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## Surveying Silicon Valley on Cycling, Travel Behavior, and Travel Attitudes

Kevin Fang  
*Sonoma State University*

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# Surveying Silicon Valley on Cycling, Travel Behavior, and Travel Attitudes

Kevin Fang, PhD



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REPORT 20-31

# **SURVEYING SILICON VALLEY ON CYCLING, TRAVEL BEHAVIOR, AND TRAVEL ATTITUDES**

Kevin Fang, PhD

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## EXECUTIVE SUMMARY

### PROJECT OVERVIEW AND METHODS

The following report presents the results of a survey on travel behavior and travel attitudes conducted in Santa Clara County in March 2020. The 72-question survey asked respondents about travel overall and a wide range of travel modes. However, the survey was particularly focused on cycling, which was the theme of most of the second half of the survey. Funding for the administration of the survey was provided by the Silicon Valley Bicycle Coalition and the Santa Clara County Department of Public Health. Survey design and data analysis were independently conducted and funded by the Mineta Transportation Institute.

The survey was administered by Change Research, a national polling firm based in Santa Clara County. Change Research utilizes online survey methods, with respondents both recruited online and completing the survey online. Respondents were recruited via the purchase of location-based targeted advertisements generally promoting a survey of Santa Clara County. The topic of the survey was not included in the ads themselves, although it became apparent once a potential respondent clicked on the ad.

In total, 1,009 survey responses were collected for an overall margin of error of  $\pm 3.1$  percent. The survey was administered in the field from March 6 through March 13, 2020. This time frame is notable, given that it occurred in the early stages of the COVID-19 pandemic in the United States. However, the data gathering period was prior to the institution of the March 16, 2020 COVID-19 shelter-in-place order covering Santa Clara County. As a result, the results here could be considered a reading of pre-COVID behaviors and opinions.

### CURRENT TRAVEL BEHAVIOR

Unsurprisingly, the use of cars dominates in Santa Clara County. Of all respondents, 89 percent indicate that they drive a motor vehicle in an average week, and 92 percent report owning a motor vehicle. Approximately 13 percent of respondents use transit in an average week. Similarly, 13 percent of respondents ride a bicycle (at least once) in an average week. Three percent cycle daily, and a further seven percent ride at least a few times per week.

The group of respondents (13 percent) who reported riding a bicycle in an average week includes seven percent who ride to any destination and nine percent who ride recreationally or for exercise (without a set destination). Since it asked respondents about non-utilitarian cycling and cycling to any destination, this survey illuminates a much greater population of cyclists in the county than the US census, which only counts cycling as a primary mode for commute trips.

Cycling rates differ by social group. In particular, men cycle more than women, although the gender split is more even than the typical gender split for cyclists in the United States. Additionally, those who have Bachelor's degrees ride bicycles more than those who do not, including nearly double the cycling to destinations (utilitarian cycling). Cycling is bipartisan, with 13 percent of both 2016 Clinton and Trump voters reporting they cycle in average week. However, they cycle somewhat differently, with Clinton voters reporting more utilitarian cycling

and Trump voters reporting more recreational cycling. Relevant to transportation planning for kids, those who grew up outside of California (either in other US states/territories or other countries) cycle more than respondents who grew up in California.

## **PERSPECTIVES ON TRAVEL IN GENERAL**

Respondents were asked about several aspects of travel in general. First, the survey explored the importance of eight different factors in the decision to select a given mode of transportation. These eight factors ended up falling into two tiers. In the top tier were five factors which a supermajority found to be important or very important: fastest time possible, safety from crime, ease of use, safety from crashes, and enjoyable/non-stressful travel. In the second tier were three factors that less than half of respondents indicated were important or very important: concern for the environment, financial cost, and desire for exercise/physical activity. That financial cost sits in the second tier, rather than in the first tier, perhaps indicates that people are willing to pay more for transportation choices that better meet their other preferences.

Looking specifically at cyclists, nearly double the cyclists rate exercise/physical activity as important or very important compared to travelers in general. Cyclists were also relatively more concerned with the environment. Cyclists were relatively less concerned with five of the other six factors, with financial cost being by far the least important factor for cyclists. This indicates that the affordability of cycling is not a primary selling point.

Next, respondents were presented with several statements about various modes of transportation and asked their agreement or disagreement with each statement. Results were presented in terms of “net agreement” (the sum of those who agreed with a statement [either somewhat or strongly] minus those who disagreed with a statement [either somewhat or strongly]).

Considering that goals for California’s transportation system generally include reducing automobile vehicle miles traveled (VMT) and promoting shifts away from private motor vehicle use, the results to several questions point to barriers in achieving these goals. In particular:

- Most feel they need a car to do many of the things they like or need to do (net agreement +89 percentage points)
- Most (+83) feel they need a car to carry shopping or other people
- Most (+54) enjoy a driving car.

Conversely, the results for several questions point toward unhappiness with the current auto-oriented paradigm. In particular:

- Most (+25) say they drive a car more than they would like to drive a car
- Most (+36) feel too much time in the car is harmful to their health

- About 20 percent find that car ownership is not affordable to them (higher for some groups)
- Drivers (+4) indicated their daily travel is stressful, while cyclists (-10) and transit riders (-15) indicated that it is not.

## **PERSPECTIVES ON CYCLING**

The survey also asked respondents about their agreement with several statements specifically about cycling. Responses to several questions point to a number of barriers to cycling. In particular:

- Respondents think the places they want to or need to go are not within cycling range (-14); geographically, this is particularly true outside of central San José
- Also related to destinations, bike parking is an issue, with most (-29) disagreeing that there are enough places to securely park a bicycle
- Respondents (+15) generally think that one needs to be in good physical shape to ride a bicycle
- A near majority (+21) think cycling to work would make someone too sweaty to be professional
- Most (+34) consider cycling incompatible with the clothing people need to wear to work.

That said, respondents also indicated that several potential issues are not problematic. In particular:

- Most (-36) do not think the weather is too poor to cycle
- Most (-27) do not report having physical limitations that make cycling difficult or prevent them from doing it
- Most (-58) strongly disagree that cycling is not an activity for someone of their age; this sentiment holds across all age groups, include seniors (-11)
- Supermajorities of respondents do not associate cycling with poverty, disagreeing (-57) that cyclists look like they are too poor to own a car
- Most (-57) disagree with the contention that cycling is “uncool.”

The survey also asked several questions about cycling and safety, another potential major barrier to cycling. In general, respondents (+9) agreed that cycling is safe for adults in their community, but most disagreed (-18) that cycling in Santa Clara County is safe for kids. These sentiments varied geographically, with cycling conditions in San José seen

as relatively unsafe compared to other parts of the county. On a more positive note with respect to safety, a plurality of cyclists (+23) stated they thought cycling conditions have become safer in the last three years.

Respondents also answered several questions about bicycle infrastructure. Notably, bike lanes appear to be insufficient for individuals to feel comfortable cycling. When asked about “conventional” bike lanes, where dedicated space for cyclists is separated from vehicular travel lanes with paint:

- Only 35 percent were comfortable/very comfortable with the idea of cycling on a conventional bike lane next to motor vehicle traffic going just 25 mph.
- A further 21 percent were comfortable or very comfortable with the idea of cycling on a conventional bike lane next to 35 mph traffic.
- Just 11 percent were comfortable or very comfortable with the idea of cycling on a conventional bike lane next to 45 mph traffic.

These numbers are from all respondents, not just people who currently ride bicycles. Active cyclists are relatively more comfortable riding in any situation. However, generating additional ridership requires turning some of these less comfortable non-regular cyclists into more regular cyclists.

Respondents were much more comfortable with the idea of cycling on “advanced” bicycle infrastructure, with additional features:

- 52 percent were comfortable or very comfortable with the idea of cycling on a bike lane delineated with vertical posts between the bike lane and adjacent vehicular traffic.
- 54 percent were comfortable or very comfortable with the idea of cycling on a bike lane where parked cars were placed as a protective buffer between the bike lane and flowing vehicles.
- 81 percent were comfortable or very comfortable with the idea of cycling on a fully off-street path with no adjacent motor vehicle traffic.

## **CARS AND BICYCLES: FRIENDS OR ADVERSARIES?**

Finally, several questions on the survey explored the interaction between cyclists and motorists. Notably, respondents (+47) generally agree that increasing the use of alternative modes (walking, cycling, and transit) is a good thing for drivers. Note, this question was not framed about benefits to society, where concerns such as pollution could come into play, but rather it was framed in terms of driver preferences specifically. Even drivers (+45) agreed, although there were some notable differences politically. Clinton voters (+60) strongly agreed that users of alternatives benefit drivers, whereas Trump voters (+5) were agreeable to the idea, but much less strongly.



While respondents generally think increasing the use of other modes is a good thing, creating or improving infrastructure for other users may be problematic when, as it often does, it requires reallocating road space away from cars. Respondents (+21) generally felt that their communities need more car lanes on city streets, and by an even greater margin (+41) they think their communities need more car parking.

With respect to motorists, cyclists, and safety, problematically, cyclists (-23) do not think drivers do a good job staying out of bike lanes. By the same margin, drivers (-23) concur that, as a group, they do not stay out of bike lanes. That said, by a wide margin (+43), respondents feel that motor vehicle drivers, who travel at high speeds in massive devices, have a greater responsibility for traffic safety than pedestrians and cyclists.

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## I. INTRODUCTION

This report presents the results from a transportation behavior and opinions survey of Santa Clara County residents conducted in early March 2020. Respondents were asked about how they typically travel, their thoughts on travel overall, and their opinions specifically about various forms of transportation. Questions were asked about all modes of transportation on the survey, but the survey particularly focused on attitudes and behavior related to cycling. Approximately half of the survey questions pertained to cycling, primarily in the second half of the survey.

A total of 1,009 survey responses were collected in the study. The survey was administered by Change Research, a national polling firm based in Santa Clara County. Funding for the administration of the survey was provided by the Silicon Valley Bicycle Coalition (SVBC) and the Santa Clara County Department of Public Health. Survey design and data analysis were independently conducted and funded by the Mineta Transportation Institute.

The survey was administered in the field from March 6 through March 13, 2020. This time frame is notable given this was in the early stages of the COVID-19 pandemic in the United States. That said, response gathering was completed prior to the institution of the regional shelter-in-place order including Santa Clara County on March 16, 2020. As a result of COVID-19, travel behaviors have certainly changed, at least in the short term, and travel attitudes may also have changed. It is conceivable that COVID-19 may have affected some responses in this survey. However, given the timing—relatively early in the pandemic—the results here could also arguably be considered as one of the last readings of pre-COVID behaviors and opinions conducted.

The following sections outline the survey's methods in greater detail and discuss the survey's results for travel behavior, perspectives on travel, perspectives specifically on cycling, and perspectives on the relationship between bicycles and motor vehicles.

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## II. METHODOLOGY

### SURVEY INSTRUMENT

The survey consisted of 72 questions in five categories. Related to travel in general, respondents were asked about their current use of various modes of transportation, followed by their perceptions about a range of modes of transportation. Next, related to cycling specifically, respondents were asked about their perceptions about bicycle travel in general, and then specifically about bicycle paths/infrastructure. Respondents were also asked a bank of demographic questions. Behavioral and demographic questions were primarily asked in a multiple-choice, categorical format. Attitudinal questions were primarily phrased in a Likert-type agreement/disagreement format. There were a small number of open response questions, as well as open response answer choices.

SVBC staff and affiliates provided input on specific topics of interest to be included in the survey. Question choices were also based on travel behavior and cycling literature as well as examples from similar surveys. For demographics, Change Research's standard bank of questions was used. Change Research staff also made some language-related and technical recommendations based on their experience in poll writing.

The full survey instrument can be found in Appendix A.

### SURVEY ADMINISTRATION

The contracted polling firm, Change Research, utilizes online survey methods. Respondents were recruited online and completed the survey online. Their standard administration process begins with the purchase of targeted ads that advertise the survey in a particular study location (in this case Santa Clara County), which respondents then click on if they so choose. Standard ads feature a graphic representing the study area and text in a heading that reads "[Study Location], What Do You Think." Further explanatory text states, "We have a new survey for [Study Location] residents. Please click the link below to share your thoughts." The ad does not mention the topic of the survey.

Respondents initially interested in the idea of taking a survey clicked on the link and were then sent to the front page of the survey. This page included the title and introductory description of the survey that illuminates the topic of the survey as well as standard Institutional Review Board disclosures.

The targeting of who gets shown the ad promoting the survey is done by the entity that sells the ads. No personally identifying information utilized in the microtargeting was furnished to either the research team or the pollster.

The target sample size for the survey was 1,000 responses. The survey was activated on Friday, March 6, 2020. After one week, on Friday, March 13, 2020, the survey was taken offline after yielding 1,009 responses included in the final analysis. (Note: respondents were not required to answer each question.) An additional 309 individuals started the survey but ceased their participation in the first half of the survey; these participants' responses were

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not included the analysis.

## **WEIGHTING OF RESULTS AND DATA ANALYSIS**

Following the collection of the survey data, the results were weighted by Change Research to reflect the actual demographics of Santa Clara County. Variables used to weight the data were gender, age range, ethnicity, education, and 2016 presidential vote.

Table 1 shows the number of responses collected from a variety of demographic and social groups, the weighted sample once weights were applied, and the margin of error based on unweighted sample sizes. Overall, with a total sample size of 1,009, the survey has a margin of error of  $\pm 3.1\%$ .

In the discussion of results, data are presented for all respondents and frequently disaggregated into various demographic and social groups. The analysis by group-groups is potentially useful for several purposes. For example, looking at variation by group could inform the targeting of programs and interventions and point to opportunities for the building of political coalitions for policy changes.

Discussion of responses by sub-group were generally limited though to categories with relatively large sample sizes/lower margins of error. For example, discussion of results by race/ethnicity were limited to Asian, Hispanic, and White respondents, the only three groups with margins of error below 10 percent.

Comparing the weighted and unweighted sample sizes shows that older individuals (age 50 and up) as well as white individuals were relatively oversampled in the survey and given weights less than one. Conversely, younger, Hispanic, and Asian individuals were undersampled and given weights greater than one.

Additionally (or perhaps consequently from the racial and age makeup of the sample), by political leanings, Trump voters were oversampled and Clinton voters were undersampled by about 100 respondents. Given that Santa Clara County is not a swing county, this feature had the benefit of increasing the sample size and in turn reducing the margin of error for the analysis of Trump voters in particular ( $n=252$ , margin of error= $\pm 6.2\%$ ). Clinton voters remained relatively well sampled, regardless ( $n=459$ , margin of error= $\pm 4.6\%$ ).

**Table 1. Weighted and Unweighted Sample Sizes for Selected Demographic Groups**

	Unweighted n	Weighted n	Margin of Error ( $\pm\%$ )
Overall	1,009	1,009	3.1
Men	511	497	4.3
Women	484	496	4.5
18–34	190	311	7.1
35–49	266	281	6.0
50–64	294	241	5.7
65 or older	244	160	6.3
Asian	139	330	8.3
Hispanic	157	237	7.8
White	605	309	4.0
Black/African–American	15	21	25.3
Two or more races	42	55	13.2
Indigenous/Other/Declined	51	68	11.9
Bachelor’s degree or higher	579	566	4.1
Some college or less	421	434	4.8
Children in household	284	318	5.8
No children in household	709	688	3.7
2016: Clinton voter	459	551	4.6
2016: Trump voter	252	155	6.2
2016: Non-voter	167	193	7.6
Grew up in California	585	586	4.1
Grew up in other US state/territory	280	219	5.9
Grew up in another country	140	200	8.3

Change Research furnished a summary document with the results of each question and crosstabs for several common demographic groups. Further analysis was conducted by MTI based on the full spreadsheet of the responses of each individual respondent.

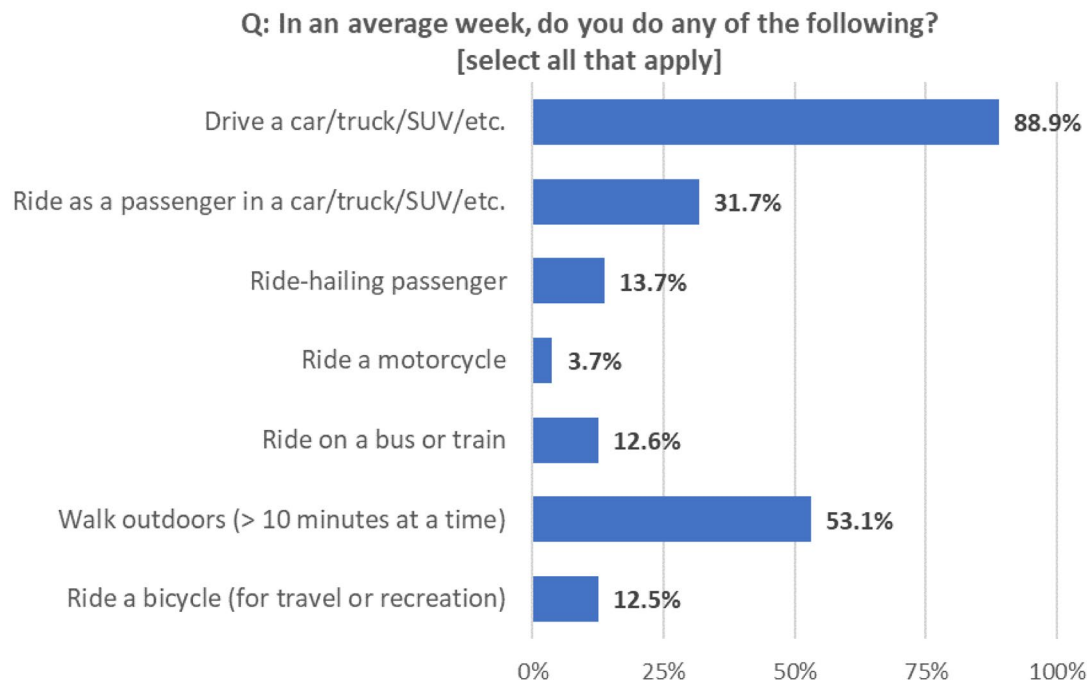
As previously mentioned, the attitudinal questions in the survey, which make up the bulk of the survey, were mostly asked in a Likert-scale agreement/disagreement format, usually with five categories. (A handful of questions used slightly different scales.) To simplify the discussion of the Likert-scale questions, their results are often framed in the following chapters in terms of “net agreement.” The net agreement for a given Likert-type statement is the sum of those who agreed with a statement (either somewhat or strongly) minus those who disagreed with a statement (either somewhat or strongly). Net agreement is thus measured in percentage points and can range from -100 to 100.

### III. CURRENT TRAVEL BEHAVIOR

#### OVERALL TRAVEL PATTERNS

##### Use of cars dominates

Nearly every respondent reported using an automobile during an average week, with 89 percent saying they drive a vehicle, and 32 percent saying they ride as a passenger (see Figure 1). Just 3.7 percent of respondents indicated they neither drove nor were a passenger in a motor vehicle. Outside of privately-owned vehicles, 14 percent of respondents reported using ride-hailing services (Lyft, Uber, and so on). Slightly more respondents reported using ride-hailing services compared to riding public transit or bicycles.



**Figure 1. Modes of Transportation Used in an Average Week**

##### Most are pedestrians, too

A common cliché related to modal splits are that (most) everyone is a pedestrian, even if they ostensibly do not walk to places. Drivers are pedestrians when they need to cross parking lots. Transit riders are often pedestrians when going to and from stops/stations. To explore the prevalence of more significant walking trips, respondents were asked whether they walk outside for more than 10 minutes at time at some point in an average week. Using this higher threshold, a majority of respondents still reported being pedestrians at some point during a given week.

##### Majority are car-dependent, but most are also at least somewhat multi-modal

While almost every respondent is either a car driver or passenger, given that the sum of

the bars in Figure 1 is far greater than 100 percent, many individuals are multi-modal in their transportation choices. This finding is further illustrated in Figure 2. Just 36 percent of respondents reported that all their travel is entirely by car, which conversely means that 64 percent are multi-modal in some way. That does not necessarily mean multi-modal users travel heavily by non-car modes, as 71 percent of respondents utilize cars for three-quarters or more of their travel and are thus mostly car-dependent.

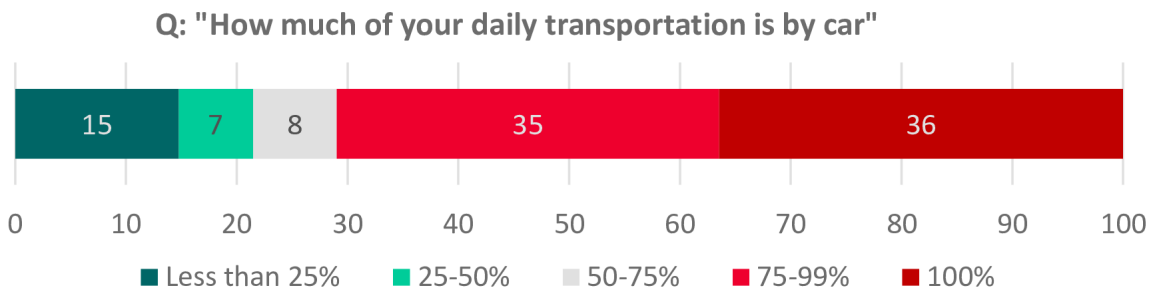


Figure 2. Car Use as a Share of All Respondents' Travel

**Drivers, cyclists, and transit riders are not in fully separate camps**

Figure 3 illustrates the overlap between drivers, transit riders, and cyclists. While many drivers are only drivers, rhetoric that portrays users of the different modes as entirely separate groups is not entirely accurate. More than one in six drivers (17 percent) also take transit or ride a bicycle. Also, 84 percent of cyclists drive a motor vehicle.

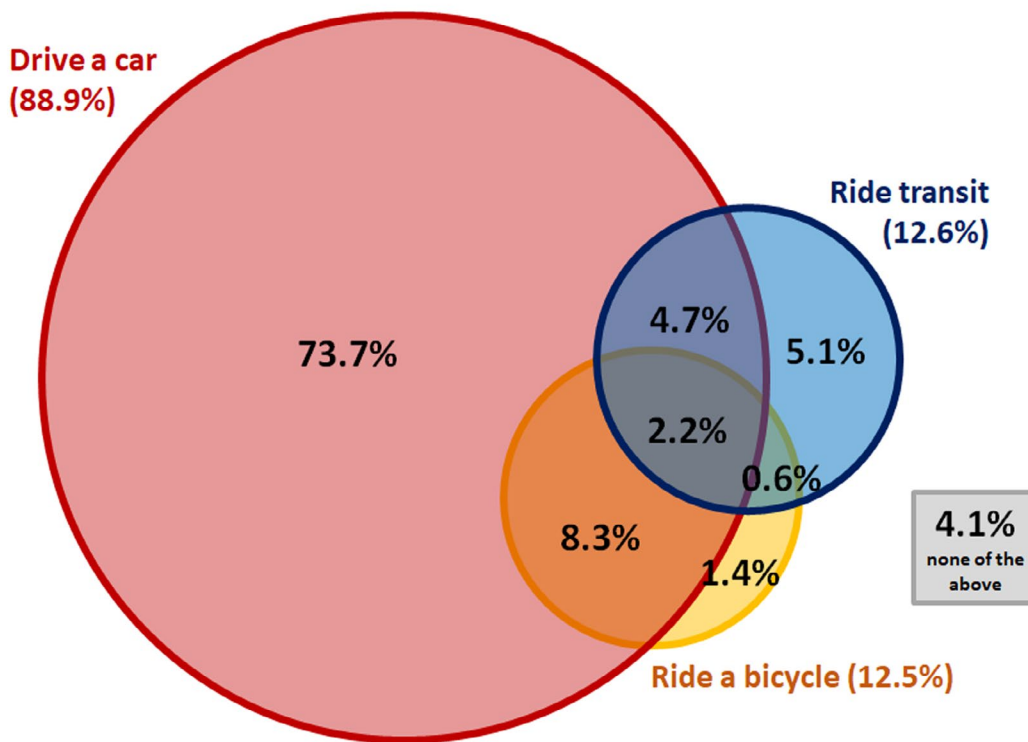


Figure 3. Overlap between Drivers, Cyclists, and Transit Riders in an Average Week

## BICYCLE TRAVEL

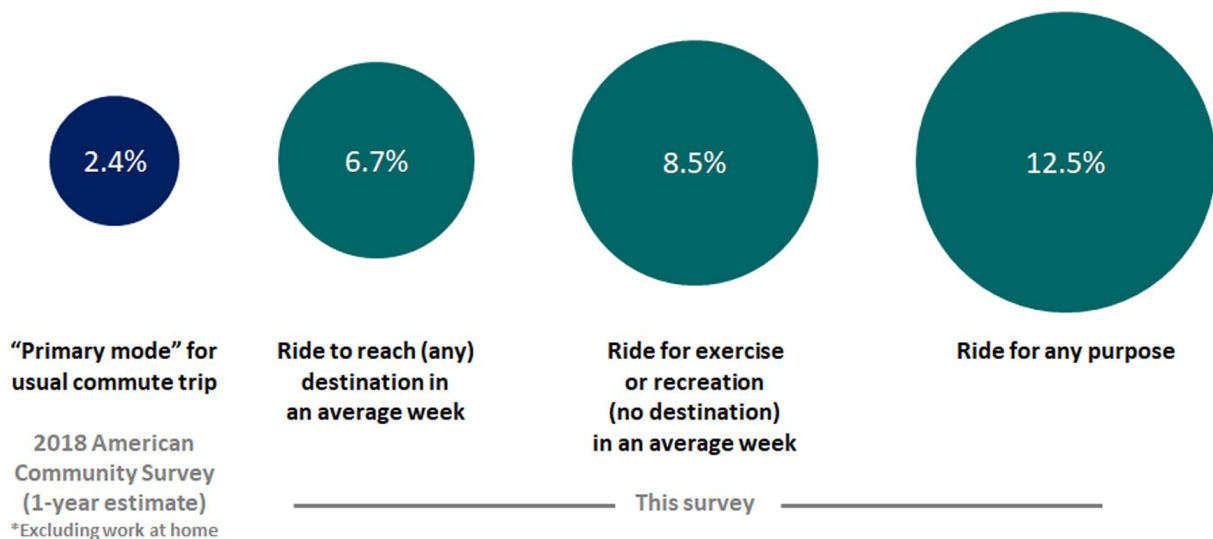
### Survey illuminates cycling not captured by census data

Data on the amount of cycling that occurs are relatively hard to come by. Unlike for cars, there are few automated sensors on roads that measure bicycles. Thus, travel surveys are generally relied upon for cycling data.

The US Census Bureau's American Community Survey (ACS) provides annual data on cycling rates with a large sample size. However, ACS data are limited in that only commute trips are captured. While commute trips are important, they account for only 17.4 percent of trips and 18.6 percent of person miles traveled, according to the 2017 National Household Travel Survey.<sup>1</sup> Additionally, for commute trips, the ACS only records the mode used for the longest distance on a trip (the "primary mode") and thus does not capture cycling use for first-mile/last-mile access (or cycling as a "secondary mode").

In this survey, however, the researchers were able to capture cyclists riding for other purposes. Respondents were asked whether they rode to any destination (including bus/train stops) as well as whether they made any non-utilitarian cycling trips for recreation or exercise. Non-utilitarian cyclists may not be traveling anywhere per se, but they are nonetheless present on roadways and create demand for cycling infrastructure.

This survey shows that 6.7 percent of Santa Clara County adults ride a bicycle to some destination at least once in a given week, including 2.0 percent who ride to a transit stop. In terms of non-utilitarian trips, 8.5 percent of adults reported riding a bicycle for recreation or exercise. Some cycle for both purposes, while some cycle for just one or the other. In total, one in eight respondents (12.5 percent) reported cycling for either purpose.

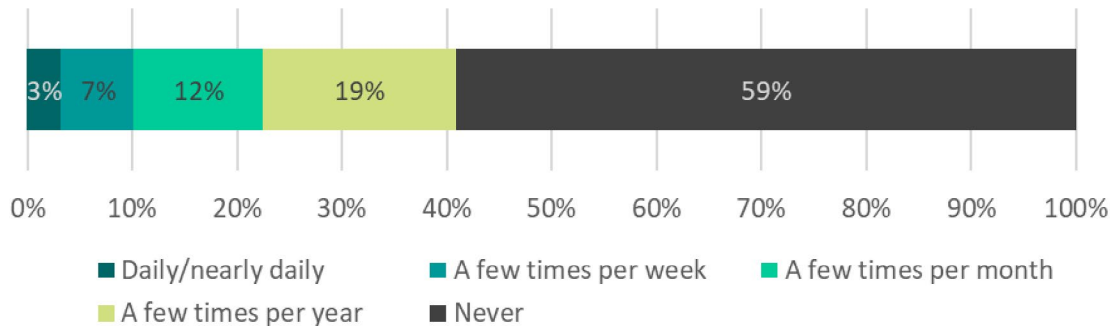


**Figure 4. Cycling for Various Purposes**



## Core and occasional cyclists

While the above numbers specify what proportion of the population rides a bicycle in an average week, they do not provide insight on the frequency of riding beyond “at least once a week.” Thus, respondents were also asked about how often they ride a bicycle. Figure 5 shows that a little more than 10 percent of respondents are relatively frequent cyclists, with 3.2 percent reporting riding daily or nearly daily and 7.0 percent reporting riding a few times per week. Beyond this core group, an additional 31 percent reported a few times per month or a few times per year, indicating a further population of occasional cyclists beyond those who do so in an average week.



**Figure 5. Cycling Frequency**

## Cycling rates highest in central San José, north county cities

There were some notable geographic variations in cycling rates and frequencies in Santa Clara County. Unsurprisingly, cycling rates were highest in central San José (downtown and nearby neighborhoods), where land uses are more mixed and compact, and rates were lower in more suburban areas of the county. That being said, there were large differences in cities outside San José. In particular, cities in the northern part of the county had much higher cycling rates than south county cities or the foothill-adjacent enclaves in the western part of the county.

Utilitarian cycling exceeded 10 percent in central San José and north county cities. These two areas also differed from other areas in that utilitarian cycling exceeded recreational cycling in central San José and was equivalent in north county. In other areas, recreational cycling exceeded utilitarian cycling.

**Table 2. Cycling Rates by Parts of the County**

Location	Unweighted n	Ride a Bicycle in an Average Week (%)			Frequency (%)	
		To a destination	For exercise/recreation	Any purpose	Daily or nearly daily	Few times/week
San José: Central <sup>a</sup>	80	12.1	9.6	18.2	3.5	9.7
San José: Outer	473	5.2	6.3	9.1	2.4	6.4
North county <sup>b</sup>	278	10.6	10.6	17.4	5.7	8.0
South county <sup>c</sup>	95	0.3	10.8	11.1	1.5	5.5
West foothills <sup>d</sup>	76	1.7	8.4	8.4	0.4	5.9
Overall	1009	6.7	8.5	12.5	3.2	7.0

Note: Locations based on ZIP codes, which do not perfectly align with city political boundaries

<sup>a</sup>95110, 95112, 95113, 95126

<sup>b</sup>Includes Campbell, Milpitas, Mountain View, Palo Alto, Santa Clara, Sunnyvale

<sup>c</sup>Includes Gilroy, Morgan Hill, San Martin

<sup>d</sup>Includes Cupertino, Los Altos, Los Altos Hills, Los Gatos, Saratoga

## BICYCLE TRAVEL BY SOCIAL GROUP

While 12.5 percent of respondents indicated that they ride a bicycle in an average week, there were some interesting differences between social groups in the total amount of cycling and the types of cycling people choose. For the most part, a greater proportion of people ride for recreation than for travel. However, there are a handful of groups where this trend is reversed and individuals ride more often for travel than recreation: for instance, younger age groups, non-voters, and those who grew up in another country.

**Table 3. Cycling Rates by Purpose across Various Social Groups**

	Unweighted n	Ride a Bicycle in an Average Week %		
		To a destination	For exercise/recreation	Any cycling
Overall	1,009	6.7	8.5	12.5
Men	511	7.4	10.4	14.4
Women	484	5.9	6.3	10.2
18 to 34	190	7.4	7.4	12
35 to 49	266	9.5	8.9	15
50 to 64	294	5.1	7.9	11.4
65 or older	244	3.4	9.6	10.2
Asian	139	5.9	7.4	11
Hispanic	157	5.7	6.0	9.7
White	605	5.3	12.4	14.3
Bachelor's degree or higher	579	8.5	9.2	14.2
Some college or less	421	4.3	7.7	10.2
2016: Clinton voter	459	7	8.6	12.9
2016: Trump voter	252	5.2	10.5	13.3
2016: Non-voter	167	6.7	4.5	9.6
2016: Stein voter	23	15.1	32.7	38.5
Grew up in California	585	4.2	6.0	8.5
Grew up in other US state/territory	280	6.4	8.7	11.2
Grew up in another country	140	10.8	7.0	15.6

### Men ride bicycles more, but gender split is more even than US average

Of all those who reported cycling in an average week in Santa Clara County, 59 percent are men and 41 percent are women. While cyclists are skewed towards men, this is common in the United States, and the gender gap is actually less pronounced in Santa Clara County than the US in general. Emond, Tang, and Handy (2009) note that most studies of the US find that male cyclists outnumber female cyclists by at least 2 to 1.<sup>2</sup> Conversely, they note that in high cycling countries in the world, the gender split is more even. That men ride much more than women in Santa Clara indicates that local conditions do not match those in the parts of the world with the highest levels of cycling, but conditions are arguably better than the US average.

### Cycling is bipartisan, but not quite the same across parties

Both 13 percent of respondents who voted for Donald Trump and 13 percent of those who voted for Hillary Clinton in the 2016 election reported cycling for any purpose. This finding is despite some notable differences in travel attitudes discussed later in this report. Non-voters have notably lower rates of cycling at under 10 percent, while voters of Green Party candidate Jill Stein (perhaps unsurprisingly) had extremely high rates of cycling (38.5 percent), although over a small sample size.

While respondents on both sides of the aisle report similar total cycling, they do not cycle for the same reasons. For both Clinton and Trump voters, more ride for recreation than for travel. However, Trump voters more heavily ride for recreation than travel, while for Clinton voters, the split is more even. This disparity could indicate differing support for cycle infrastructure in different contexts (e.g. recreational trails compared to urban street facilities).

### Respondents who grew up outside of California cycle more

Quite large differences can be seen in cycling rates based on where respondents grew up. In particular, those who grew up in California bike much less as adults than respondents who grew up elsewhere. Only 8.5 percent of California-raised respondents cycle, compared to 11.2 percent of those raised in other US states and 15.6 percent of those raised in other countries (driven by 2.6 times greater utilitarian cycling for those raised abroad versus in California).

While economic differences between immigrants and native-born residents likely play a role in the differences between those born outside the US versus those born in California, the striking differences among those born in different parts of the US raise questions about the importance of childhood conditions for adult cycling. In particular, the data seem to imply relatively poor cycling conditions for kids in California relative to other states.

### Riding throughout childhood matters

Survey respondents were asked generally about their cycling backgrounds: specifically, whether they rode as a pre-teen kid or as a non-adult teenager. Nearly all respondents (88.8 percent) said they had used a bicycle at some point as child.

Respondents were not asked how frequently they rode a bicycle as a child. However, one indicator is available in the results signaling continued cycling as a minor: namely, respondents who said they rode as a both a pre-teen and a teenager. Those who rode in both age groups are the likeliest to bicycle today, with 16.2 percent of these respondents currently cycling in an average week. This may indicate that measures to keep kids cycling as they become teenagers, such as safety improvements or other initiatives at middle and high schools, may be particularly valuable.

**Table 4. Bike Riding as a Child/Teenager and Bike Riding Today**

	Unweighted n	Rode a bicycle while in this age group	Of those who rode a bicycle while in this age group, ride a bicycle in an average week today
Pre-teen kid only	201	23.7%	9.6%
Teenager only	61	8.3%	2.3%
Both	663	56.8%	16.2%
Neither	84	11.2%	6.9%
Overall	1,009	---	12.5%

## USE OF OTHER MODES BY SOCIAL GROUP

Variations in travel behavior by social group can also be seen when looking at other modes (see Table 5). In terms of gender, men and women drive motor vehicles at essentially equal rates. However, women were more than 80 percent more likely to use ride hailing services than men. Conversely, men were more likely to use transit than women by about 30 percent.

Ride hailing was much more popular among younger age groups, with more than one in five of respondents between 18 and 34 using the services. Notably, this younger group also drives cars at much lower rates than other age groups, so some of this may be in lieu of private car driving. Transit use is also generally more popular among younger groups than older age groups, although transit use rebounds at retirement age.

Trump voters are less than one-third as likely to use ride hailing services compared to Clinton voters or non-voters. Interestingly, Trump voters have a relatively high propensity to ride devices they operate (motor vehicles, bicycles overall) while having a much lower propensity to ride vehicles operated by someone else. Also—notable politically—about one in five non-voters do not drive a motor vehicle, while voters of both parties drive much more (one in 10 for Clinton voters, one in 20 for Trump voters).

**Table 5. Use of Various Modes of Transportation in an Average Week across Various Social Groups**

	Drive a motor vehicle (%)	Walk >10 min at a time (%)	Ride hailing, e.g., Uber/Lyft (%)	Transit (%)
Overall	88.9	53.1	13.7	12.6
Men	89.7	50.5	9.9	14.2
Women	89.3	55.4	17.7	11.1
18 to 34	80.3	52.2	22.9	19.4
35 to 49	93.3	55.1	13.9	11.3
50 to 64	94.9	52.8	9.0	6.3
65 and up	88.3	51.3	4.9	12.8
Asian	90.3	51.5	16.3	10.4
Hispanic	84.1	44.6	11.3	16.8
White	91.3	61.8	10.0	9.9
Bachelor's degree or higher	93.8	54.7	13.7	10.6
Some college or less	82.5	51.5	13.8	15.3
2016: Clinton voter	89.4	55.6	16.0	14.1
2016: Trump voter	94.8	43.5	5.2	4.0
2016: Non-voter	80.9	52.4	16.9	15.5

## VEHICLE OWNERSHIP

Heavy reliance on driving private vehicles is also indicated by vehicle ownership data. Overall, 92 percent of respondents indicated owning a car, truck, or SUV. Table 6 shows vehicle ownership by group. While vehicle ownership rates are very high for every group,

the youngest adults (84 percent), non-voters (86 percent) and those without a Bachelor's degree (87 percent) had relatively low rates. These are the only three groups shown that have vehicle ownership rates below 90 percent.

**Table 6. Vehicle Ownership by Social Group**

	Car, truck, or SUV (%)	Car (%)	Truck or SUV (%)	Share of vehicle owners with a truck/ SUV (%)
All respondents	92	83	37	41
Men	93	84	44	47
Women	92	82	31	33
18 to 34	84	77	22	26
35 to 49	96	85	47	49
50 to 64	95	83	47	49
65 or Older	95	89	35	37
Asian	95	90	31	33
Hispanic	90	79	39	44
White	94	81	42	45
Bachelor's degree or higher	96	88	35	37
Some college or less	87	76	40	46
Grew up in California	90	81	38	42
Grew up in other US state/territory	92	84	36	39
Grew up in other country	96	85	38	39
No children in household	90	83	31	34
Children in household	96	83	52	53
2016: Clinton voter	92	85	33	35
2016: Trump voter	98	80	60	61
2016: Non-voter	86	78	32	37

Some variation can also be seen in the types of vehicles owned. In particular, there is varying propensity to own a truck/SUV as opposed to a car. Notably, a majority of those living with children and Trump voters own trucks or SUVs. On the other end, only around one-third of women, Asians, people without children, and Clinton voters own SUVs, and less than a quarter of the youngest adults do.

A notable proportion of the population also owns bicycles. Table 7 shows that nearly two in five adults own a bicycle: this is more than transit pass owners and several times more than bicycle owners. That several times more people own a bicycle than ride one in an average week indicates there is a sizable population that could be targeted for ridership growth for whom, at the very least, a bicycle is already available.

**Table 7. Other Ownership by Group**

	Motorcycle (%)	Bicycle (%)	Transit pass, e.g., Clipper card (%)
All respondents	9	39	24
Men	13	45	25
Women	5	32	24
18 to 34	8	32	32
35 to 49	11	42	28
50 to 64	10	48	15
65 or older	6	33	21
Asian	10	37	28
Hispanic	8	29	19
White	8	47	24
Bachelor's degree or higher	7	43	27
Some college or less	12	34	21
Grew up in California	12	38	21
Grew up in other US state/territory	8	47	30
Grew up in other country	3	33	29
No children in household	9	37	26
Children in household	9	43	20
2016: Clinton voter	7	38	29
2016: Trump voter	19	44	11
2016: Non-voter	7	32	26

By group, men (45 percent) own bicycles at a nearly 50 percent greater rate than women (32 percent). Those who grew up in other US states (47 percent), white residents (47 percent), and those with a Bachelor's degree (43 percent) also own bicycles at above-average rates. Politically, Trump voters (44 percent) were the most likely to own a bike. They were also the most likely political group to own a motor vehicle of any kind, a truck or SUV, or a motorcycle.

## VEHICLE MILES TRAVELED

A supermajority of respondents reported driving 30 miles or less per day on an average weekday. About one in seven, though, travel more than 50 miles per day. This question was asked in categories (0, 1–10, 11–30, 31–50, 51 or more), and thus mean and median VMT cannot be calculated.

Figure 6 shows that VMT does vary noticeably by group. Among the differences, men drive more than women, the youngest and oldest adults drive less than middle-aged adults, and people who live with children drive more than those who do not.

"On an average weekday, approximately how many miles do you drive a car per day?"

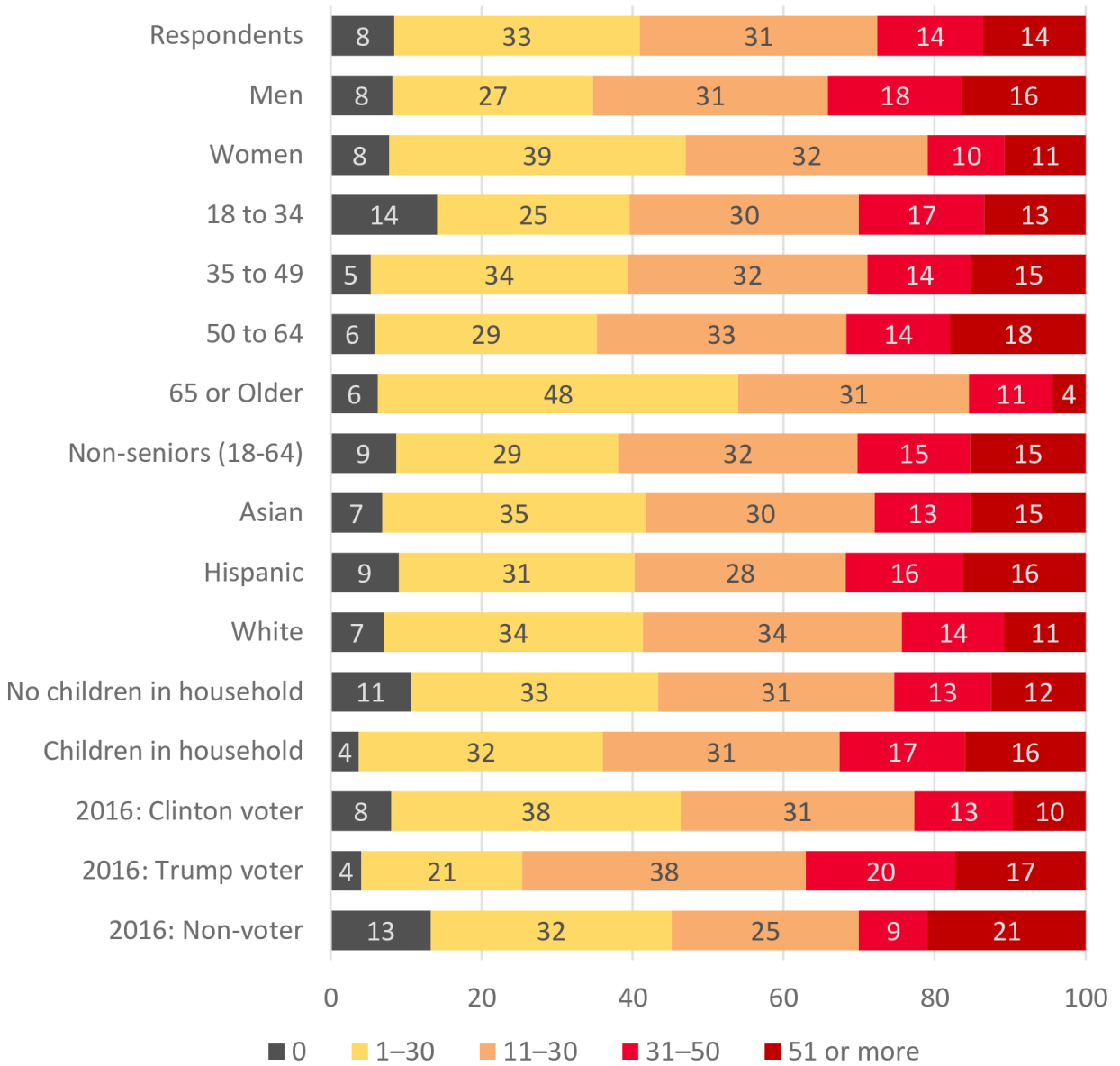


Figure 6. Vehicle Miles Traveled on an Average Weekday



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## IV. PERSPECTIVES ON TRAVEL IN GENERAL

### WHY TRAVELERS SELECT THEIR MODES OF TRAVEL

How an individual chooses to travel for a given trip is subject to many factors. When an individual has several potential options available, Schneider, 2013, posits that they then weigh three categories of factors: convenience and cost, basic safety and security, and enjoyment.<sup>3</sup> Different individuals vary in how they weigh these factors and how they perceive different mode options' performance along those factors. Expanding from Schneider's three categories, the research team asked respondents how they weight eight specific factors.

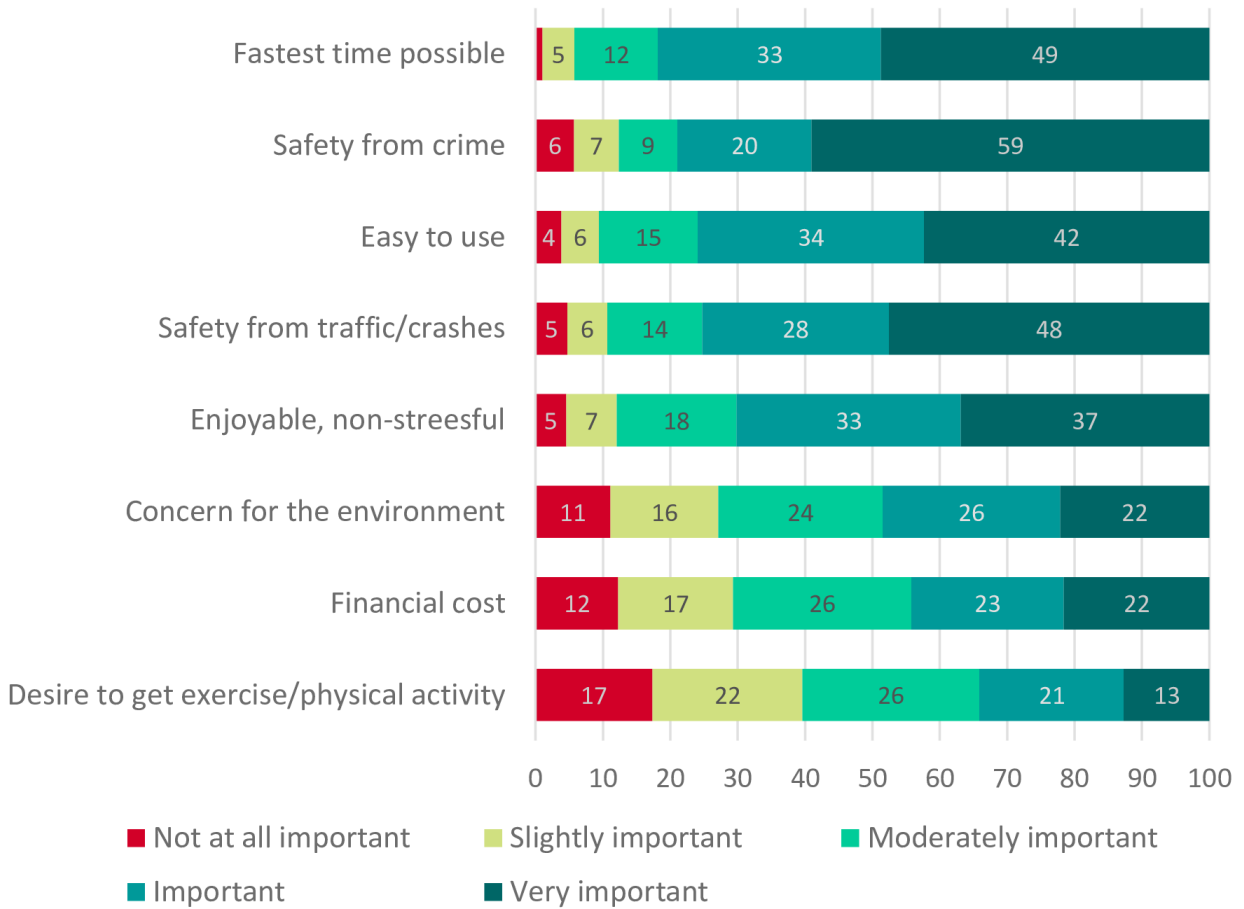
#### **Speed, safety from crime lead two tiers of mode choice factors**

Figure 7 shows that respondents found that all eight factors were at least moderately important. However, when looking at which factors respondents found most important, two tiers of factors emerge.

In the top tier are five factors which a supermajority found to be important or very important: fastest time possible, safety from crime, ease of use, safety from crashes, and enjoyable/non-stressful travel. Of these factors, one could argue that speed (fastest time possible) or safety from crime rate is the single most important. More respondents found fastest time possible important or very important (82 versus 79), but more found safety from crime very important (59 versus 49).

The second tier of factors includes concern for the environment, financial cost, and desire for exercise/physical activity; fewer than half of respondents indicated these were important or very important. That financial cost sits in the second tier, rather than in the first tier, perhaps indicates that people are willing to pay more for transportation choices that better meet their other preferences.

**Q: “Indicate how important each one is to you when you’re deciding which form of transportation to use for your daily travel”**



**Figure 7. Importance of Various Factors in Mode Choice Decisions**

**Every mode choice factor is more important to women**

As Schneider, 2013, describes, individuals differ in how they value various factors. In turn, differences are seen across social groups. One particularly interesting set of differences is seen by gender: women find every factor more important than men (see Table 8). Some differences are larger than others, though. Women are much more concerned about the environment and crime by 17 and 10 percentage points, respectively.

**Table 8. Importance of Mode Choice Factors by Gender**

	Factor is Important or Very Important (%)		Gender difference
	Men	Women	
Fastest Time Possible	80	84	4
Safety from Crime	74	85	10
Easy to Use	72	80	8
Safety from Traffic/Crashes	72	79	7
Enjoyable, Non-Stressful	68	74	6
Concern for the Environment	39	57	17
Financial Cost	40	49	9
Desire to Get Exercise/Physical Activity	31	37	6

**Cyclists more concerned with physical activity and the environment**

Looking specifically at cyclists, they find exercise/physical activity much more important than respondents overall. Nearly double the cyclists rate exercise/physical activity important or very important than travelers in general. Cyclists were also relatively more concerned with the environment.

Conversely, cyclists were relatively less concerned about speed of travel, safety from crime, ease of use, and financial cost. That cyclists are less concerned with speed makes sense, given that bicycles are generally slower than cars. However, that cyclists find financial cost less important is interesting, given that bicycles are a relatively low-cost mode of transportation. In fact, financial cost was by far the least important factor for cyclists. This finding indicates that the affordability of cycling as a mode is not a primary selling point for cycling.

**Table 9. Importance of Mode Choice Factors among Cyclists**

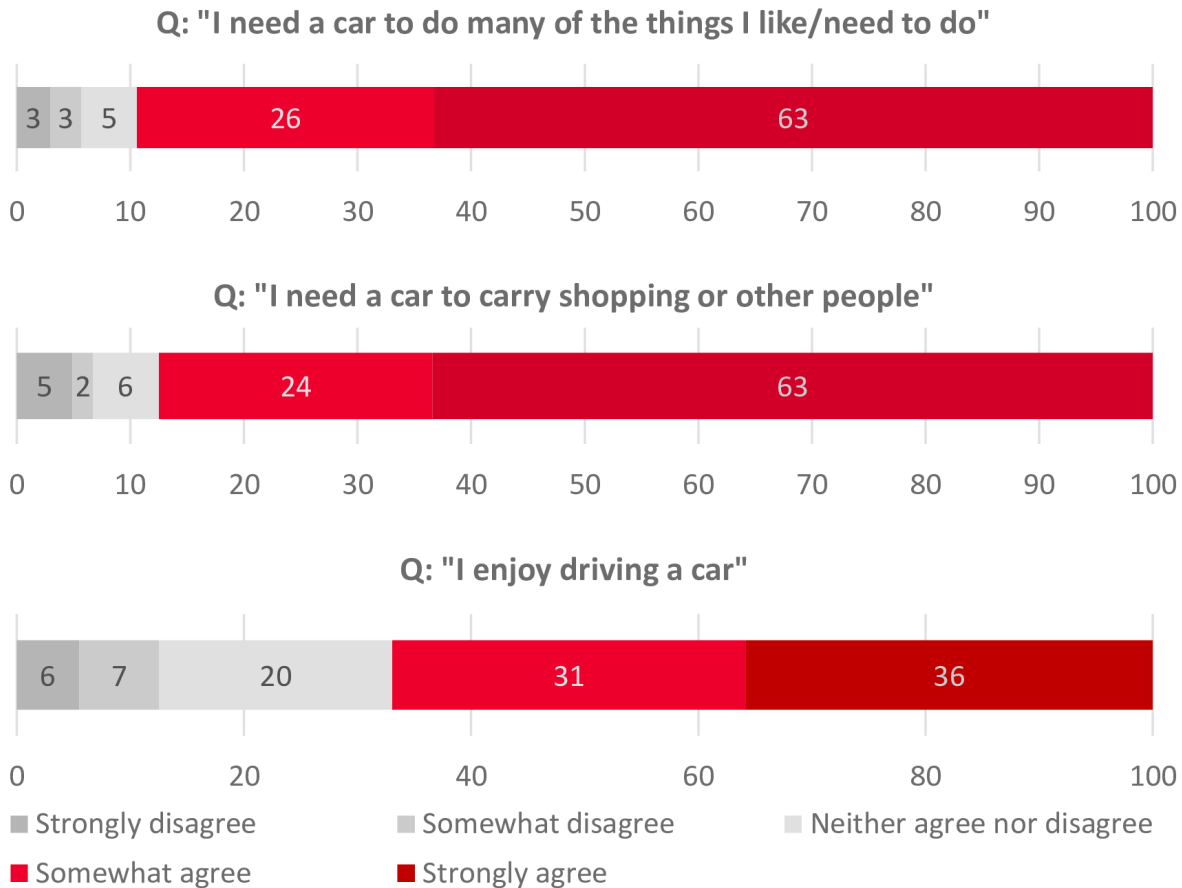
	Factor is Important or Very Important (%)		Difference (cyclists vs. all)
	All respondents	Cycle in an average week	
Fastest Time Possible	82	74	-8
Safety from Crime	79	68	-11
Easy to Use	76	67	-9
Safety from Traffic/Crashes	75	74	-1
Enjoyable, Non-Stressful	70	70	0
Concern for the Environment	49	57	8
Financial Cost	44	37	-8
Desire to get Exercise/Physical Activity	34	66	32

## POSITIVE AND NEGATIVE VIEWS ON DRIVING

### Most enjoy driving, think it is necessary

An obstacle to potential mode shifts away from motor vehicles is that the vast majority of respondents feel they need to drive for multiple reasons. By 83 percentage points, respondents net agreed with the statement that they need cars to do many of the things they like or need to do. (As previously mentioned, net agreement is the sum of those who agreed with a statement [either somewhat or strongly] minus those who disagreed with a statement [either somewhat or strongly]. Net agreement is thus measured in percentage points and can range from -100 to 100.)

Further, most said they need to drive to carry shopping cargo or other people, with a net agreement of 80 percentage points. Not only do respondents feel they need to use vehicles, but also, a supermajority said they enjoy driving cars, with a net agreement of 54 percentage points (see Figure 8).



**Figure 8. Perceptions on Need and Enjoyment of Driving**

Table 10 shows net agreement for needing to drive or enjoying driving cars across several social groups. Regarding the idea of needing cars to do the things one likes or needs to do, net agreement was relatively even across groups (between 80 and 88 percentage points).

There was a bit more variance in responses about the feeling that cars are necessary to carry goods or other people, with net agreement ranging from 75 to 91 percentage points. In particular, those living with children in their household (+91) almost universally agreed with this statement.

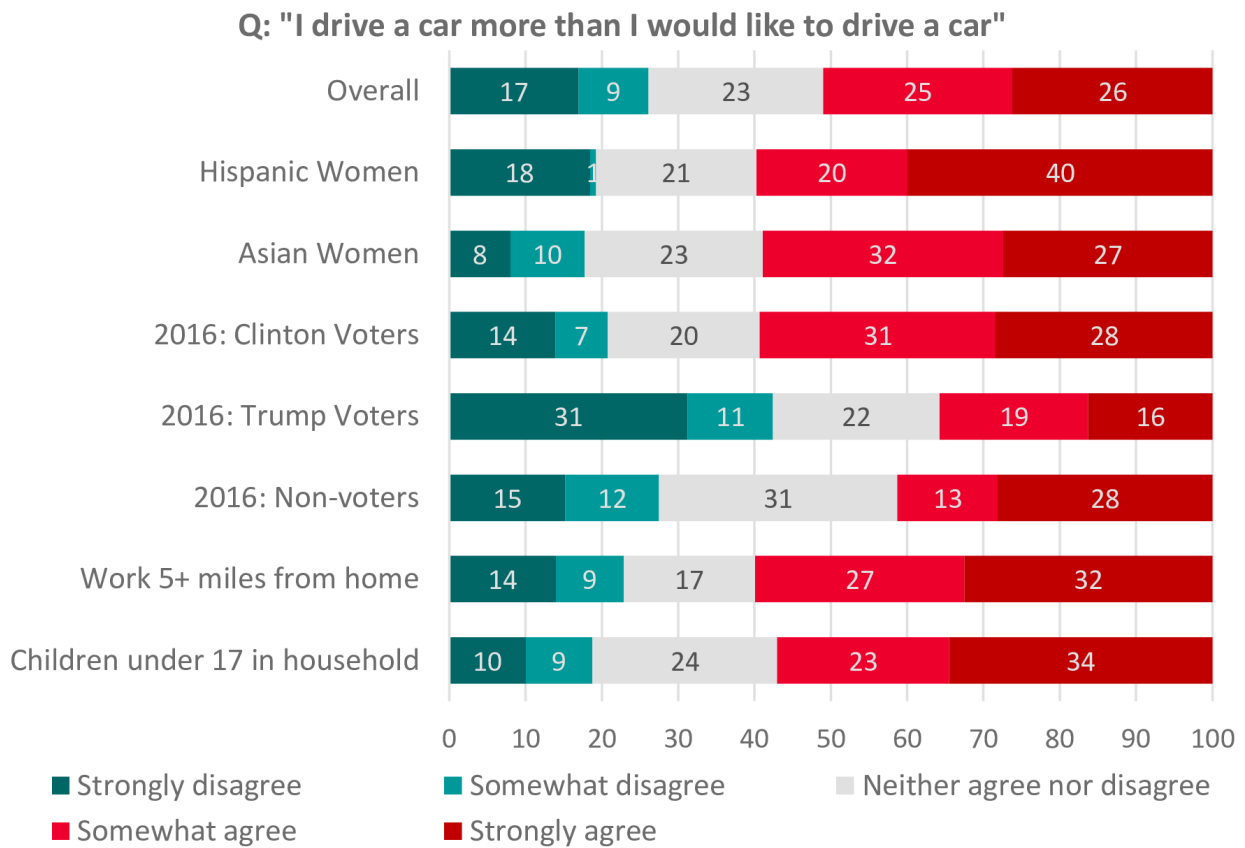
In terms of enjoyment, men (+64) reported enjoying driving cars more than women (+47), and Trump voters (+77) more than Clinton voters (+49). Despite the differences, net agreement was still extremely high, even for the groups that agreed less.

**Table 10. Net Agreement with Need/Enjoyment of Driving Statements by Social Group**

	I need a car to do many of the things I like/need to do	I need a car to carry shopping or other people	I enjoy driving a car
Respondents	84	81	54
Men	82	78	64
Women	86	83	47
18 to 34	83	80	47
35 to 49	88	87	61
50 to 64	83	75	60
65 or older	81	81	52
Asian	88	84	55
Hispanic	80	83	54
White	85	79	52
Bachelor's degree or higher	85	81	53
Some college or less	82	80	56
No children in household	83	76	53
Children in household	85	91	57
2016: Clinton voters	84	79	49
2016: Trump voters	87	82	77
2016: Non-voters	81	84	52

**Most would rather drive less**

Interviews conducted by Handy, Weston, and Mokhtarian proposed a strong mismatch between actual and desired levels of driving.<sup>4</sup> The results here, collected over a large sample size, corroborate this idea. A majority of respondents indicated they would prefer to drive less than they actually do. Net agreement was 25 percentage points among respondents overall. Hispanic women (+41), Asian women (+41), Clinton voters (+38), those who worked more than five miles from home (+36), and people who lived with kids/teenagers (+38) were among the groups that most strongly agreed with this idea. Trump voters (-7) notably did not express that they drive more than they would like.



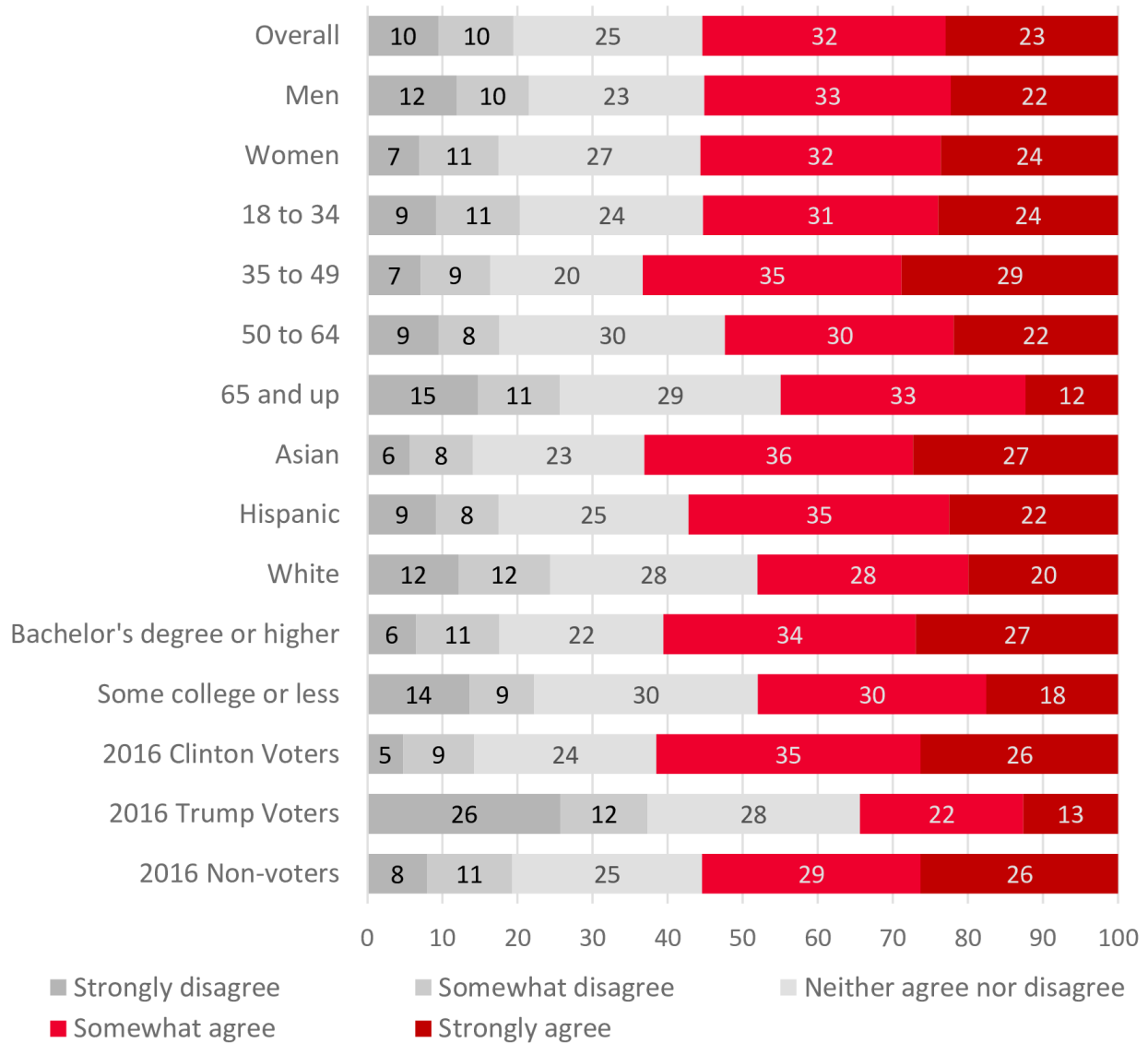
**Figure 9. Actual versus Desired Amount of Driving**

**Most agree too much driving is harmful for your health**

Literature on transportation and health frequently discuss the negative ramifications of excessive driving. For example, an epidemiological study by Maizlish argues that if California achieved “stated goals of doubling walking and transit trips and tripling bicycling,” that would reduce chronic disease associated with physical inactivity.<sup>5</sup> Such gains would “constitute a major public health accomplishment on par with California’s successful efforts at tobacco control.” (This would be despite slight increases in traffic deaths incurred by the greater numbers of pedestrians, cyclists, and transit riders.)

Respondents generally agree with the sentiment that spending too much time in a car is harmful for one’s health. Figure 10 shows that all but one group net agreed with this statement. Net agreement was 36 percentage points among respondents overall. Asians (+49), Hispanics (+40), those aged 35 to 49 (+47), and Clinton voters (+47) showed the greatest appreciation of a link between driving and negative health outcomes. White respondents (+26) and seniors (+19) had relatively low agreement, with Trump voters (-3) being the only group that net disagreed with the statement.

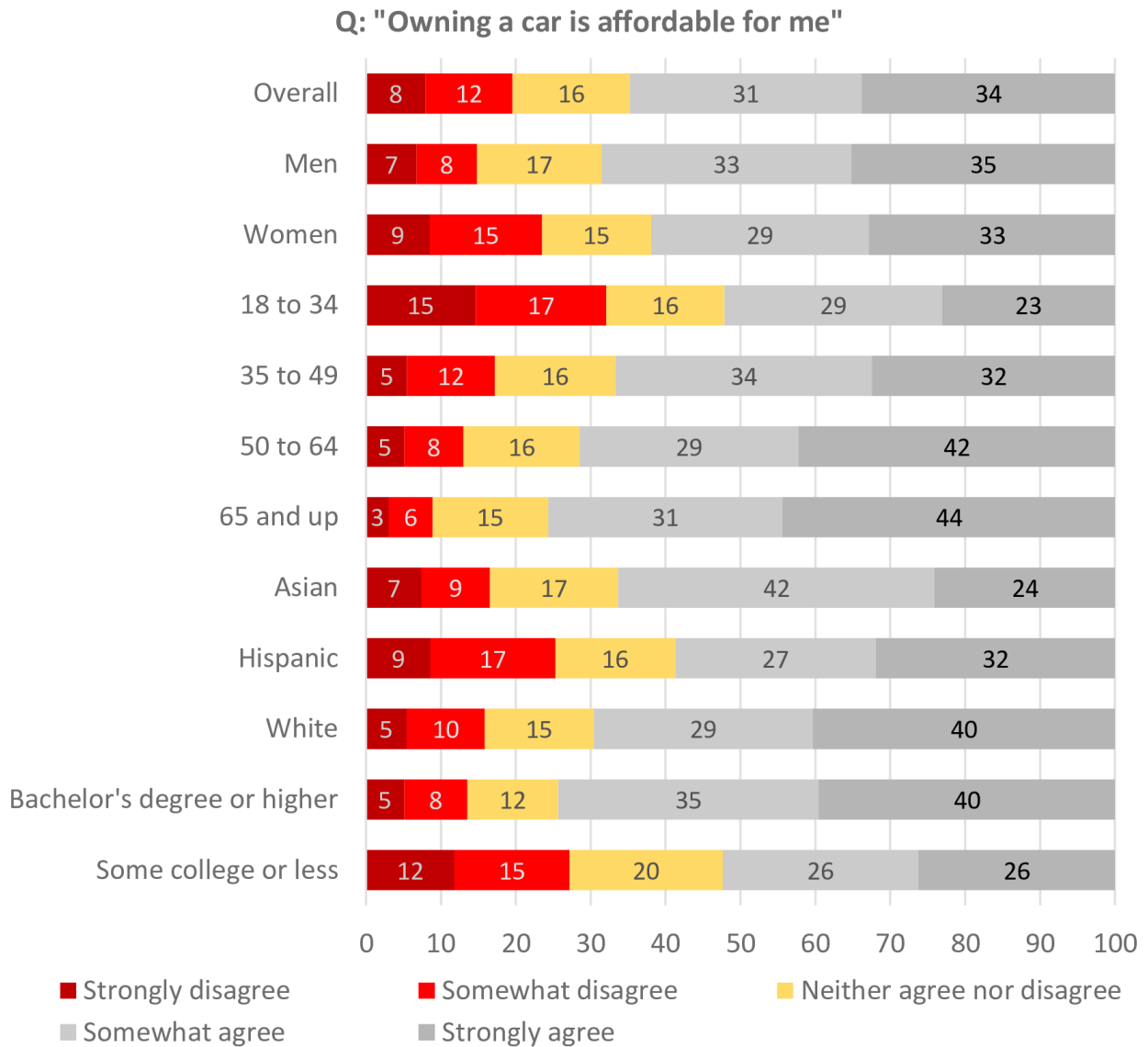
**Q: “Spending too much time in a car is harmful to your health”**



**Figure 10. Perceptions on Driving and Harm to Health**

**Driving is unaffordable for sizable proportions of many groups**

Respondents were asked whether car ownership was affordable for them, and a majority generally agreed that it was. That being said, car ownership is not viable for everyone, with 20 percent indicating car ownership is unaffordable (see Figure 11). A further 16 percent noted that while car ownership was not unaffordable, neither was it affordable. Women (24 percent), youngest adults (32 percent of ages 18–34), Hispanics (26 percent), and those without a Bachelor’s degree (27 percent) were relatively more likely to indicate that car ownership is unaffordable to them.



**Figure 11. Perceptions on the Affordability of Car Ownership**

## DAILY TRAVEL AND STRESS

### Nearly even numbers of people find their daily travel stressful, not stressful

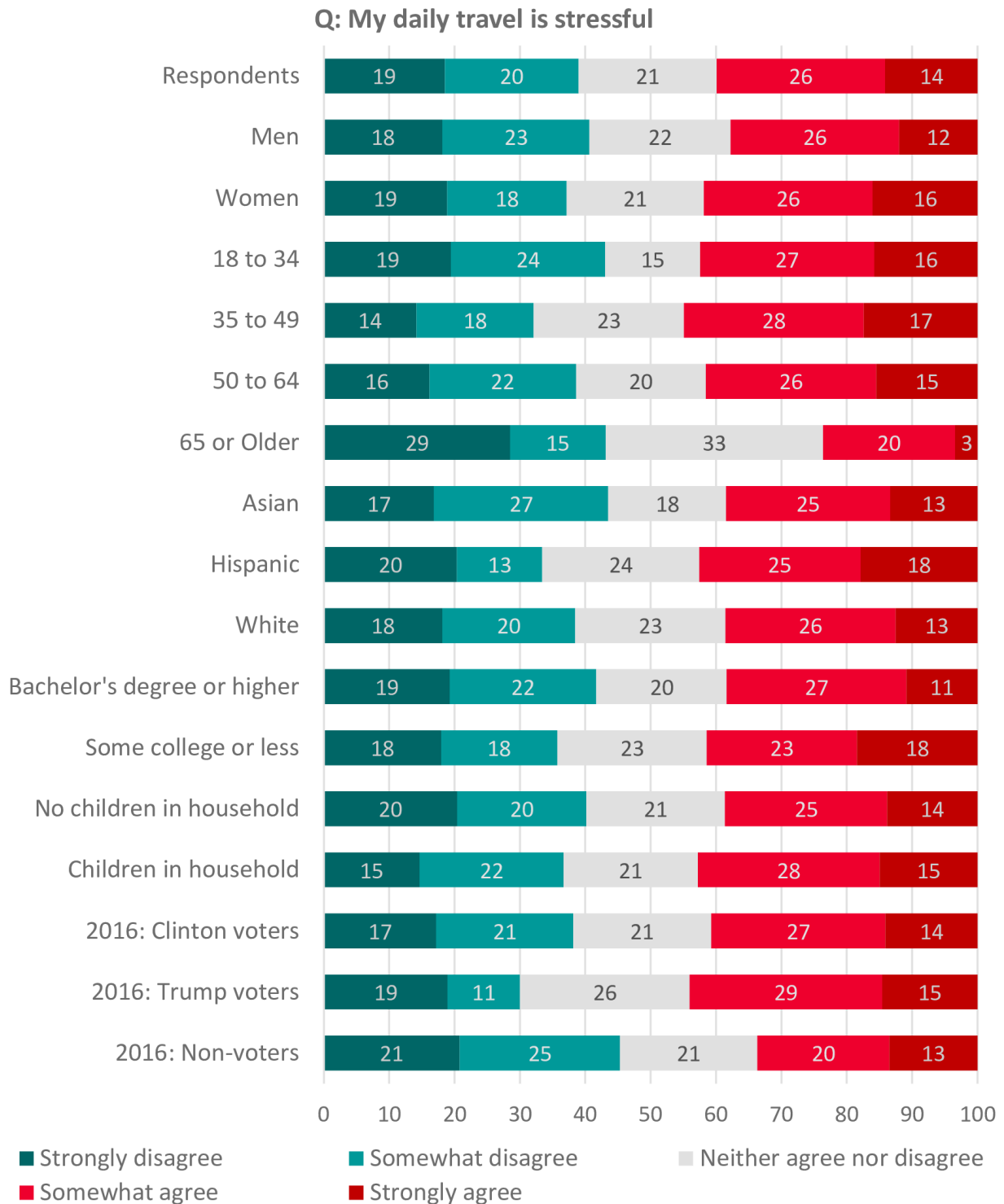
When asked whether their daily travel is stressful, 40 percent agreed, and 39 percent disagreed—a near even split. However, Figure 12 shows there is some wide variation by group.

Women (+5 net agreement) tend to find their travel more stressful than men (-3). Those with kids (+6) were also more stressed than those without kids (-2).

There were vast differences in opinion by age, but these differences were not linear. Those aged 18 to 34 were split (-1), whereas those aged 35 to 49 (+13) were much more stressed.



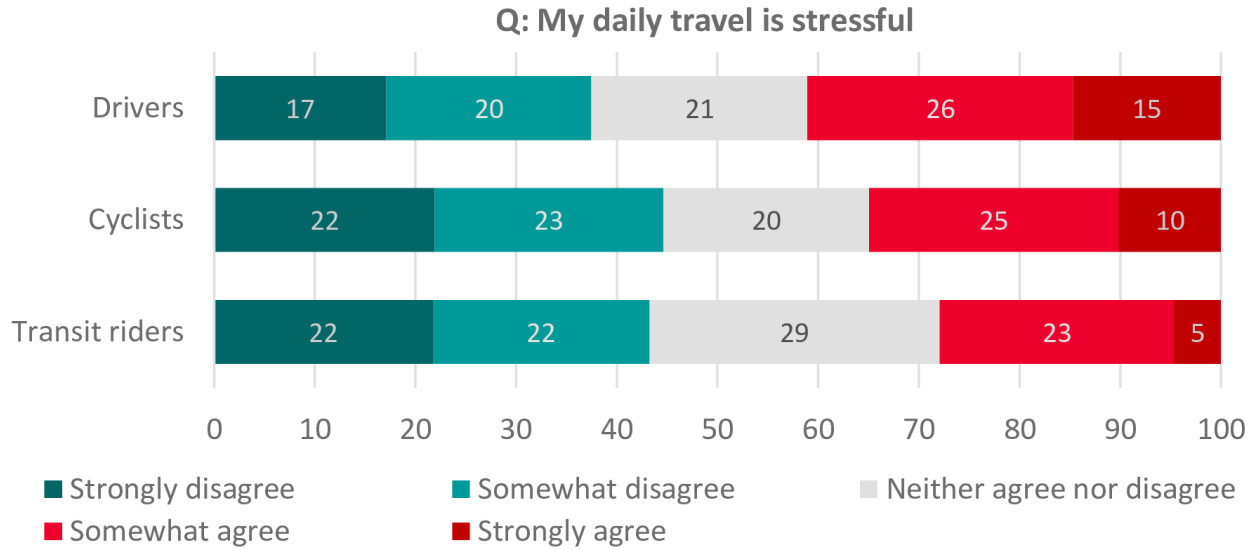
Senior citizens (-19), perhaps unsurprisingly, were the least stressed of any social group in Figure 12. There were also fairly wide differences in opinion by race and political alignment.



**Figure 12. Perceptions on Daily Travel and Stress**

### Cyclists and transit users find their travel less stressful than drivers

Clear differences in reports about travel stress are also apparent by mode of transportation. Drivers (+4) are stressed by their daily travel. Cyclists (-10) are much less stressed, and transit riders (-15) were even less stressed.



**Figure 13. Perceptions of Daily Travel and Stress by Modes of Travel (in an average week)**

## V. PERSPECTIVES ON CYCLING

### POTENTIAL BARRIERS TO CYCLING

#### In most places, respondents say places they go are outside cycling range

One notable barrier to cycling in Santa Clara County is that respondents net disagreed (by a 14-percentage point margin) that the places they need to go are close enough to reach on a bicycle. In particular, residents in relatively sprawling south county (-34) and outer San José districts (-20) felt destinations were too far away to bike to. Respondents in central San José (+11), however, did tend to think their desired destinations were close enough to bike to.

Q: Many of the places I need to go are close enough to reach by bicycle

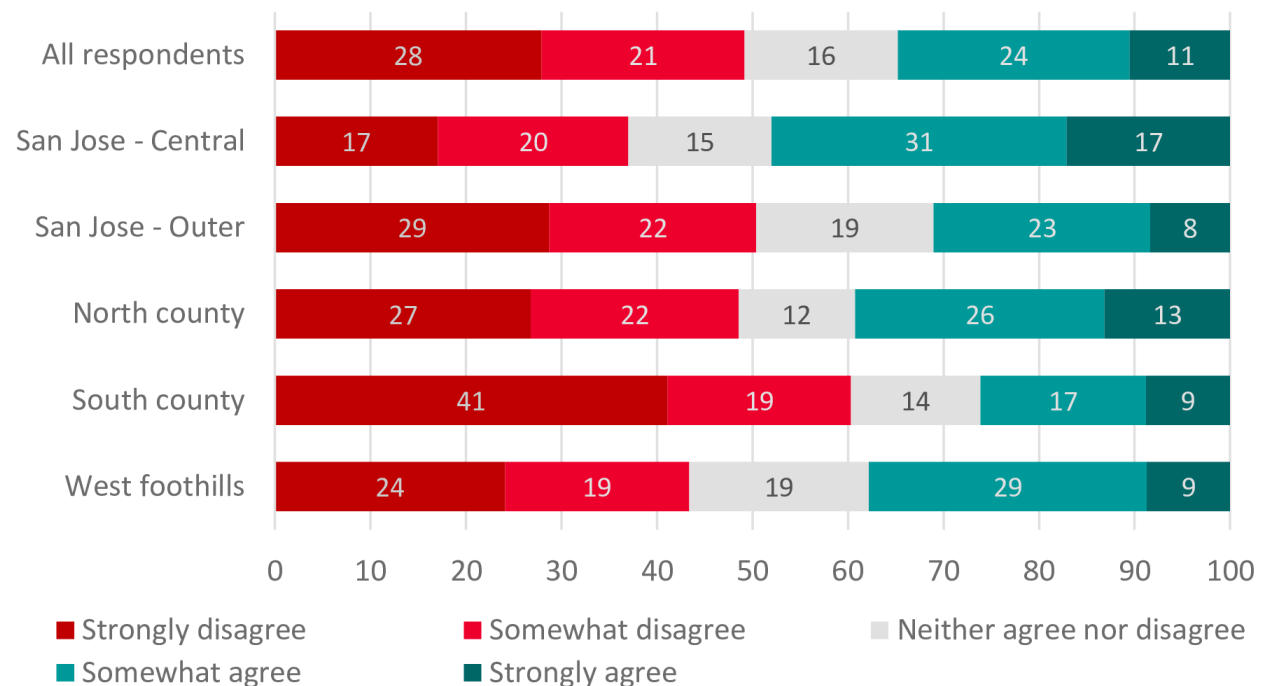
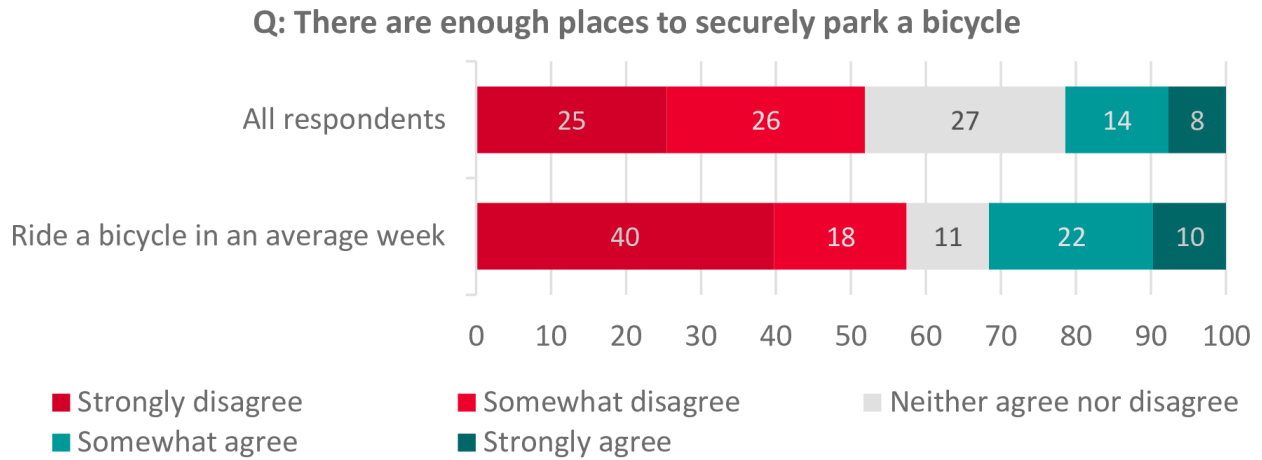


Figure 14. Perceptions on Distance of Destinations and Cycling

#### Bike parking also problematic

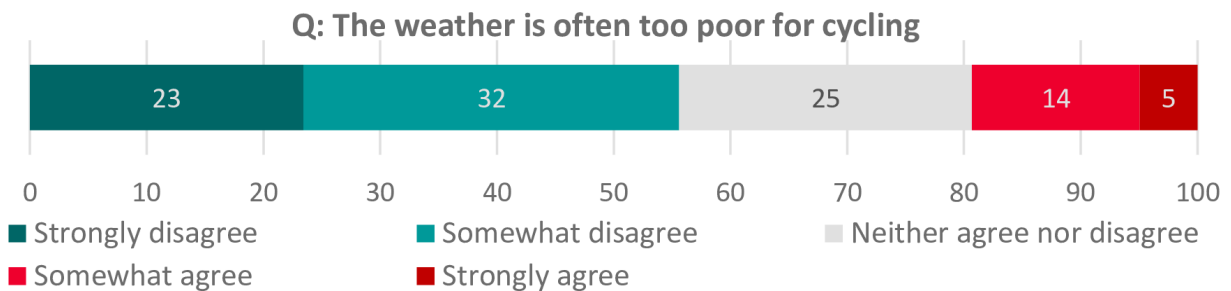
Another destination-related challenge for cycling is that most do not think there are enough secure places to park bicycles. Figure 15 shows that a majority of respondents disagree that there is enough secure parking (-29 net disagreement). Active cyclists, who have a more experience looking for bike parking, also reported that parking was not available (-26).



**Figure 15. Perceptions on the Sufficiency of Bicycle Parking**

**Weather is not seen as an issue**

On a positive note for cycling in Santa Clara County, respondents generally find the weather to be conducive to cycling. Asked whether the weather is often too poor for cycling, only about one in five agreed, although one in four were neutral (see Figure 16).



**Figure 16. Perceptions on Distance of Cycling and Weather**

**Most do not see age or physical limitations as a barrier, but think cyclists need to be in good shape**

Table 11 shows that most respondents do not think cycling is incompatible with their age group (-58 net disagreement). This holds true even for senior citizens (-11). Respondents also do not report having physical limitations that would preclude cycling (-27). On this point, though, senior citizens were an exception, with a majority indicating they have a physical limitation that prevents cycling or makes it difficult (+20).

While most respondents do not report having physical limitations, most reported agreeing that one needs to be “in shape” to bicycle. Thus, even absent a discrete physical limitation, general physical condition could still be a potential barrier. This sentiment also varied by age: seniors (+46) highly agreed, while young adults (-2) slightly disagreed. This finding may

indicate that among young adults, most think you can ride a bike whether you are in shape or not, but seniors see cycling as being for those in better physical condition. Sentiment also varied by race, with Hispanic respondents disagreeing (-4) that someone needs to be in shape to ride a bicycle while white (+19) and Asian (+30) respondents highly agreed.

**Table 11. Perceptions on Physical Condition, Age, and Cycling**

	Net Agreement (%)		
	A person needs to be in good physical shape to bicycle	A physical limitation prevents or makes it difficult for me to ride a bicycle	Bicycling is not an activity for someone of my age
All respondents	15	-27	-58
Men	11	-44	-63
Women	20	-9	-52
18 to 34	-2	-43	-80
35 to 49	18	-42	-77
50 to 64	12	-20	-41
65 or older	46	20	-11
Asian	30	-29	-58
Hispanic	-4	-36	-69
White	19	-24	-53

**Concern over cycling and professional concerns**

Another potential barrier for cycling—in particular for commuting trips—is that respondents generally agree that cycling, and its associated physical activity, are not conducive to professionalism. By a 21-percentage-point margin, respondents agreed that by cycling to work, one becomes too sweaty to be professional, and by a 34-percentage-point margin respondents agreed that cycling is incompatible with work clothes. Such concerns were higher among women and people without Bachelor’s degrees. Interestingly, young adults were also more concerned than older adults, who presumably are more likely to be in supervisory positions.

**Table 12. Perceptions on Cycling and Professional Concerns**

	Net Agreement (%)	
	Bicycling to work would make someone too sweaty to be professional	Bicycling is incompatible with the clothing people need to wear to work
Respondents	21	34
Men	14	30
Women	30	38
18 to 34	24	43
35 to 49	34	42
50 to 64	14	24
65 or Older	7	20
Asian	26	34
Hispanic	18	36
White	18	33
Bachelor’s degree or higher	20	31
Some college or less	23	37

**Most do not know people “like them” who are cyclists**

Social influences, including the attitudes and behaviors of one’s personal contacts and communities, can play a role in whether cyclists start to ride or keep cycling.<sup>6</sup> To ascertain the social environment in which respondents make their travel decisions, the researchers asked whether respondents are aware of people like them who use various modes of transportation. Essentially: is the use of various modes of transportation a socially “normal” activity for people similar to oneself?

Table 13 shows that by a 29-percentage-point margin, respondents overall indicate that they do not know people like them who routinely ride a bicycle for travel. Unsurprisingly, most everyone reported knowing people like them who drove cars to get around (+88). Respondents generally did not know people like them who rode transit (-15), but for most groups, respondents reported knowing more people like them who used transit than rode bicycles.

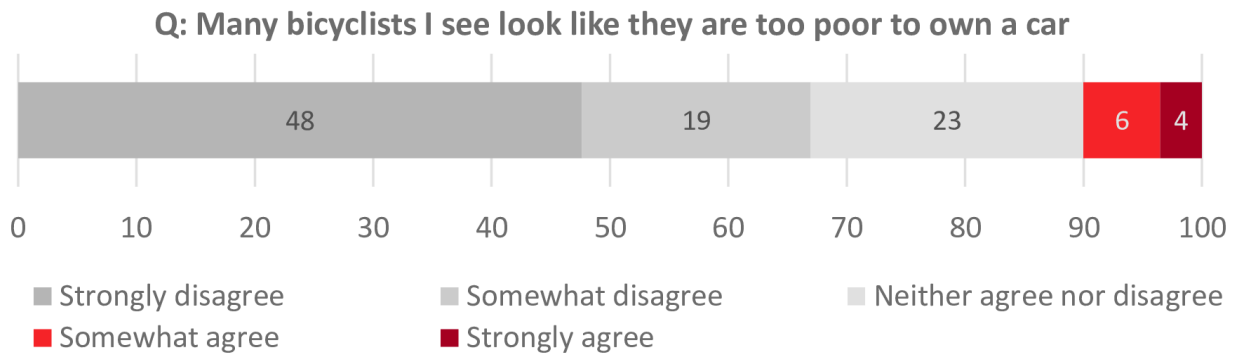
With increasing age, respondents reported knowing fewer people like them who cycle (-24 for those aged 18 to 34; -43 for seniors). Additionally, white respondents (-38) and Trump voters (-53) reported knowing relatively few people like them who routinely ride a bicycle to get around.

**Table 13. How do People “Like Me” Travel?**

	Net Agreement (%)		
	I know several people like me who routinely drive a car to get around	I know several people like me who routinely use transit to get around	I know several people like me who routinely bicycle to get around
Respondents	88	-15	-29
Men	86	-23	-31
Women	91	-8	-28
18 to 34	93	6	-24
35 to 49	95	-16	-27
50 to 64	83	-22	-29
65 or older	76	-43	-43
Asian	85	-2	-28
Hispanic	90	1	-23
White	90	-34	-38
Bachelor’s degree or higher	90	-23	-30
Some college or less	86	-4	-27
No children in household	87	-15	-31
Children in household	92	-14	-25
2016: Clinton voters	87	-2	-29
2016: Trump voters	90	-41	-53
2016: Non-voters	87	-9	-23

**Cycling not associated with poverty**

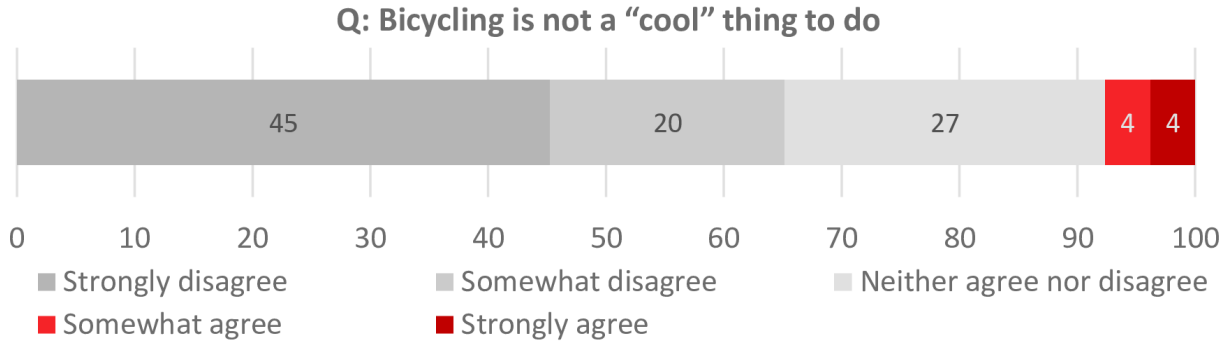
Also, in terms of the social environment, cycling can be associated with various types of social stigma.<sup>7</sup> For example, people may deem that cycling connotes being impoverished. To get at this dynamic, the researchers asked respondents whether many bicyclists appeared to be too poor to own a car. Figure 17 shows that only 10 percent of respondents agreed, showing that most in Santa Clara County do not appear to associate cycling (or cyclists) with poverty.



**Figure 17. Perceptions on Cycling and Economic Status**

### Cycling not “uncool”

Cycling being “uncool,” or less “cool” than other modes of travel such as driving, is another hypothesized social barrier to cycling. Figure 18 shows that when asked whether cycling was, in fact, an uncool thing to do, respondents mostly rejected this idea, with only eight percent in agreement and 45 percent in strong disagreement.

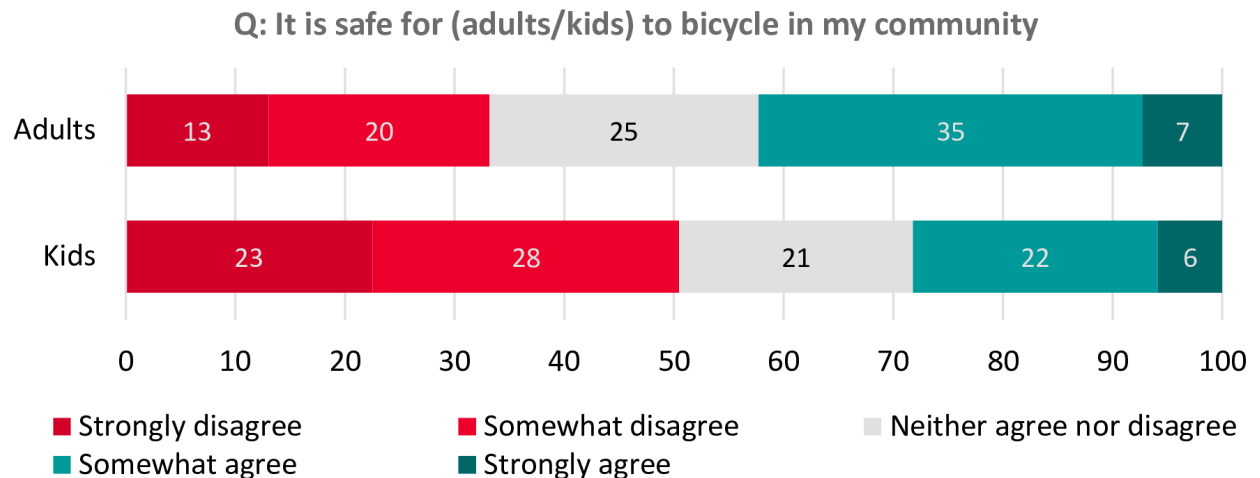


**Figure 18. Perceptions on Cycling and Coolness**

## CYCLING SAFETY

### Cycling perceived as somewhat safe for adults, not safe for kids

Respondents have mixed opinions on the safety of cycling in Santa Clara County. Overall, more respondents think it is safe for adults to ride a bicycle (+9 net agreement). However, only 42 percent agree that cycling is safe for adults. Additionally, a majority of respondents do not think cycling is safe for kids (-22 net agreement). Those who have minors in their households were even more negative (-27 net agreement).



**Figure 19. Perceptions on Cycling Safety among All Respondents**

Those who reported riding a bike in an average week had slightly more positive views on cycling safety. By 16 percentage points, cyclists thought cycling was safe for adults, and by -18 percentage points they disagreed that cycling was safe for kids. That cyclists have more positive views of safety is expected: regardless of their opinions on cycling safety,



positive or negative, they have deemed it at least safe enough to ride.

### Geographic variations in perceptions of cycling safety

Some differences in opinion on safety can be seen when looking at different geographic areas in the county. In general, respondents who live in San José had relatively poorer perceptions of safety. This was particularly true in the outer neighborhoods of San José.

Interestingly, safety perceptions do not necessarily appear to correspond to cycling rates. Respondents from both the central and outer areas of San José had poor safety perceptions, but cycling rates were high in central San José and low in outer San José. Additionally, the west foothill areas had the most positive safety perceptions and the lowest rates of cycling.

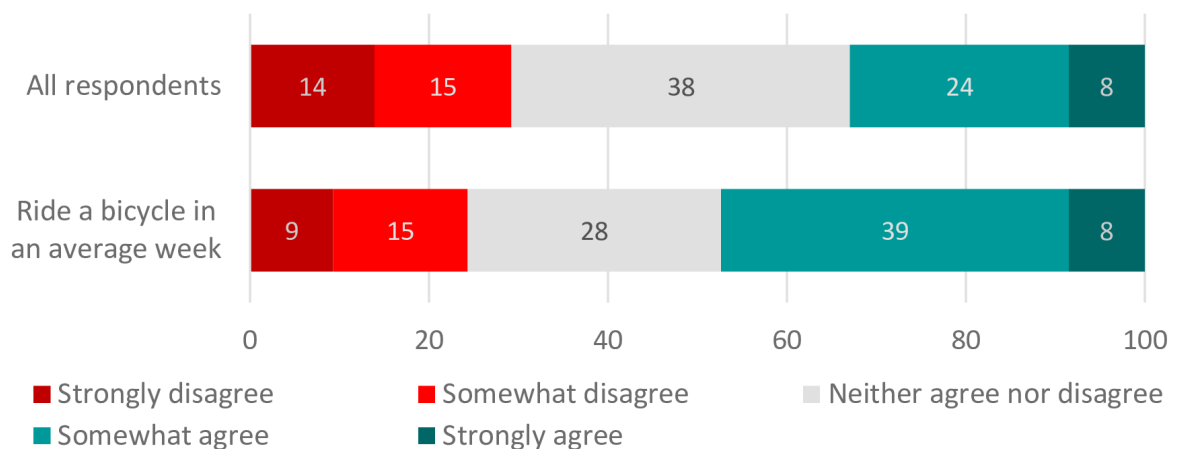
**Table 14. Perceptions on Cycling Safety by Area**

	Cycle for any purpose in an average week (%)	Net Agreement: Cycling is safe for this demographic (%)	
		Adults	Kids
San José: Central	18.2	8	-17
San José: Outer neighborhoods	9.1	4	-26
North county	17.4	16	-31
South county	11.1	13	-16
West foothills	8.4	16	8

### Recent safety improvements

To gauge whether recent actions may have impacted safety, respondents were asked if they thought cycling conditions had gotten safer over the last three years. Among all respondents, sentiment was very mixed, with a plurality neither agreeing nor disagreeing. Nearly even proportions agreed and disagreed (+3 net agreement). Among those who ride a bicycle in an average week, sentiment was more positive, with just under a majority agreeing that conditions have gotten safer (+23 net agreement).

**Q: “Bicycling conditions have become safer over the last 3 years”**

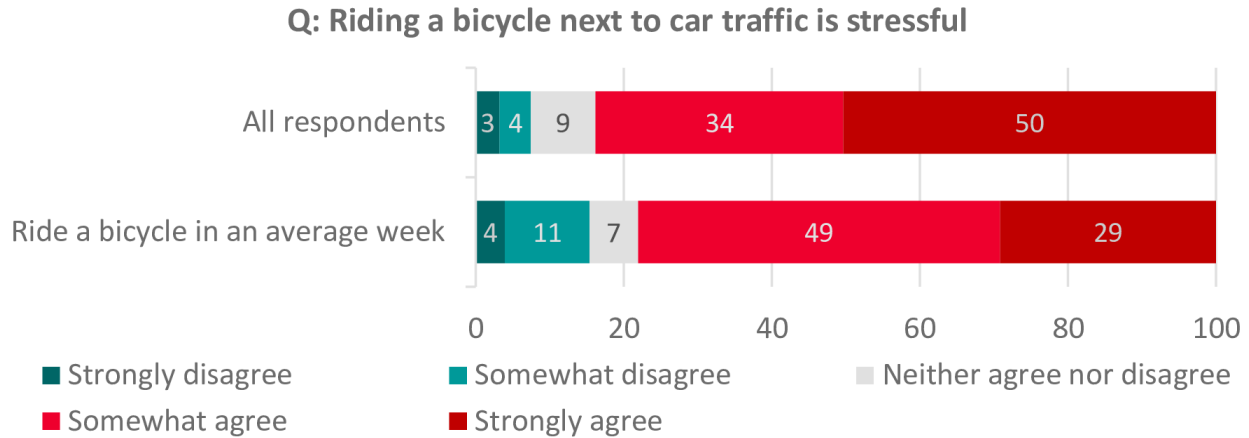


**Figure 20. Perceptions on Recent Changes to Cycling Safety**

## CYCLING INFRASTRUCTURE

### Cycling next to traffic seen as stressful

In most places in the US, cyclists ride mixed with or directly adjacent to motor vehicle traffic. Respondents generally agreed that riding next to cars is stressful: 84 percent of all respondents hold this sentiment. Active cyclists are slightly more comfortable, but still, more than three-quarters find riding next to cars stressful.



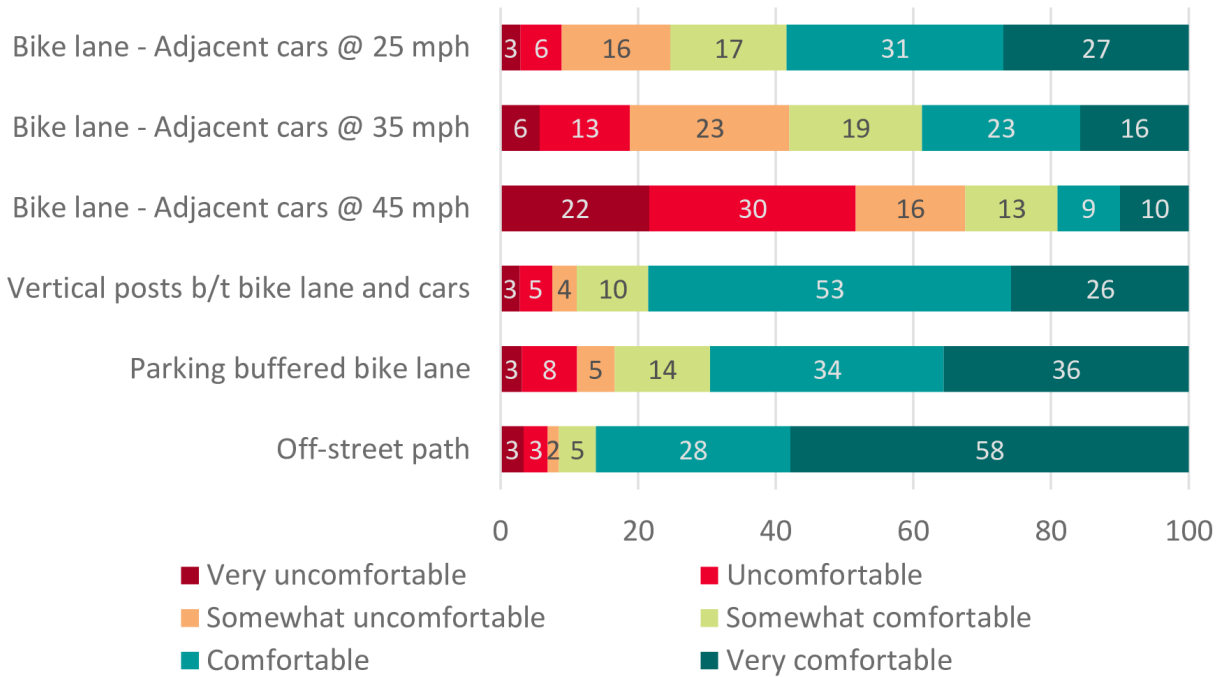
**Figure 21. Perceptions on Stress of Cycling Next to Car Traffic**

### Bike lanes are not enough

More specifically in terms of bicycle infrastructure, respondents were asked how comfortable or uncomfortable they would be in six scenarios. First, they were asked how comfortable they would be riding on a “conventional” bike lane, delineated from adjacent road traffic with only paint, with that adjacent traffic moving at three different speeds (25, 35, and 45 miles per hour). Respondents were shown two photos of conventional bike lanes to assist with comprehension of the concept.

Figure 22 shows that a majority of cyclists (58 percent) are comfortable or very comfortable riding on a bike lane next to traffic going 25 miles per hour. However, as speed increases, comfort quickly decreases. In a bike lane next to 35 mph traffic, only 39 percent of cyclists are comfortable or very comfortable, and next to 45 mph traffic, only 19 percent are comfortable or very comfortable. At moderate speeds and above, bike lanes are not enough to make cyclists comfortable.

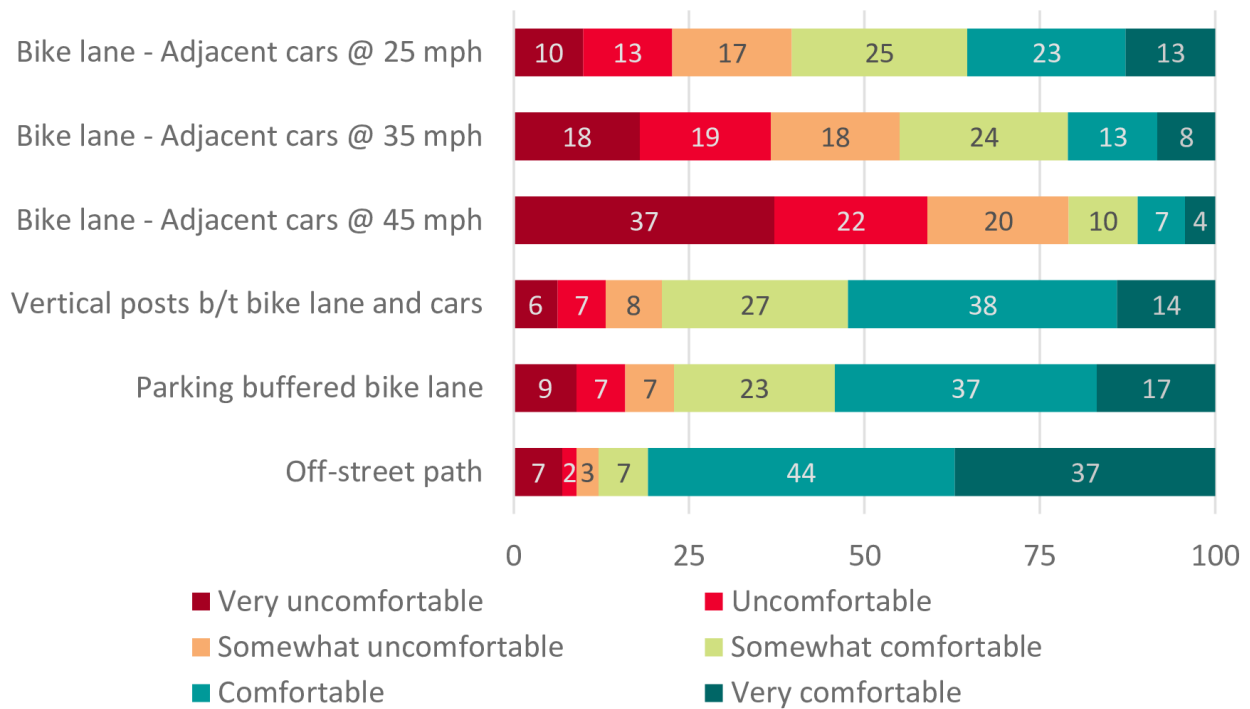
Looking specifically at cyclists, they are more comfortable on any facility compared to respondents in general. However, cyclists are similar to all respondents in that they find conventional facilities less comfortable than advanced facilities, and comfort on conventional facilities drops with increasing speed. Notably, supermajorities of cyclists are comfortable or very comfortable on all three advanced facilities (as opposed to simple majorities for vertical post and parking-buffered bike lanes for all respondents).



**Figure 22. Comfort Riding on Various Bike Facilities (bicycle in avg. week)**

Respondents were also asked how comfortable or uncomfortable they would be riding on three “advanced” types of bicycle infrastructure. First, they were asked about bike lanes where vertical posts are installed between the bike lane and adjacent cars (e.g., there is more than just paint). Additionally, they were asked about a setup where car parking spaces are placed between the bike lane and moving traffic, with the cars acting as a protective physical buffer. Finally, respondents were asked about completely off-street paths for cycling. Again, respondents were shown images of each to assist with comprehension of these concepts. Figure 22 also shows that comfort is much higher on these advanced facilities than on conventional bike lanes. Supermajorities of cyclists said they would be comfortable or very comfortable on these types of paths.

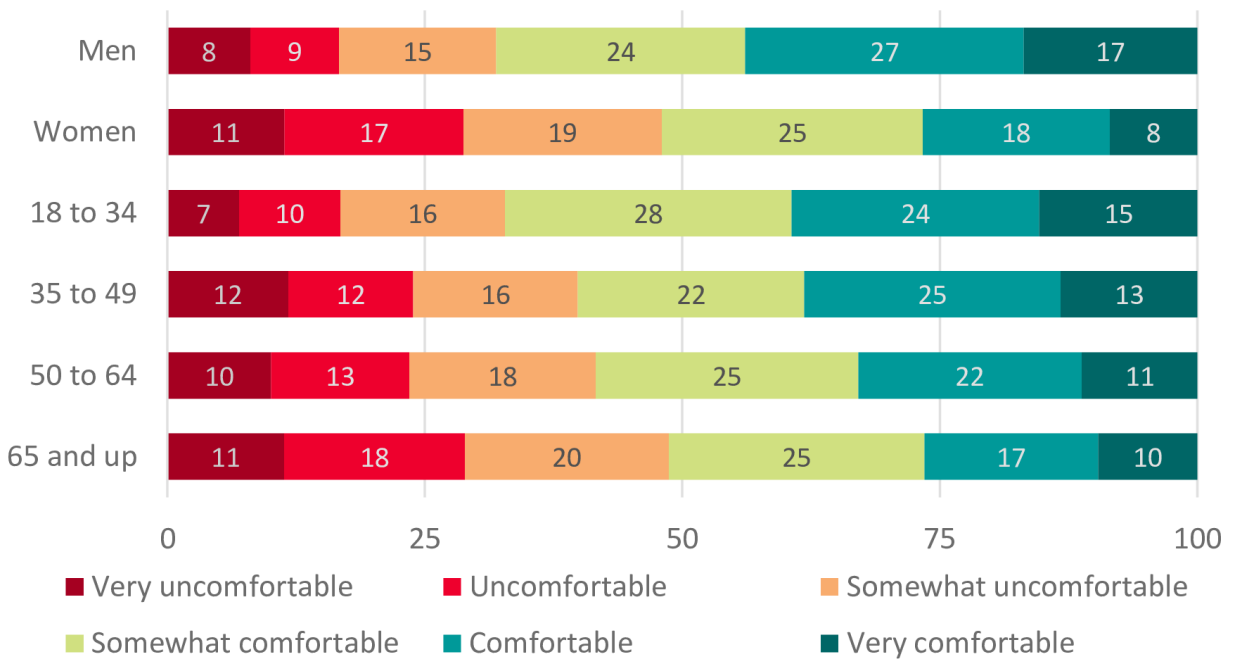
Looking at all respondents, whether they currently cycle or not, shows a similar trend of lower comfort on conventional bike lanes and greater comfort on advanced infrastructure (see Figure 23). The comfort of current non-cyclists is important to measure as some of them must be converted if additional cyclists are to be created. Respondents overall were generally less comfortable with the idea of cycling on any facility than current cyclists. Only 40 percent of respondents overall were comfortable or very comfortable with the prospect of riding on a conventional bike lane next to traffic going just 25 mph. This further highlights the importance of providing more than just conventional bike lanes.



**Figure 23. Comfort Riding on Various Bike Facilities (all respondents)**

**Variation in comfort by group**

Comfort when cycling on different facilities also varies with certain demographic factors. Figure 24 shows that generally, for the same facility (in this case, a conventional bike lane next to 25 mph traffic), men are more comfortable than women, and younger groups are more comfortable than older groups. Thus, if planning to build facilities that are comfortable for all, one might want to design facilities that are comfortable for women and senior citizens (and also kids, based on the responses to other questions). Table 15 further breaks down comfort riding on various facilities by social group.



**Figure 24. Comfort Riding on a Conventional Bike Lane Next to 25 mph Traffic**

**Table 15. Comfort on Various Bike Facilities by Group**

	Comfortable or Very Comfortable (%)					
	Conventional bike lane, adjacent traffic at...			Bike lane w/ vertical posts	Parking-buffered bike lane	Off-street path
	25 mph	35 mph	45 mph			
All respondents	35	21	11	52	54	81
Men	44	27	14	56	62	84
Women	27	15	8	48	45	78
18 to 34	39	19	8	72	65	90
35 to 49	38	21	11	46	51	82
50 to 64	33	25	14	46	53	76
65 or older	26	18	11	38	43	72
Asian	33	13	5	53	56	85
Hispanic	36	18	9	55	65	79
White	34	24	12	49	51	81
Bachelor's or higher	36	22	11	53	56	83
Some college or less	34	20	12	51	51	77
Grew up: California	33	20	11	51	56	77
Grew up: Other US	39	22	12	53	52	85
Grew up: Other country	39	22	10	56	53	86
No children in household	35	22	11	49	52	80
Children in household	36	19	11	60	58	84
2016: Clinton voters	34	17	9	56	54	81
2016: Trump voters	34	28	15	41	48	70
2016: Non-voters	43	25	14	59	63	92

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## VI. CARS AND BICYCLES: FRIENDS OR ADVERSARIES?

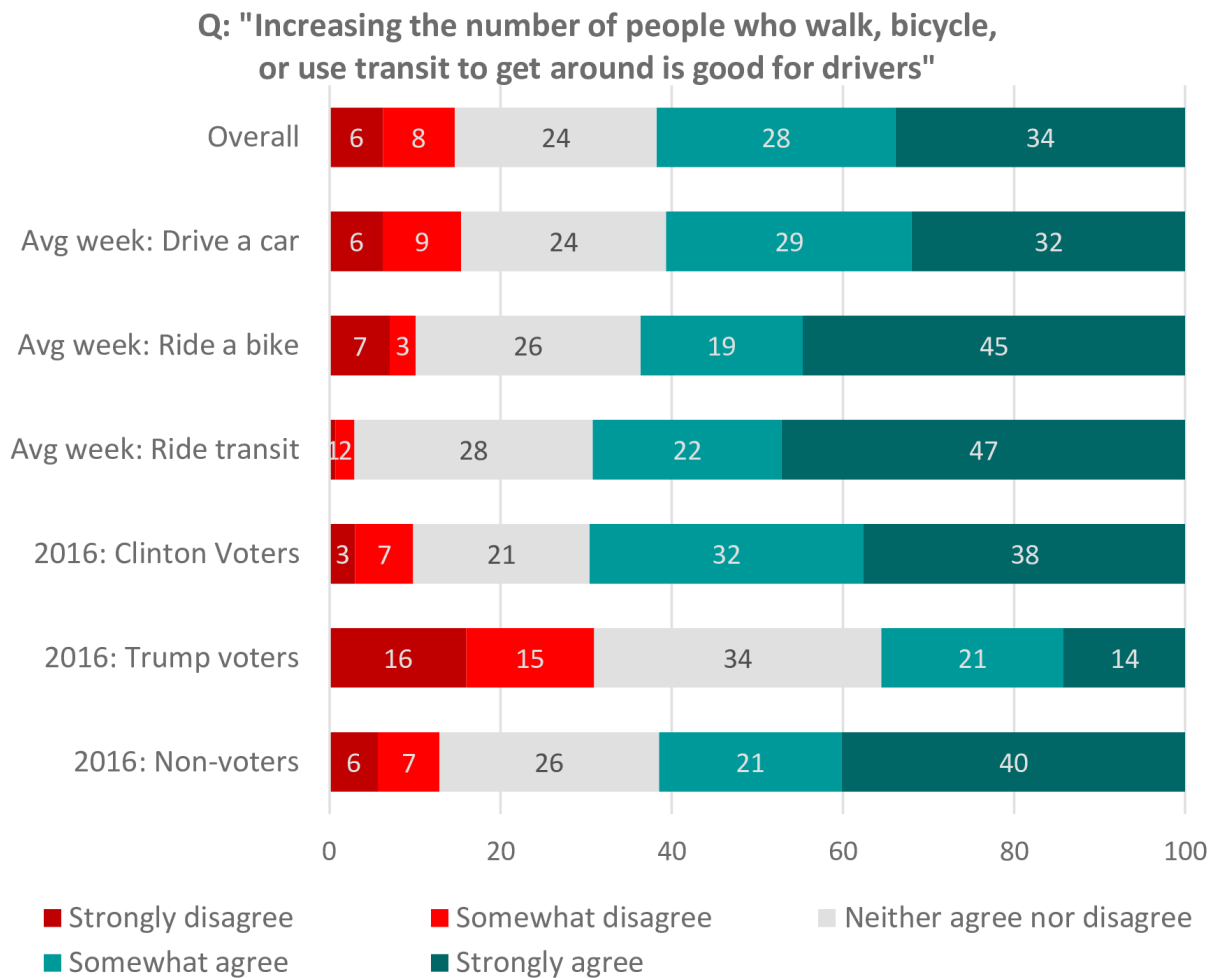
In areas that are already developed, creating infrastructure that specifically serves cyclists, pedestrians, and transit users usually requires re-allocating road space that is currently devoted to cars. Given the heavy use of cars, projects creating facilities for other users have often led to heated opposition, such as in the case of the “road diet” project on Lincoln Avenue in San José.<sup>8</sup> In some cases, opponents “fighting to preserve a way of life” have even launched recall efforts of pro-road-diet public officials.<sup>9</sup> Given this “bikelash,” respondents were asked a few questions exploring the relationship between drivers and cyclists.

### DRIVERS AND THE USE OF OTHER MODES

Respondents were asked whether they think increasing the number of people who walk, ride bicycles, or use transit is good for drivers. Note that this question was not framed about benefits to society, where concerns such as pollution could come into play, but rather in terms of drivers specifically. Presumably, one might agree that other users are beneficial to drivers if they think the use of other modes would reduce the number of other drivers competing on the road. One might disagree, if they think other users and their infrastructure get in their way or take space from them.

Overall, the vast majority of respondents indicated that they thought more people using alternative modes was good for drivers (+47 net agreement). Among drivers, positive sentiment was slightly lower but still very high (+45 net agreement).

Relevant for policymaking, political leanings represented one area where there was some notable divergence of opinion. Non-voters and Clinton voters strongly agreed that increasing the use of alternatives benefited drivers (net agreement of 49 and 60 percentage points, respectively). While Trump voters were in net agreement as well, the percentage was much lower (+5), with only 35 percent of respondents in agreement.



**Figure 25. Perceptions on Benefit of Increased Use of Alternative Modes for Drivers**

## DEMAND FOR MORE CAR INFRASTRUCTURE

While respondents generally agreed that an increase in pedestrians, cyclists, and transit riders is a good thing for drivers, most respondents also reported wanting more infrastructure for cars.

Table 16 shows that across most social groups, there was strong net agreement that respondents' communities needed more lanes for cars, specifically on city streets, as well as more car parking. Support for more parking was particularly strong.

Users of alternative modes were least likely to support more car lanes or more car parking. That said, bicyclists and transit riders still had fairly high agreement for more parking. This finding may reflect the fact that, as previously discussed, a majority of transit riders and a vast majority of cyclists are also drivers.

Among other groups, Asian and Hispanic respondents, Trump voters, and those without Bachelor's degrees were relatively more in favor of car infrastructure than whites, Clinton voters, and those with Bachelor's degrees.

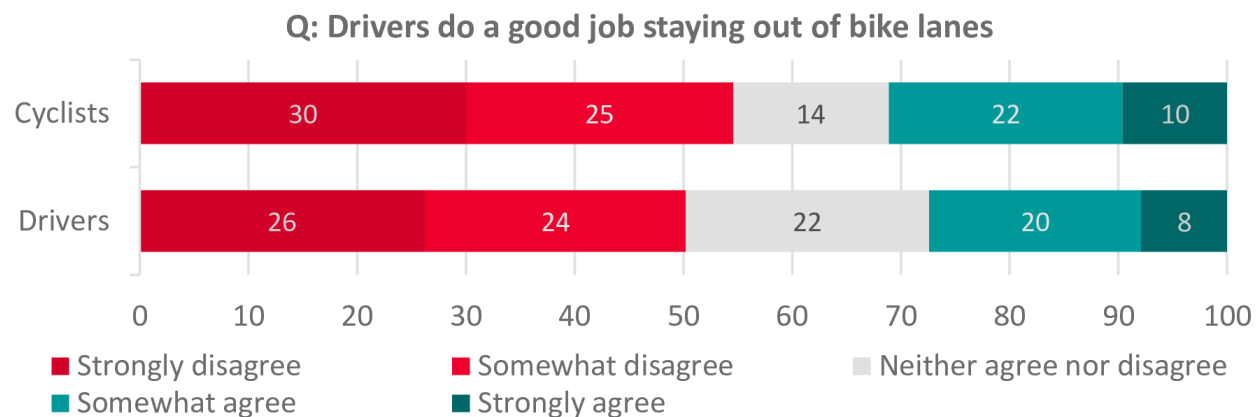
**Table 16. Perceptions on the Need for More Vehicle Infrastructure**

	Net Agreement (%)	
	In my community, we need more lanes for cars on city streets	In my community, we need more car parking
All respondents	21	41
Men	26	39
Women	15	43
18 to 34	18	46
35 to 49	24	39
50 to 64	23	38
65 or older	16	41
Asian	29	51
Hispanic	26	49
White	7	28
Bachelor's degree or higher	13	30
Some college or less	30	56
2016: Clinton voters	13	35
2016: Trump voters	49	53
2016: Non-voters	16	47
Avg week: Drive a car	22	43
Avg week: Ride a bike	1	25
Avg week: Ride transit	-8	19

## DRIVERS AND CYCLING SAFETY

### Even drivers don't think they respect bike lanes

Cyclists think drivers do a bad job staying out of bike lanes, with a majority disagreeing that they do a good job. Drivers also admit that as a group they do not stay out of bike lanes, with the same 23-percentage-point net disagreement as cyclists, albeit with a larger proportion of neutral responses.

**Figure 26. Driver Treatment of Bike Lanes**



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## Every group thinks drivers have a greater responsibility for traffic safety

Cyclists, pedestrians, transit users (walking and cycling from stops), and users of micromobility devices are often referred to as the “vulnerable” users of the transportation system. These users are vulnerable statistically—they are over-represented in traffic-related injuries and fatalities—and conceptually—they are not surrounded by thousands of pounds of metal like those riding in motor vehicles.

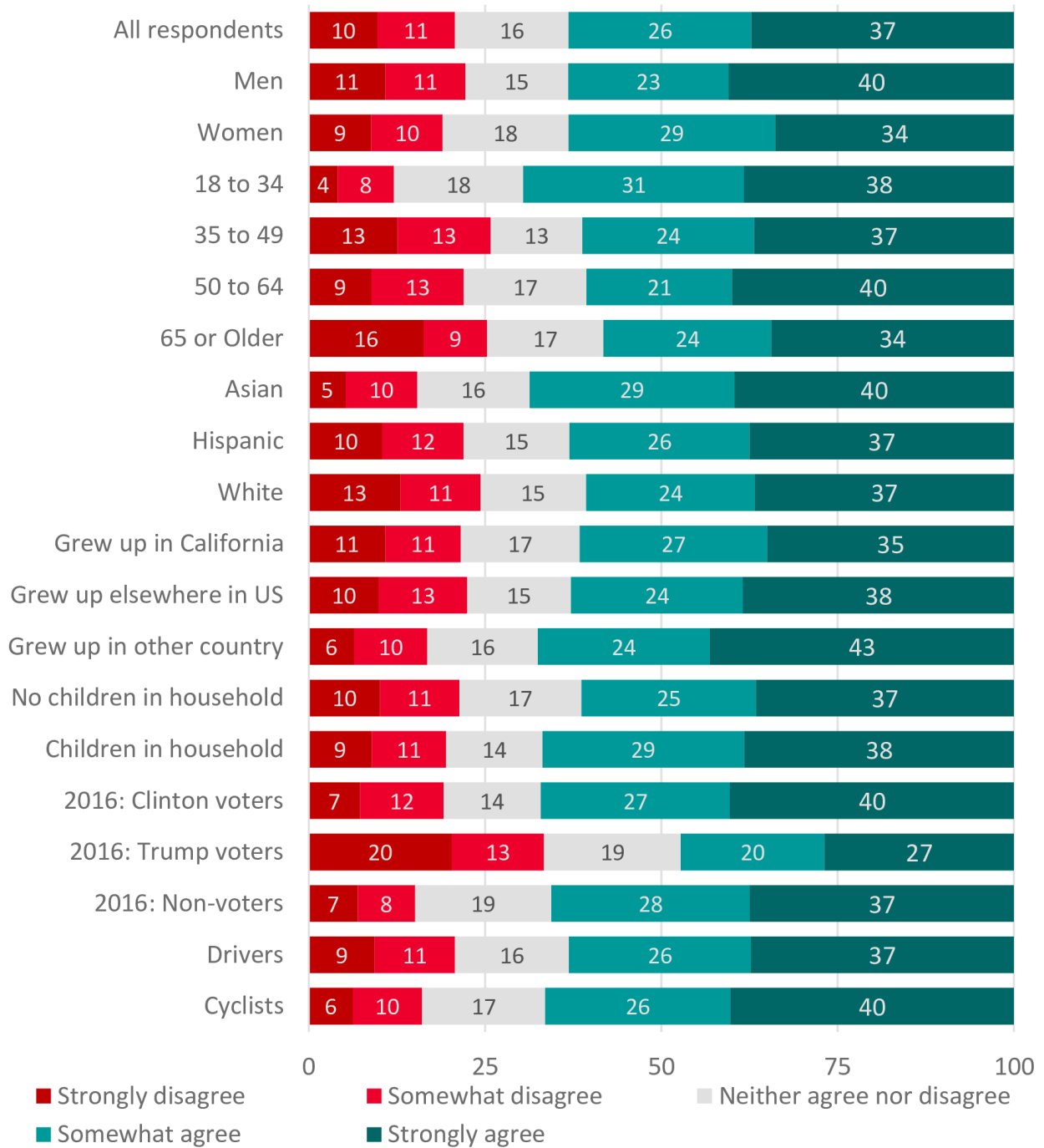
Some traffic safety campaigns will argue that addressing transportation safety issues on roads is an equal responsibility for all users. While most would likely agree that everyone has at least some responsibility for ensuring safe operations, arguments that responsibilities are equal have drawn criticisms given the differences in mass and travel speeds, and in turn the risk potential, of different modes.<sup>10</sup>

Younger adults (+58) had higher net agreement versus other age groups, seniors (+33) in particular. Asian (+53) respondents also had relatively high net agreement versus Hispanic (+41) and white (+36) respondents, as did immigrants (+51) versus those who grew up in the US (+40). Those living with kids (+47) also more frequently reported that drivers have a greater responsibility for safety versus those not living with kids (+40). Trump voters were the only group that agreed with the statement without a majority while still being in net agreement (+14). Comparatively, non-voters (+51) and Clinton voters (+58) had high net agreement. Cyclists (+50) strongly agreed that drivers have greater responsibilities. Drivers (+42) matched the net agreement of all respondents—unsurprising, given that most respondents drive.

Figure 27 shows that when asked whether drivers in fact have a greater responsibility for traffic safety than kids or adults, strong majorities of most groups agreed, thus rejecting the notion that responsibilities are equal. Overall, net agreement was 42 percentage points.

Younger adults (+58) had higher net agreement versus other age groups, seniors (+33) in particular. Asian (+53) respondents also had relatively high net agreement versus Hispanic (+41) and white (+36) respondents, as did immigrants (+51) versus those who grew up in the US (+40). Those living with kids (+47) also more frequently reported that drivers have a greater responsibility for safety versus those not living with kids (+40). Trump voters were the only group that agreed with the statement without a majority while still being in net agreement (+14). Comparatively, non-voters (+51) and Clinton voters (+58) had high net agreement. Cyclists (+50) strongly agreed that drivers have greater responsibilities. Drivers (+42) matched the net agreement of all respondents—unsurprising, given that most respondents drive.

**Q: Drivers of cars/SUVs have a greater responsibility for traffic safety than kids or adults walking or bicycling**



**Figure 27. Safety Responsibilities between Drivers, Pedestrians, and Cyclists**

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## VII. CONCLUSIONS

In Santa Clara County, and California in general, reducing automobile VMT and encouraging shifts away from the use of private motor vehicles are common goals. The results from the many questions in this survey signal difficulties in achieving those goals while also showing some potential reasons for optimism.

This duality can be seen in the questions on current travel behavior. Results highlight what is plainly visible from traveling the streets of Santa Clara County: that the use of private motor vehicles dominates. Driving rates and vehicle ownership sit at around 90 percent, with the use of alternatives like transit and cycling are at just over 10 percent.

That said, from a “glass half full” perspective, this survey finds greater numbers of transit users and cyclists than other datasets such as the American Community Survey, which counts only commute trips. A sizable slice of the population (39 percent) own bikes and ride at least occasionally. Thus, from a political perspective, cyclists may be a larger constituency than is commonly perceived. From a mode shift perspective, the presence of considerable numbers of occasional cyclists indicates that increasing the amount of regular, utilitarian cycling does not necessarily require converting people with zero cycling experience.

Fostering mode shifts from motor vehicles is still a tricky proposition, though. Respondents clearly indicate that they think they need cars for various reasons and generally enjoy driving, which points to driving as an inelastic behavior. That fast travel times rated as one of the most important factors behind mode choice decisions, while cost did not, further portends the continued attractiveness of automobiles.

Again, though, from a “glass half full” perspective, people are unhappy with several aspects of the current auto-oriented paradigm. Most say they drive more than they would like and feel too much driving is harmful for their health. Drivers are also more stressed by their daily travel than users of other modes. Additionally, 20 percent of all respondents find that car ownership is unaffordable (the percentage is higher for some sub-groups). While this is a minority of users, it is insufficient for the transportation systems to serve just the majority: everyone needs transportation.

Specifically for cycling, the survey highlighted several potential barriers to increased ridership while also finding that some hypothesized barriers may actually not be so problematic. On the more challenging side are land use issues, with respondents generally feeling that the destinations they need to or want to go to are outside of cycling range. This result highlights the long-standing contention in transportation literature of an inextricable link between transportation and land development patterns.<sup>11</sup> Attitudinally, not everyone will want to drive less and ride bicycles more, but troublingly, inconvenient land use blocks those who might want to make this mode choice. Thus, cycling advocacy may also require land use advocacy, in particular for things like greater mixes of land uses and more housing closer to where people work and play.

Local land use issues may be of particular importance when thinking about children and

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cycling. A majority of respondents say it is not safe for kids to bike in Santa Clara County. In the short term, this concern hampers the meeting of the travel needs of kids old enough for independent travel. This finding is also potentially troubling in the long term, as the survey found that people who grew up in California bike less today than those who grew up in other parts of the US or abroad. Non-ideal conditions for child cyclists today could be setting up low cycling rates among adults in the future.

Of course, cycling infrastructure is also important, as respondents emphatically agree that bicycling next to cars is stressful. While bike lanes are a start, considering that they are not ubiquitous, they are not necessarily enough. Respondents were not particularly comfortable with the idea of cycling in bike lanes next to traffic moving at even 25 mph. Supermajorities would be uncomfortable cycling, even in a bike lane, if vehicle traffic were 45 mph. Respondents were much more comfortable with bike lanes separated with vertical posts, lanes where cars are parked between cyclists and moving vehicles, and especially fully off-street paths.

Any interventions for cycling or other sustainable modes of transportation requires political will to be implemented. On a hopeful note, respondents of every major group explored here net agree that increasing the use of alternative modes is good for drivers. A complicating factor is that most also want more car infrastructure (travel lanes and parking), explaining some of the contention seen with proposals to reallocate road space.

Politically, there are some notable differences in attitudes by party/ideology, as indicated by respondent-reported 2016 election votes. Such differences may be less acute in Santa Clara County, given that the area is not a partisan battleground, but may have a more significant impact on debates elsewhere where groups with differing opinions are of more similar size. While there are attitudinal differences, it is interesting to note that about the same share of Clinton voters and Trump voters reported riding bicycles in an average week, albeit for different purposes. This survey also found occasional differences between non-voters and voters of either major party. Non-voters, by definition, are not represented in electoral politics, but they are still a sizable portion of the constituents that policymakers serve.

The results of this survey show behavior and opinions at one point in time. In future surveys, it would be interesting to track if behaviors and opinions change over time, particularly in response to policies and programs implemented that try to change behavior. Future surveys could also delve deeper into some topics explored lightly here. While this survey was 72-questions in length and covered many topics, not all topics were explored in depth. Additionally, future surveys could further examine some of the interesting findings from this edition. One such theme is the presence of both pro-car and pro-bike attitudes. How do individuals balance those interests in situations where they may be mutually exclusive?

Furthermore, the results of this survey of course lay under the specter of the continued implications of the COVID-19 pandemic. Travel behavior questions asked here queried respondents about what they do in an “average week.” What that means from here is anyone’s guess. Will the world return to old averages, or will new average behavior be

seen? At least anecdotally, the pandemic has garnered greater interest in cycling, which may bring greater support for cycling infrastructure.<sup>12</sup> The pandemic has also made many uneasy about transit, with some officials recommending driving more instead.<sup>13</sup> Increased numbers of motorists and cyclists perhaps could lead to more contention between them. Travel behavior and attitudes will thus continue to be interesting and important to continue tracking in the future.

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## APPENDIX A: SURVEY QUESTIONS

Welcome to the Silicon Valley transportation behavior and perceptions survey. The survey will ask you some questions about how you get around as part of your daily activities, what you think about when deciding how to get around, and your thoughts on different forms of transportation. This survey is being administered by the Mineta Transportation Institute at San José State University and is for research purposes.

The survey should take approximately 25 minutes to complete. No personally identifying information about you will be collected. Your participation in this study is completely voluntary. You can refuse to participate in the entire study and you also have the right to skip any question you do not wish to answer.

Thank you for your willingness to participate in this survey.

### Section A: Demographics

In this section, we would like to learn a little about you. This information will remain anonymous and is for research only.

1. In what ZIP code do you currently live?
2. In what year were you born?
3. Are you from a Hispanic, Latino/a or Spanish-speaking background?
  - a. Yes
  - b. No
4. [IF NO on previous question] What race/ethnicity best describes you?
  - a. Black or African American
  - b. Hispanic or Latino/a
  - c. White / Caucasian
  - d. Asian / Pacific Islander
  - e. American Indian or Alaska Native
  - f. Mixed race
  - g. Other (please specify): \_\_\_\_\_
5. What is the highest level of education you have completed?
  - a. High school diploma or less
  - b. Some college, but no degree
  - c. Associate's degree, or two-year college degree

- 
- d. Bachelor's degree, or four-year college degree
  - e. Graduate degree
6. To which gender do you most identify?
- a. Woman
  - b. Man
  - c. Transgender
  - d. Prefer to self-describe: \_\_\_\_\_
7. Are you currently employed?
- a. No
  - b. Yes, and I work at home
  - c. Yes, and my workplace is less than 2 miles from my home
  - d. Yes, and my workplace is between 2 and 5 miles from my home
  - e. Yes, and my workplace is more than 5 miles from my home
8. Where did you live for most of your childhood?
- a. In California
  - b. In another US state/territory (please specify): \_\_\_\_\_
  - c. In another country (please specify): \_\_\_\_\_
9. Do you have children under the age of 17 or live with any children under the age of 17?
- a. Yes
  - b. No
10. In the 2016 presidential election, did you vote for:
- a. Donald Trump, the Republican
  - b. Hillary Clinton, the Democrat
  - c. Gary Johnson, the Libertarian
  - d. Jill Stein, the Green Party
  - e. Another candidate
  - f. Did not vote

### **Section B: Your current daily travel**

In this section, we would like to ask you about how you currently travel as part of your

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routine activities.

11. In an average week, do you do any of the following? Select all that apply.

- a. Drive a car/truck/SUV/etc.
- b. Ride as a passenger in a car/truck/SUV/etc.
- c. Ride as a passenger in an Uber/Lyft or similar service
- d. Ride a motorcycle
- e. Ride on a bus or train
- f. Walk outdoors for more than 10 minutes at a time
- g. Ride a bicycle to reach a destination (such as work, school, store, home, etc.)
- h. Ride a bicycle to reach a bus stop or train station
- i. Ride a bicycle for exercise or recreation, without having a destination for the trip
- j. Ride an electric scooter
- k. Ride another device that you used for transportation (please specify):  
\_\_\_\_\_

12. Do you own/possess any of the following? (select all that apply)

- a. Car
- b. Truck/SUV
- c. Driver's license
- d. Motorcycle
- e. Bicycle
- f. Electric scooter
- g. Transit pass (such as a Clipper card)

13. Another device you use for transportation (please specify): \_\_\_\_\_

14. On an average weekday, approximately how many miles do you drive a car per day?

- a. 0
- b. 1–10
- c. 11–30
- d. 31–50



- e. 51 or more
15. How much of your daily transportation is by car (as opposed to walking, using transit, cycling, etc.)
- a. Less than 25%
  - b. 25–50%
  - c. 50–75%
  - d. 75–99%
  - e. 100%
16. Did you ride a bicycle when you were in any of the following age groups? Select all that apply.
- a. As a pre-teen child (age 12 or younger)
  - b. As a non-adult teenager (age 13–17)
  - c. As an adult (age 18 and over)
17. [If selected C on previous question] How often do you ride a bicycle?
- a. Daily/nearly daily
  - b. A few times per week
  - c. A few times per month
  - d. A few times per year
  - e. Never

### Section C: Your thoughts about travel

In this section, we would like to ask you a few questions about how you feel about your daily travel, how you make decisions about how to travel, and what you think about different forms of travel.

18. [Open ended] When deciding what form of transportation to use to go somewhere (driving, walking, using transit, cycling, etc.), what considerations are important to you?

For each of the following factors, please indicate how important each one is to you when you're deciding which form of transportation to use for your daily travel. (Not all important, slightly important, moderately important, important, very important)

19. Financial cost
20. Fastest time possible

- 
21. Easy to use (does not require a lot of thought or planning)
  22. Safety from crime
  23. Safety from traffic/crashes
  24. Desire to get exercise/physical activity
  25. Desire for enjoyable, non-stressful travel
  26. Concern for the environment

For each the following statements about daily travel, please indicate to what degree you agree or disagree with each. (Strongly disagree, somewhat disagree, neither agree not disagree, somewhat agree, strongly agree)

27. My daily travel is stressful
28. I need a car to do many of the things I like/need to do
29. I need a car to carry shopping or other people
30. I drive a car more than I would like to drive a car
31. Owning a car is affordable for me
32. I enjoy driving a car
33. Spending too much time in a car is harmful to your health
34. In my community, we need more lanes for cars on city streets
35. In my community, we need more car parking
36. Posted speed limits for cars are set too slow
37. Drivers of cars/SUVs have a greater responsibility for traffic safety than kids or adults walking or bicycling
38. I know several people like me who routinely drive a car to get around
39. I know several people like me who routinely use transit to get around
40. I know several people like me who routinely bicycle to get around
41. When choosing how to get around, people have a large number of high-quality options to choose from

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42. My non-car transportation options are better today than they were three years ago
  43. Increasing the number of people who walk, bicycle, or use transit to get around is good for drivers

#### Section D: Your thoughts about bicycling

In this section, we would like to ask you a few questions about what you think about bicycling. For the following statements, please indicate to what degree you agree or disagree with each. (Strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, strongly agree)

44. Many of the places I need to go are close enough to reach by bicycle
45. The weather is often too poor for bicycling
46. Riding a bicycle next to car traffic is stressful
47. It is safe for adults to bicycle in my community
48. It is safe for kids to bicycle in my community
49. A person needs to be in good physical shape to bicycle
50. A physical limitation prevents or makes it difficult for me to ride a bicycle
51. Bicycling is not an activity for someone of my age
52. Many bicyclists I see look like they are too poor to own a car
53. There are enough places to securely park a bicycle
54. Bicycling is not a “cool” thing to do
55. Bicycling to work would make someone too sweaty to be professional
56. Bicycling is incompatible with the clothing people need to wear to work
57. I have noticed new bicycle lanes and paths in my community over the last 3 years
58. Bicycling conditions have become safer over the last 3 years
59. I’ve noticed more people riding bicycles over the last 3 years
60. Drivers do a good job staying out of bike lanes

Would you consider cycling (or cycling more) in any of the following situations? (Yes, definitely | Yes, probably | Maybe | No, probably not, No, definitely not)

- 61. To ride with a friend or relative
- 62. If I received a financial incentive from an employer
- 63. If my doctor recommended it to improve my physical fitness
- 64. If there were more safe places to ride
- 65. If there were classes available to help me become more confident

### Section E: Bicycle paths

In the next few questions, we'll ask you about how comfortable you might be riding on bicycle paths of different designs. If you do not know how to ride a bicycle, please answer the following questions based on how comfortable you think you would be if you knew how to ride a bicycle.

Conventional bicycle lanes in the United States are typically a space designated for bicycles on the side of a street, divided from adjacent moving traffic by a painted line (like the ones seen below). How comfortable would you be riding: (*Very uncomfortable, uncomfortable, somewhat uncomfortable, somewhat comfortable, comfortable, very comfortable.*)



- 66. On a conventional bicycle lane, where adjacent cars are traveling at 25 miles per hour
- 67. On a conventional bicycle lane, where adjacent cars are traveling at 35 miles per hour
- 68. On a conventional bicycle lane, where adjacent cars are traveling at 45 miles per hour or greater

Some bicycle lanes have additional features. How comfortable would you be riding:

- 69. On a bicycle lane where vertical posts are placed between the bicycle lane and adjacent cars



70. On a bicycle lane where parked cars are placed as a barrier between the bicycle lane and moving cars



71. On a bicycle path that is completely outside a street and thus not adjacent to any cars



## Section F: Final Thoughts

72. [Open ended] Please share any additional thoughts you have about current bicycling conditions in Santa Clara County, or how they might be improved.

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**Thank you for your participation.**

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## ABBREVIATIONS AND ACRONYMS

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ACS	American Community Survey
MPH	Miles per Hour
SVBC	Silicon Valley Bicycle Coalition
VMT	Vehicle Miles Traveled

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## ENDNOTES

1. “Average Annual PMT, VMT Person Trips and Trip Length by Trip Purpose,” Bureau of Transportation Statistics (updated May 18, 2018), <https://www.bts.gov/content/average-annual-pmt-vmt-person-trips-and-trip-length-trip-purpose>.
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11. Vergil G. Stover and Frank J. Koepke, *Transportation and Land Development* (Edgewood Cliffs, NJ: Prentice-Hall, 1988).

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