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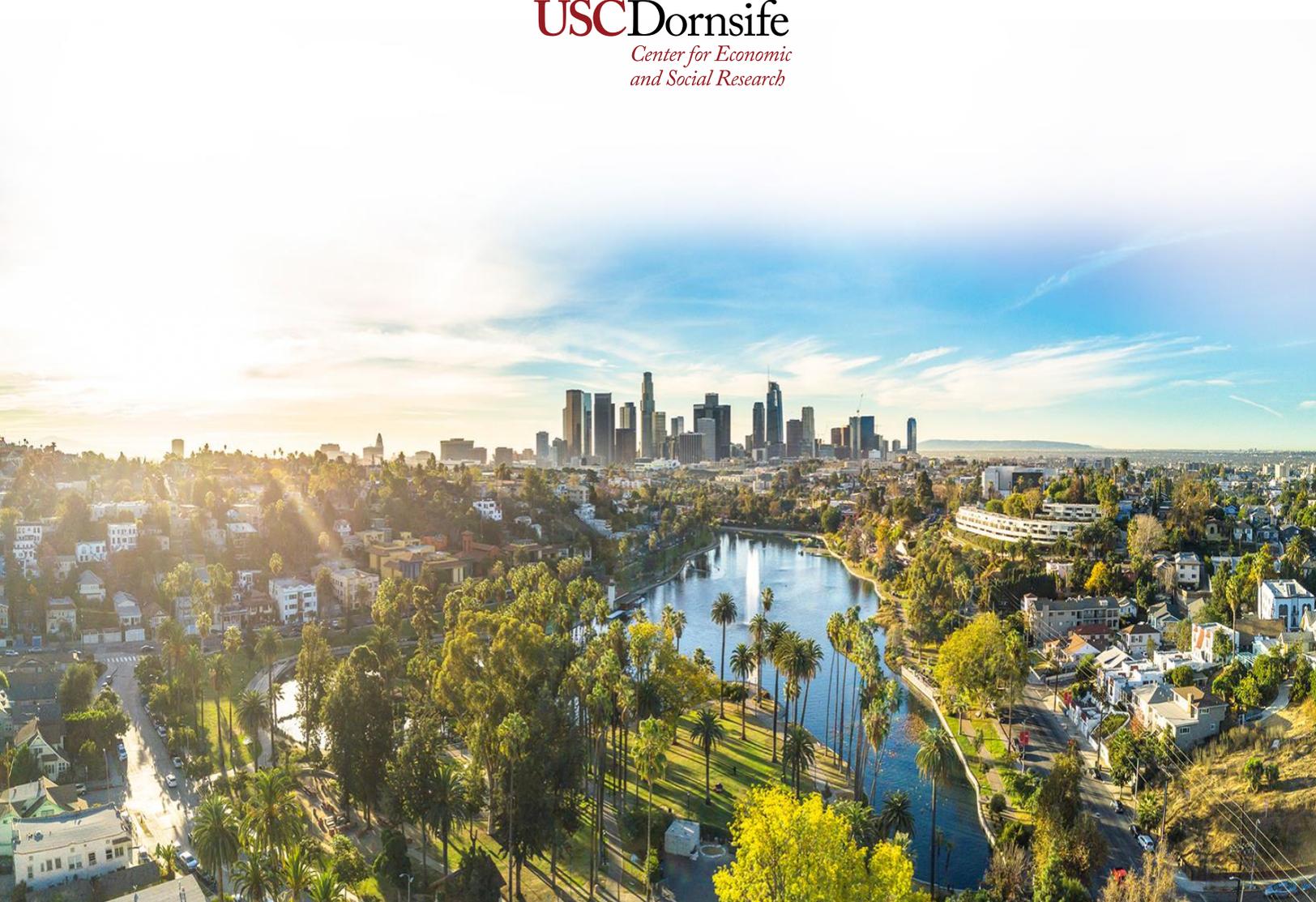
LA Barometer



The Mobility Report

Release Date: February 19, 2020

USC Dornsife
*Center for Economic
and Social Research*



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EXECUTIVE SUMMARY

The mobility landscape in Los Angeles has changed significantly over the past ten years. On the one hand, alternatives to car ownership are increasingly plentiful, given the growing popularity of ride-hailing and massive investments in local public transit. On the other, traffic congestion continues to grow and public transit ridership is on the decline.

Many transit organizations in L.A. seem to agree on the same goal: to increase mobility while effectively and equitably reducing traffic congestion. In a county as sprawling as Los Angeles, however, reaching that goal requires a more nuanced understanding of how L.A. residents use the diverse transit options available to them and how their travel behaviors are shaped by their individual circumstances, attitudes, and environments.

The goal of this Mobility Report – the second in our annual series of USC Dornsife-Union Bank LABarometer surveys – is to bring much-needed data and insight to the evolving mobility landscape in our nation’s most populous and congested county.

LABarometer is a quarterly, internet-based survey of approximately 1,800 L.A. County residents, designed and administered by the Dornsife Center for Economic and Social Research at the University of Southern California. It is the first survey of its kind to regularly engage with the same group of L.A. County residents over time, tracking how individual lives change in the face of L.A.’s dynamic environment.

LABarometer is made possible by the generous financial support of Union Bank.

Each year, the LABarometer Mobility survey will assess residents’ transportation behaviors, experiences, and attitudes, especially as they relate to county-wide efforts to reduce automobile congestion and increase the use of alternative transportation modes. This year’s survey covers a number of topics, from personal car ownership and car use, to public perceptions of public transit and electric scooters, to the relationship between ride-hailing and public transit, and the social conditions and attitudes that facilitate the use of alternatives to the personal car.

In our review of the results, we find that the personal car remains, by far, the most dominant mode of transportation in Los Angeles County. Ninety-percent of residents report having used a personal car at least once in the last year to travel around L.A. – twice the percentage of residents who used any other mode. Ninety-three percent of households currently own or lease a car in working condition, and 25% report that they are likely to buy or lease a new or used car this year.

The most common substitute for the personal car in L.A. is public transit. Yet our results indicate that public transit still lags far behind the personal car in how widely and frequently it is used. Only 35% of residents report having used some form of public transportation at least once last year. Among those who use Metro light rail or subway, the vast majority are occasional users – 67% report using the Metro less than one day per week, most commonly for social or leisure activities. Bus users, in contrast, are more likely to be moderate or high frequency users who use the bus for daily necessities like work or school. The bus, however, is still not used with the regularity that the personal car is used.

So why don't more Angelenos use public transit? Competition from ride-hailing does not appear to be the reason, as our survey shows that residents who ride-hail are significantly more likely to have used public transit than those who do not. In fact, the most frequent users of ride-hailing – lower-income residents – are also the most frequent users of public transit.

Instead, our results point to infrastructure and public perception as hurdles that dissuade public transit use. Compared to the personal car, public transit is perceived by residents as a considerably less safe, less convenient, and less enjoyable way to move around the County. In turn, our analyses suggest that these relatively negative perceptions of public transit may constitute a barrier to use, as they are associated with a reduction in the likelihood of using public transit.

That said, both public transit users and non-users share many of the same concerns with using the bus and Metro, including the behavior of other riders and a perceived lack of safety. Angelenos feel substantially safer from harassment and crime in their cars than on public transit. Drivers are not, however, safer from accidents. We find that 15% percent of residents were involved in an accident or collision last year, most commonly while driving.

We also find that more travel-related incidents of harassment and assault are happening on our sidewalks than anywhere else, and to women more so than to men. Sixteen percent of women and 5% of men report that they experienced some form of sexual harassment or assault last year while traveling. Seventy-four percent of these respondents were walking during at least one of their experiences; 32% were using the bus.

Convenience ranks high among residents as a concern with public transit as well. Transit time tops the list of issues residents have with the bus and lack of nearby Metro stops tops the list of issues residents have with the Metro.

Notably, e-scooters and e-bikes are not yet the first/last mile solution some hope they will someday be. Only 6% of the population used an e-scooter or e-bike last year, often less than one day a week, and many users are young, single men living in urban areas.

To what extent do safety and convenience concerns discourage public transit use in L.A.? When we examine the individual attitudes and circumstances associated with increased public transit use, we find that proximity to a bus stop and lack of access to parking encourage occasional bus use, while convenience for work or school encourages high frequency use. In the case of the Metro, perceptions of safety and convenience for personal or leisure activities seem to encourage occasional use, while convenience for work or school is, once again, central to high frequency use.

In sum, our results suggest that a number of improvements may make public transit ridership more attractive to Angelenos. First of all, travel time and convenience are important, so adding more routes and stops that are convenient both to places of residence and to places of work and play appear a necessary condition for increasing ridership. A second important dimension is related to the perception or reality of safety, cleanliness, and the behavior of other passengers on buses and trains.

DATA AND METHODS

Sample Information

A total of 1,394 Los Angeles County residents participated in the Mobility Survey from December 11, 2019, through February 7, 2020. Participants were recruited from LABarometer’s survey panel of 1,821 adults living in randomly selected households throughout Los Angeles County, described in greater detail in the Appendix. The participation rate for the survey was 77%. The overall margin of sampling error[†] is 2.6 percentage points.

The table below summarizes select characteristics of our Los Angeles County sample, with and without survey weights.

Select Sample Characteristics		
Fraction of	LA (n=1,394)	
	Unweighted	Weighted
Males	38%	49%
NH Whites	29%	27%
NH Blacks	8%	8%
NH Other	17%	17%
Hispanics	46%	48%
College Graduates	42%	31%
Age 18-34	37%	34%
Age 35-44	21%	18%
Age 45-54	16%	18%
Age 55-64	14%	15%
Age 65+	12%	16%

We calculate weights in two stages: (1) base weights account for the probabilities of selection in our sampling procedures, and (2) post-stratification weights align survey distributions to population benchmarks. Population benchmarks for L.A. County were obtained from the American Community Survey. The weighted statistics in the figure above correspond to the population benchmarks.

[†] Survey Error

Factors other than sampling error, including question wording, question order, interviewing mode (e.g. telephone vs. probability-based panels such as UAS), population coverage, and impact

of current events, may affect the results of any survey. The margin of sampling error is calculated at the 95% confidence level, using a sample proportion of 0.5 to generate an upper bound of uncertainty. Please note that this is only an approximate measure of error. A more precise measure would require upper and lower bounds to be calculated for each individual question or outcome.

Survey Information

The Mobility Survey (UAS 219) took an average of 19 minutes to complete. Respondents participated via computer, mobile device or tablet, at any time of day or night during the field period. The data, codebooks, and questionnaires associated with the survey are available at <https://uasdata.usc.edu/survey/UAS+219>.

Analysis

The summary statistics included in this report are based on weighted data. Multivariate statistical analyses were conducted using unweighted data and the following demographic controls: gender, age, education, income, race, ethnicity, an indicator for being born in the U.S., marital status, employment status, and residential urbanicity. Statistical tests and regression models are not included in this report, but they are available upon request. Throughout the text, we identify effects that are statistically significant at a confidence level of 95%.

This report and links to the data archive are available at <https://cesr.usc.edu/labarometer>.
For questions about the survey, contact us at labarometer-l@usc.edu.

The USC Dornsife Center for Economic and Social Research is a proud member of the American Association for Public Opinion Research's [Transparency Initiative](#).

LABarometer is funded by Union Bank

SURVEY RESULTS

How Angelenos Travel

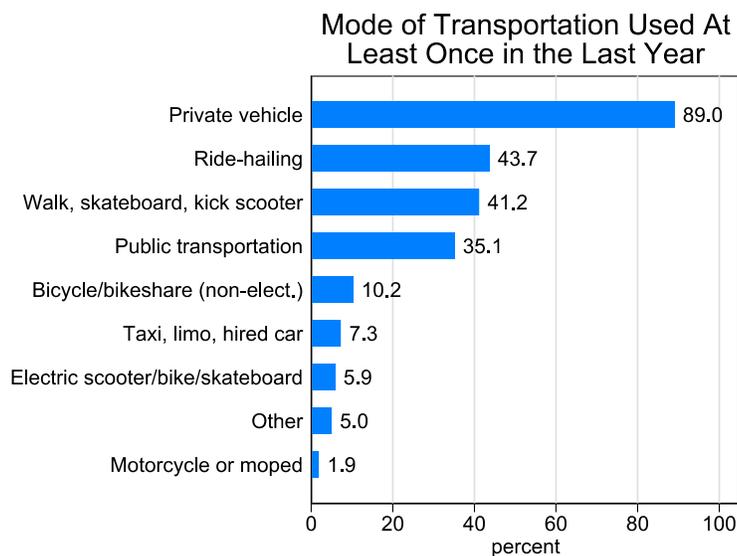
Takeaway #1: The personal car is, by far, the most dominant mode of transportation in L.A. County.

- ◆ **The personal car is the most widely-used mode of transportation, followed by ride-hailing and walking.**

To assess transportation behaviors in L.A. County, we asked respondents if they had used any of the following modes of transportation, over the last year, to go to places in or around Los Angeles County: private vehicle; ride-hailing service; taxi, limo, or hired car service; public transportation; walk, skateboard, or kick scooter; bicycle or bikeshare (non-electric); electric scooter, electric bike, or electric skateboard; motorcycle or moped; other.

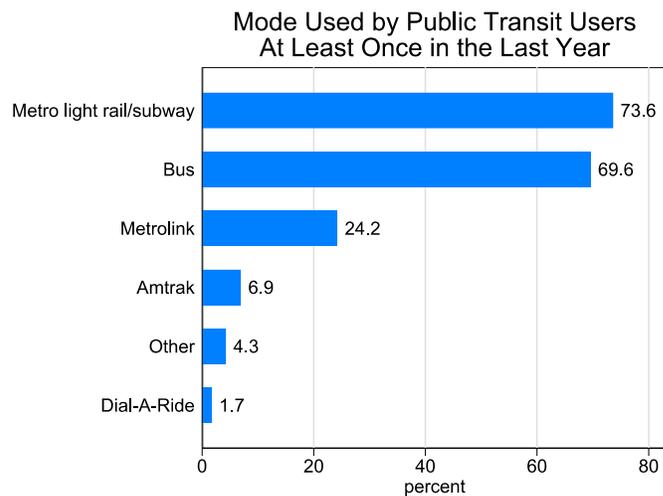
Respondents were asked to exclude any trips that were made to transport people or goods for pay, as we are interested in understanding transportation decisions not mandated by employers. Please note that this measure of transportation use does not take into account frequency of use or vehicle miles traveled.

Our results indicate that, by this measure, the personal vehicle is the most widely-used mode of transportation in L.A. County. Eighty-nine percent of residents report that they used a personal vehicle at least once in the last year – twice the percentage of residents who used any other mode of transportation.



Currently, the most common alternatives to the personal vehicle are ride-hailing, walking, and public transportation. Forty-four percent of residents report having used a ride-hailing service at least once in the last year, though usage varies significantly across demographic groups. Residents who are non-Hispanic white, single, socioeconomically advantaged, or living in the city are significantly more likely than those who are non-white, married, socioeconomically disadvantaged, and living outside the city to have used ride-hailing.

35% of residents report using public transportation at least once in the last year. According to the figure below, about 70% of these public transit users took the bus or the Metro light rail/subway to travel around L.A.; 24% used Metrolink.



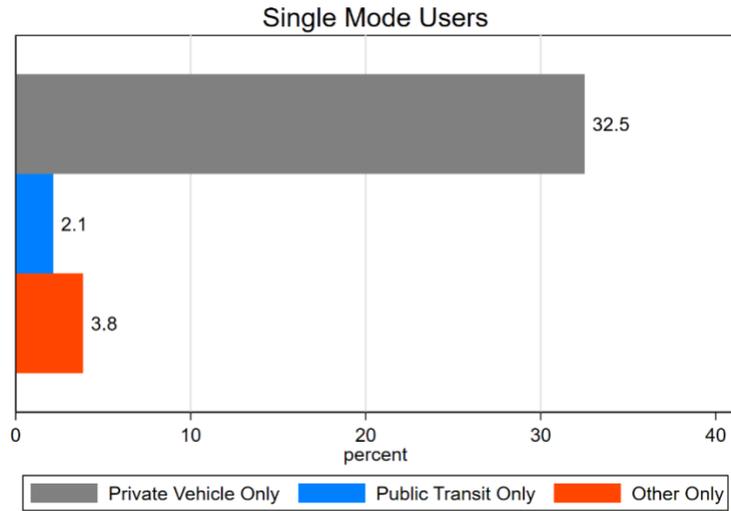
When we examine levels of public transit use across demographic groups, we find that residents who are Black, single, college-educated, or living in the city are more likely than residents who are non-Hispanic White, married, non-college-educated, and living outside the city to be public transit users.

We also find that residents who are Black or Hispanic, lower-income, and not working are more likely to use the bus than any other form of public transportation. Plausibly, these groups are less likely to have access to a working car and the bus, as we will see later, tends to be more commonly used for daily necessities than any other mode of public transport. Among public transit users, we do not find any demographic characteristics to be uniquely associated with Metro light rail use.

◆ **33% of residents relied solely on a personal car to travel around L.A. last year.**

When we examine the percentage of residents who report relying on only *one* mode of transportation to travel around L.A., we find that 33% of residents relied solely on a personal vehicle, compared 2% who relied solely on public transportation. All other transportation modes, including ride-hailing, walking, electric scooters, etc., are grouped into an “other”

category because fewer than 1% of residents indicate that they relied solely on one of those modes.



The likelihood of relying solely on a personal vehicle to travel around L.A. County varies significantly across demographic groups. Residents who are married, age 60+, or Asian-American are significantly more likely than residents who are single, under 60, and non-Hispanic White to report that they relied solely on a car in the last year. Residents who are middle-income, lower-educated, and/or live outside the City of Los Angeles are also more likely to rely solely on a car than lower-income residents, college-educated residents, and residents living in the city.

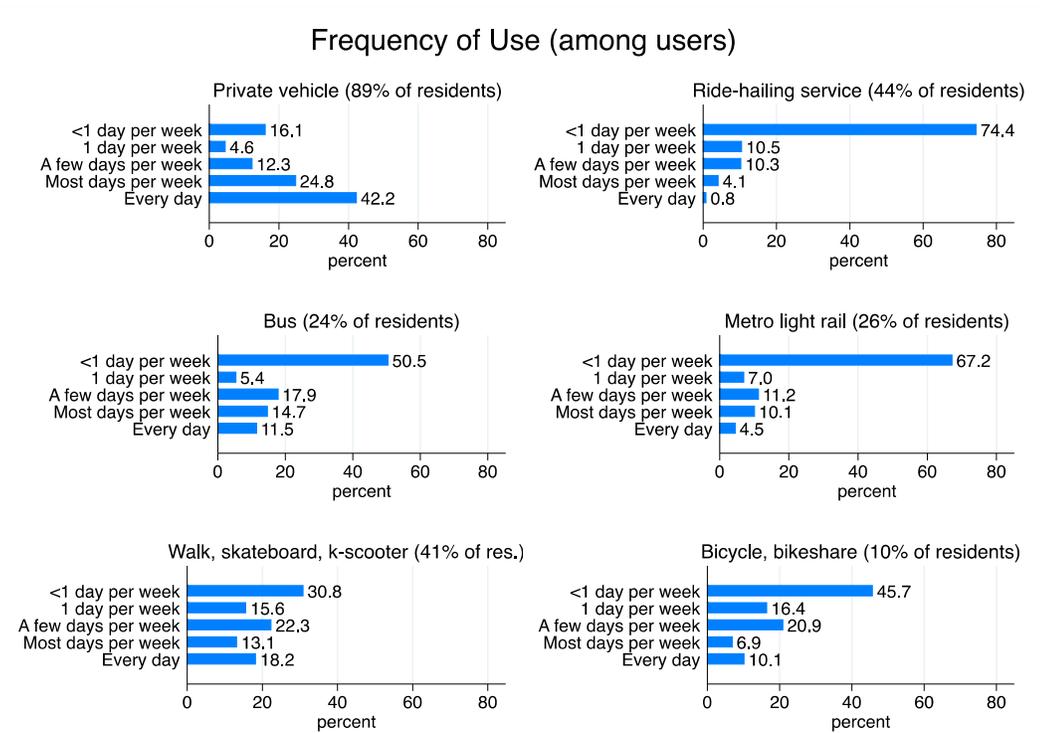
Altogether, these results suggest that families, seniors, Asian-Americans, middle-class residents, and non-city dwellers are perhaps the least satisfied with the quality or accessibility of alternatives to the personal car in L.A.

- ◆ **Of the six most widely-used travel modes, the personal car is used with the highest frequency, while ride-hailing and Metro light-rail are used with the lowest frequency.**

A closer look at the frequency with which residents report using different modes of transportation in a typical month reveals that the personal vehicle is both the most widely-used *and* the most frequently-used mode of transportation in L.A. Two-thirds of residents report using a car most days a week or every day in a typical month. Again, it is important to note that this frequency measure does not take into account vehicle miles traveled.

Frequency of car use is significantly associated with employment status. Working Angelenos report using a car with a much higher frequency than Angelenos who are unemployed, retired, or in school.

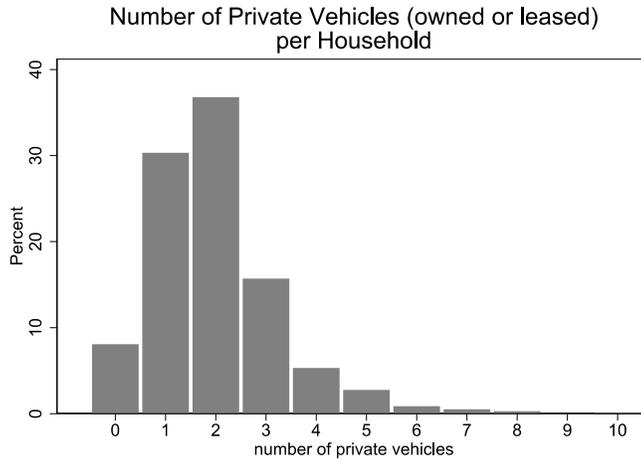
Ride-hailing, in contrast, is the second most widely-used travel mode in L.A. County but one of the *least frequently* used modes. Seventy-four percent of the residents who use ride-hailing services use them less than one day per week.



It is also notable that Metro light-rail is used with a substantially lower frequency than the bus. The vast majority of Metro users are occasional users – 67% use the Metro less than one day per week in a typical month – compared to 51% of bus users who use the bus less than one day per week. Relative to Metro users, bus users are far more likely to be moderate or high frequency users – 26% of bus users report that they use the bus most days a week or every day.

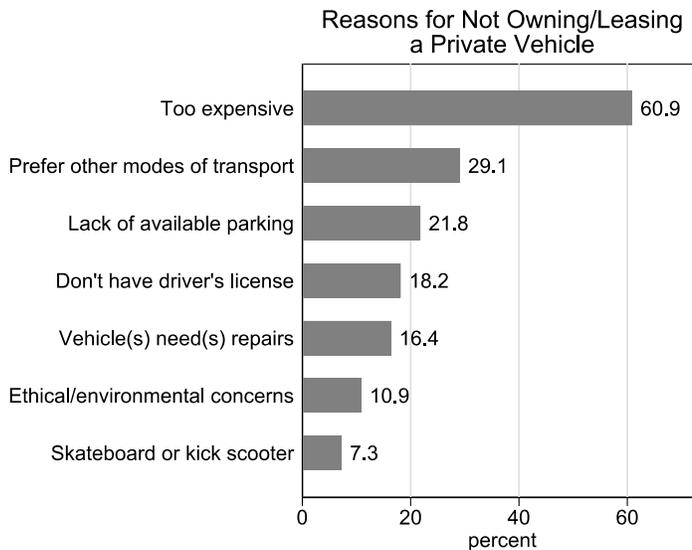
- ◆ **93% of residents have least one car in working condition, and 25% are likely to buy or lease a new car this year.**

The widespread use of cars in L.A. County coincides with widespread access to cars. Ninety-three percent of residents report that they currently own or lease at least one personal vehicle in working condition. The average and median number of personal vehicles owned or leased by a household in L.A. County is two.



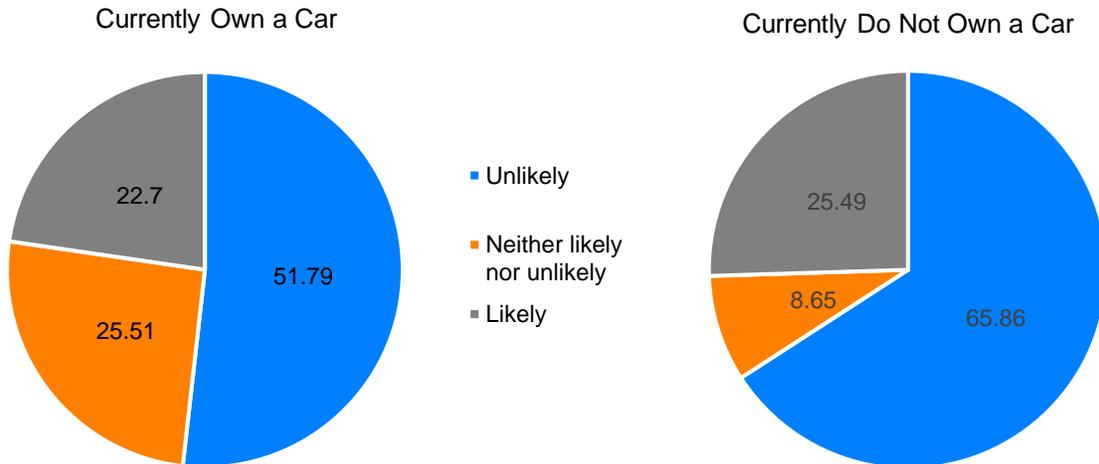
Car ownership numbers vary significantly across demographic groups. Controlling for demographic factors like income, race, education, being born in the U.S., and residential location, we observe a number of differences. African-Americans tend to own/lease fewer cars than non-Hispanic Whites, while Hispanics tend to own/lease a higher number of cars than non-Hispanic Whites. Married and higher-income residents also tend to own/ lease more cars than non-married and lower-income residents, while higher-educated residents tend to own/lease fewer cars than lower-educated residents, regardless of income. All of these differences are statistically significant.

We asked residents who do not own or lease a personal vehicle to select from a list of potential reasons why. Cost tops the list of reasons selected for not owning a car, followed by a preference for alternative modes and a lack of parking availability.



Our survey also suggests that car ownership is unlikely to decline anytime soon. Twenty-five percent of residents who currently own or lease a car report that they are somewhat to very likely to buy or lease a new car in the next year. Twenty-three percent of residents who do *not* currently own or lease a car also report that they are somewhat to very likely to buy or lease a new car in the next year. Interestingly, car purchase/lease plans are uncorrelated with residents' demographic characteristics, including their income.

% Likelihood of Buying or Leasing a New or Use Car in the Next Year



A Closer Look at Public Transit

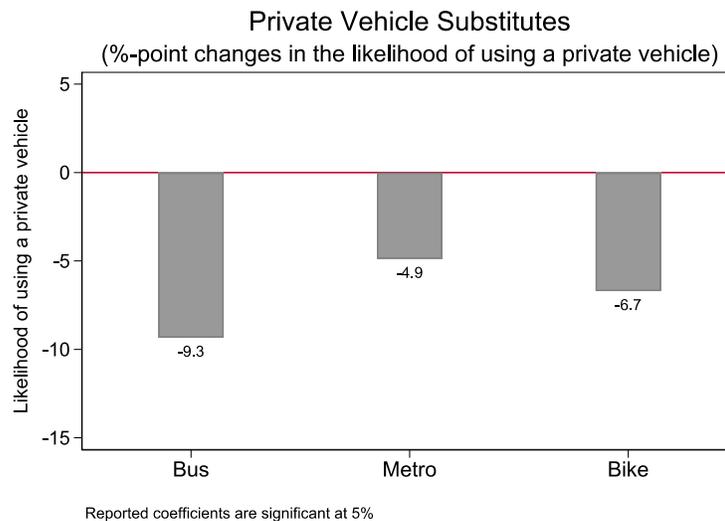
Takeaway #2: The most common substitute for the personal car is public transit – the bus more so than the Metro – but the gap in usage is still substantial.

- ◆ **People who use the bus, Metro light-rail, or bicycle to get around L.A. County are less likely than others to use a personal car.**

To identify the most common substitutes for the personal car, we examine the correlation between use of a personal vehicle in the last year and use of alternative transportation modes. We control for demographic characteristics that might also be correlated with transit behavior. We consider a mode of transportation a substitute for a car if having used that mode of transportation at least once in the last year makes a person less likely to have used a private vehicle at least once in the last year to travel around L.A.

The graph below shows that using the bus, Metro light rail/subway, or a bicycle/bikeshare makes a person less likely to have used a personal vehicle in the last year. For example, using

the bus is associated with a 9.3 percentage-point decrease in one’s likelihood of using a personal vehicle. Using Metro light rail is associated with a 4.9 percentage-point decrease in one’s likelihood of using a personal vehicle. Using a bicycle or bikeshare is associated with a 6.7 percentage-point decrease in one’s likelihood of using a personal vehicle.



Bus use has the strongest negative association with use of a personal vehicle. The negative effect of bus use on use of a private vehicle is nearly twice as large as the effect of Metro use. This aligns with our previous finding that the bus is one of the more widely- and frequently-used alternatives to the personal car in L.A.

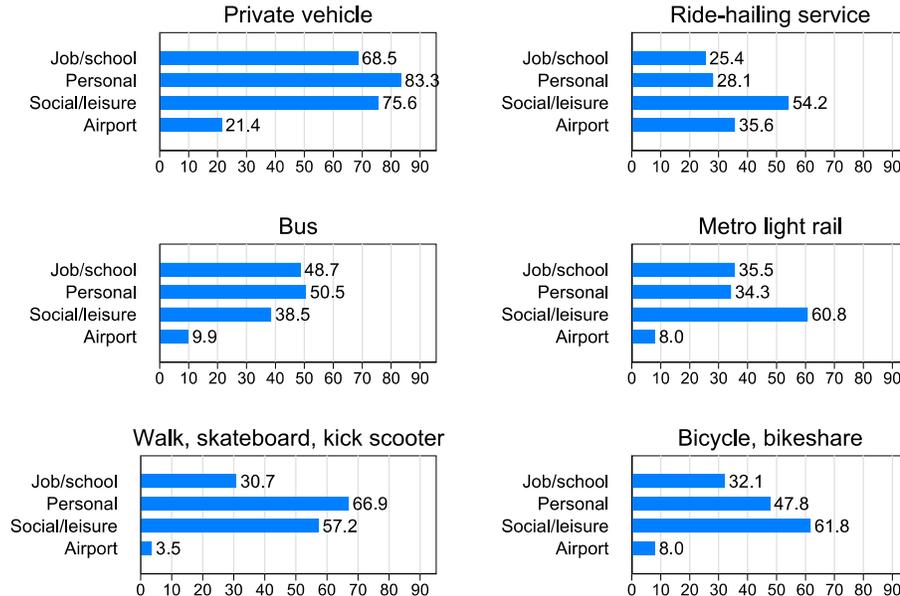
Notably, we find that use of ride-hailing services is not significantly associated with a reduction in use of a personal vehicle.

- ◆ **Like the personal car, the bus tends to be an all-purpose mode, while the Metro – like ride-hailing – is most commonly used for social activities.**

To better understand why residents use different transportation modes at different frequencies, we asked residents to indicate the different types of activities for which they use different modes. As the graph below shows, the bus tends to be used for a variety of purposes. After the personal car, it is the most likely to be used for work or school activities. However, the bus is less likely than other modes to be used for social/leisure activities.

In contrast, Metro light-rail and ride-hailing are less likely to be used for daily activities like work but more likely to be used for social/leisure activities. This difference in the purposes for which the bus, Metro, and ride-hailing are used likely explains the differing frequencies with which they are used, as job or school related activities tend to occur with greater frequency than social/leisure activities.

Purpose of Use (among users)



Another notable pattern in this figure is that residents rely heavily on cars for transportation to the airport. Twenty-one percent of personal car users and 36% of ride-hail users report using these modes to get to or from the airport, while 8-9% of public transit users are using public transit for airport trips. A part of the explanation for this is likely that car and ride-hail users are generally financially better off than public transit users and therefore more likely to fly.

◆ Most residents live within walking distance of a useful bus stop but not a useful Metro stop.

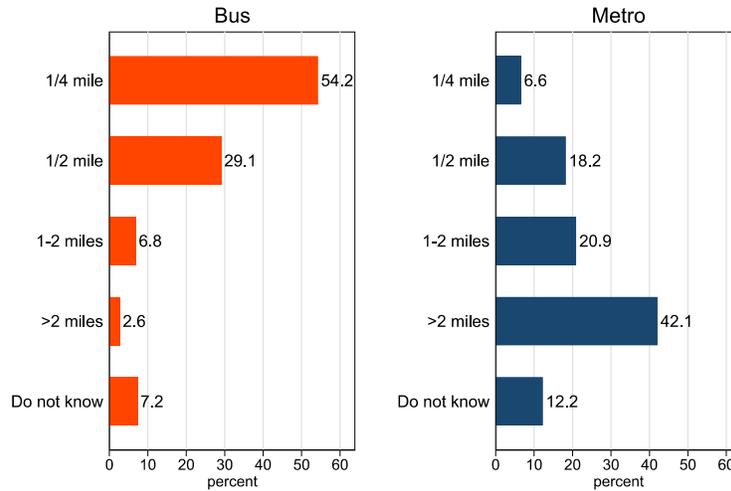
Why are Angelenos more likely to use the bus than the Metro? A part of the explanation is likely that bus stops are more accessible to residents than Metro stops. When we ask residents to report how far their home is from the nearest, useful bus stop and the nearest, useful Metro stop, 83% of residents report that they live within half a mile of a useful bus stop. In contrast, 25% of residents report that they live within half a mile of a Metro stop. Research shows that half a mile (which equates to a 10-15 minute walk) is the median distance that people will generally walk.¹

Notably, 12% of residents indicate that they do not know their distance to the nearest useful Metro stop, while 7% of residents do not know their distance to the nearest useful bus stop. Later in this report, we find that simply knowing where the closest public transit stop is –

¹ Yang, Yong and Ana V. Diez-Roux. 2012. "Walking Distance by Trip Purpose and Population Subgroups." *American Journal of Preventive Medicine* 43(1): 11-19.

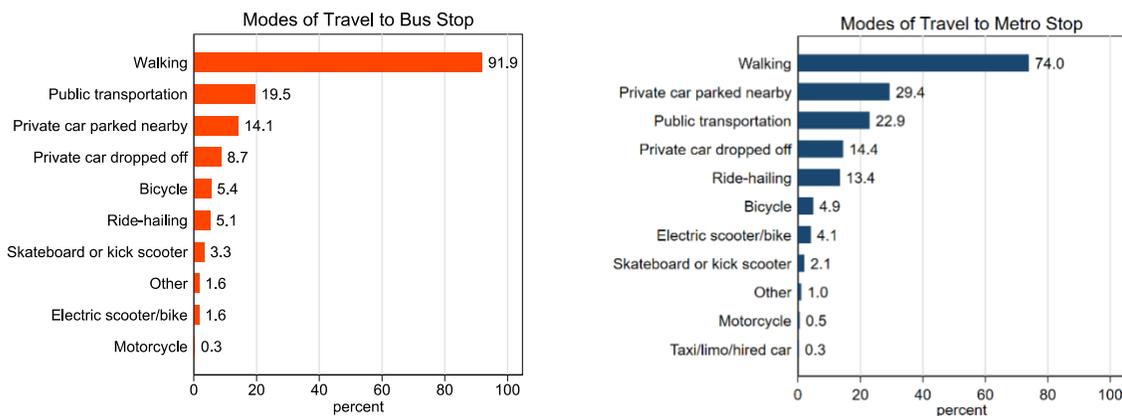
regardless of how far away it is – is associated with a significant increase in one’s likelihood of using public transit.

Distance of Home from Useful Stop/Station



Just as we find that a higher percentage of residents report living within half a mile of a useful bus stop than a useful Metro stop, our results indicate that walking is a more common mode of getting to and from bus stops than getting to and from Metro stops.

That said, while about 25% of residents report living within a half mile of a Metro stop, 70% of Metro users report walking to get to and/or from Metro stops. This suggests that a high proportion of Metro users live or spend their time in neighborhoods clustered around Metro stations.



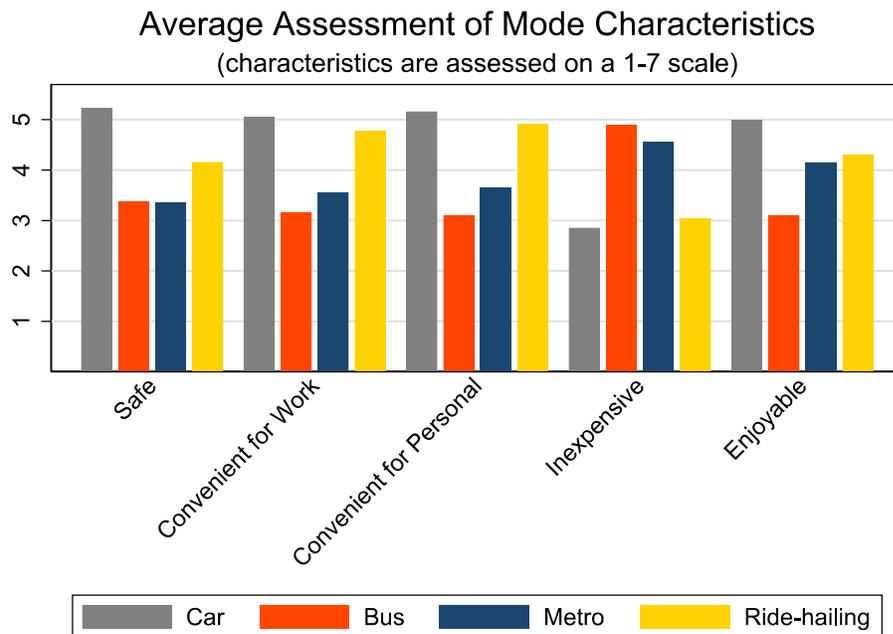
Notably, ride-hailing and driving are a more common mode of traveling to Metro stops than bus stops, likely because Metro stops tend to be more sparse than bus stops.

Takeaway #3: Public transportation has multiple perception problems in L.A. County, especially around safety and convenience.

- ◆ **Public transit is perceived as less safe, less convenient, and less enjoyable than the personal vehicle and ride-hailing.**

To better understand the relationship between public perception and transportation use, we first asked residents to rate, on a scale 1 to 7, the personal car, bus, Metro light-rail, and ride-hailing on a number of dimensions, including safety, convenience for work or school related trips, convenience for personal or leisure trips, cost, and enjoyment.

Overall, we find that the personal car ranks highest on all dimensions except cost, the one dimension where public transit is viewed more favorably. The Metro is perceived as slightly more convenient and enjoyable to ride than the bus. This suggests that perceptions of convenience are shaped by more than proximity to a stop, as the figure on the previous page showed that bus stops are proximate to a higher percentage of residents than Metro stops. Compared to the personal car, ride-hailing is perceived as similarly convenient for work and personal trips but less safe and less enjoyable to ride.



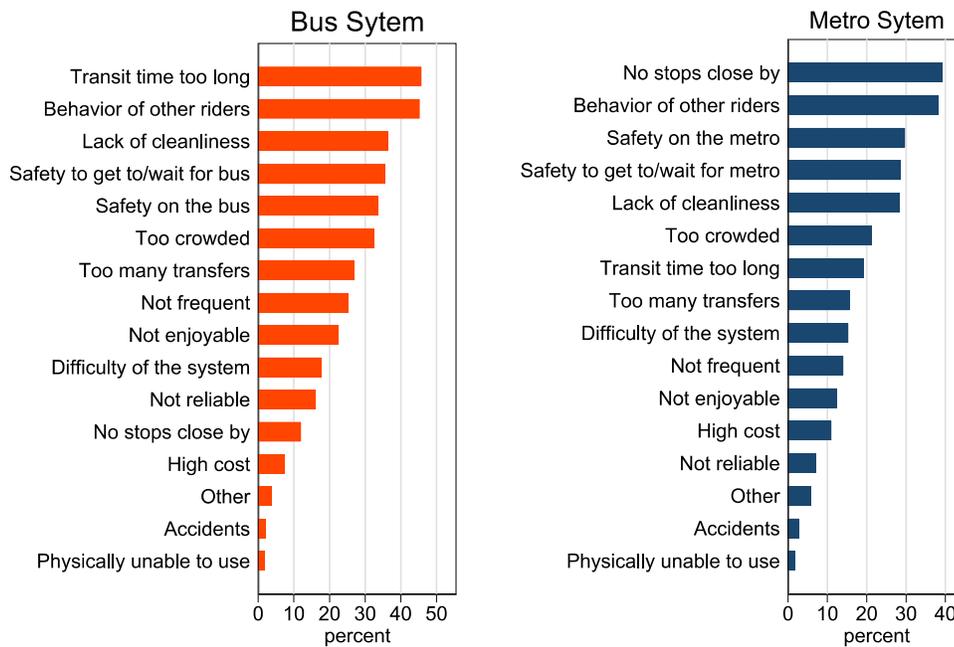
Perceptions of bus, Metro, and ride-hailing safety vary significantly by gender, age, and use. Men, public transit or ride-hailing users, and older residents tend to perceive each mode as safer than women, non-users, and younger residents. College-educated residents tend to perceive the Metro and ride-hailing as safer than non-college-educated residents.

Additionally, native-born residents tend to perceive the bus as safer than foreign-born residents.

- ◆ **One of the most commonly reported issues residents have with public transit is the behavior of other riders. Other issues include lengthy bus rides, too few Metro stops, and personal safety.**

In addition to asking residents to rate the bus and Metro on a number of dimensions, we asked residents to identify their top five concerns with using the bus and Metro. According to our results, one of the most commonly reported concerns both public transit users and non-users have with using the bus and the Metro is the behavior of other riders.

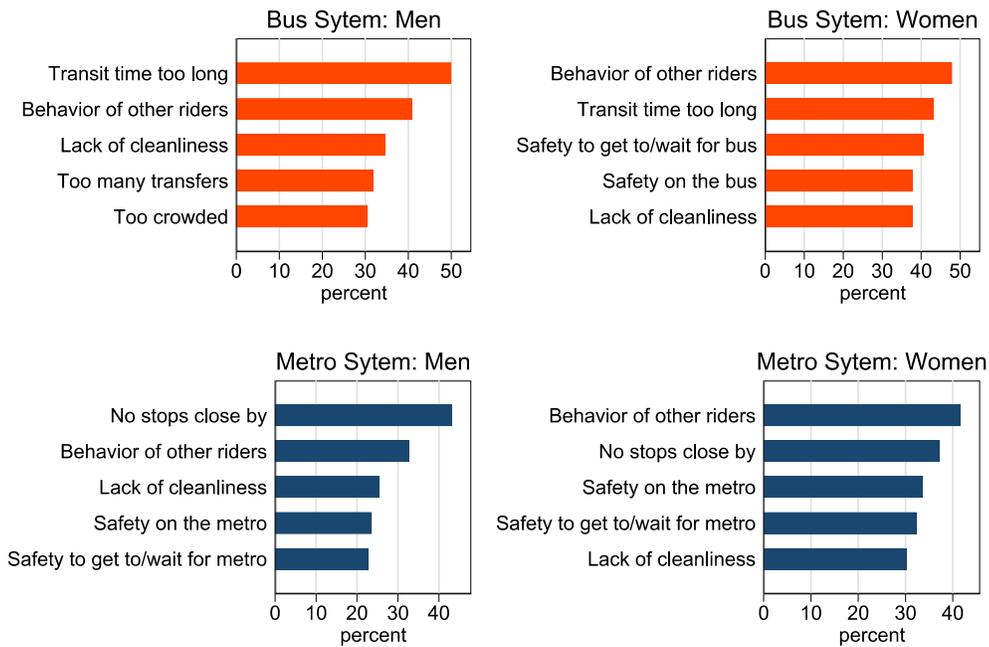
Concerns and Issues with Using the Bus/Metro System



Other frequently-cited concerns relate to cleanliness and convenience, though convenience concerns differ for bus and Metro systems. Transit time tops the list of concerns residents have with the bus while lack of nearby Metro stops tops the list as a concern with the Metro. This suggests that bus and Metro systems require different infrastructure changes to improve convenience for passengers.

According to our results, safety also ranks relatively high as both a bus and Metro concern, though safety concerns do vary in the frequency with which they are cited by women versus men. Women are significantly more likely than men to select lack of safety as a top 5 issue with getting to, waiting for, or riding both the bus and the Metro.

Top 5 Issues with Using the Bus/Metro System by Gender



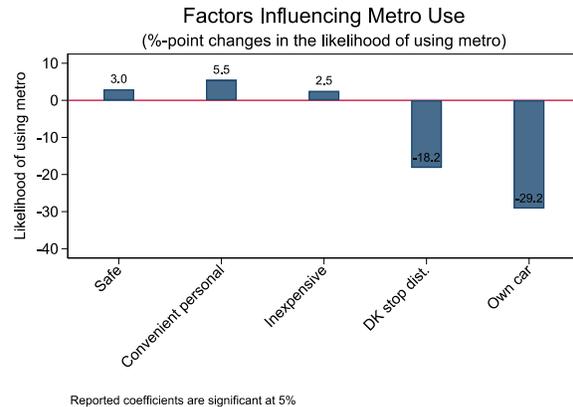
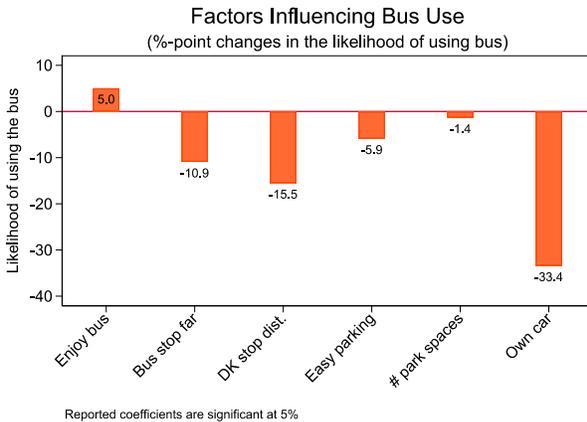
When we look at the top five concerns listed above by men and women, we see that, for both men and women, safety is a top 5 concern with using the Metro. When it comes to the bus, however, safety makes it into the top 5 concerns cited by women but not the top 5 cited by men.

Takeaway #4: Necessity, proximity, and perceptions of safety and cost are key factors associated with public transit use.

Do concerns about safety and convenience discourage public transit use in L.A.? To better understand how attitudes, individual circumstances, and neighborhood context shape the transportation behaviors of L.A. residents, we use statistical modeling techniques to measure the positive and negative correlates of bus and Metro use.

We include the following perceptual and contextual factors in our statistical models: perceived safety, perceived convenience for personal trips, perceived convenience for work or school trips, perceived cost, perceived enjoyment, distance of home to a useful bus or Metro stop, car ownership, street parking availability in neighborhood, number of parking spots at home, residential location, as well as a host of demographic characteristics.

The main results of our analyses for bus use and Metro use are outlined in the figures below. Only statistically significant associations are reported. Our results indicate that there are similarities as well as differences in the factors that matter for bus versus Metro use.



- ◆ **Residents are more likely to use the bus if they know of and live near a useful stop, but they are not more likely to use the Metro.**

According to our results (shown above), residents who report living far from a useful bus stop – defined as greater than half a mile – are 10.9 percentage points less likely to use the bus than residents who report living closer to a useful bus stop.

Knowing whether or not there is a useful bus stop nearby also seems to matter for bus use, as well as Metro use. People who report that they do not know the distance of their residence to a useful bus or Metro stop are 15.5 and 18.2 percentage-points less likely to use the bus and Metro, respectively, at least once.

There are a few potential explanations for this. It may be that public transit use increases transit knowledge – people are more likely to inform themselves about the proximity of their residence to a public transit stop if they plan to use public transit. Alternatively, it could be that transit knowledge increases public transit use – people may be more likely to use public transit if they know where their nearest stop is located. It could also be that residents are more likely to select “Don’t know” if their nearest stop is far away.

Notably, proximity to a Metro stop is not significantly correlated with Metro use. Residents who live near a useful Metro stop are neither more nor less likely to use the Metro than residents who do not live near a useful Metro stop. This may be because Metro lines in L.A. are still relatively sparse and they are used infrequently. Proximity to a Metro stop is only useful to residents if the associated Metro line takes them somewhere they frequently need to go. This will therefore be important to track over time – as L.A.’s Metro system is further developed, the importance of proximity to a Metro stop may grow.

- ◆ **Residents are more likely to use the Metro if they perceive it as safe, convenient for personal or leisure trips, and inexpensive.**

While physical proximity to a useful Metro stop is not significantly correlated with Metro use, perceptions of convenience for personal or leisure trips are significantly and positively correlated with Metro use.

Residents who consider the Metro convenient for personal or leisure trips are more likely to use the Metro at least once than those who do not. Interestingly, perceptions of convenience for work or school have no significant relationship to Metro use. This suggests that personal/leisure convenience matters more for general Metro use than work convenience, which aligns with our previous finding that people who currently use the Metro, use it most commonly for social or leisure activities.

We also find that perceptions of safety and cost are significantly correlated with Metro use but have no relationship to bus use. The safer and less costly residents perceive the Metro to be, the more likely they are to use the Metro, but not the bus. This echoes our previous finding that safety is one of the most frequently cited issues both men and women have with the Metro, even more so than the bus. It also suggests that improvements to the reality or perception of safety on the Metro may play an important role in increasing the attractiveness of the Metro for current non-users.

◆ **Residents are more likely to use the bus and the Metro if they do not own or lease a car or if parking in their neighborhood is difficult.**

The one factor we find to be significantly correlated with both bus use and Metro use is car ownership. Residents who own or lease a car in working condition are significantly less likely to use the bus and the Metro than those who do not own or lease a car. This suggests that necessity encourages public transit use.

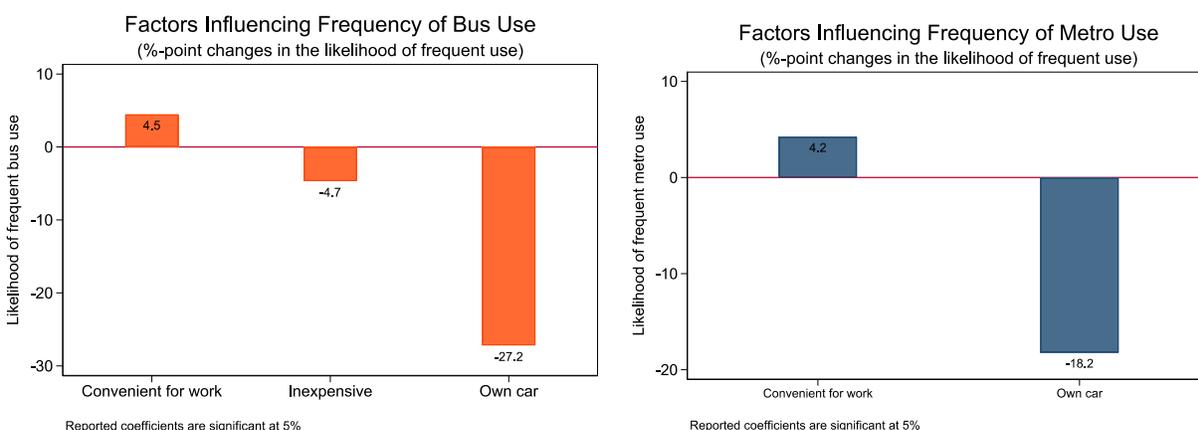
We also find that residents who live in a neighborhood where street parking is difficult are more likely to use the bus than those live in neighborhoods where street parking is easy. It is unclear if this is because lack of access to parking encourages people to use the bus or if the types of people who use the bus are living in neighborhoods where parking is difficult. Over time, we will be able track the relationship between public transit use and access to parking and eventually answer this question.

Takeaway #5: Among users, necessity and convenience for work or school are key factors associated with *frequent* public transit use.

Interestingly, we find that some of the individual circumstances and attitudes that encourage public transit use in general have no relationship to *frequency* of public transit use. In the figure below, we outline the results of our analyses of bus and Metro users, which examine the individual circumstances, attitudes, and contextual factors that are associated with frequent (versus infrequent) bus or Metro use, defined as using the bus or Metro “most days” or “every day” in a typical month, versus “a few days,” “once a week,” or “less than one day per week.”

As in the previous model, we include the following perceptual and contextual factors in our statistical models: perceived safety, perceived convenience for personal trips, perceived convenience for work or school trips, perceived cost, perceived enjoyment, distance of home to a useful bus or Metro stop, car ownership, parking availability in neighborhood, access to free parking at home, residential location, as well as a host of demographic characteristics.

The main results of our analyses are outlined in the figures below. Only statistically significant associations are reported. Our results indicate that there are many similarities in the factors that encourage high, versus low, frequency bus and Metro use.



◆ **Bus users are more likely to frequently use the bus if they perceive it as convenient for work or school and if they do not own or lease a car.**

While physical proximity to a bus stop is significantly correlated with bus use, it is *not* significantly correlated with high frequency use among bus users. Proximity to a stop is not a factor that distinguishes high frequency users from low frequency users, as most bus users live within half a mile of a bus stop. Instead, we find that perceptions of convenience for work or school related trips, perceptions of cost, and access to a car are the primary factors associated with high frequency bus use.

The more convenient for work or school bus users perceive the bus to be, the more likely they are to use the bus with a high frequency. Furthermore, we find that car ownership is associated with a 27.2 percentage-point decrease in the likelihood of frequent bus use.

It is notable that perceived convenience for work or school is more strongly correlated with bus use frequency than perceived convenience for personal or leisure trips. While convenience for leisure activities may get residents on the bus some days, workplace proximity is more likely to get residents on the bus *every day*.

Surprisingly, our results indicate that residents who perceive the bus as inexpensive have a lower likelihood of using the bus than those who perceive it as expensive. This likely reflects the generally lower economic status of public transit users who rely on the bus every day.

- ◆ **Metro users are more likely to use the Metro with a high frequency if they perceive it as convenient for work or school and if they do not own or lease a car.**

Once again, in the case of the Metro, we find that convenience for work or school trips as well as car ownership are the primary factors associated with frequency of Metro use. Perceptions of safety are positively associated with Metro use in general but they are not significantly associated with *frequency* of Metro use. Residents who use the Metro with a high frequency do not differ significantly from residents who use the Metro with a moderate or low frequency in how safe they perceive the Metro to be.

This suggests that perceived safety may be a barrier to Metro use for non-users but it is not a barrier to higher frequency use among residents who already use the Metro. Instead, convenience for daily necessities like work or school appears to be one of the primary factors influencing frequency of Metro use.

A Closer Look at Ride-hailing

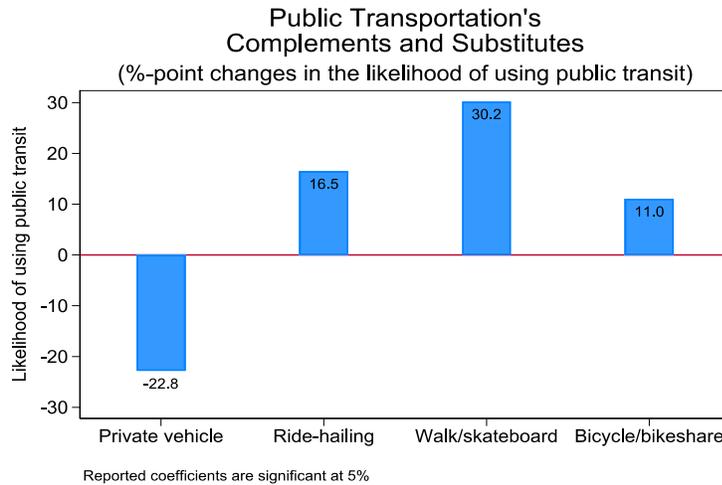
A point of debate in L.A. County is whether ride-hailing services compete with or complement public transit. To shed new light on this issue, we use statistical models to explore the relationship between ride-hailing and public transit use and to identify the individual circumstances associated with ride-hailing use.

Takeaway #6: Ride-hailing complements use of public transit, and is used with the highest frequency by lower-income residents.

- ◆ **Residents who ride-hail are more likely to use public transit than those who do not.**

Thus far, our results have suggested that ride-hailing is not used with a high enough frequency to compete with public transit. Similarly, when we examine the relationship between ride-hailing and public transit use in the last year, controlling for a host of demographic characteristics, we find that ride-hailing is significantly and *positively* correlated with use of public transit.

Residents who report that they used ride-hailing services at least once in the last year are 16.5 percentage points more likely than those who did not use ride-hailing services to report that they used public transit at least once.

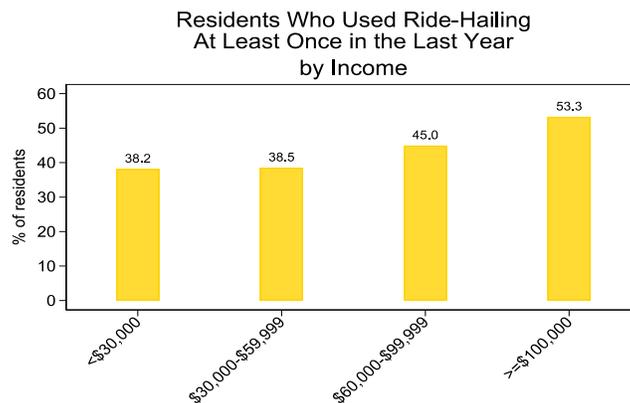


We also find that, among residents who use the bus or the Metro, those who use ride-hailing services with a high frequency (most days or every day) are more likely to use the bus and Metro with a high frequency. Altogether, these findings suggest that ride-hailing services do not reduce public transit ridership in L.A. County.

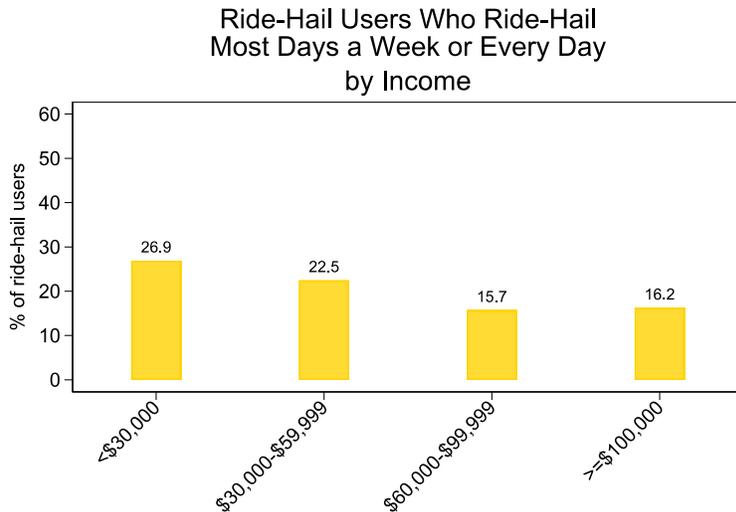
How residents string together ride-hailing and public transit trips is unclear from our survey and would require more detailed travel diary data. We know that 5% of residents report using ride-hailing to travel to or from a bus stop and 13% of residents report using ride-hailing to travel to or from a Metro station. This suggests that some residents are using ride-hailing in order to use public transit. Others may rely on public transit for most trips but use ride-hailing as an alternative at certain times or for trips that are not well-covered by public transit.

- ◆ **While higher income residents are more likely to use ride-hailing occasionally, lower income residents who use ride-hailing tend to do so with a higher frequency.**

Regarding the individual circumstances that facilitate ride-hailing use, we find that higher-income residents are more likely to use ride-hailing services than lower-income residents.



Among ride-hail users, however, we find that lower-income residents are, in fact, more likely than higher-income residents to report using ride-hailing services with a *moderate or high frequency*.



In other words, our data suggest that higher-income individuals comprise a higher percentage of occasional ride-hailing users while lower-income residents comprise a higher percentage of frequent ride-hailing users. Lower-income residents are more likely than higher-income residents to use ride-hailing, like public transit, as a substitute for the personal car.

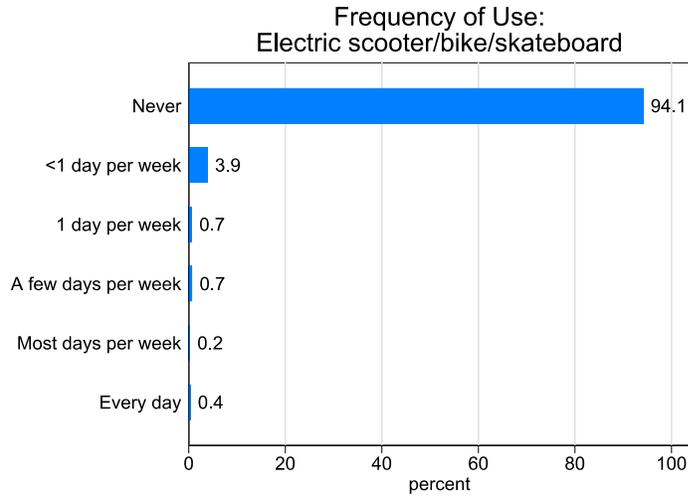
A Closer Look at E-Scooters and E-Bikes

While e-scooters and e-bikes are fairly new to the transportation scene in L.A. County, they have received a lot of attention as a potential first/last mile solution for public transit users. In our survey, we aimed to better understand how widely these micro-mobility solutions are used and how residents feel about their prevalence and accessibility in neighborhoods.

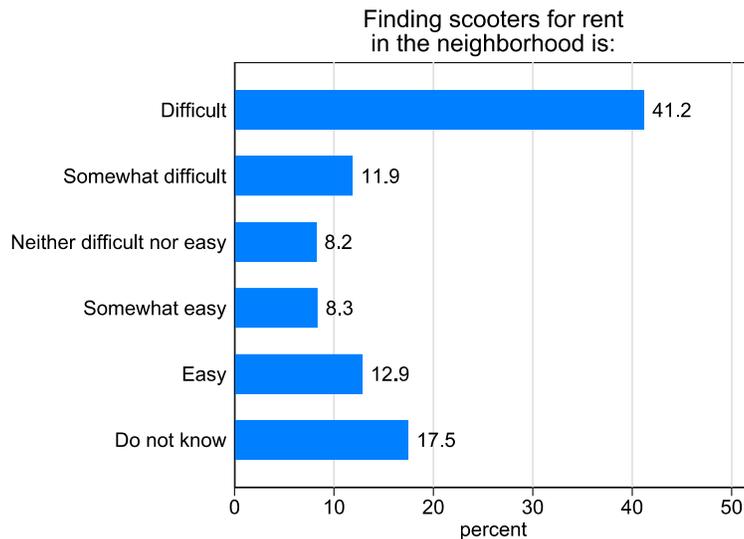
Takeaway #7: E-scooters are not yet commonly used or preferred by most residents.

- ◆ **E-scooters and e-bikes are not very accessible in many neighborhoods and they are rarely used on a frequent basis.**

When asked to report whether or not they used an e-scooter, e-bike, or e-skateboard in the last year to go to places in or around L.A. County, 94% of residents report that they did not use one at all. Of the 6% who did use one at least once, two-thirds report using an e-scooter/e-bike/e-skateboard infrequently – less than one day per week.



Young, single, college-educated men who live in the city are the most common e-scooter/e-bike/e-skateboard users. For comparison, we find that non-electric bicycles/bikeshares are a little more widely used. Men under 60 are the most common users and manual bike/bikeshare use does not vary by education, marital status, or urbanicity.

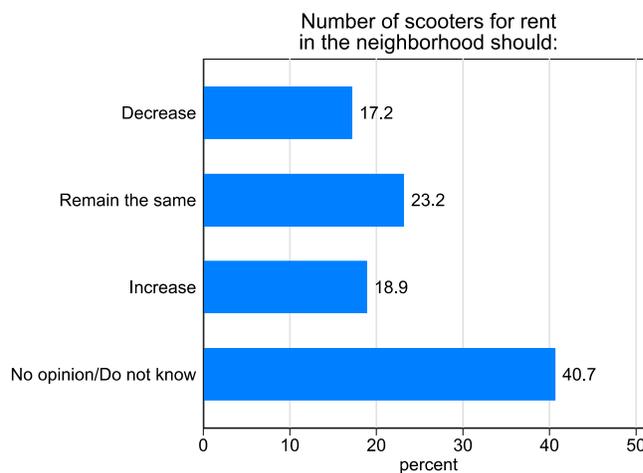


The relatively low frequency with which e-scooters, e-bikes, and e-skateboards are used could be attributable to a lack of availability. When asked how easy or difficult it is to find scooters for rent in their neighborhood, fifty-three percent of residents report that it is difficult to find scooters for rent in their neighborhood. Only 22% of residents report that rental scooters are easy to find. Notably, 18% of residents do not know if scooters are difficult or easy to find, likely because they have not sought one out.

- ◆ **Many residents feel lukewarm about the prevalence of rental scooters in their neighborhood. Those who oppose them tend not to use them.**

While scooters are not widely used in L.A. County, it is unclear if their lack of use is due to a lack of availability or a widespread distaste for them. To better understand public sentiment around scooters, we asked residents if they think the number of scooters available for rent in their neighborhood should increase, decrease, or remain the same.

The highest percentage of respondents (40%) selected “No opinion/Don’t know,” a signal that many in L.A. County are indifferent to scooters. Seventeen percent of residents would like to see the number of scooters decrease while 19% would like to see the number of scooters increase.



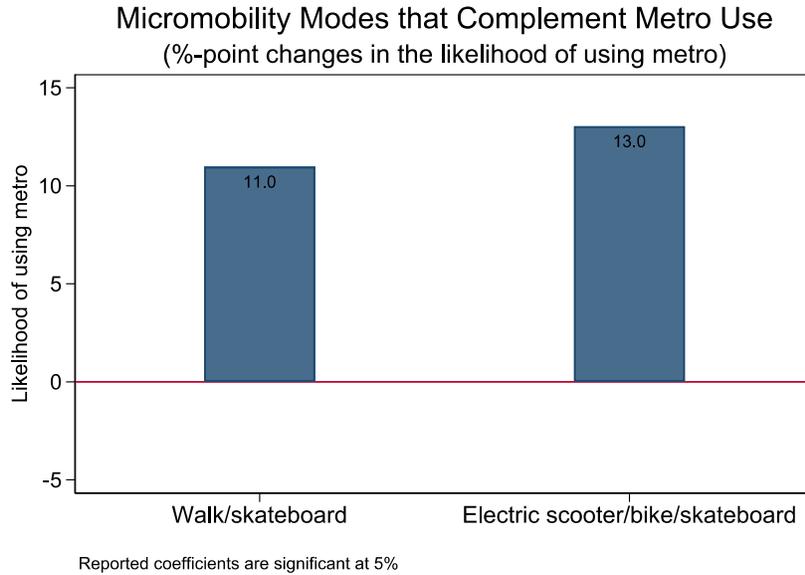
When we measure the relationship between scooter sentiment, scooter availability, and scooter usage, controlling for demographic characteristics, we find that residents who live in neighborhoods where scooters are easier to find are more likely to say they’d like to see the number of scooters in their neighborhood decrease rather than increase.

This pattern, however, is driven primarily by the majority of residents who have not used a scooter. Residents who live in neighborhoods where scooters are easier to find and who report having used a scooter at least once in the last year are more likely to say they’d like to see the number of scooters in their neighborhood increase.

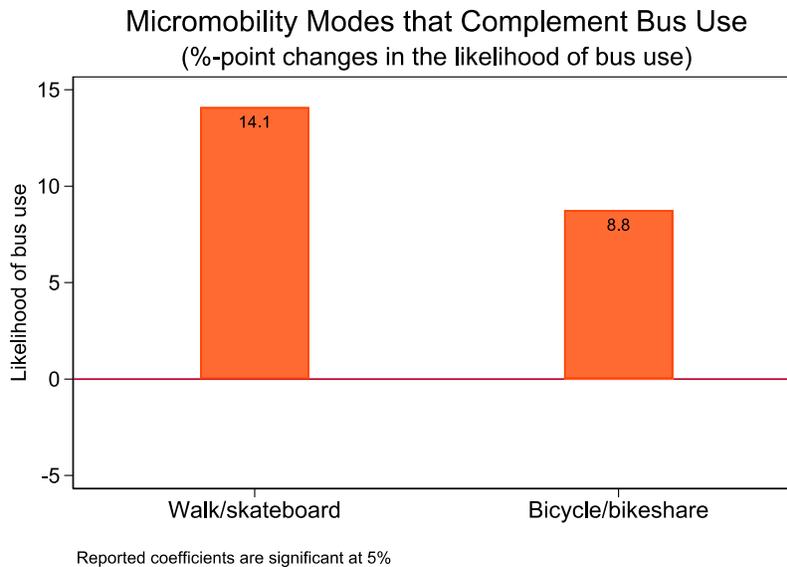
- ◆ **Residents who use e-scooters or e-bikes are more likely to use the Metro than those who do not, but they are not more likely to use the bus.**

When we examine the correlates of Metro and bus use, controlling for other modes of transportation as well as demographic characteristics, we find that e-scooter/e-bike/e-skateboard use is statistically significantly and positively correlated with Metro use. Residents

who use e-scooters/e-bikes/e-skateboards are more likely to use the Metro than those who do not, though they are not more likely to report living near a useful Metro stop.



E-scooter/e-bike/e-skateboard use is not significantly correlated with bus use. Residents who use e-scooters/e-bikes/e-skateboards are neither more nor less likely to use the bus than those who do not. In contrast, we find that manual bike/bikeshare users are significantly more likely to use the bus than non-users while they are not significantly more likely to use the Metro.



- ◆ **E-scooters or e-bikes are not commonly used for travel to and from Metro stations or bus stops.**

Given the low frequency with which e-scooters are used, it is unlikely that a significant number of trips to the Metro are facilitated by e-scooters, e-bikes, or e-skateboards. When we examine the modes of transportation residents use to get to and from Metro stations on page 13, we find that only 4% of Metro users used an e-scooter/e-bike/e-skateboard to travel to or from a Metro station. That said, e-scooters/e-bikes/e-skateboards do not trail too far behind manual bicycles in the frequency with which they are used for trips to the Metro.

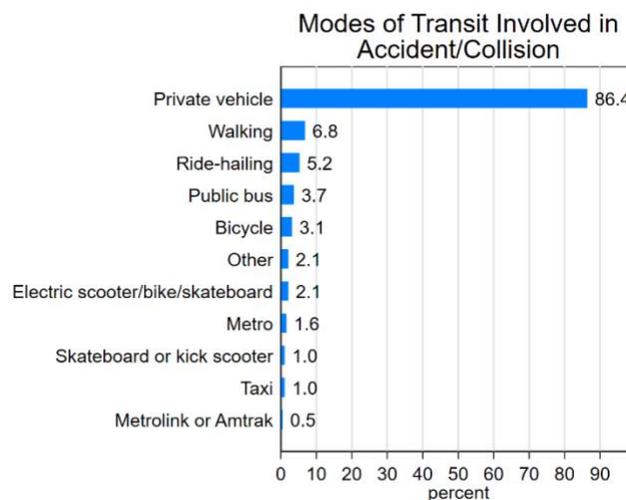
E-scooters/e-bikes/e-skateboards rank much lower on the list of modes used to travel to or from bus stops. This aligns with our finding that e-scooter/e-bike/e-skateboard use is not positive correlated with bus use. Among bus users, the manual bicycle/bikeshare is a much more popular micro-mobility solution than the e-scooter or e-bike.

Travel Safety

Takeaway #8: More traffic accidents and collisions involve personal cars than any other mode of transportation.

- ◆ **The highest percentage of travel-related accidents and collisions involve a personal vehicle.**

While the personal car is widely perceived by Angelenos as safer from crime and harassment than both ride-hailing and public transit, residents are more likely to be involved in an accident or collision while using a personal vehicle than any other mode of transportation.



According to our survey, 15% of residents were involved in an accident or collision last year, and 86% of those accidents or collisions occurred while residents were using a personal

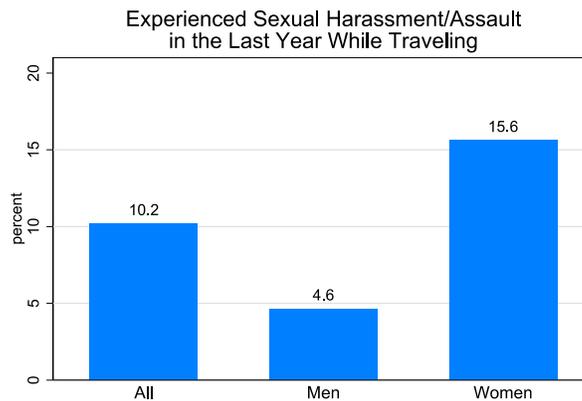
vehicle. Seven percent occurred while residents were walking and 5% occurred while residents were using a ride-hailing service.

When we look at accident/collision rates among specific transit users, we find that about 14% of residents who used a personal vehicle at least once in the last year report an accident that involved a personal vehicle. About 2% of residents who used a bus at least once in the last year report an accident that involved a bus, less than 2% of walkers and ride-hail users were involved in walking or ride-hailing related accident, and less than 1% of Metro users were involved in a Metro-related accident.

Takeaway #9: More travel-related experiences of harassment/assault are happening on our sidewalks than anywhere else, and to women more so than to men.

◆ **10% of residents – including 16% of women – experienced sexual harassment or assault while traveling in L.A. last year, most commonly while walking.**

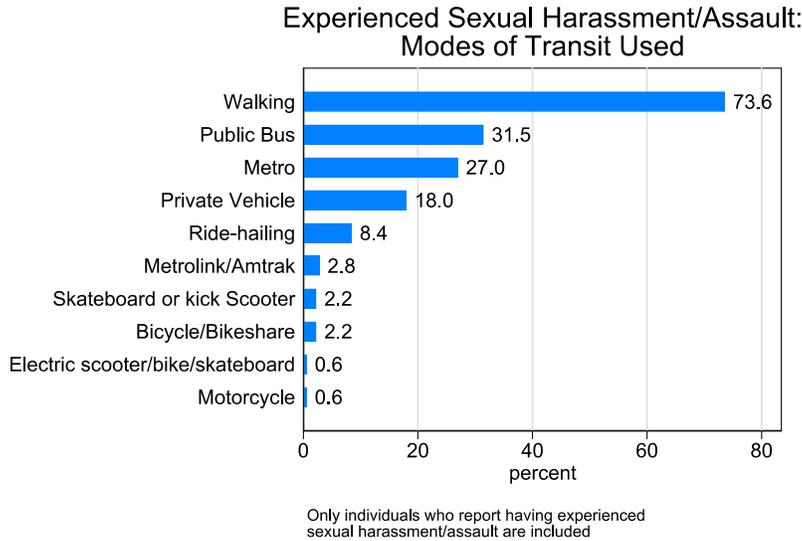
According to our survey, 10% of residents experienced some form of sexual harassment or assault while traveling in L.A. County last year. Additionally, rates of sexual harassment and assault vary substantially by gender. Sixteen percent of women report at least one experience of sexual harassment or assault, while 5% of men report at least one such experience.



We asked residents who experienced sexual harassment or assault while traveling to report the mode(s) of transportation they were using during the incident(s). Seventy-four percent report that they experienced sexual harassment or assault while walking; 32% and 27% report that they experienced sexual harassment or assault while using the bus and Metro, respectively.

When we look only at residents who report having used a particular mode of transportation in the last year, we find that, among residents who walk with any frequency, 19% of women

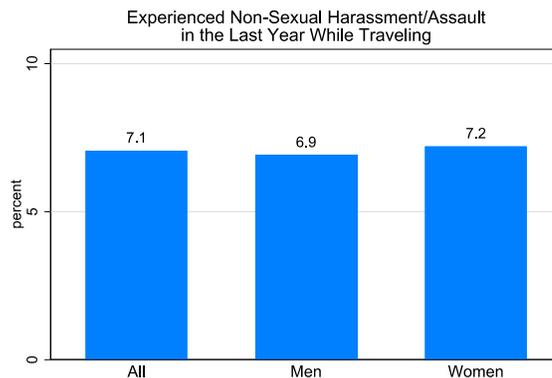
experienced sexual harassment or assault while walking, compared to 4% of men. Among bus users, 14% of women experienced sexual harassment or assault while using the bus, compared to 5% of men. Among Metro users, 12% of women experienced sexual harassment or assault while using the Metro, compared to 3% of men.



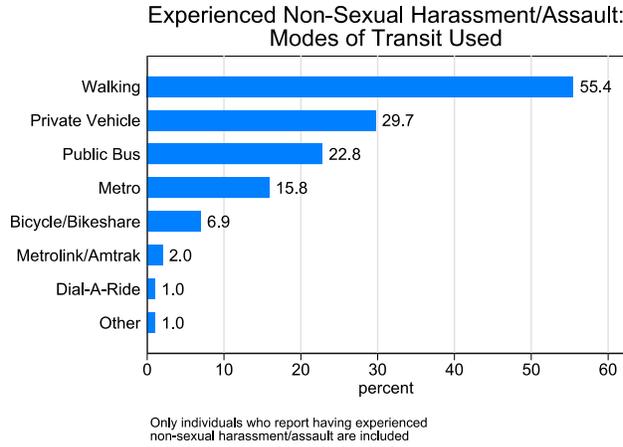
Altogether, these results suggest that public sidewalks offer women less protection from harassment and crime than other transportation modes, which raises some important questions regarding the degree to which personal safety concerns may limit walkability for women, even in neighborhoods where improvements are being made to the density or accessibility of services and amenities.

◆ **7% of residents experienced non-sexual harassment or assault while traveling in L.A. last year, most commonly while walking.**

According to our survey, 7% of residents experienced non-sexual harassment/assault or robbery while traveling last year. These rates do not vary significantly by gender.



About 55% of the residents who experienced non-sexual harassment/assault or robbery while traveling in L.A. report that they had an experience while walking. Thirty percent report that they were using a personal vehicle.



When we look only at residents who report having used a particular mode of transportation in the last year, we find that, among residents who walk, about 6% of residents experienced some form of non-sexual harassment, assault, or robbery while walking. About 2% of personal vehicle users report non-sexual harassment, assault, or robbery while using a personal vehicle, and 5% of bus users experienced a bus-related incident.

Mobility and Livability

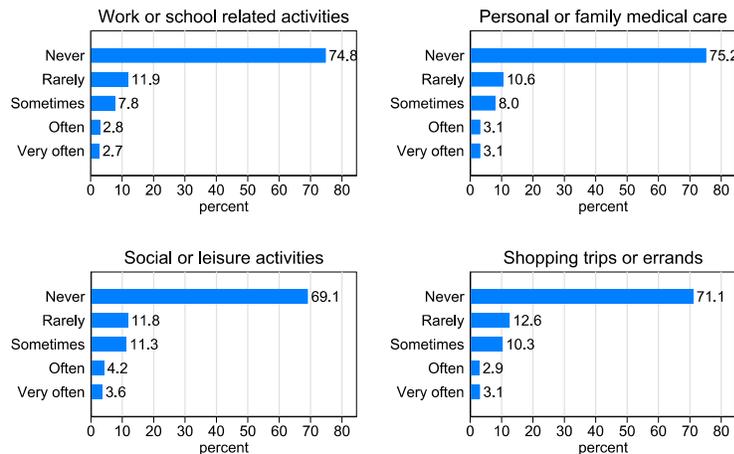
Takeaway #10: Over the last year, transportation issues caused nearly 50% of residents to miss out on social or leisure activities

To better understand how transportation quality and accessibility shape access to the social, economic, and health-related resources that matter for general well-being, we asked residents how often, if ever, they missed attending or doing any of the following activities in the last year specifically because they did not have access to affordable transportation: work or school related activities, personal or family medical care, social or leisure activities, shopping trips or errands.

About 25-30% of residents indicate that they missed one of these activities at least once in the last year due to lack of affordable transportation. As expected, lower-income residents are consistently more likely than higher-income residents to report missing out on an activity because they did not have access to affordable transportation.

Relative to the percentage of respondents who missed out on an activity due to lack of affordable transportation, a higher percentage – 30% to nearly 50% of respondents – report missing out on an activity because travel times were too long.

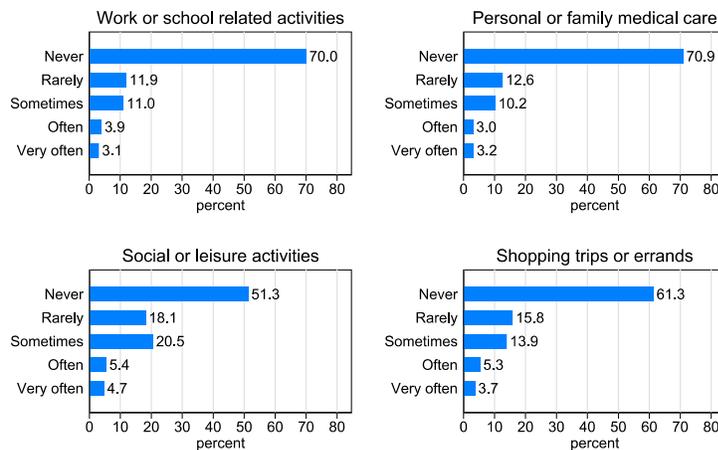
Missed Attending or Doing Things Because Did Not Have Access to Affordable Transportation



Note: Figure excludes respondents who selected “not applicable” for certain activities.

Forty-nine percent of residents indicate that they missed out on a social or leisure activity due to long travel times; 39% opted out of a shopping trip or errand. Again, lower-income residents are more likely than higher-income residents to report missing an activity due to lengthy travel times.

Missed Attending or Doing Things Because Travel Times Were Too Long



Note: Figure excludes respondents who selected “not applicable” for certain activities.

Altogether, these results raise some interesting questions about the implications of traffic congestion and lengthy public transit times not just for residents’ mobility around the County but also for their social engagement, health, employment, and overall quality of life.

ABOUT US

USC Dornsife-Union Bank LABarometer

LABarometer is a quarterly, internet-based survey of approximately 1,800 randomly selected Los Angeles County residents, designed and administered by the *Center for Economic and Social Research* at the University of Southern California. The survey monitors social conditions in Los Angeles, with a focus on four key issues: livability, mobility, sustainability & resiliency, and affordability & prosperity. By following the same residents over time, LABarometer aims to capture trends and shifts in residents' attitudes and circumstances, allowing decision-makers in the public and private sectors to better understand the evolving lives and needs of L.A. residents. LABarometer is made possible by the financial support of Union Bank.

Center for Economic and Social Research

The Center for Economic and Social Research (CESR), part of the USC Dornsife College of Letters, Arts and Sciences, conducts basic and applied research in economics, psychology, demography, and sociology. The center's name signifies the breadth of the research, which encompasses numerous disciplines, topics and methodologies. The Center's multi-disciplinary philosophy fosters an informal and free-flowing research environment.

About the Mobility Survey

The LABarometer Mobility survey assesses residents' transportation patterns, experiences, and preferences, especially as they relate to county-wide efforts to reduce automobile congestion and increase the use of alternative transportation modes. Wave 1 of the survey covers the following topics: transportation mode use (frequency, purpose), personal car ownership, public perceptions of public transit and ride-hailing, access to public transit, public sentiment around electric scooters, traffic safety, travel-related experiences of harassment and assault, and activities missed due to transportation issues.

The Team

*Special thanks to the Understanding America Study team and the USC Dornsife Office of Communication for their expertise and support. Thank you as well to Madeline Brozen (UCLA Institute of Transportation Studies) and the government agencies, businesses, and non-profits we consulted with at the early stages of survey design.

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APPENDIX

LABarometer Panel Information

The LABarometer Panel

The LABarometer panel is an internet survey panel of approximately 1,800 individuals (as of December 10, 2019) residing throughout Los Angeles County. LABarometer is a subpanel of the Understanding America Study (UAS), a national internet panel managed by the USC Dornsife Center for Economic and Social Research.

Following UAS procedures, LABarometer panel members are recruited through address-based sampling using postal codes. Eligible individuals are all non-institutionalized adults aged 18 and older living in a contacted household in Los Angeles County. Compared to convenience (“opt-in”) panels, LABarometer’s probability-based panel is more likely to accurately reflect our population of interest, Los Angeles County, and to reduce biases in our estimates. All LABarometer surveys include weights, which allow data users to generalize survey results to the larger population of Los Angeles County residents.

Below is a summary of the demographic composition of the LABarometer panel (as of December 10, 2019), alongside Los Angeles County population benchmarks for individuals aged 18 and older obtained from the 2016 American Community Survey.

LABarometer Panel Demographic Characteristics and Population Benchmarks (percentages)

Demographic Characteristics	LABarometer Panel (N = 1,821)	Los Angeles County (N = 7,832,110)
Female	63.5	50.7
Age		
18-34	36.9	33.5
35-44	22.0	17.8
45-54	16.0	17.6
55-64	13.1	14.9
65+	12.0	16.2
Race & Ethnicity		
NH White	28.6	26.5
NH Black	7.5	7.9
NH Other	16.7	17.2
Hispanic	47.2	48.4
Education		
Less than BA	58.5	69.2
BA or more	41.5	30.8
Foreign-born	25.6	34.3

The Understanding America Study

The Understanding America Study (UAS) is a national internet panel of approximately 8,500 non-institutionalized adults living in households throughout the United States. It includes special subpanels of California residents, Los Angeles County residents (the LABarometer panel), and Native Americans. The UAS started in 2014 and has been expanding since. Panel members are recruited in batches through a probability-based sampling design. As of September 30, 2019, there are 19 recruitment batches. The UAS draws from multiple sample frames (United States population, California, Los Angeles County, Native American population), but each batch is drawn from only one frame. The UAS uses an adaptive sampling approach to keep the subpanels representative of their target populations, even in the face of selective nonresponse and attrition. Nevertheless, sampling weights that adjust for imbalances in the distribution of demographics and socio-economic variables are provided with each survey. To ensure full coverage of the targeted populations, the UAS provides internet-connected tablets to individuals who do not have internet access.

Panel Recruitment and Retainment

Procedures for LABarometer panel recruitment and retainment follow UAS procedures. For a full description of UAS recruitment procedures, visit: <https://uasdata.usc.edu/page/Recruitment>. For a full description of UAS retainment procedures visit: <https://uasdata.usc.edu/page/Retainment>.

In line with the general UAS recruitment procedure, LABarometer panel members were recruited in batches. The bulk of the LABarometer panel (91%) belongs to batches specifically targeting Los Angeles County residents, namely LA County Batches 2 - 5.² The remainder of the sample is split between California Batches 1 and 2 targeting California residents, which account for 5% of the LABarometer sample, and the ASDE Nationally Representative Batch and MSG Nationally Representative Batches 1 and 4-8, accounting for another 4% of the sample. For a full description of response rates for each of these batches, visit: <https://uasdata.usc.edu/page/Response+And+Attrition>.

Attrition rates have not yet been calculated for the LABarometer panel. LABarometer attriters are defined as panel members who have not participated in a UAS survey in 10 months or who, according to the UAS quarterly household survey, no longer reside in Los Angeles County.

Survey Participation

LABarometer panel members take surveys specifically designed for Los Angeles County residents, as well as general UAS surveys, which allow for comparisons of outcomes between Los Angeles and other geographic areas in the country. Response rates for each LABarometer survey are provided with each survey's documentation. All surveys are distributed online in English and in

² UAS recruitment batch 4 is a simple random sample from a list of women who gave birth in Los Angeles County between 2009 and 2012 in zip codes around restaurants participating in a healthy menu options project. Because of the highly specific nature of this subsample, we do not include UAS members from batch 4 in the LABarometer sample.

Spanish and are mobile-friendly. To participate in a survey, panel members can use any computer, cell phone, or tablet with Internet access.

Standard Variables

Following UAS procedures, each LABarometer dataset contains a set of default survey and demographic variables. Default survey variables include individual, household, and batch identifiers, language indicator, time stamps, and respondents' rating of how much they liked the survey. The demographic variables provide background information on the respondent and household, including gender, age, race/ethnicity, education, marital status, work status, state of residence, family composition, and family income. Demographic variables are taken from the most recent MyHousehold survey, which elicits UAS members' basic demographic information every quarter. If at the time of a survey, the information in MyHousehold is more than three months old, a respondent is required to check and update the information before being able to take the survey. The complete list of standard variables included with each LABarometer (and UAS) dataset is available at <https://uasdata.usc.edu/page/Standard+Variables>.

Survey Weights

Each LABarometer dataset includes a set of survey weights. These weights allow data users to generalize survey results and statistics to the reference population. This is the Los Angeles County adult population, for Los Angeles County-specific surveys, or the U.S. adult population for general UAS surveys.³ The weighting procedure consists of two steps. In the first step, we generate base weights that correct for unequal probabilities of selection in the sample. Due to selective nonresponse, the sample of actual respondents may have different characteristics than the population of interest, even after correcting for different sampling probabilities through the base weights. Hence, in the second step, we calculate post-stratification weights (using a raking algorithm) so that weighted distributions of specific socio-demographic variables in each survey sample match their population counterparts. The socio-demographic variables used in this second step of the weighting procedure are gender, race/ethnicity, age, and education. For post-stratification purposes, population benchmarks are obtained from the American Community Survey and the Current Population Survey. A full description of the general UAS weighting procedure can be found at <https://uasdata.usc.edu/page/Weights>.

³ In national surveys relevant for the LABarometer project, separate weights for Los Angeles residents, California residents (excluding Los Angeles), and U.S. residents (excluding Los Angeles and California) are also provided.

This survey was conducted by the

**University of Southern California
Dana and David Dornsife College of Letters, Arts and Sciences
Center for Economic and Social Research**

Sponsored by



Toplines and survey data available at
<https://cesr.usc.edu/labarometer>

**For more information,
please contact us at**
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