

INTRODUCTION & METHODOLOGY

Davis, Hibbitts & Midghall, Inc. (DHM) conducted a recent survey of King County residents to assess their knowledge, perceptions, and support of Electric Vehicles (EVs).

Research Methodology. The survey was conducted online between October 5 and 11, 2009 among 304 King County residents. Survey respondents were randomly invited using a panel of residents ages 18 and older. Quotas were set by age and gender based on the total population of each county to assure a representative sample.¹

In gathering responses, DHM employed quality control measures including monitoring the survey to identify potential participant hardware or browser issues, questionnaire pretesting, and validation.

Statement of Limitations. Any sampling of opinions or attitudes is subject to a margin of error, which represents the difference between a sample of a given population and the total population (here, King County residents). For a sample size of 304, the margin of error would be +/-5.7%, at the 95% confidence level.

This plus-minus error margins represent differences between the sample and total population at a confidence interval, or probability, calculated to be 95%. This means that there is a 95% probability that the sample taken for this study would fall within the stated margin of error if compared with the results achieved from surveying the entire target population.

KEY FINDINGS: KNOWLEDGE, PERCEPTIONS, & SUPPORT OF EVs

There is high interest in King County to purchase EVs, especially when considering the \$7,500 federal tax credit and a potential \$5,000 state tax credit.

- **56%** think EVs are immediately available to purchase by the general public in Washington, but are unsure which motor vehicle companies are selling EVs.
- **65%** *expect* to pay some premium above the price of an equivalent gasoline-powered vehicle to purchase an EV knowing that EVs cost less than half to power and less to maintain over their lifetime than their gasoline-powered vehicle equivalent.
- **63%** are *willing* to pay a premium above the price of an equivalent gasoline vehicle to purchase an EV.
- **58%** would pay at least a 10% premium to purchase an EV.
- **33%** would pay a 20% premium.
- **53%** would *strongly consider* purchasing an EV that can drive 400 miles between charges.
- **13%** would *strongly consider* an EV purchase if it could go 200 miles between charges.
- **75%** would most prefer an EV that is similar to a gasoline styled vehicle.
- **68%** would most likely purchase a type and size of EV that is comparable to a sedan.

¹ U.S. Census Bureau, King County, Washington, 2005-2007 data.

- **37%** would purchase one comparable to a SUV.
- **43%** believe the operating cost of an EV is about the same or less expensive than a hybrid.
- **57%** believe EVs are more expensive than hybrids.

King County residents are positive in their views about EVs and perceive them to be good for inner city travel, an important public investment, environmentally friendly, and safe.

- **83%** have some degree of knowledge about EVs, with 36% who say they are at least “somewhat knowledgeable,” 45% say they are “not very knowledgeable,” representing an opportunity to educate residents.
- **51%** believe it costs less to power an EV than it does to fuel a gasoline powered vehicle.
- **53%** think EVs are better for the environment than fuel efficient (gas-electric) hybrids, and 40% think they are about the same.
- **43%** believe the biggest advantage of driving an EV is helping reduce the nation’s carbon and greenhouse gas emissions, 40% think it is saving money on gasoline.
- **62%** think EVs are as safe as today’s gasoline-powered vehicles, while 31% think they are not as safe, a perception that may be changed through education.
- **57%** say it is more important for individuals who drive within the city on a daily basis to use EVs than it is for businesses shipping goods within the city.

Access to charging stations is critical to the promotion of EVs in King County.

- **54%** think charging stations should be made more readily available before EVs are manufactured in high volume.
- **16%** are under the impression that charging stations are currently available in Washington cities. The 84% who do not think they are available believe it will take an average of more than 5 years for this infrastructure to be developed.
- **89%** think it is important that their local, regional, and state governments promote the use of EVs for businesses and residents by investing in easy to access charging stations and offering tax incentives for EV purchases.
- **65%** think a \$5 fee is fair for the use of public charging stations for 30 minutes, which would allow an EV to travel 80 miles, 35% say a minimum of \$10 is a fair price.
- **49%** assume EVs can travel at least 100 miles before running out of battery power, and 43% think they can travel between 50 and 99 miles.
- **37%** believe the biggest disadvantage of driving an EV today is being able to drive 100 miles between charges, 31% think it is the risk of getting stranded because the battery has discharged.

Impressions of businesses could rise significantly if they use EVs.

- **72%** report they would have a higher impression of a company that uses EVs to distribute its products and conduct its business within the city.
- **58%** believe EVs are *best* used for all of the following: distributing of goods and products by businesses within cities, by public and private fleets like the post office or electric utilities, for short inner city trips, or for trips between cities that are less than 100 miles.

- **43%** believe it is more important for *businesses* that ship goods and products within a city on a daily basis to use EV trucks than for individuals who drive within the city on a daily basis.

King County residents expect the nation and their state to be leaders in the use of EVs, and highly support government incentives and promotion of EVs.

- **88%** believe it is important for the United States to be a leader in using EVs as an alternative to gasoline fueled vehicles.
- **81%** believe it is important that Washington be a leader in the nation for using EVs as an alternative to gasoline fueled vehicles.
- **89%** are supportive of their local, regional, and state governments promoting the use of EVs for inner city travel by investing in easy to access charging stations for EVs and offering tax incentives for residents purchasing EVs.

APPENDIX A
Electric Vehicle (EV) SURVEY—ANNOTATED QUESTIONNAIRE
October 2009; King County (N=304)
A collaboration between Davis, Hibbitts, & Midghall, Inc. (DHM), Fusion MR, LLC, and PSU Hatfield School of Government

Welcome to our regional survey on future vehicles.

This survey will help local & regional planners, and a select group of manufacturers to better understand the public's awareness, knowledge and support for a variety of future types of vehicles which have just begun (or will soon be) hitting dealer showrooms in the region. The survey is being conducted by Davis, Hibbitts & Midghall, Inc., a public opinion research firm that has conducted these types of studies in the Northwest for the past 35 years.

All of your answers will remain confidential. No individual statements or answers may be identified with who said them as the survey results are analyzed in the aggregate only. Please feel free to share your honest opinions in the questions. This survey should take 8 - 15 minutes to complete.

Thanks for your participation.

GENERAL KNOWLEDGE ABOUT EVS

1. While most vehicles on the road are fueled by gasoline, some are powered by alternative methods or have the technology to use gasoline more efficiently. That being said, which one type of propulsion system are you most familiar with? **(ROTATE, ACCEPT ONE RESPONSE)**

Response Category	King County (N=304)
Biodiesel powered vehicles	5%
Ethanol powered vehicles	8%
Hydrogen fuel-cell powered vehicles	3%
Hybrid or combination gas/battery powered vehicles	79%
Ultra low sulfur diesel powered vehicles	1%
100% battery/electric powered vehicles	4%

2. Regarding electric vehicles, or EVs for short, do you consider yourself ...

Response Category	King County (N=304)
Not at all knowledgeable	17%
Not very knowledgeable	45%
Somewhat knowledgeable	36%
Very knowledgeable	2%

3. Are Electric Vehicles (EV) generally available for purchase by the public in Washington right now?

Response Category	King County (N=304)
Yes	56%
No	44%

3A. (IF NO TO Q3) In how many years do you think EVs will be generally available in Washington?

Response Category	King County (N=304)
1-2 years	35%
3-5 years	53%
More than 5 years	12%
Mean	4.6

4. Are charging stations for EVs generally available in cities in Washington right now?

Response Category	King County (N=304)
Yes	16%
No	84%

5. (IF NO TO Q4) In how many years do you think charging stations for EVs will be generally available in Washington? ____

Response Category	King County (N=304)
0	1%
1-2 years	21%
3-5 years	56%
More than 5 years	23%
Mean	5.3

6. Which do you think needs to occur first? (ROTATE)

Response Category	King County (N=304)
Charging stations are readily available	54%
Electric vehicles are manufactured in high volume	46%

7. What do you believe is a fair price for the use of a public charging station that allows an EV to travel 80 miles and takes 30 minutes? Charging stations will likely be located at retail, commercial and hospitality businesses, public streets, parking garages/lots, and some employers.

Response Category	King County (N=304)
\$5	65%
\$10	21%
\$15	8%
\$20	4%
\$25	1%
\$30	1%
\$40	0%

8. Are EVs worse, better, or about the same for the environment as fuel efficient (gas-electric) hybrid vehicles like the Toyota Prius?

Response Category	King County (N=304)
Worse	5%
Better	53%
About the same	42%

9. Are EVs more safe, as safe, or not as safe as today's vehicles?

Response Category	King County (N=304)
More safe	7%
As safe	62%
Not as safe	31%

10. Compared to fuel efficient vehicles like hybrids, purchasing or leasing an EV is...

Response Category	King County (N=304)
A lot more expensive	22%
Somewhat more expensive	35%
About the same	8%
Somewhat less expensive	3%
A lot less expensive	1%
Don't know	30%

11. Compared to fuel efficient vehicles like hybrids, operating an EV is...

Response Category	King County (N=304)
A lot more expensive	7%
Somewhat more expensive	24%
About the same	16%
Somewhat less expensive	18%
A lot less expensive	9%
Don't know	26%

12. How many miles do you think the average EV can travel before it runs out of battery power and needs a charge?

Response Category	King County (N=304)
400 or more miles	4%
250-399 miles	15%
100-249 miles	30%
50-99 miles	43%
Less than 50 miles	8%

13. Which of the following motor vehicle companies have announced the sale of EVs to the general public and/or business by 2010? Check all that apply.

Response Category	King County (N=304)
General Motors	21%
Tesla	19%
Toyota	17%
Honda	17%
Ford	12%
Zap	5%
Chrysler	4%
BMW	4%
Subaru	3%
Zenn	3%
Renault-Nissan	2%
Think	2%
Daimler	1%
Volvo	1%
Reva	1%
Aptera	0%
Arcimoto	0%
Navistar	0%
BYD	0%
All of the above	1%

Don't know	56%
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SUPPORT OF EV USAGE AND INFRASTRUCTURE

14. How important is it that the United States becomes a leader in using EVs as an alternative to gasoline fueled vehicles?

Response Category	King County (N=304)
Not at all important	3%
Not too important	9%
Somewhat important	46%
Very important	42%

15. What about Washington? How important is it that Washington becomes a leader in the nation for using EVs as an alternative to gasoline fueled vehicles?

Response Category	King County (N=304)
Not at all important	6%
Not too important	13%
Somewhat important	46%
Very important	35%

16. (IF NOT IMPORTANT TO Q15) Why “not important?” (OPEN)

Response Category	King County (N=304)
We should not need to be first/Another state should be/Let somewhere else lead/Doesn't matter whose first	25%
Not convinced EV better for environment/not a solution to fossil fuel dependence	18%
EV is a dead technology / not powerful enough / limited capability / Range limitation	14%
Not a state issue / All states need to / one state insignificant / Oregon not a trendsetter/leader/spend time on other things	10%
Not sure / Don't know / not important / fad/inconvenient	9%
Not enough political backing/More important issues to address at state level (Unemployment, Ed.)/spend time on other things	6%
High cost / drive up electricity rates/ Use more electricity / more taxes	5%
Public transportation is more efficient	5%
State not big enough to influence / Not feasible for state / not dense enough population	4%
Too new	3%
Too long of wait for charging	0%
No answer	8%

17. (IF IMPORTANT TO Q15) Why “important?” (OPEN)

Response Category	King County (N=304)
OR/WA is green/innovative reputation/We are a green leader/ We are the "Green"	50%
For the environment/Reduce smog/pollution/sustainability/We are environmentally conscious	19%
Economic development / jobs/lead industry not follow /technological development/ advantage	13%
High gas prices / reduce oil usage / availability of hydro/wind/solar	13%
Don't know/not sure it is important	4%
Important for all states/More options still needed/ Needs to be more popular in general	2%
Our short commutes make EVs an efficient choice	2%
High population	0%
No answer	12%

18. How important is it that local, regional, and state governments in Washington promote the use of EVs for residents and businesses for inner city travel by investing in easy to access charging stations for EVs and offering tax incentives for residents and businesses purchasing EVs?

Response Category	King County (N=304)
Not at all important	3%
Not too important	8%
Somewhat important	45%
Very important	44%

19. Would you oppose or support local, regional, and state governments promoting the use of EVs for inner city travel by investing in easy to access charging stations for EVs and offering tax incentives for residents and businesses purchasing EVs?

Response Category	King County (N=304)
Strongly oppose	5%
Somewhat oppose	8%
Somewhat support	51%
Strongly support	37%

20. Which is more important? (ROTATE)

Response Category	King County (N=304)
<i>For businesses</i> that ship goods and products within a city on a daily basis to use EV trucks	43%
<i>For individuals</i> who drive within the city on a daily basis to use EVs	57%

21. If you knew a company used EV trucks to distribute their products and conduct their business, would your impression of that company: **(ROTATE)**

Response Category	King County (N=304)
Rise	72%
Fall	3%
Remain unchanged	26%

BEST USE & PURCHASE LIKLIHOOD OF EVs

22. Which of the following do you think is the best use of EVs? **(ROTATE)**

Response Category	King County (N=304)
For short inner-city trips	15%
For public and private fleets (e.g., city government, Postal Service, hospitals, electric utilities)	9%
For trips that are between cities, but less than 100 miles	9%
For the distribution of goods and products by businesses within cities	7%
All of the above	58%
None of the above	2%

23. Compared to a gasoline powered vehicle, how much do you think it costs to fuel/power a similar EV for the same amount of driving?

Response Category	King County (N=304)
More	24%
Less	51%
About the same	25%

24. Compared to a gasoline-powered vehicle of equivalent size, styling, safety & performance, an EV costs less than half to power and it costs less than half to maintain over its entire life (according to studies.²) Additionally, starting in 2009 there is now a federal tax credit of \$7500 for EV purchasers. Given these benefits, how much of a premium above that of an equivalent gasoline-powered vehicle would you expect to pay for an EV?

Response Category	King County (N=304)
0%	9%
1%	1%
2%	1%
5%	3%
10%	16%
15%	8%
20%	11%
25%	10%
30%	6%
40%	2%
More than 40%	7%
Don't know	29%

25. If the state offered a one-time \$5,000 tax incentive to drive an electric vehicle, in addition to the \$7500 federal tax credit, how much of a premium above the price of an equivalent gasoline-powered vehicle would you be willing to pay?

Response Category	King County (N=304)
0%	11%
1%	0%
2%	1%
5%	4%
10%	17%
15%	8%
20%	12%
25%	9%
30%	3%
40%	6%
More than 40%	3%
Don't know	27%

26. Most mass-produced EVs are currently only able to go up to **100** miles between charges and cost an average of \$5,000 more than equivalent-gasoline powered vehicles. It is estimated that, on average, they will save \$1200 per year in fuel costs. If owners who purchase an EV receive a \$7500 federal tax credit plus a one-time \$5,000 state tax incentive, how likely are you to consider purchasing an EV in the next five years that can travel... (Scale: 1 to 10, where 1 means you would not at all consider purchasing an EV, and 9 means you would strongly consider purchasing an EV and 10 means you are not buying anything in next 5 years)

Response Category	King County (N=304)
1 (Not at all consider purchasing an EV)	20%
2	6%
3	8%
4	4%
5	29%
6	10%
7	9%
8	4%
9 (would strongly consider purchasing an EV)	6%
10 (you are not buying anything in next 5 years)	6%
Mean	4.4

If owners who purchase an EV receive a \$7500 federal tax credit plus a one-time \$5,000 state tax incentive, how likely are you to consider purchasing an EV in the next five years that can travel **200** miles between charges?

Response Category	King County (N=304)
1 (Not at all consider purchasing an EV)	6%
2	2%
3	4%
4	5%
5	21%
6	12%
7	19%
8	13%
9 (would strongly consider purchasing an EV)	13%
10 (you are not buying anything in next 5 years)	6%
Mean	6.1

If owners who purchase an EV receive a \$7500 federal tax credit plus a one-time \$5,000 state tax incentive, how likely are you to consider purchasing an EV in the next five years that can travel **400** miles between charges?

Response Category	King County (N=304)
1 (Not at all consider purchasing an EV)	4%
2	0%
3	1%
4	2%
5	11%
6	4%
7	9%
8	10%
9 (would strongly consider purchasing an EV)	53%
10 (you are not buying anything in next 5 years)	5%
Mean	7.6

27. What do you think is the biggest advantage of driving an EV today? **(ROTATE)**

Response Category	King County (N=304)
Helping to reduce the nation's carbon and greenhouse gas emissions	43%
Saving money on gasoline	40%
Helping to reduce the nation's dependency on foreign oil	18%

28. What do you think is the biggest disadvantage of driving an EV today? **(ROTATE)**

Response Category	King County (N=304)
Being able to drive only 100 miles before charging the EV	37%
The risk of getting stranded because the batter has discharged	31%
The addition cost to purchase	20%
Replacing the battery before the car's useful life is exhausted	9%
Other	4%

29. If, after weighing all the factors that go into purchasing a vehicle, you decided an EV was best, which type would you buy? **(ROTATE)**

Response Category	King County (N=304)
NEV (Neighborhood Electric Vehicle; ~35mph max; <\$15,000)	3%
PEV (Personal Electric Vehicle; ~95mph max; 2-seater; <\$25,000)	22%
EV similar to gasoline styled vehicle	75%

30. (IF "EV" TO Q29) Which type and size would you most likely purchase?

Response Category	King County (N=304)
Pick-up	25%
SUV	37%
Minivan	24%
Van	19%
Station Wagon	24%
Sedan/Car	68%
Sports Car	26%
Luxury Vehicle	28%
None	1%

DEMOGRAPHICS

31. How many vehicles does your household currently own? ____

Response Category	King County (N=304)
0	2%
1	32%
2	45%
3 or more	20%
Mean	2.0

32. How many total miles do you drive in a year? _____

Response Category	King County (N=304)
0-999	2%
1,000-4,999	9%
5,000-9,999	22%
10,000-14,999	35%
15,000-24,999	22%
25,000-49,999	6%
50,000 or more	3%
Mean	13,300

33. Which types of vehicles does your household own? (Select one type for each vehicle you own and leave the remaining rows blank.)

Vehicle #1	King County (N=304)
Pick-up	13%
SUV	20%
Minivan	8%
Van	2%
Station Wagon	6%
Sedan/Car	39%
Sports Car	4%
Luxury Vehicle	5%
Hybrid	2%
None	3%

Vehicle #2	King County (N=304)
Pick-up	4%
SUV	10%
Minivan	4%
Van	2%
Station Wagon	1%
Sedan/Car	29%
Sports Car	7%
Luxury Vehicle	5%
Hybrid	1%
None	36%

Vehicle #3	King County (N=304)
Pick-up	2%
SUV	3%
Minivan	1%
Van	0%
Station Wagon	0%
Sedan/Car	8%
Sports Car	3%
Luxury Vehicle	2%
Hybrid	0%
None	80%

Vehicle #4	King County (N=304)
Pick-up	0%
SUV	0%
Minivan	0%
Van	0%
Station Wagon	0%
Sedan/Car	2%
Sports Car	1%
Luxury Vehicle	1%
Hybrid	0%
None	95%

Vehicle #5	King County (N=304)
Sedan/Car	1%
None	98%

34. In which category is your age?

Response Category	King County (N=304)
18-24	11%
25-34	18%
35-44	21%
45-54	22%
55-64	17%
65-74	10%
75 and above	2%

35. What is your gender?

Response Category	King County (N=304)
Female	52%
Male	48%

36. Where is your home located?

- a. Would you describe the place where you live as urban, suburban, rural changing to suburban, or rural?

Response Category	King County (N=304)
Urban	39%
Suburban	53%
Rural changing to suburban	5%
Rural	3%

37. Are you registered to vote?

Response Category	King County (N=304)
Yes	91%
No	9%

38. When it comes to politics, do you consider yourself to be...?

Response Category	King County (N=304)
Strong Democrat	28%
Lean more towards the Democrats	30%
Independent	20%
Lean more towards the Republicans	14%
Strong Republican	8%

39. For classification purposes only, please indicate which of the following best describes your total annual household income before taxes.

Response Category	King County (N=304)
Under \$15,000	3%
\$15,000 - \$24,999	3%
\$25,000 - \$34,999	5%
\$35,000 - \$49,999	10%
\$50,000 - \$74,999	24%
\$75,000 - \$99,999	19%
\$100,000 - \$124,999	19%
\$125,000 - \$149,999	7%
\$150,000 - \$174,999	4%
\$175,000 - \$199,999	2%
\$200,000 or More	4%