are employed full-time, while the remaining are employed part-time. 51.2% of employed individuals report that they generally commute to their out-of-home workplace three or more days per week, while only 14.8% of employed individuals report that they never commute to an out-of-home workplace. Conversely, 33.6% of respondents work from home at least one day per week.

Another notable finding is that there seems to be substantial interest in hybrid and flexible work arrangements, particularly for part-day teleworking. 30.4% of respondents report that they work from home for part of the day (splitting work between home and another location) at least

once per week. And, while still less popular, 20.9% reported working for some amount of time at a third work location at least once per week. These findings emphasize the need to continue to study how changing work conditions and habits are impacting commuting travel. With many respondents adopting flexible schedules with a combination of in-person and remote work, within-week variations in travel patterns are likely to continue to grow. Further, the substantial portion of the sample reporting that they work from home for part of the day or use third workplace locations indicates that may be embracing this flexibility to align work travel with other scheduling needs or avoiding peak period commutes by splitting work hours. In fact, there seems to be a strong desire for flexibility in work arrangements, with 75.6% somewhat or strongly agreeing that they want flexibility in when and where they work and 50.8% agreeing that mixing workplace and remote locations suits their lifestyle. The implications for travel demand modeling are significant. Rather than treating work location as a binary choice between home and workplace, models need to incorporate more hybrid daily and weekly patterns of work location choice, with corresponding impacts on peak period travel, route choice, and mode selection. The possibility of hybrid working patterns within a single day also has significant implications for non-work travel and activity participation, including shifting working hours away from peak periods and splitting work hours with mid-day leisure/maintenance activities. These possibilities may necessitate realignment of travel planning with these new activity patterns, including redistributing transit capacity to off-peak services and considering how new patterns of trip-chaining and activity participation throughout the day impact the traditional assumption of fixed workplace locations as anchor points in activity-based models. Finally, the potential for residential relocation due to remote work flexibility (45.3% would consider moving if they could work from home more often) suggests a need to consider how access to different types of services (beyond employment), as well as physical dwelling unit characteristics, influence housing and residential location choices.

Beyond these general trends in workplace choices, respondents were asked about their specific workplace choices in the week prior to the survey. The results are shown in Figure 2. The daily pattern data shows clear weekday-weekend distinctions, with Sunday and Saturday having much higher non-work rates (76.6% and 63.0% respectively). Telework, work at third workplace locations, and splitting work between multiple locations all appear to be slightly more common on weekends (among those who work on these days). Fridays appear to be somewhat different than other weekdays, with lower rates of workplace-only respondents (52.8% compared with 57.7% or more for other weekdays) and higher rates of split-location work (9.3% compared with 7.9% or less for other days). Additionally, although the aggregate patterns of workplace location choice seem similar across most weekdays, only around half of employed individuals in the sample (50.1%) selected the same workplace location for all five weekdays. While these individuals seem to have stable day-to-day workplace routines, the remainder of the participants had more within-week variation in workplace choices, choosing different locations on different days. As noted above, these results indicate that the traditional assumption of fixed workplace locations as trip anchors in travel demand models needs to be revisited, as significant portions of the workforce

have variable daily work locations. Additionally, given variations in work patterns throughout the week, multi-day models may need additional consideration.

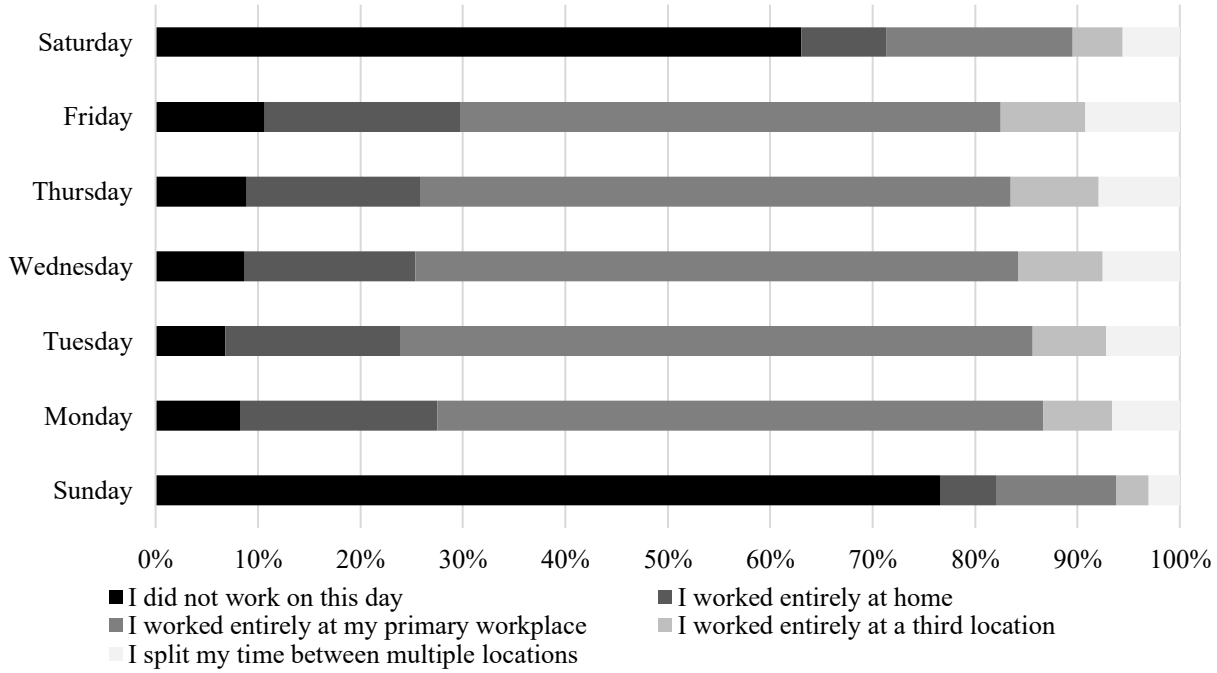

Figure 2: Daily Work Location Choices

Figure 3 shows the distribution of commute distance for all individuals in the sample who reported that they were employed and commuted (at all). The vast majority (89.5%) of respondents reported having a commute distance of less than 30 miles, with more than 50% reporting a commute distance of less than 10 miles. In addition, the large number of individuals reporting that they live relatively close to their workplace (particularly within five miles) presents opportunities for the promotion of active transportation modes for these short commutes, particularly as 87.7% of commuting individuals currently report that personal vehicles are their primary mode for their commuting trips, as discussed further in the following section.

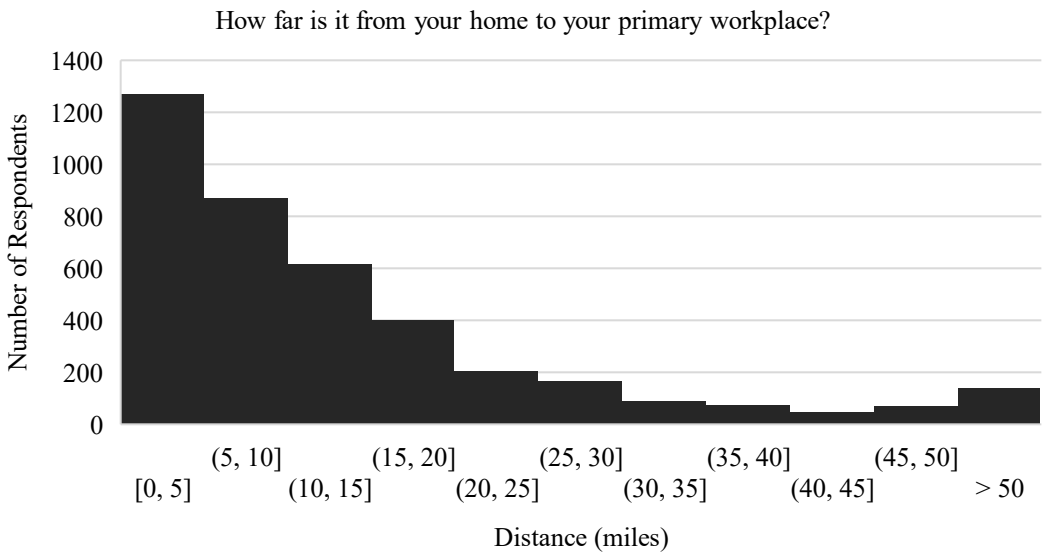

Figure 3: Distribution of Commute Distances

The distribution of commute distance is further broken down, in Figure 4, between individuals who work in-person at least once per week and those who work in person less than once per week. As seen in the figure, those who rarely work in-person are more likely to have the longest commutes of 45 miles or more. However, they are also more likely to have commute distances of less than five miles compared with those working in-person at least once per week. This is an interesting result and highlights the importance of continuing to study the relationships among employment, telework, and residential location trends. For instance, these teleworkers who live very close to their workplace may prioritize other types of access that are available in urban employment centers near their workplace, beyond access to their own workplace. Simultaneously, there may be individuals who place a high value on having a low commute distance, motivating them to prioritize a short commute distance when they originally moved to the area as well as their avoidance of commuting entirely when remote work options became available. Still, they may not have had reason to relocate even if they are not currently as tied to their in-person workplace.

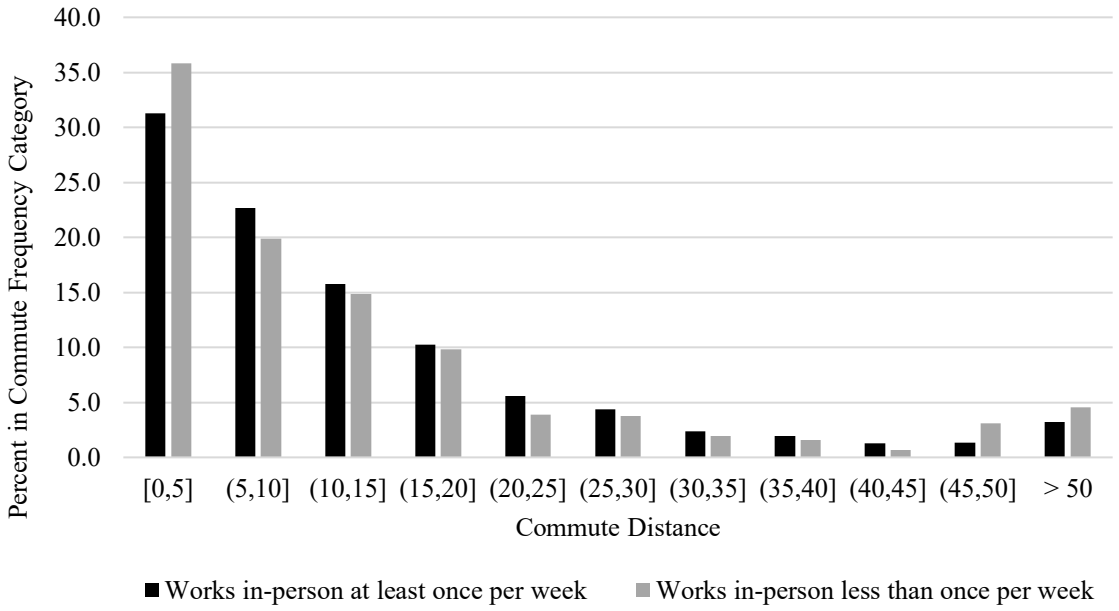

Figure 4: Distribution of Commute Distance by In-Person Work Frequency

3.2 Vehicle Ownership and Travel Mode Choices

The findings indicate that Americans exhibit a strong affective attachment to private motorized vehicles, with an overwhelming 84.8% indicating that they somewhat or strongly agree that owning a car is important to them. In fact, only about 8.4% of respondents report that they do not own a motorized vehicle, with the majority of households owning 1-2 vehicles (see Figure 5). Of these vehicles, the vast majority are internal combustion engine vehicles, with only about 10.2% of vehicles having other fuel types (including electric and hybrid vehicles). The most common body types are SUVs, pickup trucks, and sedans, as shown in Figure 6. The popularity of larger vehicles, such as pickup trucks and SUVs, highlights challenges with safety disparities where there are conflicts between these large personal vehicles and vulnerable road users such as cyclists and pedestrians.

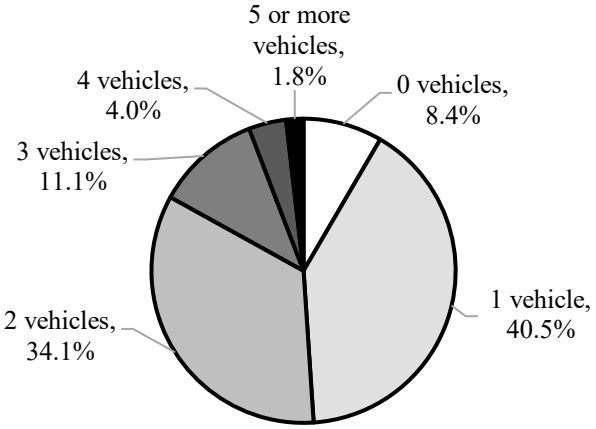

Figure 5: Household Vehicle Ownership

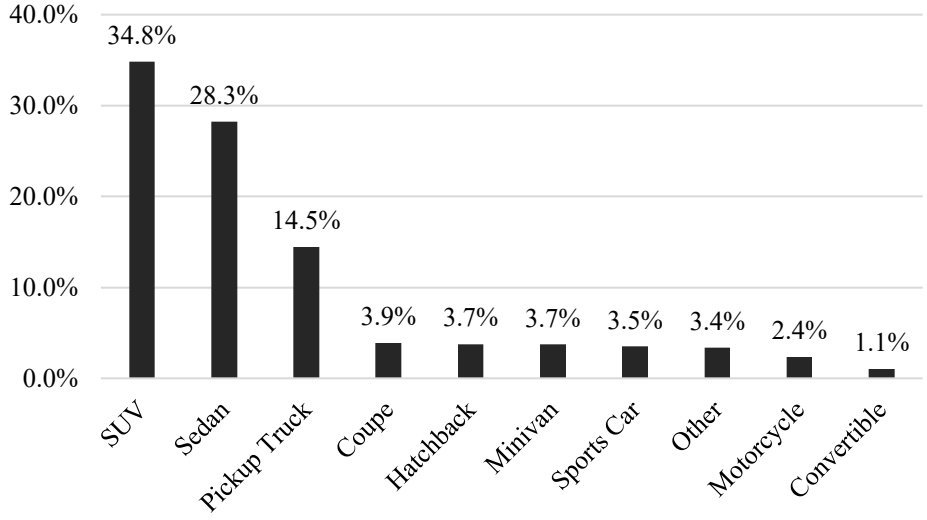

Figure 6: Household Vehicle Body Type

The distribution of vehicle model year and year acquired are shown in Figure 7 and Figure 8, respectively. As seen in these figures, the majority (more than 95%) of vehicles have model years since 2000, with a median model year of 2016. As expected, the year acquired is skewed more towards recent years, with a median acquisition date of 2020. In fact, the discrepancy between vehicle model year and acquisition year indicates that a large portion of the sample likely bought their vehicles used rather than new (59% of vehicles were bought more than two years after the model year). The prevalence of pre-owned vehicles highlights the importance of the secondary vehicle market for consumers, particularly in terms of affordability. However, since many policies and regulations are focused on pricing and regulation of new vehicles, this finding underscores the fact that many of these policies take significant time to penetrate to all vehicle buyers and users.

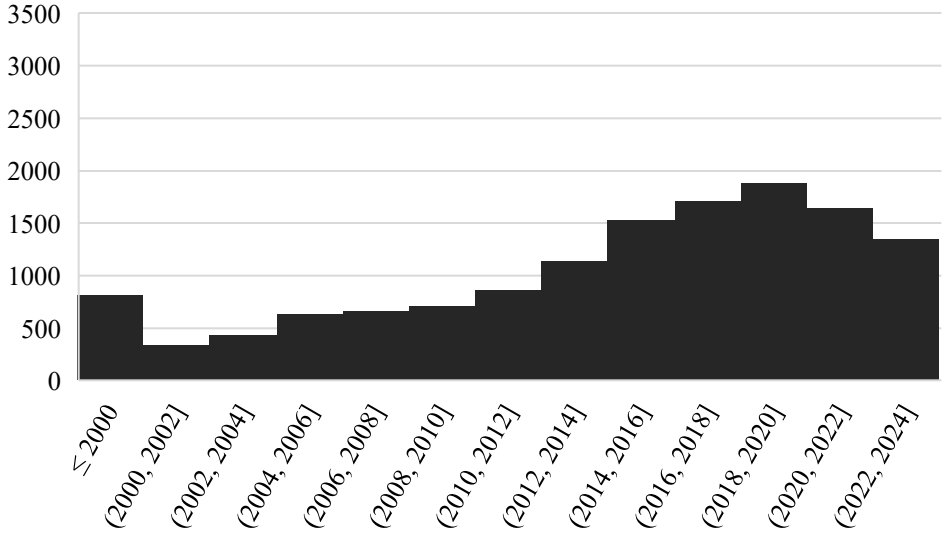

Figure 7: Distribution of Vehicles by Model Year

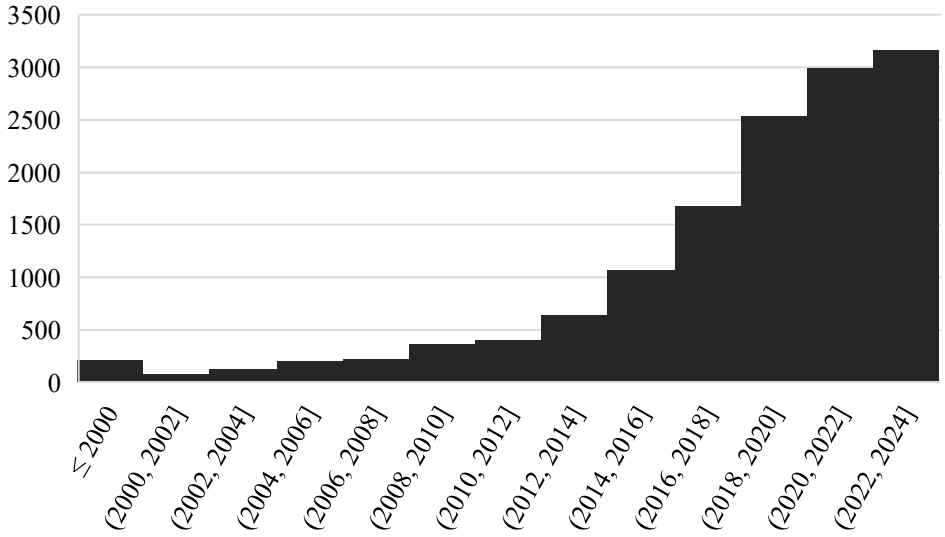

Figure 8: Distribution of Vehicles by Year Acquired

In terms of more general vehicle preferences, it seems that vehicle functionality matters more to most consumers than branding or status issues (85.7% agree that vehicle functionality is more important than brand or appearance, while only 28.2% value the status associated with vehicle ownership). These finding highlight that most Americans view private vehicle ownership as a necessity rather than a luxury. In terms of vehicle use, most individuals feel safer driving themselves rather than being driven by others. We also find strong support (68.0%) for technological enforcement measures such as cameras to curb dangerous driving behaviors and reduce vehicle crashes.

Although these results indicate that Americans continue to rely heavily on single-occupancy private vehicles (with 59.8% reporting that they drive alone three or more days per week and 87.7% reporting that they use personal vehicles for their commute; see Figure 9), many respondents also report that they routinely drive with passengers or ride as passengers themselves. These results indicate a need to continue enhancing approaches in travel demand models to better accommodate trip-chaining and household vehicle allocation decisions. Concurrently with the use of private vehicles, the emergence of new on-demand mobility services reveals interesting results. Despite being available to 74.5% of respondents, only 7.7% of respondents use ridehailing services routinely (one or more days per week). Ridehailing services appear to be used most for occasional trips rather than daily or weekly use. This indicates that these services may be acting as an important safety valve, with broad availability and convenience making them appropriate for situational use when other more routine modes are unavailable or unsuitable for these irregular trips. Finally, despite the growing availability of micromobility options (e-scooters and shared bikes), they reach limited population segments, with over 90% reporting that each of these services is unavailable or unused.

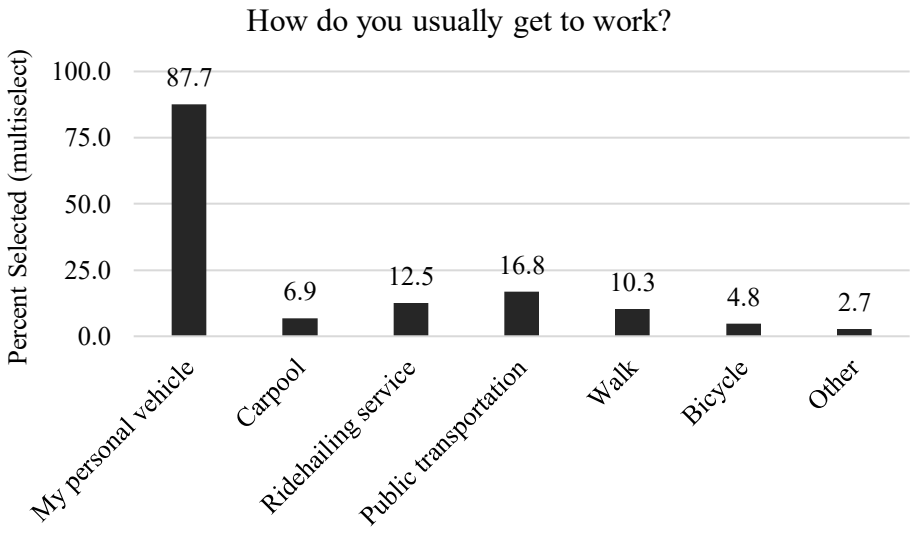

Figure 9: Mode Choice for Commute Trips

Finally, while much of the sample exhibits at least moderate levels of environmental consciousness, these feelings do not seem to strongly translate to travel behavior. Specifically, while 53.2% report that they somewhat or strongly agree that they are committed to an environmentally friendly lifestyle (and only 15.1% somewhat or strongly disagree), only 31.8% regularly choose low-pollution travel modes such as walking, cycling, or public transit, only 30.6% actively try to maximize walking and cycling trips, and only 39.4% view public transit favorably as a personal travel option. In fact, looking at the distribution of mode choices for commute trips in Figure 9, it seems like even fewer individuals choose active/public transit modes for their regular commutes. The data suggests a notable gap between environmental attitudes and actual travel choices, suggesting a growing need to improve these environmentally friendly transportation alternatives and help translate these concerns into sustainable travel behaviors. These findings have important implications for transportation policy, suggesting that simply raising environmental awareness may be insufficient to change travel behavior without concurrent improvements in alternative transportation infrastructure and convenience.

3.3 Online Shopping and Deliveries

Beyond the travel undertaken by individuals themselves, the data reveals patterns in the use of online shopping and delivery services. The most common source of these home deliveries comes through major providers (such as UPS, FedEx, and Amazon), with 67.4% of respondents receiving at least monthly deliveries and 26.7% receiving them weekly or more frequently. In contrast, crowdsourced delivery services have much lower adoption rates, with 59.0% never using these services and only 10.5% using them weekly or more often. The contrast between traditional package delivery and newer crowdsourced services suggests that while Americans have embraced e-commerce generally, they maintain more traditional preferences for how goods are delivered to

their homes. Notably, the use of delivery services is substantially influenced by income. As seen in Figure 10, a significantly larger proportion of high-income households receive deliveries at least once per week (42.5%) compared with low-income families (14.7%). In addition, these findings highlight the need to accommodate delivery services in travel demand models and better integrate individual-level travel demand models and commercial vehicle movements, as these deliveries may impact personal travel for errands as well as generating commercial vehicle trips for deliveries.

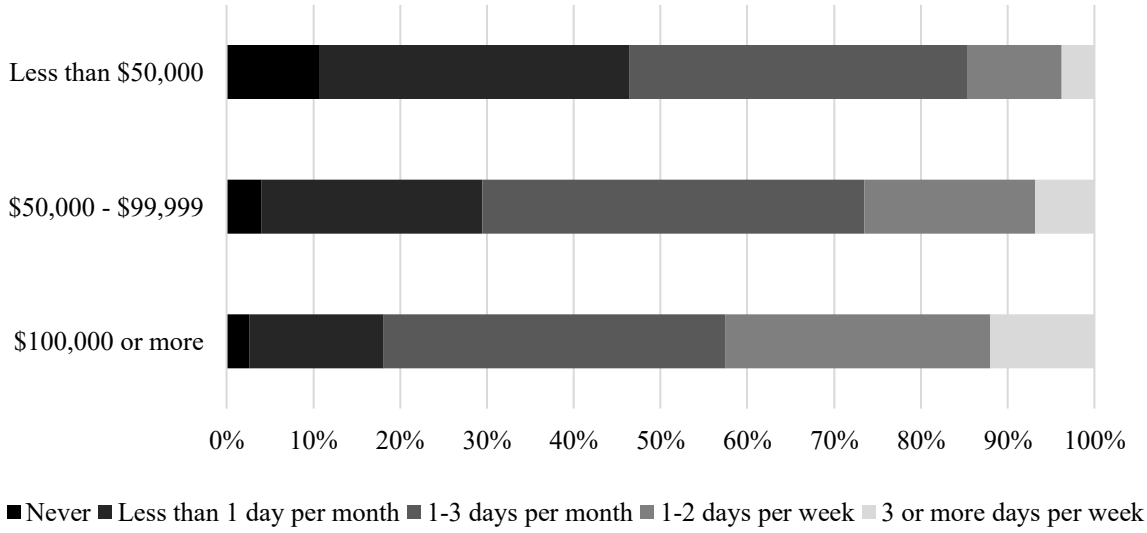

Figure 10: Use of Package Delivery Services by Household Income

Food and grocery delivery services show moderate levels of adoption, with 52.4% of respondents using these services at least occasionally, though only 15.3% use them weekly or more frequently. The use of grocery delivery services is also significantly impacted by home location, as shown in Figure 11. Unsurprisingly, grocery deliveries are more widely available and more commonly utilized in urban areas compared with rural areas. Thus, these delivery patterns have particularly significant implications for urban planning and traffic management, suggesting a need to redesign residential areas to better accommodate increased delivery vehicle traffic while maintaining neighborhood livability as well as increasing need to update freight and logistics operations to match the reality of consumer preferences for on-demand delivery services. However, while the use of delivery services for food and groceries has grown, the majority of respondents still use them relatively infrequently. In fact, many respondents exhibit a clear preference for in-store grocery shopping (70.2% say they would rather shop for groceries in stores than online) even if they use these services for occasional food deliveries. Concurrently, significant segments of the sample express interest in getting groceries at a curbside pickup location (46.2%) or secure drop off location (41.6%) due to high concerns of package security (51.6% are worried about theft of packages more generally). These patterns suggest that, rather than simple

substitution of physical with online shopping, we are seeing hybrid behaviors that combine online and physical shopping in ways that may generate new types of trips. Travel demand models need to account for these emerging patterns, the rise of pickup trips that may be chained with other activities, and the potential for delivery services to generate new types of local commercial vehicle movements.

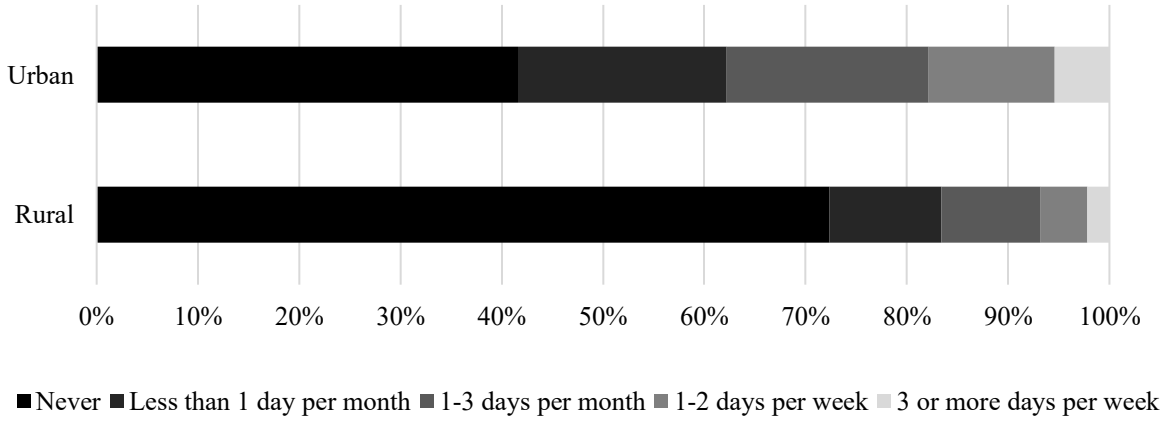

Figure 11: Use of Grocery Delivery Services by Household Location

Finally, while a large portion of the sample reported having services performed at their home, these tended to be only occasional occurrences. Specifically, while 52.3% utilize these services at some frequency, this is predominantly on a less-than-monthly basis (31.9%), reflecting the periodic nature of home maintenance and care needs. The upcoming employer-oriented survey component is intended to shed additional light on these dynamics of home services that generate large numbers of trips in residential areas but would go unreported in traditional travel surveys of these impacted individuals (who essentially generate these travel activities).

3.4 Emerging and Future Technologies

The survey assesses perceptions of six emerging transportation technologies, including: (1) electric vehicles, (2) fully self-driving vehicles, (3) delivery drones, (4) urban air mobility (flying shuttles or air taxis), (5) high-speed rail services, and (6) virtual reality and holograms to replace travel. As shown in Figure 12, many respondents indicated that electric vehicles are already widely available in their area now, but the other technologies are much less common at present. Fully self-driving vehicles and delivery drones are reported much less frequently as being available now (as expected), but respondents seem to have confidence that they will be available soon, with many reporting that they expect self-driving vehicles to be widely available in their area within the next five years. Urban air mobility and virtual reality are less familiar to many respondents (with 23.3% and 26.8% respectively reporting that they do not know what these terms mean), and most respondents do not expect these technologies to be available soon. In fact, 33.0% of respondents say they do not expect that urban air mobility will be available in the next 20 years in their area, while 35.9% say they do not expect virtual reality and holograms to replace travel in the next 20

years. Results for high-speed rail services are more mixed, likely because these technologies are currently being deployed but only in specific regions of the country.

Respondents familiar with each of these technologies were asked if they would use them if they became available (assuming they could afford and access these technologies), as shown in the right side of Figure 12. Electric vehicles, delivery drones, and high-speed rail seemed the most appealing to respondents, while many fewer reported being interested in adopting self-driving vehicles, urban air mobility, and virtual reality and holograms. Given that these perceptions are related to the current state of each of these technologies, exploring how these perceptions and adoption intentions develop over time as these technologies continue to develop is of particular interest within the existing milieu of transportation alternatives.

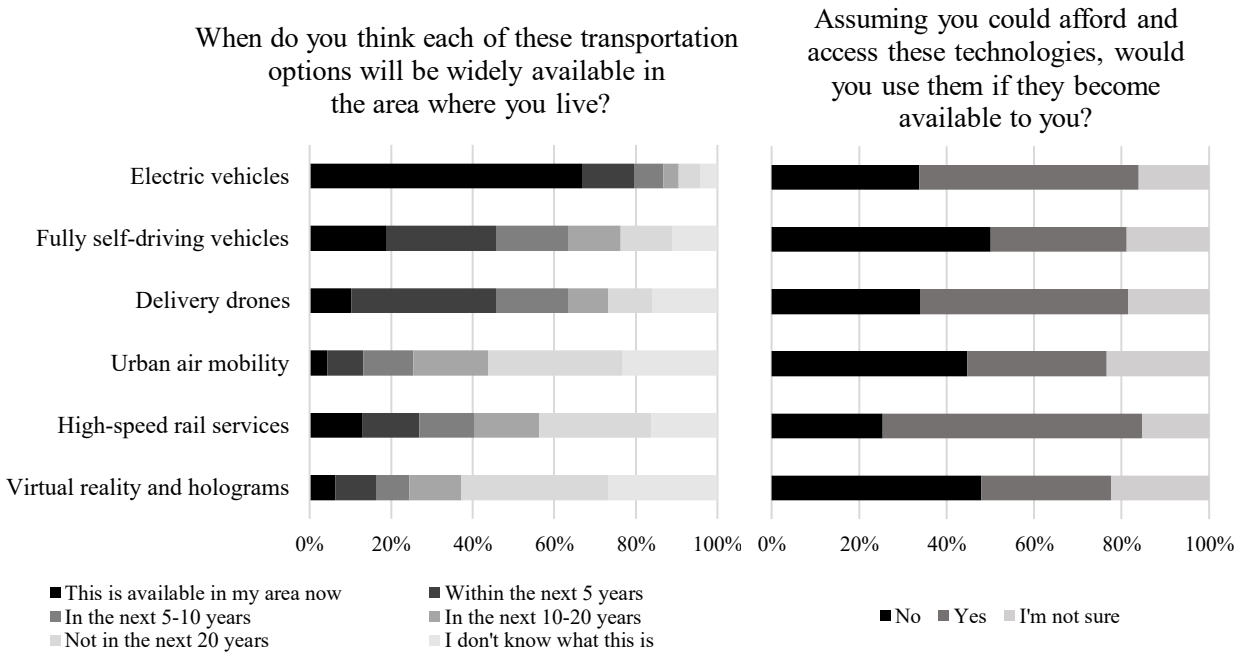

Figure 12: Perceptions of Emerging and Future Technologies

3.5 Transportation Funding

The survey reveals important trends regarding Americans' attitudes toward transportation funding, and satisfaction with the current state of various transportation alternatives. Overall, there seems to be skepticism about how transportation funding is used, with only 29.2% of the respondents indicating that they somewhat agree or strongly agree that they are confident that funding is used effectively. Further, 63.9% of respondents indicate that they think the federal government should let state and local governments determine how funding should be allocated in their areas, indicating greater confidence in the decision-making of state/local agencies.

In terms of funding sources, there seems to be a significant spread in beliefs about the fairness of mileage-based fees compared with the existing gas tax. 32.1% of respondents agree or strongly agree that charging drivers per-mile for road use would be more fair than the gas tax, because everyone pays the same for use of the roads regardless of vehicle fuel efficiency.

Conversely, 34.7% of respondents agree or strongly agree that charging drivers per mile for road use would be less fair than the gas tax, because the mileage fee doesn't reward people who buy cleaner vehicles. For both questions, a sizeable share of individuals responded that they neither agree nor disagree (35.5% and 42.0% respectively), indicating that many individuals have not formed strong opinions about these funding options. Further, there seems to be skepticism overall about congestion pricing, with 64.8% of respondents indicating that they agree or strongly agree that congestion pricing is unfair. Respondents living in urban areas in New York (where congestion pricing was implemented starting January 5, 2025) have slightly less negative views, with about 5% fewer individuals living in these areas indicating that they believe congestion pricing to be unfair. Of course, the majority of responses were collected before the congestion pricing program went into effect in New York, so most respondents even in the New York area did not have first-hand experience with congestion pricing programs when responding to the survey.

Additionally, the levels of satisfaction with different aspects of transportation in the United States are shown in Table 2. Overall, "road conditions" and "affordability" seem to be areas of specific concern, while respondents have higher satisfaction levels for overall "availability of good transportation" and "sidewalks and bicycle lanes/paths." Notably, the percentage of respondents selecting "Extremely satisfied" for each transportation aspect is relatively low (below 12% for all options).[1] This finding emphasizes the need to better align overall transportation development priorities and funding strategies with the local needs of different communities.

Table 2: Transportation Satisfaction

In general, how satisfied or dissatisfied are you with these aspects of transportation in the United States:	Extremely dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Extremely satisfied
Public transportation systems	8.8	18.9	31.8	31.5	9.0
Sidewalks and bicycle lanes/paths	8.3	20.9	22.1	37.8	10.9
Environmental impacts of transportation	9.8	23.2	37.7	21.5	7.8
Freight systems	5.4	12.6	49.2	25.5	7.3
Road conditions	17.1	34.3	19.3	22.4	6.9
Affordability	16.5	27.0	26.3	22.4	7.8
Air travel	10.1	16.3	38.1	26.9	8.6
Roadway safety	10.9	24.7	28.7	28.1	7.6
Availability of good transportation	8.6	17.3	30.2	32.4	11.5

Beyond these aggregate satisfaction ratings, there is variation based on individual demographics, geographic regions and characteristics, and existing transportation service provision. For instance, ratings of "road conditions" and "affordability" seem to be slightly higher in urban areas and for

[1] Of course, the responses may not be reflecting satisfaction (or dissatisfaction) with the transportation aspects, as much as the perception of benefits of additional investments in these aspects vis-à-vis the current intensity of use of different modes.

high-income households compared with rural areas and those with lower incomes, see Figure 13 and Figure 14.

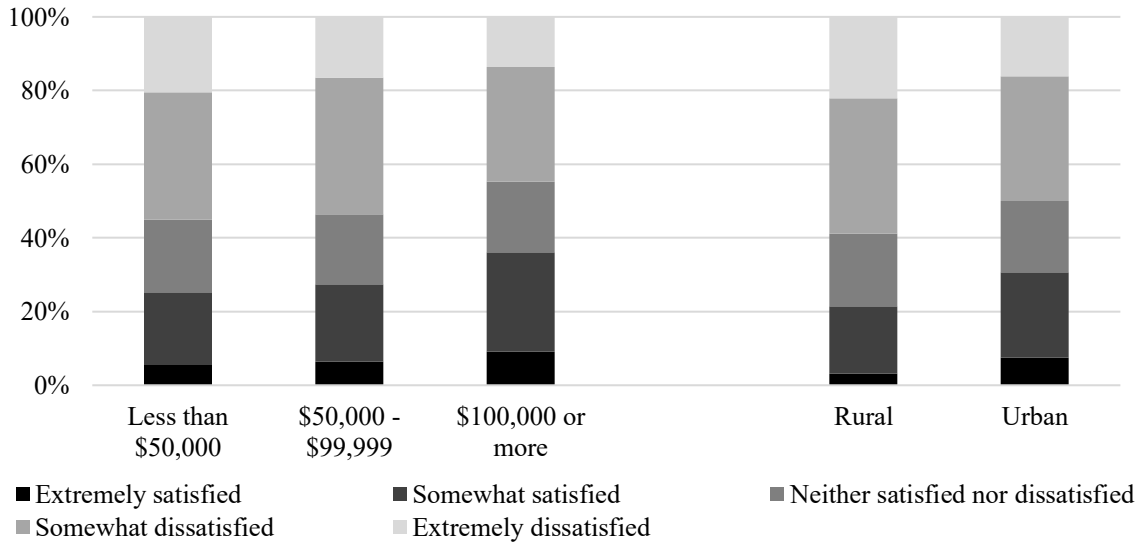

Figure 13: Satisfaction with Roadway Conditions by Household Income and Location

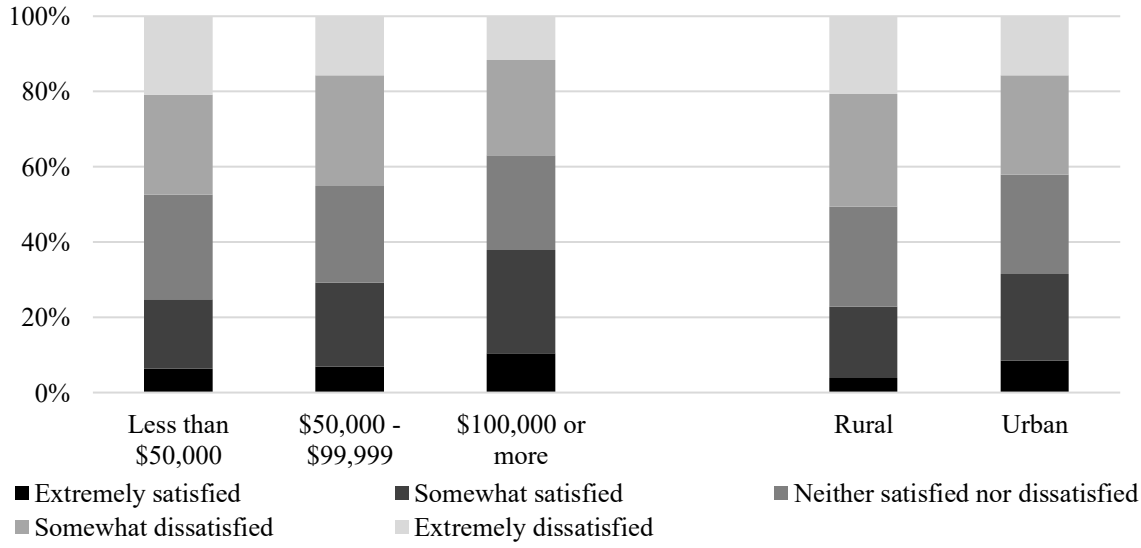

Figure 14: Satisfaction with Affordability by Household Income and Location

Additionally, satisfaction with the quality of sidewalks and bicycle lanes/paths is influenced by gender, with women generally having a more negative perception of the quality of this active transportation infrastructure (see Figure 15). In fact, we also find that women are significantly less likely to report that walking and cycling are available to them or that they use these modes regularly. These results reflect the need to ensure that active transportation is designed to meet the

mobility needs and safety concerns of women, as poor infrastructure quality seems to be disproportionately impacting their mobility options.

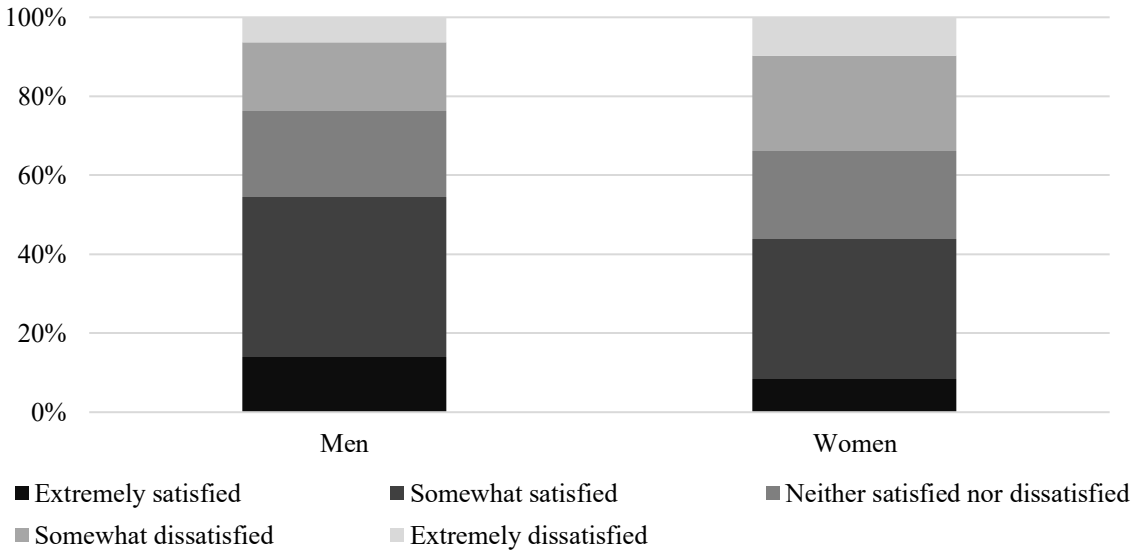

Figure 15: Satisfaction with Sidewalks and Bicycle Lanes/Paths by Gender

3.6 Transportation Satisfaction and Well-Being

Although most respondents report that they are generally satisfied with their life in general (73.1%), as well as with their current transportation options (75.3%), a substantial portion of the sample also states that they face regular transportation challenges that impact their quality of life and well-being. Table 3 presents the percentage of respondents who experienced each of five significant transportation challenges in the 30 days before the survey. As may be observed from the table, nearly 40% of respondents reported being late getting to destinations or indicated that they had skipped activities due to problems with transportation. A slightly lower percentage of respondents reported needing to reschedule appointments or feeling stuck at home because of challenges with transportation, and 26.5% of respondents reported that problems with transportation had affected their relationships with others. These results demonstrate the impacts of transportation challenges from a health and well-being perspective, even as many respondents are satisfied with their options overall. Thus, deeper investigation is needed to determine which individuals are most prone to experience transportation challenges and how best to align additional transportation options to address these issues.

Table 3: Transportation Well-Being

In the past 30 days, how often has each of the following happened to you?	Often	Sometimes	Never or rarely
You skipped going somewhere because of a problem with transportation	9.0	29.5	61.5
You were not able to leave the house when you wanted to because of a problem with transportation	9.5	24.4	66.1
Problems with transportation affected your relationships with others	8.6	17.9	73.5
You were late getting somewhere because of a problem with transportation	10.0	29.9	60.1
You had to reschedule an appointment because of a problem with transportation	10.1	24.9	65.0

A rather high percentage of respondents also report facing transportation constraints, which suggests that current transportation systems may be failing to meet the needs of a significant portion of the population. In particular, 60.1% of respondents have no reasonable alternatives to their current mode and 42.4% indicate that their situation makes public transit use difficult or impossible. Additionally, 71.9% of respondents report that they need to make schedule adjustments to avoid traffic. These results, when taken together, highlight the lack of mobility options as well as how traffic conditions dictate behavior. There is a need to better align transportation offerings with the actual needs and preferences of individuals; planners must recognize that the observed travel trends do not necessarily represent the preferences of individuals, but rather the choices made out of necessity that leave many individuals dissatisfied.

4. CONCLUSIONS

By capturing a broad range of current transportation attitudes and behaviors, the Transportation Heartbeat of America (THA) survey provides important insights to help planners and policymakers navigate the changing landscape of transportation in the United States. In particular, by capturing detailed data across multiple dimensions, the survey's broad scope allows for deeper investigation into a range of transportation behaviors as well as interconnections between preferences for various emerging transportation technologies. Additionally, the representative nature of the survey across all regions of the United States provides the capability to assess the broad range of different transportation attitudes, behaviors, and outcomes in different regions and for different population segments across the country.

Several key findings emerge from this initial wave of data collection:

1. There is broad overall interest in hybrid and flexible work, with 75.6% of respondents indicating that they want flexibility in when and where they work and 50.8% agreeing that mixing workplace and remote locations suits their lifestyle. Further, 33.6% of respondents work from home for the full day at least one day per week, 30.4% of respondents report that they work from home for part of the day (splitting work between home and another

location) at least once per week, and 20.9% reported working for some amount of time at a third work location at least once per week.

2. There seems to be significant variation in individual workplace choices throughout the week, with only around half of employed individuals in the sample (50.1%) selecting the same workplace location for all five weekdays.
3. Ownership and use of private vehicles is nearly ubiquitous, with 84.8% of respondents indicating that owning a car is important to them and 91.6% of households actually owning at least one vehicle. The vast majority of these vehicles (89.8%) are internal combustion engine vehicles, and the median purchase year, across all vehicles is 2016.
4. Ridehailing is emerging as a widely available service but is most commonly being used on an occasional basis for infrequent trips (only 7.7% of respondents regularly use ridehailing services one or more days per week).
5. The use of package deliveries is widespread, particularly among higher-income households. Food and grocery deliveries also have high uptake rates in urban areas (with 58.4% of urban households utilizing these services at least occasionally) but seem to be primarily used on an occasional basis and much less commonly in rural areas.
6. Most respondents (66.9%) consider electric vehicles to be available to them now and seem optimistic about autonomous vehicles and delivery drones becoming available in the near future (more than 63% of respondents think these will be widely available within the next 10 years). However, fewer respondents are familiar with the concepts of urban air mobility (for human use) and virtual reality and holograms to replace travel, and many do not expect that these services will be available for many years.
7. Respondents are only moderately satisfied across a variety of different transportation aspects, with the percentage of respondents selecting "Extremely satisfied" for each aspect remaining low (below 12% for all options). Overall, "road conditions" and "affordability" are areas of specific concern, while respondents have slightly higher satisfaction levels for overall "availability of good transportation" and "sidewalks and bicycle lanes/paths."
8. Although most respondents report that they are generally satisfied with their life in general (73.1%), as well as with their current transportation options (75.3%), a substantial portion of the sample also states that they face regular transportation challenges that impact their quality of life and well-being. Notably, nearly 40% of respondents reported being late getting to destinations or indicated that they had skipped activities due to problems with transportation, indicating that when transportation constraints are present, they do have significant quality of life impacts.

The future of this effort entails the collection of the remaining waves of household-level data as well as the development and deployment of the employer-oriented survey component. Additionally, more detailed investigations into the current point-in-time insights provided by the first survey wave will provide a baseline of comparison for longer-term analysis incorporating data from the remainder of the project.