Final Project Report

Strong Interest in Car-Free Living in the United States: Findings from a Nationwide Survey

Prepared for **Teaching Old Models New Tricks (TOMNET) Transportation Center**

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16. Abstract

The United States (US) is infamously car dependent, causing environmental, safety, and social problems. Planners have suggested actions to reduce car dependence for years; many cities have reformed zoning and parking regulations, and some have allowed private developers to build car-free or car-lite housing in otherwise car-dependent cities. Demand for car-free living in the US is unknown, however. Based on responses to an original, representative national survey (N=2,155), this project sheds light on (1) the magnitude of demand for car-free living in the US, and (2) how car owners interested in car-free living differ from today's zero-car households. Descriptive statistics indicate that approximately one in five car-owning adults in the US is interested in living car-free, and nearly half are open to it. Multivariate analysis illustrates interest in car-free living is related to having lived without a car in the past, using a car for most trips, and regular transit ridership. Perhaps surprisingly, interest in car-free living is largely unrelated to sociodemographics. These results are limited by the fact that they are based on stated preferences for car-free living. Given the interest in car-free living, planners should allow and facilitate car-free and car-lite development by investing in alternative transportation infrastructure, lowering parking requirements, and encouraging mixed land uses, including in residential neighborhoods.

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Descriptive statistics indicate that approximately one in five car-owning adults in the US is interested in living car-free, and nearly half are open to it. Multivariate analysis illustrates interest in car-free living is related to having lived without a car in the past, using a car for most trips, and regular transit ridership. Perhaps surprisingly, interest in car-free living is largely unrelated to sociodemographics. These results are limited by the fact that they are based on stated preferences for car-free living.

Given the interest in car-free living, planners should allow and facilitate car-free and car-lite development by investing in alternative transportation infrastructure, lowering parking requirements, and encouraging mixed land uses, including in residential neighborhoods.

INTRODUCTION

The United States (US) is infamously car dependent; 92% of households own at least one car (US Census Bureau, 2023) and 91% of ground transport passenger miles are traveled in cars (NHTS, 2017). In most American cities, cars provide more convenient mobility and access than any other form of transportation. The convenience of the car comes at a cost, however. Cars generate safety hazards, air pollution, greenhouse gas emissions, traffic congestion, and they take up copious amounts of valuable urban real estate (Parry et al. 2007; Sultana, Salon, and Kuby 2017; Hoehne et al. 2020). In addition, decades of car-oriented planning, policy, and investments have left most who do not own cars with relatively low levels of mobility and access (King, Smart & Manville, 2022).

Reducing car dependence has been a focal point for transportation planning scholarship and practice for decades (e.g. Newman, 1996; Nicholas & Kuss, 2022; Rode, 2023). Proposals to accomplish this include investments in public transit and non-motorized transportation infrastructure, parking policy reform and pricing, congestion pricing, and pricing of vehicle miles traveled (e.g. Fiol et al. 2022; Herriges, 2021; MTA, n.d.). Technologies that provide flexible car access without ownership have also arrived in US cities, in the form of ridehailing and car sharing. Recently, some private developers have taken it upon themselves to create car-lite or even car-free communities - housing developments with little to no parking provision for residents (Dougherty, 2020).

In this context, we contribute new evidence on the demand for car-free living in the United States. Specifically, we address the following three research questions:

(1) How large is the demand for car-free living among car owners?
(2) Which individual factors determine interest in car-free living among car owners?, and
(3) How do car owners interested in car-free living differ from those currently living without a car?

In what follows, first we review existing literature on the demand and supply of neighborhoods for people, and not for cars. Second, we present the statistical methods used to analyze our unique dataset – survey responses from a representative sample (N=2,155) of the adult urban and suburban population in the US. Third, we present findings showing that over half of car owners express an openness to car-free living (58%), and a nearly one fifth express a definite interest (18%). This is in addition to the small share (10%) of urban and suburban US residents currently living without a car. Next, regression results highlight three major determinants of interest in car-free living: past exposure to the car-free lifestyle, using a transport mode other than the car for at least five percent of trips, and riding transit regularly. Further, we find that car owners interested in car-free living are a diverse group, with few significant associations between interest in car-free living and key socioeconomic or demographic variables.

Given the sizable unmet demand for car-free living, we conclude that planners should allow and facilitate car-free and car-lite developments. In practice, this can be done by embracing zoning reform, investing in alternative transportation infrastructure, lowering parking requirements for development, and encouraging mixed land uses, including in residential neighborhoods.

DEMAND FOR WALKABLE NEIGHBORHOODS, ZONING AND PARKING REGULATORY REFORM, AND THE RISE OF CAR-LITE DEVELOPMENT

To our knowledge, no prior research has directly estimated the demand for car-free living in the United States, but there is evidence of the potential for sizable demand. A 2015 survey by the Urban Land Institute (2015) found that 52% of Americans would prefer to live in a place where they do not have to use a car very often. In a Boston case study, Basu & Ferreira (2021) found that the introduction of non-car mobility options in neighborhoods was associated with an uptake in car-lite living, suggesting that when non-car options become available, residents take advantage of them.

In the remainder of this section, we summarize two related literatures. The first estimates the demand for higher density, more walkable neighborhoods. The second documents recent zoning reform trends that facilitate car-free development – including removing minimum parking requirements and allowing higher density development – and begins to estimate how developers are changing their projects in response.

Demand for Walkable and Accessible Neighborhoods

Walkable neighborhoods account for only a small fraction of the US – around 12% of census block groups (EPA, 2021). Furthermore, walkable neighborhoods are typically concentrated in dense urban cores, enhancing car-free living opportunities in those areas. Indeed, urbanites have lower rates of car ownership, with 18% of urban adults living without a car, compared to 5.6% of suburban adults (US Census Bureau, 2023). There is substantial evidence, though, that demand for walkable neighborhoods may exceed this supply. Most directly, a 2023 opinion poll conducted by the Pew Research Center, finding that 42% of Americans would prefer to live where "houses are smaller and closer to each other, but schools, stores and restaurants are within walking distance" (Green, 2023). Other evidence comes from both residential location choice studies as well as studies that estimate the dollar value of neighborhood walkability using real estate prices.

Recent studies on residential location choice suggest that housing supply constraints are the main reason why households often live in neighborhoods with lower accessibility than desired (Yan, 2020; Frank et al. 2022). This scarcity relative to demand, and resulting high price, of walkable neighborhoods, creates large discrepancies between the number of US residents interested in living in walkable neighborhoods, the number of the residents actually living in these areas, and the number of people who can afford to do so in the current market (Yan, 2020).

An established body of research employs hedonic regression models to estimate the real estate price premiums associated with walkability and destination accessibility (e.g. Gilderbloom et al. 2015; Sohn et al. 2012). These studies have largely found that more pedestrian infrastructure and walkable destination access are associated with higher real estate prices, though studies that control for spatial effects – including the three studies cited here – tend to find smaller relationships. Diao and Ferreira (2010) found that both destination accessibility and pedestrian infrastructure such as sidewalks had positive relationships with single family home sale prices in the Boston, MA metropolitan area. Li et al. (2014) similarly found a positive association between condominium sale prices in Austin, TX and the Walkscore destination accessibility metric. In their 2015 article, Li et al. found a positive association between these prices and pedestrian infrastructure, but no clear association between single family home sale prices and the Walkscore metric.

In addition, recent before-after studies of zoning changes suggest that higher-density neighborhoods, which are usually also more walkable, are associated with higher home values. Within one year of the abolition of single-family zoning in Minneapolis, average home prices increased by 3-5% compared to similar homes in unaffected surrounding cities (Kuhlmann, 2021). More generally, a literature review on the observed impact of zoning changes in the US and around the globe found that upzoning is generally associated with an immediate increase in housing prices, followed by often modest increase in housing construction, and retained high housing prices in denser areas over time (Freemark, 2023).

Zoning and Parking Reform

Meeting growing demand for higher densities and walkability requires major retrofits of the built environment. Residential suburbs are the dominant urban form in the US. In most cities, approximately 75% of residential land is reserved for single-family homes (Badger & Bui, 2019). Single-family zoning limits the number of dwelling units to one per parcel of land, and excludes other types of development in residential neighborhoods. Single-family zoning increases daily travel distances, both by limiting urban density and by forcing most destinations (e.g., workplaces and shops) to be in different neighborhoods than homes. Longer trips mean greater car dependence and associated negative externalities (Cervero & Murakami, 2010; Brownstone & Golob, 2009).

Since the 2010s, many US cities have adopted zoning reforms to increase the density and diversity of land uses. In 2019, Minneapolis was the first US city to end single-family zoning citywide and allow duplexes and triplexes on all residential lots (Kahlenburg, 2019). That same year, Oregon passed a statewide bill promoting increased density on land previously zoned single-family residential; property owners could build duplexes in medium-size cities, and multifamily housing structures in larger cities (State of Oregon, n.d.). California followed suit in 2021 (State of California, n.d.), and Maine in 2022 (Southern Maine Planning and Development Commission, n.d.). In addition, over 70 municipalities have reformed single-family zoning since 2019, and as of mid-2023, dozens more were working to follow suit (Cantong et al. 2023).

Even before the late 2010's, cities were changing their zoning codes to allow higher density development. Pendall et al. (2022) found that between 2003 and 2019, the share of urban jurisdictions with residential land zoned for densities higher than thirty dwelling units per acre rose from 21% to 28%. Kolko (2021) confirms that as of 2020, residential density was indeed on an upward trajectory in the US. The average overall census tract-weighted density was higher than 1990, 2000, and 2010, as was the share of Americans living in high-density urban tracts.

Similar to single-family zoning, minimum parking requirements have been a staple of US urban planning since the 1950s; one that is increasingly challenged today. The original intent of minimum parking requirements is to ensure that parking spots are available to drivers when they reach their destinations. Minimum parking requirements perpetuate car dependence, however, by making parking spots plentiful virtually everywhere, and usually also free of charge (Shoup, 1999). Indeed, Chester et al. (2015) found that the ratio of residential off-street parking spaces to automobiles in Los Angeles was approximately one over the last 50 years. In addition, minimum parking requirements offset the true cost of parking to developers rather than drivers, thus reducing opportunity for dense urban development (Weinberger, 2020).

Recently, many US cities have reconsidered the need for parking minimums, first in select neighborhoods, then citywide. In 2017, Buffalo, NY became the first major city to eliminate parking minimums completely (Poon, 2017). As of 2021, over forty major cities had done the same, and hundreds more had removed parking minimums in their city centers (Herriges, 2021).

Lastly, famous urban design concepts ranging from the neighborhood unit (Perry, 1929) to the 15-minute city (Moreno et al., 2021) have long challenged American cities to become less car-centric, and called for placing amenities close to or within residential areas. The median resident in the US today only makes about 14% of their trips to basic amenities within a 15-minute walk from their home (Abbiasov et al. 2024). The same research shows that when the amenities are located locally, however, residents are likely to use them, indicating a lack of local amenities in the US. In 2008, Portland, Oregon included the 20-minute city vision in their plan to combat climate change, aiming to ensure that all are residents within a 20 minute walk, bike, or public transit ride to all amenities (Steuteville, 2008). Several other US cities have also adopted the concept in some capacity, including Tempe, AZ (City of Tempe, 2023), Eugene, Oregon (City of Eugene, n.d.), Cleveland, Ohio (City of Cleveland, 2023), and Cedar Rapids, IA (City of Cedar Rapids, 2021).

Together, these measures including zoning reform, reduced parking requirements, and mixed uses in residential areas, can be referred to as the urban reform movement. They hold potential to curb automobile dependence. Because they are relatively new, their impact on car dependence has been neither fully realized nor thoroughly measured yet. What has been partly documented, however, is the response of the housing market to growing demand for urban reform.

Developers' Response: Emerging Car-Free/Car-Lite Development

Developers have responded to the momentum of the urban reform movement with a growing supply of developments that include fewer parking spaces. For example, two years after Buffalo, NY removed parking minimums, the city observed a 53% reduction in parking space provision by mixed-use developers (Hess & Rehler, 2021).

Some bold developers have recently gone as far as to build car-free and exceptionally car-lite housing developments in traditionally car-dependent American cities like Tempe, AZ, Houston, TX, and Charlotte, NC, with some success (Doughtery, 2020; Sisson, 2023). These developments are strategically placed to optimize access with good connections to public transit, biking, and walking. Furthermore, developers have collaborated with shared mobility companies (i.e. car-share, ride hailing, and e-scooter rentals) to provide residents with first-last-mile connectivity and alternative mobility options. Lastly, car-free and car-lite developments are typically mixed-use; they include on-site grocery stores, restaurants, coffeeshops, laundry services, and the like, to enhance accessibility for local residents.

Planners and other city officials are also playing a role in shaping the demand for car-free living. For instance, many cities have subsidized transit services by providing free or reduced fare rides on city transit systems (Ionescu, 2022). Additionally, some states and cities have enacted E-bike incentive programs by offering rebates on E-bike purchases (Serna, 2022).

Car-free living and limited residential parking are nothing new in other parts of the world; but in

post-car cities, proactive steps are needed to support car-free living (Jamme et al., 2019). For example, intentionally car-free developments have been available in Europe since the early 1990s (Baehler & Rerat, 2020). Their success cannot solely be attributed to thriving transit, cycling, and walking infrastructure, however (Aumann et al, 2023); but also to detailed assessments of travel needs at the community level, political initiatives and stakeholder involvement, and an established cultural "social norm" of car-free behaviors (Morris et al. 2009; England & Erikson, 2020; Baehler & Rerat, 2020). Resident experiences may also play a role in European car-free development success; a recent study qualitative study in Germany found that car-reduced neighborhoods were more successful where residents had prior positive experiences with non-car mobility (Selzer & Lazendorf, 2022).

This section provided an overview of the demand for more car-*in*dependent neighborhoods in the US, and also explored the ways that planners and developers have been supporting this demand. To our knowledge, however, there has yet to be a study that directly estimates the demand for car-free living in the US. We contribute by measuring the untapped demand for the car-free lifestyle among those who currently own cars in the US, and uncovering associated demographic factors and life experiences. We also discuss how car owners who are interested in car-free living compare to those who already live in zero-car households.

AN ORIGINAL SURVEY FOCUSED ON CAR-FREE LIVING

This research is based on an original survey dataset focused on understanding the demand for car-free living. It includes questions pertaining to interest in car-free living, transport and residential preferences and attitudes, current and past transport choices, and sociodemographic characteristics.

The survey was fielded in fall 2022 to a sample of 2,155 adults from the Dynata Survey Panel living in urban and suburban neighborhoods in the United States. Urban and suburban respondents were targeted using zip code-level density cutoffs for survey invitations, but home neighborhood type was determined by the direct screening survey question, "Which one of the following best describes your neighborhood?" with the answer options of "Urban," "Suburban," or "Rural." Respondents who selected "Rural" exited the survey and are not included in this sample. This direct approach to identifying home neighborhood type was inspired by the work of Kolko (2015).

Quota sampling was used to generate a near-representative sample based on gender, age category, income category, whether the respondent holds a bachelor's degree, and race/ethnicity categories in urban and suburban neighborhoods. Urban residents were oversampled to ensure sufficient urban sample size for analysis. For efficient survey fielding, all other quotas were set such that the final sample's distribution on each variable could be a maximum of 10 percentage points different from the population distribution according to the 2020 5-year American Community Survey (US Census Bureau, 2020). The final sample was weighted to be representative of the US urban and suburban adult population using an iterative proportional fitting algorithm with these same variables, as well as whether a household owns 0, 1, or 2 or more vehicles. Weights are used in all descriptive statistics presented here, as well as in the calculation of estimated marginal effects. The multivariate models were estimated without weights because these models control for the variables used to create the weights.

The survey sequence was intended to thoughtfully prepare respondents to answer the interest in

car-free living question. First, respondents were briefed about the car-free living community Culdesac, in Tempe, Arizona, located in an accessible location, and supported by a suite of mobility services (Culdesac, n.d.). Then, respondents were asked questions that required them to think about where they live, how they get around, and what they value about their home and transportation choices. At the very end of the survey, respondents were asked to answer our question about interest in living car-free. It was our intention to motivate respondents about the possibilities of car-free living, then intervene with questions regarding their current lifestyle, and their value of this lifestyle, to then allow them to answer our survey question about interest in car-free living mindfully and with proper context.

ESTIMATING AND UNDERSTANDING THE DEMAND FOR CAR-FREE LIVING

We directly estimate the demand for car-free living in the US using the weighted answers to survey questions about car ownership and interest in car-free living. To do so, we rely on our question asking the number of cars currently owned by the household, and a second asking survey respondents from car-owning households, "Would you ever consider living car-free, that is, not owning a car?" The response choices were "Yes", "No", and "Maybe one day." We then differentiate interest into four categories: living without a car now, definitely interested in car-free living, interested in car-free living "maybe one day," and not interested in car-free living.

To parse out the determinants of interest in car-free living among car owners, controlling for confounding relationships, we estimate a multinomial logit model. The dependent variable is the three levels of interest in car-free living, and the explanatory variables can be divided into three categories: car-related experiences, attitudes, and socioeconomic/demographics.

Two key car experience variables are included in our main analysis of interest in car-free living. The first is a binary variable indicating whether the respondent has any past experience living without a car. Weinberger and Goetzke (2010) showed that past experience living without a car leads to car-free and car-lite living in the future, even after moving to a more car-dependent city. The second is a binary variable that takes the value of 1 if the respondent answered "95% or more" to the survey question, "When you leave your home for any reason, what percent of the time do you use a car?" and 0 otherwise.

There are also three included attitudinal variables. These were collected as 5-point Likert scale agreement responses to the following three statements: (i) I am committed to an environmentally friendly lifestyle; (ii) I am adaptable to change, and (iii) It is important to me to feel a sense of community in my neighborhood. For the analysis, these variables were condensed to become binary, in which "Agree" and "Strongly Agree" answers were coded as 1 and neutral and disagree responses were coded as 0.

Others have examined transportation behaviors of those who currently live in car-less or car-deficit households (i.e., living with no or fewer cars out of necessity), and how these contrast with those who currently live car-free (i.e., living without a car by choice) (Brown, 2017; Blumenberg et al., 2018; Mitra & Saphores, 2019; Blumenberg et al. 2020; Eenoo, 2023; Paijmans & Pojani, 2021; Klein & Smart, 2017; Klein & Smart, 2019; Klein et al. 2023). Our models include transportation, built environment, socioeconomic, and demographic covariates inspired by this literature.

We recognize that interest in car-free living for current car owners is a choice, whereas Brown (2017) estimated that about 80% of zero-car households in the US are car-less rather than car-free; they simply cannot afford to own a car. For this reason, we use a binary logit model to separately estimate the determinants of currently living in a zero-car household, and compare the results both with the existing literature and with those of our model of interest in car-free living.

Finally, we estimate binary logistic models for the first two car experience variables (e.g. past car-free experience and frequency of car mode use). While past car-free experience and current car mode use are independent variables in the multinomial logit model, they are choices in themselves. Exploring the relationship between sociodemographic variables and car experience allows for a more in-depth understanding of the mechanisms behind interest in car-free living.

LIMITATIONS

This study is limited by the nature of the survey as well as the source of the sample. The question on interest in car-free living is hypothetical and does not allow us to know who would actually give up their car. In addition, to comply with Institutional Review Board transparency requirements, we were transparent in our survey invitation that this was a survey about car-free living. This may have skewed our respondents to be more likely to be interested in the subject, and our sample did include a large fraction of respondents living in one-car households, with 47% of respondents living in a one vehicle household, compared to 37% of urban and suburban households in the census. However, result data is weighted based off census-level household car ownership. We also note that we did not attract an oversample of people currently living car-free, as might be expected if there were substantial self-selection bias among our respondents.

A final limitation of note is that we used the Dynata market research survey panel to field our survey. Market research survey panels are composed of people who, for a variety of reasons, have volunteered to take surveys in exchange for small monetary rewards. This means that once a panel member begins a survey, they are much more likely to complete it than would be true of the general US adult population; among those who began our survey and were not screened out based on our quota groups, 85 percent completed it. We do not know how this type of self-selection might impact the results of our study, but we expect that the impact is small, since interest in surveys is not obviously related to interest in and experience with car-free living.

UNEXPECTEDLY HIGH DEMAND FOR CAR-FREE LIVING AMONG CAR OWNERS

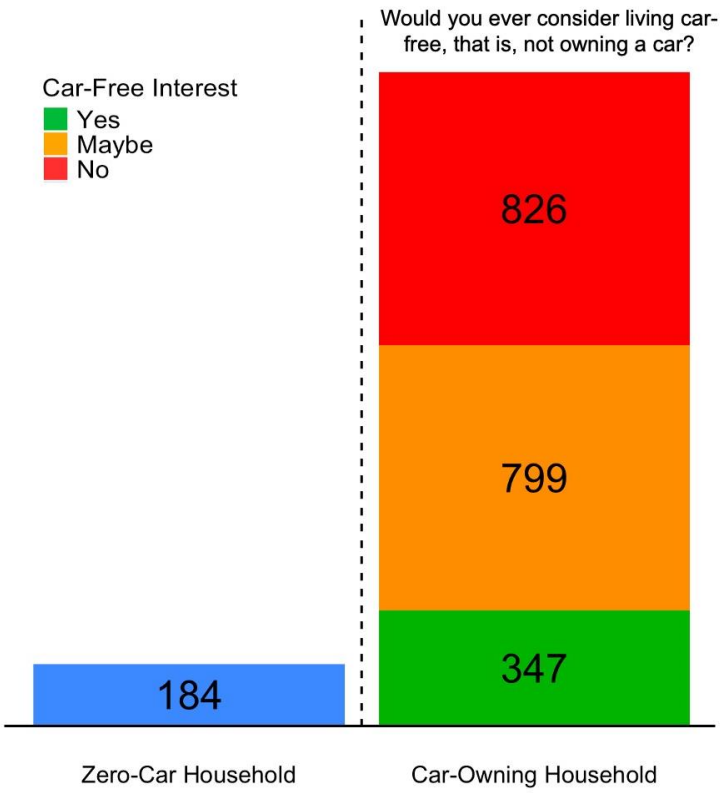


Figure 1 Interest In Car-Free Living and Current Zero Car Households in Urban and Suburban US (weighted distribution among 2,155 survey respondents)

We find that a large share of adult car owners is interested in car-free living, much larger than the share of households currently living without a car. Figure 1 illustrates the weighted distribution in our survey sample of interest in car-free living and living in a zero-car household. Nearly 1 in 5 car-owning adults in urban and suburban America are interested in living car-free, and an additional 40% are open to car-free living (those who answered "Maybe one day"). Approximately 10% of our unweighted sample reported living in a zero-car household. The 2020 American Community Survey puts this figure at about 9% in urban and suburban census tracts (U.S Census Bureau, 2020). In Figure 1, the zero-car household bar is weighted to be equal to the Census figure.

Approximately 40% of respondents indicated that they would never be interested in living without a car. We asked them to select up to three of their top reasons. Nearly half selected each of "I enjoy driving," and "Driving makes them feel free and independent." Another popular reason for not wanting to live car-free is not wanting to give up the flexibility of having a car (40%). Additionally, 32% of those who are not interested in living car-free stated that it is because driving is the safest way for them to get around.

DETERMINANTS OF INTEREST IN CAR-FREE LIVING AMONG CAR-OWNERS

Table 1 presents the variables used in this analysis along with their weighted distributions for our full sample, and separately for zero-car household and car owner subsamples. All percentages are weighted in terms of gender, age, income, education, race/ethnicity, and household vehicle ownership. Of note, about half of our weighted sample of car owners has experienced living without a car, and more than half are highly car dependent, using their car for at least 95% of all of their trips. Interestingly, nearly a quarter of the car owners in our sample are in both of these groups.

Table 1 Summary Statistics, Weighted by Urban/Suburb, Race/Ethnicity, Gender, Age, Income, Educational Attainment, and Household Vehicles

VARIABLE	MEASUREMENT	CAR OWNERS	ZERO CAR HHS	FULL SAMPLE
Lived without car	Lived without car in past	52%	100%	56%
Always use car	Use car for 95% or more of trips	59%	11%	55%
Walk Ever	Yes	73%	83%	73%
Bike/Scooter Ever	Yes	31%	27%	31%
Transit Use Level	Never	79%	43%	76%
	Occasionally	13%	22%	14%
	Regularly	8%	36%	10%
Environmentalist	Yes	56%	58%	56%
Community Oriented	Yes	60%	53%	60%
Adaptable to Change	Yes	77%	66%	76%
Urban	Urban (vs. Suburban)	31%	58%	33%
Car Commuter	Yes	44%	5%	41%
Employed	Yes	54%	36%	53%
Student	Yes	10%	7%	10%
Income	<$35K	22%	66%	26%
	$35-100K	44%	26%	42%
	$100K+	34%	8%	32%
Educational Attainment	High school or less	22%	40%	24%
	Some college or technical school	44%	46%	44%
	Bachelor's degree or higher	34%	14%	32%
Age	18-39	39%	40%	39%
	40-59	32%	46%	33%
	60+	29%	14%	27%
Children	Have children	30%	12%	29%
Gender	Female	50%	53%	50%
Live Alone	Yes	16%	48%	18%
Household Vehicles	Zero	0%	100%	9%
	One	37%	0%	34%
	Two or More	63%	0%	58%
Hispanic	Yes	21%	17%	21%
Black	Yes	17%	29%	18%
White	Yes	70%	60%	69%
Neighborhood Amenities	Avg. number of amenities	5.1	5.3	5.1
Observations		1891	264	2155

The results of the multinomial logit model are displayed in Figure 2. Each line on the Y axis of the figure represents a variable in the model. The shape (circle, triangle, and square) position on the graph represents the variable's marginal effect on interest, and the extending bar represents the

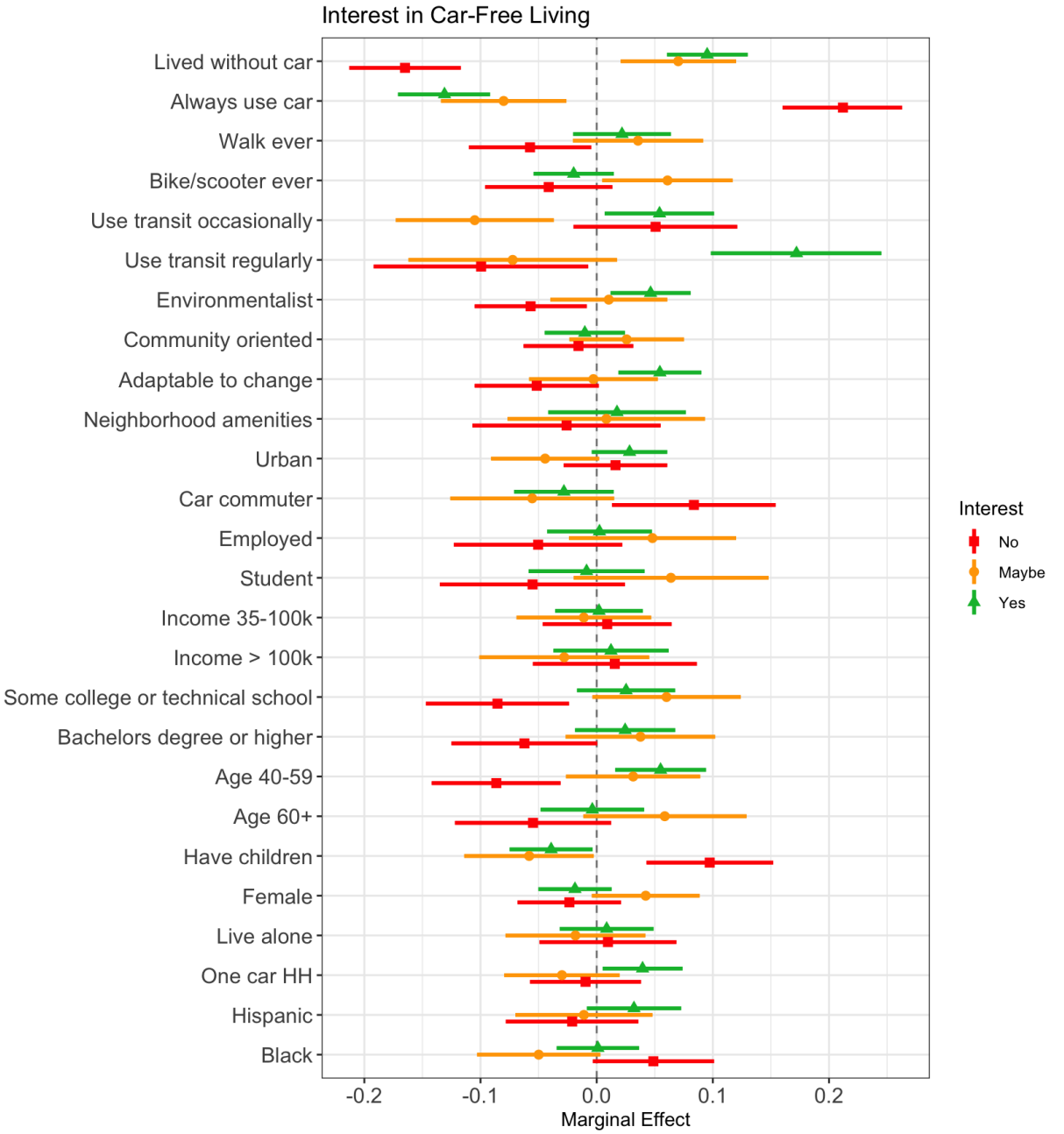
95% confidence interval. If the 95% confidence interval bar passes through 0, the variable is not statistically significant. The marginal effect should be interpreted as the change in percentage point probability of being in a certain car-free interest group given a change in the independent variable, while holding all other variables constant. For example, having lived without a car in the past increases the likelihood of being in the "yes" interest group by 10 percentage points, increases the likelihood of being in the "maybe" group 7 percentage points, and decreases the likelihood of being in the "no" group by 17 percentage points.

When controlling for confounders, car-related experience variables - having lived without a car in the past and always using a car - have large relationships with interest on car-free living. Having lived without a car in the past has a large positive relationship with interest in car-free living, while always using a car has a large negative relationship. In addition, use of the non-car transport modes of transit, walk, and bike/scooter are each associated with interest in car-free living. This is especially true for regular transit riders, who are 17 percentage points more likely to be interested in car-free living than those who never ride transit.

Two attitudinal variables that have positive relationships with interest are commitment to an environmentally friendly lifestyle and being adaptable to change. Only three other variables have a statistically significant relationship with definite interest in car-free living: being in a one-car household, being middle-aged, and not having children. Of note, most socioeconomic and demographic variables are not associated with a person's interest in car-free living.

Opposite of those who are interested in living car-free, being *un*interested in car-free living (red square) is associated with no experience living without a car, using a car for most trips, not being a regular transit rider, and not taking walks. In addition, being a car commuter is associated with an 8-percentage point increase in the likelihood of being in the "no interest" category. Again, driving-related variables have the largest relationship with being uninterested in car-free living. Having one or more children has a positive relationship with being uninterested, increasing the likelihood of being uninterested by 10 percentage points, and more educated people are also less likely to be uninterested in car-free living. A lack of interest in car-free living is unrelated to income level, race, gender, or household size.

As a robustness check, the multinomial logit model was estimated without the car-related experience and current alternative mode use variables (see Appendix Table A2). We wanted to see if socioeconomic and demographic relationships were being masked by the inclusion of these transportation choice covariates in the model. Notably, income, race, and household size remain statistically insignificant in predicting interest, and educational attainment continues to only have a small relationship with interest.



Note: US region also controlled for in the model

Figure 2 Marginal Effects for Multinomial Logit Model on Interest in Car-Free Living in Urban and Suburban US

We also explored the two car-related experience variables directly through logit models. Both the "lived without car" and "always use car" models indicate strong relationships between these experiences and socioeconomic and demographic variables (see Appendix Tables A3 and A4). Those who lived without a car in the past are more likely to live in an urban area with local amenities, and be low-income, younger, non-white, and are less likely to always use a car to get around. Those who always use a car are more likely to be older, female, live in a suburban

neighborhood with fewer local amenities, and are less likely to live in a one-car household or to have lived without a car in the past.[1]

DETERMINANTS OF LIVING IN A ZERO-CAR HOUSEHOLD

Those who live in zero-car households today differ from car owners who are interested in car-free living (see Table 1 for summary statistics and Table A5 for multivariate model of living in a zero-car household). Specifically, household income is unrelated to car-free interest, but is strongly associated with living in a zero-car household now. Further, zero-car households are more likely to live in urban neighborhoods, live in single-person households, and have no children in their households. These results are similar to other analyses on zero-car households, which have found zero-car households more likely to be low-income, urban, without children, and generally in smaller households (Blumenberg et al. 2020; Eenoo, 2023). Blumenberg et al. (2020) also found race to be an important predictor of being in a zero-car household. Our data show that black respondents were more likely to live in zero-car households (see Table 1), but this relationship becomes insignificant when controlling for confounders (see Table A5).

KEY TAKEAWAYS

Cars provide access to employment, goods, services, and recreation opportunities for most Americans. Unfortunately, widespread car use also has adverse effects on our health, environment, and communities. Planning norms have historically supported and even encouraged car dependence, but this is beginning to change. US cities are changing zoning laws and transportation priorities, leading to opportunities for more density and non-car mobility options. Complementing regulatory changes, cities are investing in transit, as well as bike and pedestrian infrastructure. Some private developers have even been attempting to cater to a car independent lifestyle by creating car-free or car-lite developments with enhanced non-car mobility options.

In this context, our study focuses on the demand for car-free living in the US. We designed and conducted an original national survey, and used the data to estimate and investigate this demand. Our findings can be summarized as follows: 1) nearly one in five car-owning Americans reported definite interest in living car-free, and an additional 40% reported being open to the idea; 2) those interested in car-free living are a diverse group, but 3) differ from those who live without a car now; 4) interest in car-free living is heavily influenced by past experience living without a car and current car dependence.

Large and diverse interest in car-free living

Interest in car-free living among US car owners is high. This is striking, since none of these people

[1] One might ask how it is possible that two of the most important variables in a model of car-free interest are strongly related to many socioeconomic and demographic variables, and yet removing these variables from the main model does not make socioeconomic and demographic variables appear to be important predictors of interest in car-free living. The answer is a combination of three facts: 1) these two car-related experience variables have opposing relationships with interest in car-free living, 2) the socioeconomic and demographic variables have opposing relationships with the two car-related experience variables, (points 1 and 2 together essentially mean that the effect of demographics on interest that would come through the effect of demographics on experience cancels out when removing both experience variables) and 3) even though the car-related experience variables have the largest relationship with interest in car-free living, they are far from fully explaining this interest.

are currently choosing not to own a car. It is also consistent with past surveys, however, which have found that a sizable fraction of US households would like to live in a more walkable neighborhood or would like to live where they can use a car less often (Urban Land Institute, 2015; RPA, 2016; Green, 2023). The people interested in car-free living are also a diverse group. This contrasts sharply with the clear socioeconomic and demographic differences between those who currently do and do not own cars in the US.

Why are so many car-owning households unable or unwilling to actualize their interest in car-free living? One possible answer is that only a small fraction of the US housing supply offers a high quality of life without owning a car. Studies estimating the magnitude of the supply constraint on walkable neighborhoods, however, have found that it is relatively small (Diao and Ferreira, 2010; Li et al., 2014; Li et al., 2015).

These findings together suggest that perhaps interest in car-free living, while real, is not a top priority for most Americans. As it is difficult to do, most people just settle for a more car-dependent lifestyle. If it were made easy, however, the evidence suggests that perhaps a surprisingly large fraction of households would go embrace a car-free lifestyle; 60% of our weighted survey respondents reported some interest in car-free living.

The effect of current and past car experiences

In our analysis, experiences of both car dependence and car *in*dependence are the most important factors associated with interest in car-free living among car owners. Controlling for socioeconomic, demographic, attitudinal, and built environment covariates, experience living without a car in the past has a strong positive association with interest, current car dependence has a strong negative association, and current regular transit ridership has a strong positive association. Of special note is that past experience living without a car is clearly associated with a desire to do it again, rather than the other way around.

Overall, then, our findings suggest that car-related experiences beget car-related experiences, and are consistent with the literature. In the US, Weinberger and Goetzke (2010) suggest that preferences for car ownership are learned and transferred across built environment contexts, meaning that once car ownership preferences are formed, they will impact car ownership choices in both car-dependent and car-*in*dependent places. Our results are also consistent with Smart and Klein's (2018) finding that greater transit access/exposure over a household head's lifetime is associated with lower car ownership.

Research on car-free living arrangements in Europe also align with our findings. Seltzer and Lanzendorf (2022) found that increased duration of time spent in car-reduced neighborhoods predicts the likelihood of rejecting one's car. These same authors then emphasized the need for exposure to positive car-free mobility experiences as a steppingstone to fully car-free living and suggest that planners continue to focus on influencing mobility practices incrementally, as a way to achieve long-term car-free goals.

To our knowledge, ours is the first study to estimate interest in car-free living in the US, and more research is warranted. Further work should be done to understand how past car-lite and car-free experience influence interest in using non-car mobility options, and whether interest today

translates into actually moving to car-free or car-lite neighborhoods when these become available. This could include more detailed research on the context of car-free experiences, such as a college campus experience in comparison to an involuntary car-free experience. It would also be beneficial to explore how additional environmental characteristics relate to car-free interest, such as climate and topology.

Planning for car-free living experiences

Our research suggests that policy makers and planners should continue moving forward with urban reform. Current initiatives are centered around abolishing parking minimums and single-family home zoning laws. To go a step further, planners can advocate for parking maximums, and incentivize multi-family housing and mixed-use neighborhoods.

In addition, the well-known mobility limitations of zero-car households emphasize the need for thoughtful implementation of car-free developments. To assist, planners could create a "playbook" for car-free and car-lite development that can be applied in diverse cities. As highlighted in the European literature, successful car-free living developments must be built intentionally on high-access sites, and the infrastructure must support community building (Aumann et al, 2023). Car-free developments could also be of special value to both lower-income households who struggle to afford their cars and to those who are already car-less. Well-placed and fairly-priced car-free developments could increase economic prosperity among these populations.

Planners can also influence the realization of car-free living on the demand side by helping people choose the lifestyle through incentives. If car-free experiences beget car-free experiences, then expanding opportunities for car-free mobility should have a proliferative effect. Planners can help communities realize this demand through subsidized systems that promote mobility without individual car ownership, such as car-shares and micromobility services, and disincentivize car-dependent lifestyles through initiatives such as congestion pricing.

Lastly, to create an environment that is suitable for car-free living for a diverse set of people, accessible areas must expand beyond urban centers and into neighborhoods. Continuing with the neighborhood unit, pedestrian pocket, and 15-minute city initiatives, planners should prioritize walkable spaces within neighborhoods beyond the urban core to allow for a larger share of the population to experience car-free living. With proper community support, the strategic placement of car-free and car-lite developments in classically car-dependent places, and improved non-car mobility infrastructure throughout cities, may act as a catapult for long-term adoption of a car-free lifestyle.

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APPENDIX

Table A1 Marginal Effects, Interest in Car-Free Living Among Car Owners, Weighted

VARIABLE	YES, INTERESTED IN GOING CAR-FREE			MAYBE ONE DAY			NO INTEREST		
	ME	SE	P	ME	SE	P	ME	SE	P
Lived without car	**0.10**	**0.02**	**0.00**	**0.07**	**0.03**	**0.01**	**-0.17**	**0.02**	**0.00**
Always use car	**-0.13**	**0.02**	**0.00**	**-0.08**	**0.03**	**0.00**	**0.21**	**0.03**	**0.00**
Bike/Scooter ever	NS			**0.06**	**0.03**	**0.03**	NS		
Walk ever	NS			NS			**-0.06**	**0.03**	**0.03**
Transit Use									
Never	base			base			base		
Occasionally	**0.05**	**0.02**	**0.03**	**-0.10**	**0.03**	**0.00**	NS		
Regularly	**0.17**	**0.04**	**0.00**	NS			**-0.10**	**0.05**	**0.03**
Environmentalist	**0.05**	**0.02**	**0.01**	NS			**-0.06**	**0.02**	**0.02**
Community Oriented	NS			NS			NS		
Adaptable to Change	**0.05**	**0.02**	**0.00**	NS			*-0.05*	*0.03*	*0.06*
One Car HH	**0.04**	**0.02**	**0.02**	NS			NS		
Urban	*0.03*	*0.02*	*0.09*	*-0.04*	*0.02*	*0.06*	NS		
# Local Amenities	NS			NS			NS		
Car Commuter	NS			NS			**0.08**	**0.04**	**0.02**
Employed	NS			NS			NS		
Student	NS			NS			NS		
Income									
<$35K	base			base			base		
$35-100K	NS			NS			NS		
$100K+	NS			NS			NS		
Education									
High School or less	base			base			base		
Some College/Tech. School	NS			*0.06*	*0.03*	*0.07*	**-0.09**	**0.03**	**0.01**
Bachelor's or More	NS			NS			**-0.06**	**0.03**	**0.05**
Age									
18-39	base			base			base		
40-59	**0.06**	**0.02**	**0.01**	NS			**-0.09**	**0.03**	**0.00**
60+	NS			*0.06*	*0.04*	*0.09*	NS		
Children	**-0.04**	**0.02**	**0.03**	**-0.06**	**0.03**	**0.04**	**0.10**	**0.03**	**0.00**
Female	NS			*0.04*	*0.02*	*0.08*	NS		
Live Alone	NS			NS			NS		
Black	NS			*-0.05*	*0.03*	*0.07*	*0.05*	*0.03*	*0.07*
Hispanic	NS			NS			NS		

Notes: ME = "Marginal Effect," SE = "Standard Error," P = "P-Value." Model also controlled for first digit zip code region. Bold font indicates statistical significance (p-value<0.05). Italic font indicates marginal statistical significance (0.05<p-value<0.1). NS indicates "Not Significant."

Table A2 Marginal Effects, Interest in Car-Free Living Among Car Owners Without Car + Alternative Mode Experience Variables, Weighted

VARIABLE	YES, INTERESTED IN GOING CAR-FREE			MAYBE ONE DAY			NO INTEREST		
	ME	SE	P	ME	SE	P	ME	SE	P
Environmentalist	**0.06**	**0.02**	**0.00**	NS			**-0.08**	**0.03**	**0.00**
Community Oriented	NS			NS			*-0.04*	*0.03*	*0.09*
Adaptable to Change	**0.05**	**0.02**	**0.02**	NS			NS		
One Car HH	**0.07**	**0.02**	**0.00**	NS			**-0.05**	**0.03**	**0.04**
Urban	**0.06**	**0.02**	**0.00**	NS			NS		
# Local Amenities (x10)	*0.06*	*0.03*	*0.07*	NS			**-0.09**	**0.04**	**0.03**
Car Commuter	**-0.08**	**0.02**	**0.00**	*-0.06*	*0.04*	*0.09*	**0.14**	**0.04**	**0.00**
Employed	**0.05**	**0.02**	**0.04**	NS			**-0.10**	**0.04**	**0.01**
Student	NS			**0.08**	**0.04**	**0.05**	**-0.13**	**0.04**	**0.00**
Income									
<$35K	base			base			base		
$35-100K	NS			NS			NS		
$100K+	NS			NS			NS		
Education									
High School or less	base			base			base		
Some College/Tech. School	NS			NS			*-0.06*	*0.03*	*0.09*
Bachelor's or More	NS			NS			NS		
Age									
18-39	base			base			base		
40-59	NS			NS			NS		
60+	**-0.07**	**0.02**	**0.00**	NS			NS		
Children	*-0.03*	*0.02*	*0.10*	**-0.06**	**0.03**	**0.05**	**0.09**	**0.03**	**0.00**
Female	**-0.05**	**0.02**	**0.00**	NS			NS		
Live Alone	NS			NS			NS		
Black	*0.03*	*0.02*	*0.01*	NS			NS		
Hispanic	NS			NS			NS		

Notes: ME = "Marginal Effect," SE = "Standard Error," P = "P-Value." Model also controlled for first digit zip code region. Bold font indicates statistical significance (p-value<0.05). Italic font indicates marginal statistical significance (0.05<p-value<0.1). NS indicates "Not Significant."

Table A3 Marginal Effects, Experience Living Car-Free for Car Owners, Weighted

VARIABLE	MARGINAL EFFECT	STANDARD ERROR	P-VALUE
Always Use Car	**-0.11**	**0.02**	**0.00**
One Car HH	**0.06**	**0.02**	**0.01**
Environmentalist	NS		
Community Oriented	NS		
Adaptable to Change	NS		
Urban	**0.10**	**0.02**	**0.00**
# Local Amenities (x10)	**0.09**	**0.04**	**0.02**
Car Commuter	*-0.05*	*0.03*	*0.09*
Employed	**0.08**	**0.04**	**0.03**
Student	NS		
Income			
Under $35K	base		
$35-$100K	**-0.12**	**0.03**	**0.00**
Over $100K	**-0.19**	**0.04**	**0.00**
Educational Attainment			
High school or less	base		
Some college or technical school	NS		
Bachelor's degree or higher	**-0.06**	**0.03**	**0.04**
Age Category			
18-39	base		
40-59	**-0.08**	**0.03**	**0.00**
60+	**-0.20**	**0.03**	**0.00**
Children	*0.05*	*0.03*	*0.09*
Female	NS		
Live Alone	*-0.05*	*0.03*	*0.07*
Black	**0.17**	**0.03**	**0.00**
Hispanic	**0.08**	**0.03**	**0.01**
Observations	1,890		

Notes: Model also controlled for first digit zip code region. Bold font indicates statistical significance (p-value<0.05). Italic font indicates marginal statistical significance (0.05<p-value<0.1). NS indicates “Not Significant.”

Table A4 Marginal Effects, Always Using a Car for Car Owners, Weighted

VARIABLE	MARGINAL EFFECT	STANDARD ERROR	P-VALUE
Lived Car-Free	**-0.11**	**0.02**	**0.00**
One Car HH	**-0.11**	**0.02**	**0.00**
Environmentalist	**-0.05**	**0.02**	**0.04**
Community Oriented	**-0.10**	**0.02**	**0.00**
Adaptable to Change	NS		
Urban NH	**-0.06**	**0.02**	**0.01**
# Local Amenities (x10)	**-0.14**	**0.04**	**0.00**
Car Commuter	**0.15**	**0.03**	**0.00**
Employed	**-0.11**	**0.03**	**0.00**
Student Status	**-0.17**	**0.04**	**0.00**
Income			
Under $35K	base		
$35-$100K	NS		
Over $100K	NS		
Educational Attainment			
High school or less	base		
Some college or technical school	*0.06*	*0.03*	*0.06*
Bachelor's degree or higher	NS		
Age Category			
18-39	base		
40-59	**0.11**	**0.03**	**0.00**
60+	**0.17**	**0.03**	**0.00**
Children	NS		
Female	**0.15**	**0.02**	**0.00**
Live Alone	NS		
Black	NS		
Hispanic	NS		
Observations	1,890		

Notes: Model also controlled for first digit zip code region. Bold font indicates statistical significance (p-value<0.05). Italic font indicates marginal statistical significance (0.05<p-value<0.1). NS indicates “Not Significant.”

Table A5 Marginal Effects, Zero-Car Household Model, Weighted

VARIABLE	MARGINAL EFFECT	STANDARD ERROR	P-VALUE
Environmentalist	NS		
Community Oriented	**-0.02**	**0.01**	**0.03**
Adaptable to Change	NS		
Urban NH	**0.06**	**0.01**	**0.00**
# Local Amenities (x10)	*0.04*	*0.02*	*0.06*
Employed	**-0.03**	**0.01**	**0.00**
Student Status	**-0.03**	**0.01**	**0.03**
Income			
Under $35K	base		
$35-$100K	**-0.10**	**0.02**	**0.00**
Over $100K	**-0.12**	**0.02**	**0.00**
Educational Attainment			
High school or less	base		
Some college or technical school	NS		
Bachelor's degree or higher	NS		
Age Category			
18-39	base		
40-59	NS		
60+	**-0.04**	**0.01**	**0.01**
Children	**-0.04**	**0.01**	**0.00**
Female	**0.02**	**0.01**	**0.02**
Live Alone	**0.07**	**0.01**	**0.00**
Black	NS		
Hispanic	NS		
Observations	2,154		

Notes: Model also controlled for first digit zip code region. Bold font indicates statistical significance (p-value<0.05). Italic font indicates marginal statistical significance (0.05<p-value<0.1). NS indicates "Not Significant."