Sonoma County Transportation Survey

Findings Report

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Submitted to:
Sonoma Clean Power

Submitted by:
ICF
620 Folsom St, Suite 200
San Francisco, CA 94107

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1 Summary of Findings

Sonoma Clean Power has embarked on a path of proactive engagement in the deployment of electric vehicles (EVs). ICF worked with Sonoma Clean Power to develop a survey that improves the agency's fundamental understanding of baseline consumer perceptions of EVs. With this knowledge in hand, Sonoma Clean Power is in a stronger position to go to market with a dual-pronged strategy for stakeholder education/outreach and engagement. The Sonoma County Transportation Survey was conducted to understand Sonoma County residents' perceptions, awareness, and knowledge regarding electric vehicles (EVs). Respondents were residents of Sonoma County, California, and at least 18 years of age.

ICF has identified aspects of the survey responses that we consider both positive and negative with regard to the potential for EV deployment over the short-term future (1—3 years). These factors are summarized separately here.

Positive Factors for EV Ownership in Sonoma County

Travel patterns in the County are conducive to electric vehicle deployment, with more than 50 percent of residents traveling less than 20 miles on a typical weekday and 80 percent of residents traveling less than 40 miles on a typical weekday.

Our survey certainly indicates that many County residents are thinking about EVs. For instance, 40 percent of residents would strongly consider an EV, and 37 percent might consider it. While not as high as gasoline vehicles (with 77 percent and 20 percent indicating that they would strongly consider and might consider, respectively), the consideration of an EV outpaces diesel vehicles. With regard to vehicle purchasing, fuel prices are generally considered a driver for more fuel efficient technologies like EVs and conventional hybrid vehicles (i.e., vehicles that do not plug-in). With that in mind, our survey indicates that almost eight in ten residents expect the price of gasoline to be either "somewhat higher" (58 percent) or "quite a bit higher" (21 percent) in 2—3 years.

When Sonoma County residents do seek out EVs, they will likely find models that are consistent with some of their most highly rated features, such as efficiency (93 percent). Furthermore, there are only modest numbers of residents seeking features that are uncommon for EVs, such as towing capacity (28 percent) or all-wheel drive (51 percent).

Negative Factors for EV Ownership in Sonoma County

As noted previously, the travel patterns of Sonoma County residents are generally conducive towards EV ownership. However, it is important to note that 20 percent of residents travel over 40 miles on a typical weekday. Furthermore, the longer trips that residents take outside of commuting travel can lead to so-called range anxiety. More than 40 percent of residents expect 4—10 trips of greater than 100 miles and another 21 percent anticipate making more than 11 trips of greater than 100 miles (one way) in the next 12 months. This is not explicitly a limitation on the market, but only a few pure EVs (i.e., not plug-in hybrids) currently have sufficient range to support this type of travel behavior (absent investments in DC fast charging infrastructure, which are happening).

Car purchasing or leasing in general is likely to be limited, with more than three quarters of residents not planning to buy or lease their next vehicle over the next couple of years (2018—2019). When they are looking to purchase or lease a new vehicle, residents are most likely to consider Toyota or Honda. These manufacturers currently have only one electric vehicle offering between them, though both are set to expand their offerings in the next several years.

When Sonoma County consumers are ready to buy or lease a vehicle, they rate safety (98 percent), retail price (95 percent), and brand reliability (94 percent) the highest; and they rate hybrid or electric drive technology much lower (52 percent). As noted above, the brand reliability issue is somewhat of a concern given the interest in brands that are less likely to have an EV model or models.

Finally, Sonoma County residents are most likely to *disagree or strongly disagree* that they expect to own or lease an electric vehicle in one to three years (46 percent), have familiarity with EVs (37 percent), and that electric vehicles are an affordable option for them (36 percent). While incentives are available to defray the higher price of EVs, 70 and 74 percent residents indicates that they are not at all familiar with state incentives or federal incentives, respectively, to buy or lease an electric vehicle Additionally, residents are most likely to say they are *unsure* about whether electric vehicles are safe (44 percent) and whether they have great performance (41 percent). Sonoma County residents' views on issues of affordability, availability of incentives, and safety suggests that these should be important areas of emphasis for future marketing/outreach efforts.

2 Methodology

The Sonoma County Transportation Survey was developed with input and approval from Sonoma Clean Power. The questionnaire consisted of three main sections:

- Transportation Needs
- Car Buying or Leasing, and
- Demographics

2.1 Sampling

To reach the target population of households in Sonoma County, California, ICF developed an effective sampling design consisting of an address-based sampling approach coupled with a mailed survey. We designed and selected a simple random sample that would yield more than 300 completed surveys, the target sample size necessary to provide precise overall estimates (within +/5% at the 95% confidence level). In all, 327 Sonoma County residents completed the survey.

2.2 Data Collection

Survey data were collected using an online web survey and a printed survey mailed to residents' households. To maximize response, we employed up to four contacts to potential respondents.[1] Our first contact was a one-page letter mailed to each selected household directing them to a website to complete the survey. The letter was mailed in both English (one side) and Spanish (reverse side). The invitation contained the website URL (www.sonomatransportion.com) and a unique password to access the online survey securely, and was mailed in a white, standard-sized window envelope. Residents receiving the survey invitation were instructed that someone 18 or older, who is responsible for vehicle purchasing/buying decisions in the household, should complete the survey.

The second contact was a reminder letter to non-responders to complete the survey online (also in English and Spanish). This was mailed in a white, standard-sized window envelope. The third contact was an English-language paper surveyed mailed to residents selected into the sample who had not responded to the web survey. An email address and toll-free number were provided to request a Spanish survey. We included $1 in this mailing, and mailed it in a white, windowed larger envelope (9 x 12) to increase the response rate. The fourth contact was a second paper survey mailed to non-responders, also sent in a larger white, windowed envelop (9 x 12).[2]

2.3 Weighting

ICF weighted survey data to account for sampling probability and non-response. The sampling weight was computed as the inverse of the random selection probability (the number of households in the frame divided by the number of sampled households). Due to the simple random sampling design, all households have equal sampling weights.

[1] Dillman, DA, Smyth, JD, Christian, LM. (2014). Internet, Phone, Mail, and Mixed Mode Surveys: The Tailored Design Method. 4th Ed. Wiley: Hoboken, NJ.

[2] All surveys were completed in English.

Sampling weights were adjusted for non-response using a simple ratio adjustment. The adjustment was computed as the ratio of the total of the sampling weights computed over the set of sampled households to the same total computed over the subset of participating households. Due to the simple random sampling design, all the households have the same base weights and adjusted weights. As the adjusted weights would be post-stratified as the next and final step of weighting, we can set both base and non-response adjusted weights equal to 1.

As a final step, the household weights were post-stratified to known population control totals available from the American Community Survey (ACS) population estimates for Sonoma County. Post-stratum cells were defined by age group and gender, and cell population totals are computed from the ACS data. Since the age and gender variables have some missing values in the survey data, the missing responses were imputed at random with the probabilities estimated from the non-missing data. The adjustment made the final adjusted weights sum to the total number of households in Sonoma County as reported in the ACS data. These post-stratification adjustments are presented in Exhibit 1.

Exhibit 1. Household-Level Post-Stratification Adjustments

Age Group	Gender	Control Total	Participated Households	Post-Stratified Factor
18 - 34	Female	54,375	15	3,625
18 - 34	Male	56,010	12	4,668
35 - 49	Female	46,168	30	1,539
35 - 49	Male	46,675	10	4,668
50 - 64	Female	57,197	69	829
50 - 64	Male	52,079	43	1,211
65 - 79	Female	37,447	60	624
65 - 79	Male	30,707	50	614
80 or older	Female	11,542	18	641
80 or older	Male	7,861	20	393

Exhibit 2 presents the key statistics for the final weights, such as their sum and coefficient of variation (CV). Examination of the CV (93% or 0.93) confirmed that no trimming was necessary; trimming would be introduced to limit the variability in the weights.

Exhibit 2. Key Statistics for the Final Weights

Analysis Variable: Analysis Weight			
Minimum	**Maximum**	**Sum**	**CVs**
393	4,668	400,062	93

It is useful to note that the design effect (DEFF) component due to unequal weighting effects can be computed as 1 + CV**2, so this DEFF component is 1.85. The DEFF is a measure of how much larger the

variance is under the design actually adopted compared to a simple random sample of the same size. It incorporates the impact of unequal weighting on the survey variances.

3 Results

In the pages that follow, we present survey results, following the order of the questionnaire, which is provided as Appendix A. For each topic, we provide the question number from the survey so that readers can reference the entire text of the question.

3.1 Transportation Needs

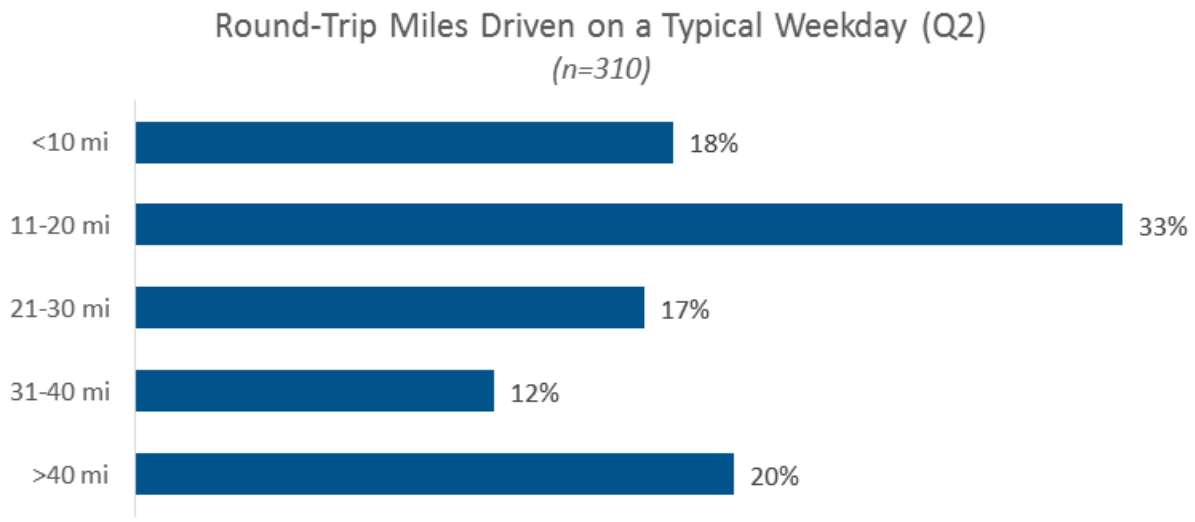
Current Drivers (Q1)

Among all residents responding to the survey, 98% currently drive a vehicle.

Round-Trip Miles on a Typical Weekday (Q2)

As presented in Exhibit 3, one-third (33%) of residents usually travel between 11 and 20 miles on a typical weekday, but 20% travel over 40 miles on a typical weekday.

Exhibit 3. Round Trip Miles Driven on a Typical Weekday



Trips Over 100 Miles (Q3)[3]

Residents expect to make an average of 8 trips of over 100 miles one way in the next 12 months. More than one-third (37%) expect to make 3 or fewer long trips, 42% expect 4 to 10 trips, and 21% anticipate making 11 or more trips of 100+ miles one way in the next 12 months.

[3] Two outliers of "292" and "300" were removed from the analysis for this question, as they likely referred to the distance of trips instead of the number of trips.

Expectations of Future Gas Prices (Q4)

Almost eight in ten residents (79%) expect the price of gasoline to be either "somewhat higher" (58%) or "quite a bit higher" (21%) in 2 to 3 years. Only 4% expect it to be lower in 2 to 3 years than it is today.

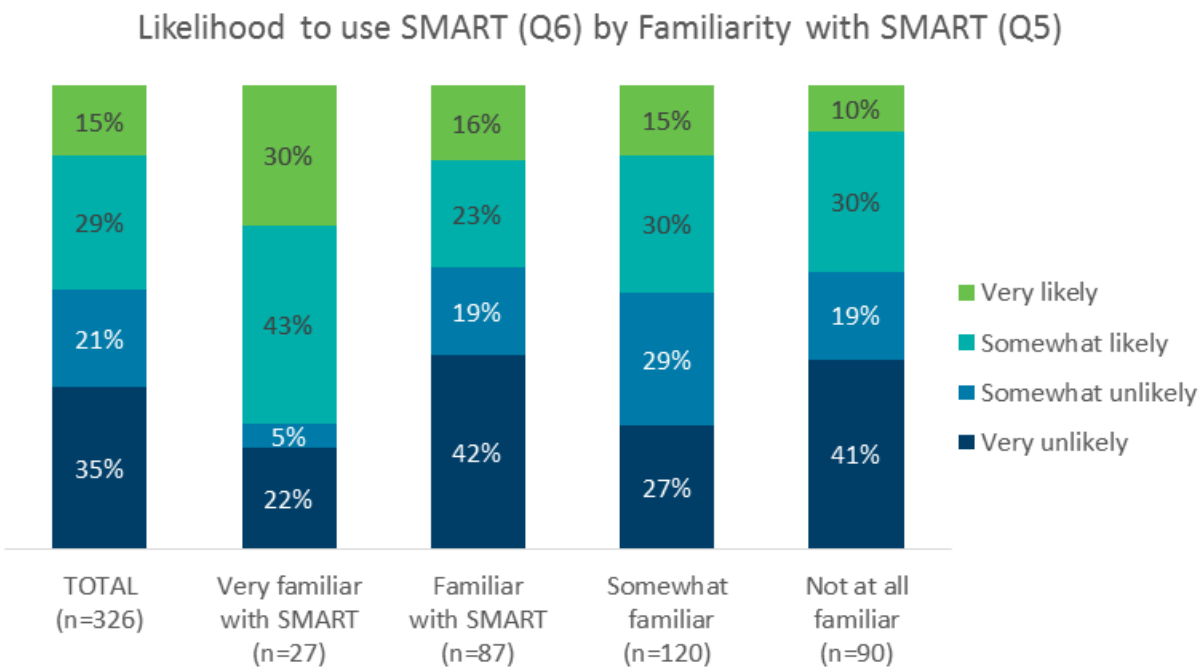
Familiarity with Sonoma-Marin Area Rail Transit (SMART) (Q5)

Only 10% of residents consider themselves "very familiar" with SMART. Another 28% say they are "familiar" with it, 35% are "somewhat familiar," and 27% say they are "not at all familiar" with SMART.

Likelihood to Use SMART for Transportation Needs (Q6)

Residents are split, with 44% very likely or somewhat likely, and 56% unlikely or very unlikely to use SMART for their transportation needs. Only 15% say they are "very likely," while 35% are "very unlikely" (see the left bar in Exhibit 4). Likely use is much higher among residents who say they are "very familiar" with SMART, with 73% of this group saying they are likely to use it. However, those who are just "familiar" with SMART have the lowest percentage of likely users, at 39%. Likelihood is not as low among residents who are only "somewhat familiar" with it (45% likely to use SMART) and "not at all familiar" (40% likely). This crosstabulation of familiarity with SMART and likely use of SMART is presented in Exhibit 4.

Exhibit 4. Likelihood of using SMART by Familiarity with SMART



Interest in Ride-Sharing (Q7) and Car-Sharing (Q8) Services

About four in ten residents (41%) say they would be interested in using a ride-sharing service such as Uber or Lyft, while 36% would not be interested, and 23% are not sure. Residents show less interest in car-sharing services, such as Zipcar, with only 24% saying they would be interested, 53% not interested, and 23% unsure.

3.2 Car Buying or Leasing

Current Vehicles (Q9)

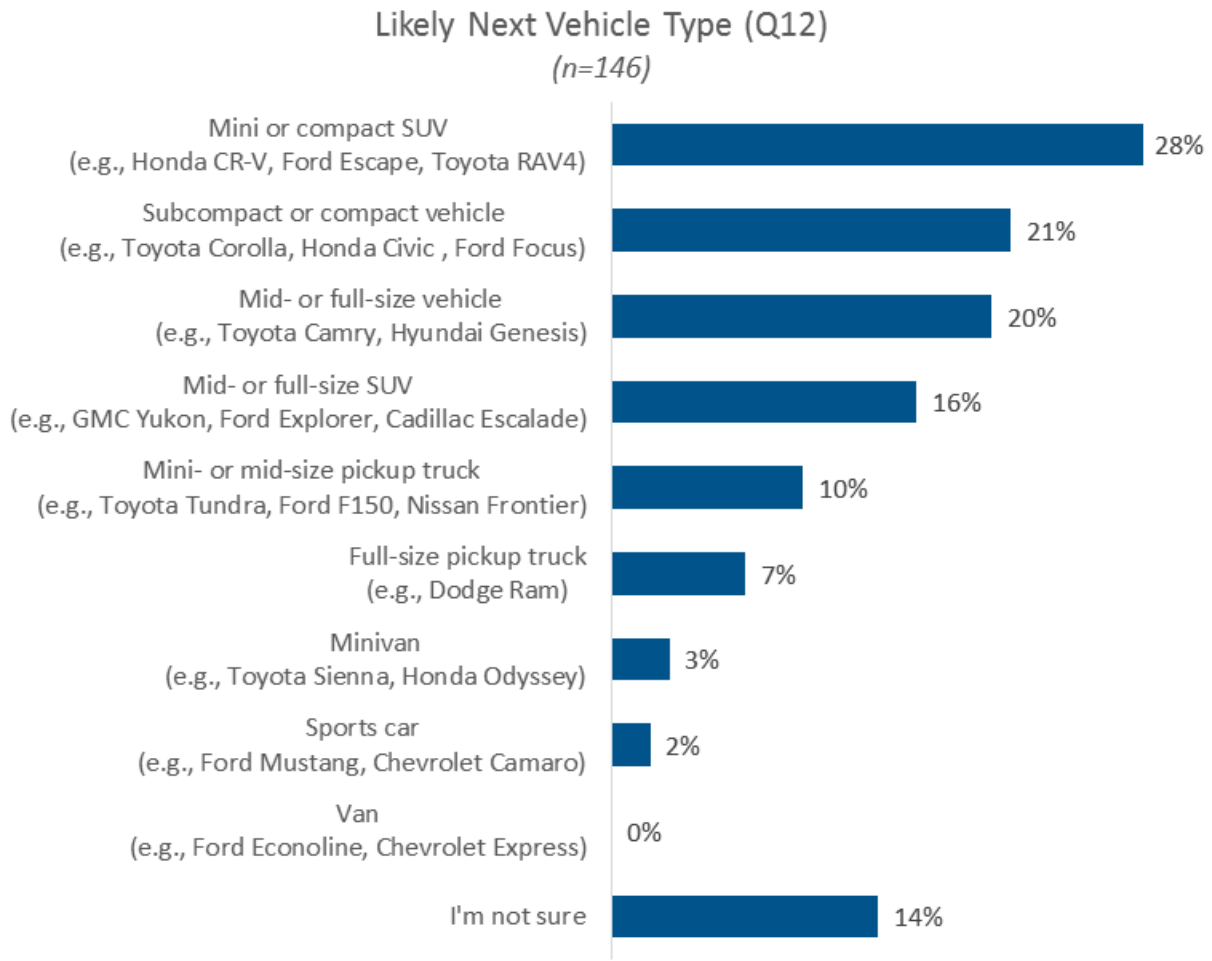
Residents are most likely to drive Toyotas (36%), Hondas (23%), Fords (11%), or Chevrolets (10%). Of those vehicles, 23% are from model years 2015 or 2016, and another 26% are from model years 2012 to 2014. A majority of residents, 70%, use at least one of their vehicles 7 days per week, and 80% use at least one of their vehicles to drive to work or school.

Buying/Leasing their Next Vehicle (Q10–Q12)

Thinking about the next vehicle they would drive regularly, 51% of residents do not plan to buy or lease their next vehicle until 2019 or later, and 27% expect to wait until 2018. When they do buy or lease their next vehicle, 37% will likely buy/lease new. This last finding is consistent with earlier surveys and constitutes a key decelerator of PEV adoption. It is also a reason why programs supporting PEV deployment should also consider used vehicle markets.

In terms of the type of vehicle they will get, shown in Exhibit 5, 28% say it will likely be a mini/compact SUV, 21% expect to get a subcompact/compact vehicle, and 20% will likely get a mid- or full-size vehicle. Respondents could choose up to two vehicle types.

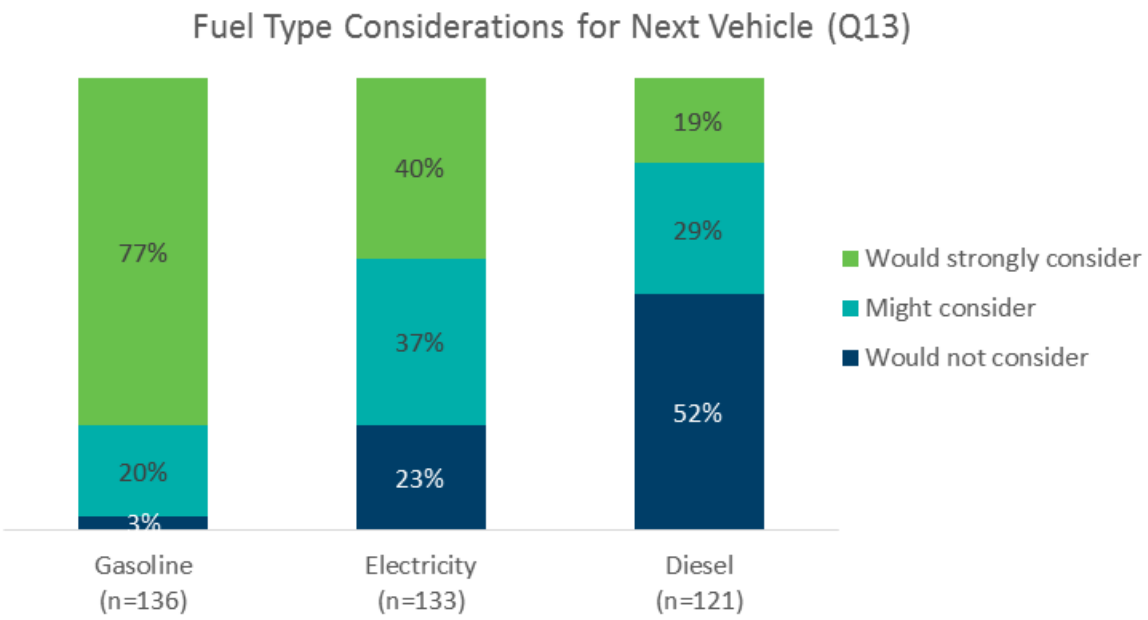
Exhibit 5. Next Vehicle Residents Would Likely Buy or Lease



Fuel Type for Next Vehicle (Q13, Q14)

Still thinking about a vehicle they would drive regularly, 40% of residents would strongly consider an electric vehicle, and 37% might consider it. This is not as high as for gasoline-powered vehicles—which 77% would strongly consider and 20% might consider—but it is notably higher than for diesel vehicles, which only 19% would strongly consider and over half (52%) say they would not consider. Please see Exhibit 6 for these results.

Exhibit 6. Which Fuel Types Residents Would Consider for their Next Vehicle

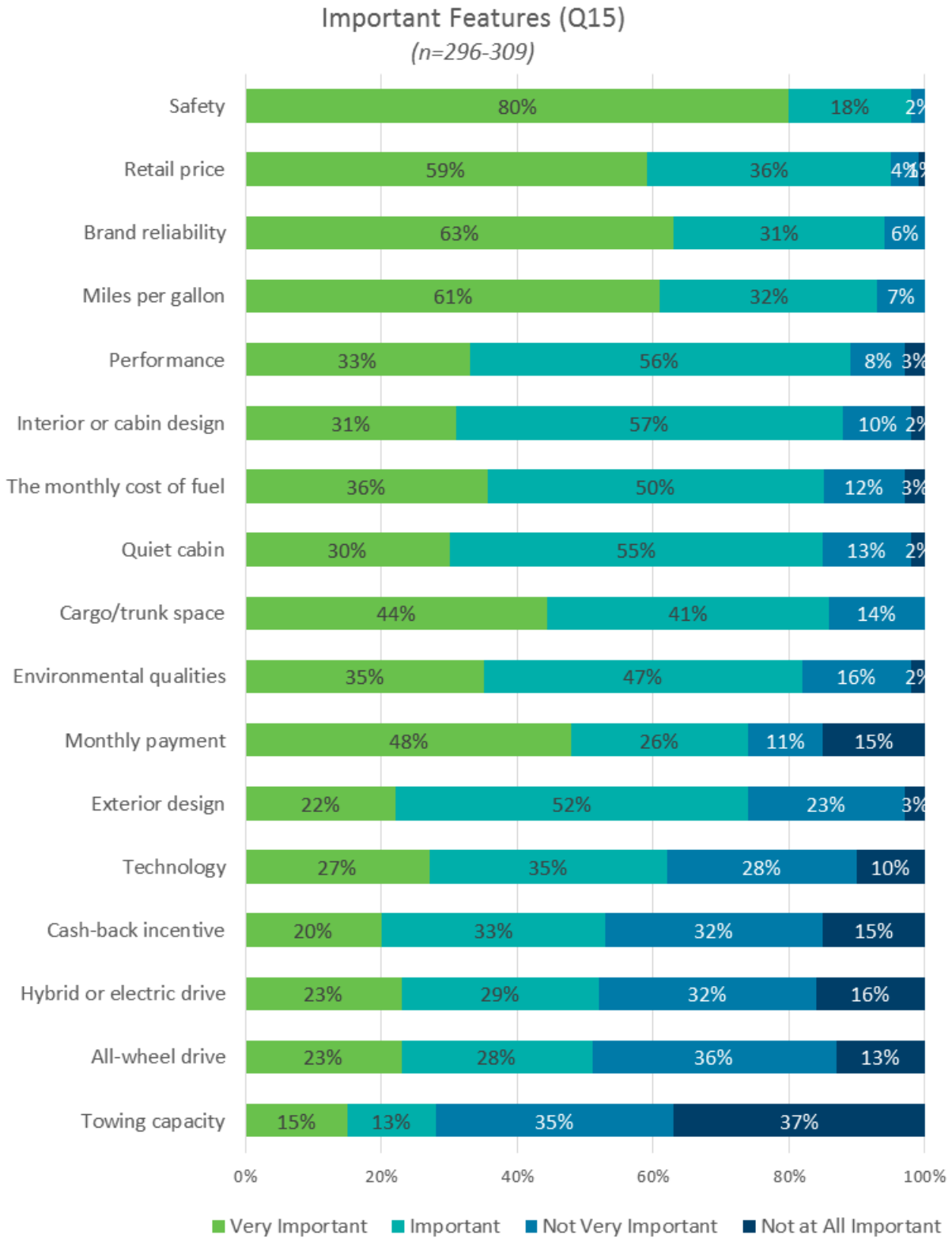


A direct question about which fuel type they would prefer follows this trend, with 50% preferring gasoline, 40% preferring electricity, and only 10% preferring diesel. The large percentage of respondents/residents preferring electricity is a point indicator of demand for plug-in vehicles in Sonoma, although deeper analysis is needed to make an inference about this.

Important Features (Q15)

Respondents rated 16 car features as very important, important, not very important, or not at all important. Looking at the features ranked "very important" or "important," the most important features to residents in their decision of what type of vehicle to get are safety (98%), retail price (95%), brand reliability (94%), and miles per gallon (93%). Features least likely to be important are towing capacity (28% find this "important" or "very important"), all-wheel drive (51%), hybrid or electric drive (52%), and cash-back incentive (53%). These data are presented in Exhibit 7.

Exhibit 7. Importance of Vehicle Features



Word Association with Electric Vehicles (Q16)

Two survey items were open-ended and allowed residents to write or type their response. Question 16 asked, "What words come to mind when you think about an electric vehicle?" These responses are presented in Appendix B.

Top of Mind Electric Vehicles (Q17)

The second open-ended question asked, "When you think of electric vehicles, what specific model names come to mind first?" Among residents who entered at least one electric vehicle, 50% of residents thought of Tesla. Other frequently mentioned electric vehicles included the Toyota Prius (mentioned by 36%), the Chevrolet Volt (22%), and the Nissan Leaf (18%). While there is a plug-in version of the Toyota Prius, we believe that these answers confirm anecdotal evidence of the confusion among consumers between hybrid vehicles and plug-in vehicles.

Brand Consideration Set (Q18)

Residents were presented with a list of 13 brands (Toyota, Honda, Ford, Nissan, Chevrolet, Lexus, BMW, Mercedes, Hyundai, Volkswagen, Dodge, Kia, Tesla), or they could write in a brand, and asked from which they would consider buying or leasing. Residents are most likely to consider Toyota, with 63% saying they would likely consider a Toyota, followed by Honda with 54%. Likelihood falls to 28% for Lexus, Chevrolet, and Tesla, and is lower for the other brands.

Experience with Electric Vehicles (Q19–Q21)

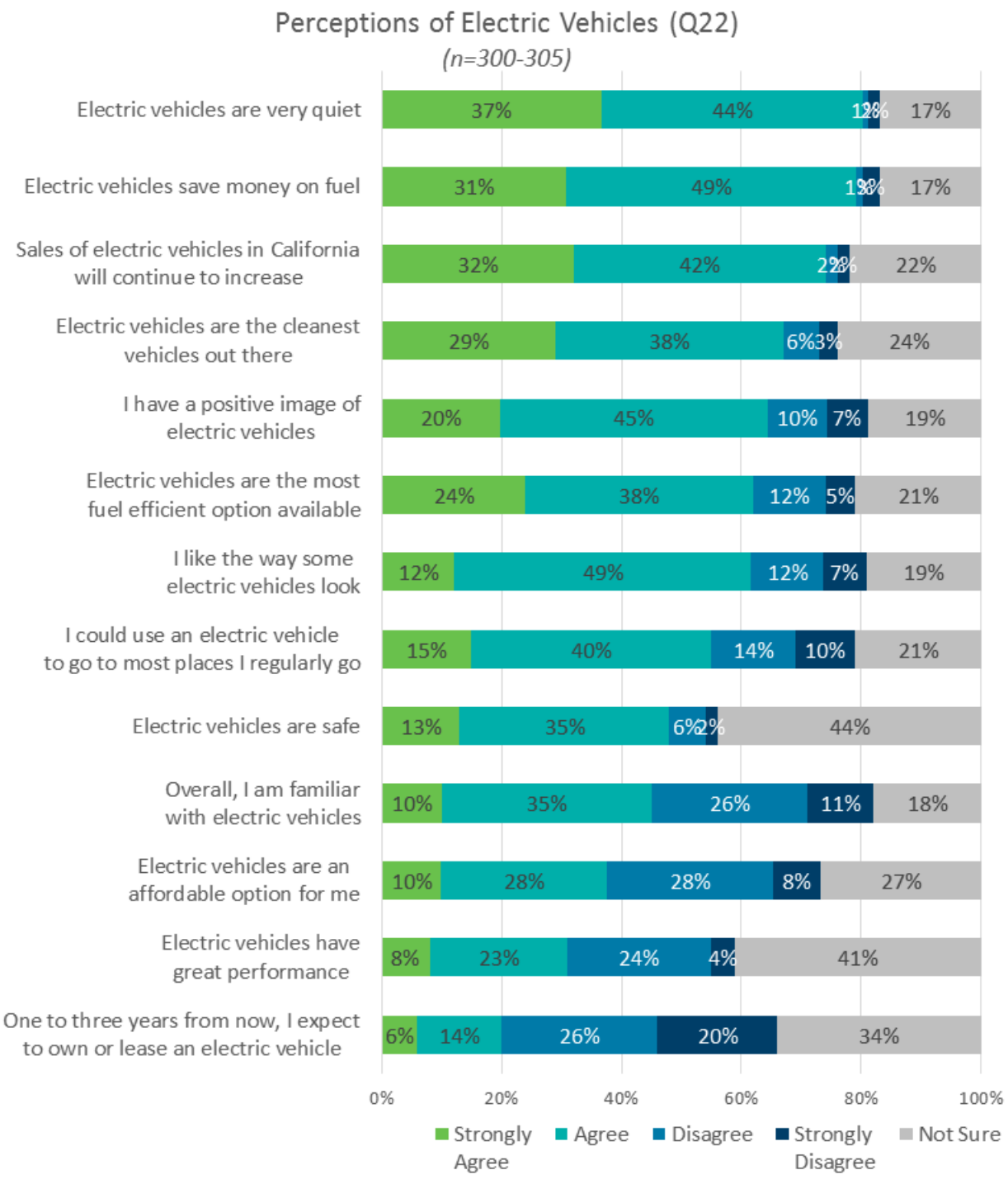
Six percent of residents currently own or lease an electric vehicle. Of those who do not currently have one, 3% have owned or leased one in the past. However, 23% of residents report having driven an electric vehicle at some time. Frequently mentioned vehicles include the Toyota Prius, the Nissan Leaf, Tesla vehicles, and the Chevy Volt.

Perceptions of Electric Vehicles (Q22)

Residents are most likely to *agree or strongly agree* that electric vehicles are very quiet (81%), save money on fuel (80%), and that sales of them in California will continue to increase (74%). Residents are most likely to *disagree or strongly disagree* that they expect to own or lease an electric vehicle in one to three years (46%), that overall, they are familiar with electric vehicles (37%), and that electric vehicles are an affordable option for them (36%). Additionally, residents are most likely to say they are *unsure* about whether electric vehicles are safe (44%), whether they have great performance (41%), and whether they expect to own/lease an electric vehicle one to three years from now. The result that 13% of respondents/residents strongly agree that electric vehicles are safe contrasts with the result that for 80% of respondents/residents safety is an extremely important attribute they seek in their vehicle. This suggests an important area of emphasis for future marketing/outreach efforts in Sonoma. Another relevant result is that only 38% of respondents believe that electric vehicles are an affordable option. It suggests a potentially strong market deterrent for electric vehicles, given that nearly all respondents indicated that price is an important attribute they seek in their vehicles. Thus, awareness of purchase incentives may be another effective element of outreach/marketing campaigns.

Please see Exhibit 8 for the distribution of all responses to this series of 13 questions.

Exhibit 8. Residents' Perceptions of Electric Vehicles



Financial Incentives (Q23)

Seven out of ten residents say they are not at all familiar with financial incentives to buy or lease an electric vehicle offered by the State of California, and 74% are not at all familiar with incentives offered by the Federal Government. Only 13% are familiar or very familiar with such incentives offered by California, and 15% for Federal incentives. These results are consistent with earlier studies.

Information Sources (Q24)

Residents are most likely to have received information about electric vehicles from television (57%), followed by internet sites (48%) and electric vehicle owners (42%). Respondents selected from 11 different source of information: electric vehicle owners, spouse, family, friends, neighbors, colleagues, radio, television, newspapers, social networks (Facebook, LinkedIn, Twitter, etc.), and internet sites.

3.3 Demographics

Household (Q25–Q28)

Six out of ten residents surveyed (60%) have two drivers in their household, and 24% have one. Nearly three-quarters (73%) live in single family homes, with 12% in condominiums or townhouses and 10% in apartments. Six in ten (60%) have a private garage, while 30% have no garage but have a driveway (covered or uncovered) next to their residence. Residents are split almost three-to-one with 74% owning and 26% renting their residence.

Other Demographics (Q29–Q34)

Slightly more than half (52%) of residents are female and 48% are male. One in ten residents (10%) reported they are of Hispanic or Latino origin, 74% reported they are not, and 15% preferred not to answer the question. Most (92%) residents indicated they speak English at home, 3% speak Spanish, 2% speak another language, and 3% preferred not to answer the question.

About two-thirds (68%) of residents self-identified as white and about one in five (18%) preferred not to answer the question. All responses are presented in Exhibit 9.

Exhibit 9. Residents' Self-Reported Race

Race/Racial Background (Q32) *Could select all that apply*	
White	68%
Asian	4%
Black or African American	2%
American Indian or Alaska Native	2%
Native Hawaiian or other Pacific Islander	1%
Other	11%
Prefer not to answer	18%

As shown in Exhibit 10, the largest proportion of residents (28%) is 18 to 34 years of age, followed closely by 27% who are 50 to 64 years of age, and 23% who are 35 to 49 years of age.

Exhibit 10. Residents' Self-Reported Age

Age (Q29)	
18 - 34	28%
35 - 49	23%
50 - 64	27%
65 - 79	17%
Over 80	5%

As presented in Exhibit 11, about one in ten residents (11%) makes less than $35,000 per year. Between 10% and 14% have incomes in the next four categories ($35,000 to less than $125,000). Almost one in four residents (23%) preferred not to answer the question.

Exhibit 11. Residents' Self-Reported 2015 Annual Household Income

2015 Household Income (Q34)	
Less than $15,000	4%
$15,000 to $24,999	4%
$25,000 to $34,999	3%
$35,000 to $49,999	10%
$50,000 to $74,999	14%
$75,000 to $99,999	13%
$100,000 to $124,999	13%
$125,000 to $149,999	6%
$150,000 or more	11%
Prefer not to answer	23%

Appendix A: Sonoma County Transportation Survey Questionnaire

Sonoma County Transportation Survey

Transportation Needs

We'd like to begin by asking a few questions about your transportation needs, such as the miles you drive on a typical day. We also would like to know how familiar you are with transportation options, such as car- and ride-sharing services. Please fill in the circle that best describes your answer.

1. First, do you currently drive a vehicle?

   - ○ Yes
   - ○ No - - - → (Please skip to Q4)

2. On a typical week day (ONE day between Monday and Friday), how many total miles do you drive round-trip for activities such as driving to work, running errands, dropping children off at school, or taking children to after-school activities?

   - ○ Less than 10 miles
   - ○ 11 to 20 miles
   - ○ 21 to 30 miles
   - ○ 31 to 40 miles
   - ○ More than 40 miles

3. Think about all of the trips that you may want to take in your vehicle in the next 12 months. How many of these trips would be over 100 miles ONE WAY (like driving from Santa Rosa to San Jose)?

   Trips over 100 miles: _____

4. The current price of a gallon of regular gasoline in the State of California is about $2.80. What do you think the price of gasoline will be in 2 to 3 years? Will it be…?

   - ○ Quite a bit lower
   - ○ Somewhat lower
   - ○ About the same
   - ○ Somewhat higher
   - ○ Quite a bit higher

5. In general, how familiar are you with the Sonoma-Marin Area Rail Transit (SMART)?

   - ○ Very familiar
   - ○ Familiar
   - ○ Somewhat familiar
   - ○ Not at all familiar

6. The Sonoma-Marin Area Rail Transit (SMART) is a voter-approved passenger rail and bicycle-pedestrian pathway project located in Marin and Sonoma counties. It will serve a 70-mile corridor from Larkspur to Cloverdale, with a first phase from San Rafael to Santa Rosa. Based on of what you know about SMART, how likely are you to use it for your transportation needs?

   - ○ Very likely
   - ○ Somewhat likely
   - ○ Somewhat unlikely
   - ○ Very unlikely

7. There are ride-sharing services (for example, Uber and Lyft) that allow members to request a ride. A driver picks you up and drops you off. Payment and tipping are handled entirely through the app, with no physical transaction required, and no tipping is requested. Would you be interested in using a service like this?

   - ○ Yes
   - ○ No
   - ○ I'm not sure

8. There are car-sharing services, like Zipcar, that allow members to use a vehicle for as little as 1 hour, and as long as 7 days. An access card allows users to unlock the vehicle, use it, and then return it to a reserved spot. Would you be interested in using a service like this?

   - ○ Yes
   - ○ No
   - ○ I'm not sure

Car Buying or Leasing

[If you answered "no" to Q1, you do not currently drive, please skip to Q10]

Next, we would like to know about the vehicles you currently drive, and the factors that you consider when deciding which vehicle to buy or lease. *If you are unsure, please give us your best guess.*

9. Please use the table below to provide information for the vehicles that you drive regularly, as long as they are owned or leased by someone in your household. Please provide information for up to two vehicles only.

Make	Model	Year	Do you use this vehicle to drive to work or school? [yes/no]	In a typical week, how many days (out of 7) do you use this vehicle?

10. Thinking only about a vehicle that you would drive regularly, when are you likely to buy or lease your next vehicle?

- ○ This year (2016)
- ○ Next year (2017)
- ○ Two years from now (2018)
- ○ In 2019 or later ----▶(Please skip to Q15, on the next page)

11. Would the next vehicle that you buy or lease to drive regularly likely be…?

- ○ New
- ○ Up to 2 years old
- ○ Up to 4 years old, or
- ○ More than 4 years old
- ○ I'm not sure

12. Would the next vehicle that you buy or lease to drive regularly, likely be a ….?
(Please select up to two answers)

- ○ Subcompact or compact vehicle (e.g., Toyota Corolla, Honda Civic, Ford Focus)
- ○ Mid- or full-size vehicle (e.g., Toyota Camry, Hyundai Genesis)
- ○ Sports car (e.g., Ford Mustang, Chevrolet Camaro, Porsche 911)
- ○ Mini or compact SUV (e.g., Honda CR-V, Ford Escape, Toyota RAV4, Lexus RX350)
- ○ Mid- or full-size SUV (e.g., GMC Yukon, Ford Explorer, Hyundai Santa Fe, Toyota Land Cruiser, Cadillac Escalade)
- ○ Mini- or mid-size pickup truck (e.g., Toyota Tacoma or Tundra, Ford Ranger or F150, Nissan Frontier, or Chevrolet Silverado)
- ○ Full-size pickup truck (e.g., Dodge Ram)
- ○ Minivan (e.g., Toyota Sienna, Honda Odyssey, Chrysler Town & Country)
- ○ Van (e.g., Ford Econoline, Chevrolet Express)
- ○ I'm not sure

13. Still thinking only about a vehicle that you would drive regularly, which of the following fuel types would you <u>consider</u> for your next vehicle?

	Would Strongly Consider	Might Consider	Would Not Consider
Gasoline	○	○	○
Diesel	○	○	○
Electricity	○	○	○

14. Still thinking only about a vehicle that you would drive regularly, which of the following fuel types would you prefer for your next vehicle?

- ○ Gasoline
- ○ Diesel
- ○ Electricity

15. People consider many different things when deciding what type of vehicle to buy or lease. Thinking about the NEXT vehicle you will buy or lease that you will drive regularly, please indicate how important each of the following will be to you.

	Very Important	Important	Not Very Important	Not at All Important
Cargo/trunk space	○	○	○	○
Towing capacity	○	○	○	○
Safety	○	○	○	○
Brand reliability	○	○	○	○
Miles per gallon	○	○	○	○
Exterior design	○	○	○	○
Interior or cabin design	○	○	○	○
Retail price	○	○	○	○
Monthly payment	○	○	○	○
Cash-back incentive	○	○	○	○
Hybrid or electric drive	○	○	○	○
Performance (acceleration or handling)	○	○	○	○
Technology (e.g., GPS, Bluetooth, and dashboard)	○	○	○	○
Environmental qualities	○	○	○	○
Quiet cabin	○	○	○	○
All-wheel drive	○	○	○	○
The monthly cost of fuel	○	○	○	○

16. What words come to mind when you think about an electric vehicle?

17. When you think of electric vehicles, what specific model names come to mind first?

18. From which of the following brands would you consider buying or leasing a vehicle?
(Place a check next to the brands that you would likely consider the next time you are ready to buy or lease a vehicle that you will drive regularly.)

Toyota	_____	Mercedes	_____
Honda	_____	Hyundai	_____
Ford	_____	Volkswagen	_____
Nissan	_____	Dodge	_____
Chevrolet	_____	Kia	_____
Lexus	_____	Tesla	_____
BMW	_____	Other	_____

19. Do you or a member of your household currently own or lease an electric vehicle?

- ◯ Yes - - ▸ (Please skip to #21)
- ◯ No

20. Have you or a member of your household ever owned or leased an electric vehicle?

- ◯ Yes
- ◯ No

21. Have **you** ever driven an electric vehicle?

- ◯ Yes. Please specify the make and model: _____
- ◯ No

22. Please indicate how much you agree or disagree with each of the following statements.
(Please place a check to indicate your response for the following three questions)

	Strongly Disagree	Disagree	Agree	Strongly Agree	I'm Not Sure
Electric vehicles are an affordable option for me	◯	◯	◯	◯	◯
Electric vehicles are the most fuel-efficient option available	◯	◯	◯	◯	◯
Electric vehicles are the cleanest vehicles out there	◯	◯	◯	◯	◯
Electric vehicles have great performance	◯	◯	◯	◯	◯
I could use an electric vehicle to go to most places I regularly go	◯	◯	◯	◯	◯
Electric vehicles are very quiet	◯	◯	◯	◯	◯
Electric vehicles are safe	◯	◯	◯	◯	◯
Electric vehicles save money on fuel	◯	◯	◯	◯	◯
Sales of electric vehicles in California will continue to increase	◯	◯	◯	◯	◯
Overall, I am familiar with electric vehicles	◯	◯	◯	◯	◯
One to three years from now, I expect to own or lease an electric vehicle	◯	◯	◯	◯	◯
I have a positive image of electric vehicles	◯	◯	◯	◯	◯
I like the way some electric vehicles look	◯	◯	◯	◯	◯

23. How familiar are you with financial incentives to buy or lease an electric vehicle offered by the following?

	Very Familiar	Familiar	Somewhat Familiar	Not at All Familiar
State of California	○	○	○	○
Federal Government	○	○	○	○

24. We often get information about products from a variety of sources (for example, our friends and family), as well as from media outlets (for example, television, radio, the Internet). Please indicate whether you have gotten information about electric vehicles from each source.

Source	I have received information about electric vehicles from this source	I have not received information about electric vehicles from this source
Electric vehicle owners	○	○
Spouse	○	○
Family	○	○
Friends	○	○
Neighbors	○	○
Colleagues	○	○
Radio	○	○
Television	○	○
Newspapers	○	○
Social networks (Facebook, LinkedIn, Twitter, etc.)	○	○
Internet sites	○	○

Demographics

Lastly, we'd like to ask you some questions about yourself and your household. Your answers will be combined with responses from other Sonoma County residents for analysis.

25. How many members of your household drive?
_____

26. Which of the following best describes the type of residence in which you live?

- ○ Single family home
- ○ Apartment
- ○ Condominium or townhouse
- ○ Mobile home
- ○ Other

27. Which of the following best describes the type of parking you have at your residence?

- ○ Private garage, either attached or separate from your residence
- ○ Parking in your building
- ○ Community garage/parking area detached from your residence
- ○ A driveway, either covered or uncovered, next to your residence
- ○ Open street parking

28. Do you currently own or rent your residence?

- Own
- Rent

29. In what year were you born?

_____

- Prefer not to answer

30. What is your gender?

- Male
- Female
- Prefer not to answer

31. Are you Hispanic, Latino/a, or of Spanish origin?

- No, I am not Hispanic/Latino/ or of Spanish origin
- Yes, I am Hispanic/Latino/ or of Spanish origin
- Prefer not to answer

32. What is your race or racial background?
(Please select all that apply)

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or other Pacific Islander
- Other
- Prefer not to answer

33. What language do you MOSTLY speak at home?

- English
- Spanish
- Other:_____
- Prefer not to answer

34. What was your total household income from all sources in 2015 before taxes?

- Less than $15,000
- $15,000 to $24,999
- $25,000 to $34,999
- $35,000 to $49,999
- $50,000 to $74,999
- $75,000 to $99,999
- $100,000 to $124,999
- $125,000 to $149,999
- $150,000 or more
- Prefer not to answer

That completes the survey. Thank you very much for your time and cooperation.

Appendix B:
Question 16: Words that Come to Mind when Thinking about an Electric Vehicle

Q16: What words come to mind when you think about an electric vehicle?

Must have, dorky looking

Quiet, no towing capability

Not sure

A good idea

About time

Batteries are expensive, can't tow and not very roomy

Battery life and replacement, length of charge, number of charging stations available

Battery replacement cost + battery recycling

Best for environment, no more dependence on oil, recharging a lot.

Can I refuel easily and everywhere?

Can't drive far enough.

Charging capability. I live in a condo.

Charging inconvenience

Charging it on a longer trip. Lack of convenient charging stations.

Charging locations

Cheaper.

Chevy- Volt- cool, all are cool for the environment

Clean

Clean

Clean air

Clean, quiet

Compact

Convenience, design.

Cool. Future. Tesla.

Cost. Short drive range. Cost per charge.

Crunchy granola

Cutting edge technology, environmentally responsible

Dangerous

Distance it can go. Charging stations availability, cost of charging, clean energy used. Cost to maintain. Performance and comfort.

Distance on 1 charge

Doesn't travel far enough on one charge.

Don't know!

Earth

Earth cookies overpriced sales pitch. Batteries, batteries, batteries, where will they go? Fool's gold, poor choices

Economical, good for ecological.

Economy

Economy, environmental, good

Efficient, expensive

Efficient + cost saving

Efficient, cost- effective, environmentally sound, clean

Electric rates

Electric vehicles are horrible. I used to own a Leaf, worst car ever! I want hydrogen.

Electric vehicles' mile range is limited. Recharge time is poor and the availability to recharge on the road is limited

Energy conservation, rebates, fuel efficiency, commuter lane, limited mileage/range, batteries, charging, growing options.

Energy efficiency, environmental protection

Environment

Environment

Environment

Environment - cost effective

Environment, charge

Environment, gas mileage

Environment, mileage, leading edge technology

Environmentally friendly

Environmentally appropriate

Environmentally essential, perform well

Environmentally friendly

Environmentally friendly

Environmentally friendly- green- small, perhaps not safe enough? I drive to Fort Bragg and share narrow roads with logging trucks who speed by

Environmentally friendly, cost effective, cost of battery

Environmentally friendly, quiet, reliable, low cost

Environmentally friendly. If all electric - can't drive very far except super expensive Tesla.

Environmentally good

Environmentally impactful

Environmentally important, quiet, charging stations

Environmentally responsible! I have a Tesla and I have solar panels

Environmentally responsible.

Environmentally sound (unfamiliar with motor of car) unsure of reliability, unsure of safety.

Excellent

Excellent rear view

Exciting, environmental, economy.

Expense + recharging unit availability

Expensive

Expensive

Expensive

Expensive

Expensive (battery replacement), full efficient battery life- charging - higher electric bill

Expensive but economical

Expensive or limited range. Odd looking.

Expensive, challenging (where to charge), positive environmental impact

Expensive, hassle, no horsepower.

Expensive, inconvenient, short range

Expensive, limited distance, limited selection

Expensive, limited travel distance

Experience, small

Fuel economy

Fuel efficient, lessen dependence on oil/gas

Future

Future

Future

Future, but currently impractical for heavy hauling + long distance off road use.

Future, performance, inconvenient, Prius, Tesla, environment

Gas-saving, environment, expensive to buy, environmentally responsible.

Gas saving

Gas saving

Gasoline- free, cost-effective, environmentally friendly, HOV/carpool lane

Geeky looking

Getting there, but not yet ready

Global warming, toxic batteries

Good choice

Good for the environment but I don't know enough about them

Good for the environment, quiet, limited range of travel.

Good for the environment.

Good idea

Good idea

Good idea

Good on gas and small

Good- necessary

Great, efficient, need more range/options of look and models

Great for city not for freeway. Long commutes or weekend drives from Sonoma to Mt. Tam

Great idea. Let's get rid of gasoline!

Great, but they all have bucket seats which are not good for people with back problems. I am one of those folks. That's why I drive a Dodge van. Its chair-like seat is the best available for my back, closer to keeping hips above knees. A vehicle with seats that keep hips a bit higher than knees would be so great. No one makes such a thing and we are a nation of folks with back problems! My husband drives our Prius...it is a great car, just uncomfortable for me.

Great, I would like my next car to be electric.

Great....but need accessible place to charge, cost a factor - hydrogen is better

Green, decreased range, expensive

Green, inconvenient charging location to hunt down

Green technology is food for the environment.

Green, economical, cost, future purchase

Green, Prius, Tesla, battery life

Green, quiet, environmentally friendly.

Green. Quiet. Where would I plug it in? Is it safe?

Hassle

Have to charge all the time, distance between charges is 100 miles or so, can only drive so far. Have to find charging stations on long trips

Having to charge it going to unfamiliar places

Headache car.

Helping the environment

How far can I go before it dies?

How far can it go on one charge?

How often can I get to a place where I can plug it in?

Hydrogen. As soon as they develop a cheap source of hydrogen- i.e., biowaste from corn production - electric cars will become obsolete

I don't drive enough for it to keep charged.

I had one several years ago. Recharging was an issue

I like the idea

I like them, but am concerned about EMF's

I want one

I would not want one!

I'm not familiar with it.

Important

Impractical

Improvements in battery lifespan, dependability and cost make it much more likely that my last vehicle could and should be electric or hybrid. Gently growing proliferation of charging stations is a hopeful sign. Still the biggest unknown for me is how the costs to purchase and, more importantly, to operate an all-electric or hybrid compare to my current vehicle.

Inconvenient, costly

Inefficient use of energy.....bicycle is an exception, but a bicycle is not a vehicle as defined in the California vehicle code.

Inflexible

Intriguing; expensive; range anxiety; I will wait for battery improvements.

It would be hard for me to plug in at home.

Know nothing about them.

Let's get it on!

Limited access or refilling stations. Why switch from gasoline when electricity is generally generated by coal powered generators.

Limited long distances drive, charging challenges

Limited mileage per charge, ease of charging?

Limited range

Limited range

Limited range, subsidized, pretentious

Limited range- great commute

Limited range, clean, small, either wimpy or too expensive.

Limited range, limited charging stations, expensive (Tesla) or ugly (Leaf)

Limited usage

Live too far from town. Need more room

Low maintenance, good acceleration, short range, environmentally friendly

Low trip mileage. Time to charge, cost of charger

Maintenance, electricity bill, unfamiliar technology.

Much more likely than hydrogen/fuel cell to be the future standard. I rate styling highly (Leaf bad, Tesla good), couldn't own a truly ugly car. Practical usability and range important. Soon to be on sale Chevy Bolt with claimed 200 mile range will be a breakthrough and I think will sell very well, will be part of the wave of the future.

N/A

Need improvement on # of miles that can be driven per charge. Charging the car mid-commute adds a longer round trip time. Previously had a Nissan Leaf but got rid of it when it wouldn't make it to Ukiah for work based on a full charge.

Need to try it - understand it more. How will we destroy the batteries - dispose of them in the future.

Next purchase

No

No emissions, clean vehicle

No gas, no carbon footprint

No thank you

No thanks

No thanks, not up for that

None

None

Not enough info on performance.

Not enough info yet

Not enough information for me right now.

Not enough mileage range

Not enough miles between charge

Not enough range

Not enough range

Not enough reliability information

Not for me

Not important

Not interested

Not interested

Not interested at this time

Not necessary for me.

Not perfected - not enough charging stations.

Not practical

Not practical yet

Not reliable

Not sure

Not sure if it's for me

Not sure where or how to plug it in?

Not sustainable

Not yet important

Ok

Ok, but not useful for my out of doors interests.

Petroleum-fired electrical power plants.

Pollution and more saving

Poor acceleration, unable to drive 200 miles before charge

Possibility

Practical, gas-free, fun

Prius

Prius, tin can when crunched, Obama bumper sticker - hehe :) Not convenient for long trips, awesome for commuters but that's not our family

Probably the way to go.

Purchase price = expensive, often very small

Quiet

Quiet

Quiet

Quiet

Quiet

Quiet

Quiet, economical

Quiet, economical to operate - expensive to buy

Quiet, clean

Quiet, economical to drive, expensive to purchase

Quiet, economical, good stewardship, clean

Quiet, environmentally friendly, low-cost to run, inconvenient to charge.

Quiet, good for environment.

Quiet, more reliable

Quiet, non-polluting, cost of charging and availability.

Quiet, not much horsepower

Quiet, smooth, environmentally friendly

Range

Range

Range of battery miles

Range per charge (mileage), cost of electricity to charge

Range, quiet, clean

Range, access to hookup, convenience, or inconvenience

Range, quiet, environmentally responsible, good torque

Reliability

Reliable, economical, long lasting, stylish

Right now

Robotic

Safe

Saving money - better for environment

Seriously, not enough stations yet.

Short drive range

Short range, batteries need expensive replacement

Short trips

Silent, useless. I need a trunk. Lot of hauling and long distance driving.

Slow - hassle

Slow, no power to pull trailers.

Slow, annoying, quiet

Slow, hard to fill up.

Slow, small, where to charge, pain to charge

Slow, too much work

Slow, ugly, limited range, no place to recharge, eventually very expensive to replace batteries

Small

Small and nice

Small, environmentally conscious, low cost to run

Smart

Solar energy

Solar panels on roof. Questions re: reliability; they still seem novel and untested to me.

Sold on Tesla, would love it but I need to tow

Special outlet to charge

Still not widely used- don't know that much about why

Still too expensive and not enough range.

Still very new to market

Streetcar

Sucks

Sustainability. Expensive, compact

Tesla

Tesla

Tesla

Tesla

Tesla, BMW, Leaf, economic to run

Tesla, Leaf, charging range

Tesla, Leaf, plug in Prius, limited driving range/refuelability

Tesla

That it doesn't go far between recharging

The future

The future

The future, cleaner and good for environment, no or little gas costs

The U.S. needs to catch up with the rest of the world in fuel economy

The way of the future for the wealthy only. (+present) documentary `who killed the electric car?` extremely expensive for the elite.

They are a complete waste of money until they make one that is recharged from the motion of the wheels. Wick should be currently possible.

They are too quiet - I was just hit by one that I could not hear and the driver was blinded by the sun.

Too much work

Too expensive

Too quiet

Too quiet, cannot hear them coming when walking.

Torave, range

Toy car, don't want to run out of power along the way.

Ugly

Ugly looking

Very efficient

Waste of resources to produce batteries and dispose of them

We are not fully ready with charge stations at this point or next few years.

Weak. Difficult to find places to charge. Expensive maintenance

Weird- can't imagine having to charge my car

What is the $$ amount for charging and acceleration.

Where do I recharge on a long trip, how long will it take?

Where will I re-charge?

Where you can charge it.

Wicked cool, zippy, new technology, untested, cleaner energy

Would never own one.

Zero