

# **NORTH NATOMAS ELECTRIC VEHICLE STUDY**

## **Community Transportation Event Participant Survey Results**

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## **FINAL REPORT**

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## **Introduction**

The purpose of this report is to describe the results of a survey conducted among North Natomas residents at a local Community Transportation Fair to determine their level of interest in several innovative electric vehicle (EV) concepts. The Community Transportation Fair experienced excellent attendance, and 80 people filled out surveys during the course of the event.

This report includes three main sections:

1. Data and research methodology
2. Survey results
3. Conclusions and recommendations

## **Data and Research Methodology**

A survey of potential EV users was conducted during the North Natomas Community Transportation Event held Saturday, September 15, 2001. One major concern is the reliability and sampling accuracy of the data thus obtained. A total of 80 EV surveys were filled out and submitted for prize drawings during the course of the event. Of these, 76 were reasonably complete, forming the basis of the comparative analysis and evaluation to follow.

In general, it is not possible to validate surveys such as those derived from the North Natomas Community Transportation Event, making the results less useful in evaluating market potential on a more general basis. In this case, however, the previously conducted North Natomas Baseline Study provides directly comparable demographic information for a random sample of North Natomas residents. If the demographic characteristics of EV survey respondents are similar to those of baseline survey respondents, this would help to establish the identity of EV survey respondents as an unbiased, representative sample of all North Natomas residents.

The results are as follows:

**NORTH NATOMAS ELECTRIC VEHICLE STUDY**

Demographic Variable	Mean		Difference of Means (t) / Proportions (z)
	Baseline	EV	

**Median**

Age (years)	38.5	36.2	1.61
Education (years)	15.9	16.0	-0.40
Family income (\$000)	78.0	73.0	1.75

**Percent**

Households w/2+ adults	90%	91%	-0.15
Households w/1+ Children	48%	58%	-1.32
Female	52%	58%	-0.81
Employed outside home	86%	82%	0.71

The following findings are noted:

1. Baseline and EV survey respondents are remarkably similar in many different ways. The vast majority of both groups are between 30 and 50 years of age, have attended at least some college, with annual family incomes of \$50,000 or more. No demographic differences between the two groups are statistically significant at the 95% level.
2. EV survey respondents tend to be a bit younger and better educated, with lower family incomes. EV survey respondents have slightly larger families (more adults, and especially more children), are slightly more likely to be female and slightly less likely to work outside the home. These differences, although not statistically significant, form a pattern. The pattern suggests that the EV sample is drawn from the same population as the baseline sample, with a slight but persistent bias toward the family. This is exactly as one would expect from a sample derived from participation in a family-oriented weekend event, as opposed to a random telephone survey of household commuters.

The following conclusions are drawn:

1. The primary conclusion is that the EV sample is an unbiased, representative sample of North Natomas residents.
2. A secondary conclusion is that the baseline sample also is unbiased, given that a potentially non-random sample (the EV sample) conforms so closely to it in terms of basic demographic characteristics.
3. A tertiary conclusion is that the residential population of North Natomas must be fairly homogeneous, in order to allow much different sample frames to produce results so similar.

## Survey Results

### ***Motor vehicles owned***

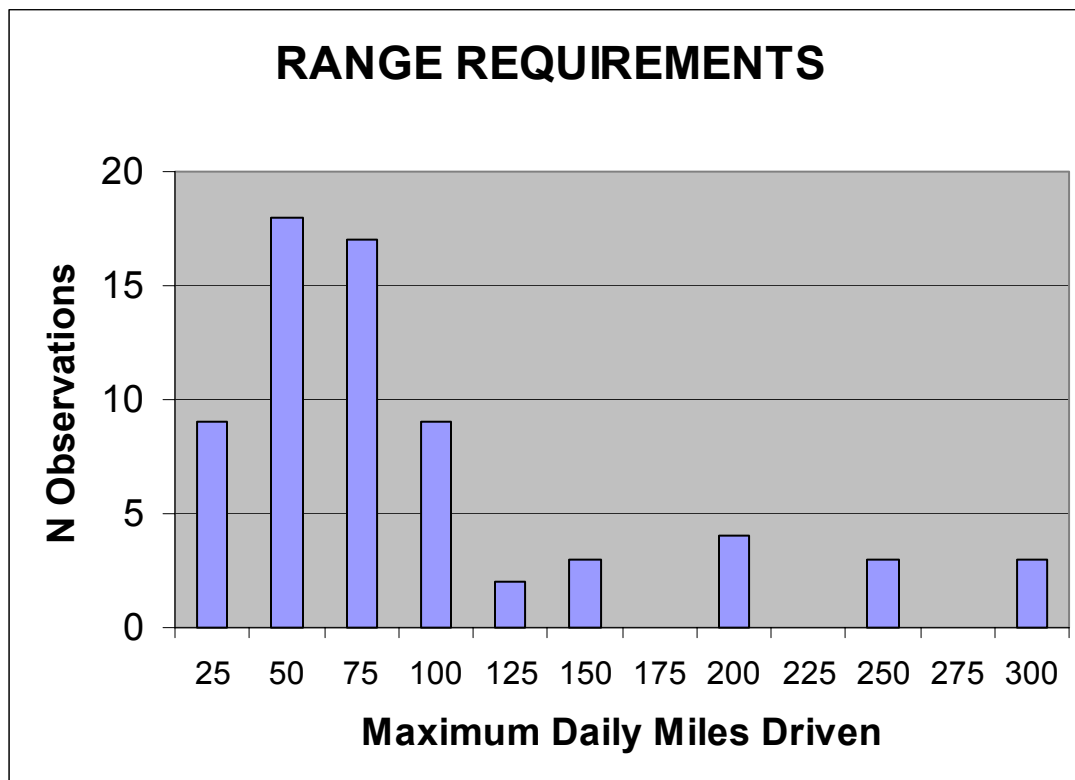
Respondents were asked to identify the types of motor vehicles owned, rented or leased by their household:

1. Four-door car (e.g., family sedan, station wagon, etc.)
2. Two-door car (e.g., sports car, hatchback, etc.)
3. Van or minivan
4. Sport utility vehicle (SUV)
5. Pickup or truck

Four-door cars were most popular (59%), followed by SUVs (37%), two-door cars (34%), minivans (30%) and pickups (13%). These figures correspond reasonably well with current national averages.

### ***Maximum daily driving range***

Respondents were asked to identify the maximum number of miles they had ever driven their car during a single day in and around Sacramento, not including long distance trips outside the area. The survey average was 91 miles, with a range of 20 miles to 500 miles. About 40% indicated they had never driven more than 50 miles in a single day; 78% had never driven more than 100 miles. These figures suggest that a high percentage of North Natomas residents should have no strong objections to current EV operating characteristics.



### ***Electric vehicles desired***

Respondents were asked to identify the types of EVs they would like to own, rent or lease, subject to availability, purchase price, tax breaks and other subsidies:

1. Four-door car
2. Two-door car (General Motors EV1)
3. Two-door car (Honda EV Plus)
4. Van or minivan
5. Sport utility vehicle (Toyota RAV4)
6. Pickup or truck

Four-door cars were most popular (50%), followed by SUVs (32%), two-door cars (29%), minivans (20%), and pickups (8%). The desire for EVs closely paralleled current motor vehicle ownership profiles.

Overall, EV desires were about 80% of current motor vehicle ownership. This varied systematically by vehicle type. EV desire as a percentage of vehicle ownership was highest for SUVs (86%), followed by two-door cars (85%), four-door cars (84%), minivans (65%) and pickups (60%).

SUVs and two-door cars presumably were rated higher as a result of the display models showcased at the community transportation event. Strong market potential for four-door EVs is suggested by these results, while minivans and pickups have considerably less potential.

### ***Neighborhood/station cars desired***

Respondents were asked to identify several innovative types of EVs they might like to own, rent, lease or borrow, subject to availability, purchase price, tax breaks and other subsidies:

1. Neighborhood car (GEM NEV)
2. Community vehicle (Toyota e.com)
3. Station car (community-owned vehicle available at central location for car sharing)

Of these, the neighborhood car/community vehicle concept was most popular (26%), followed by the station car concept (7%). Neighborhood cars were less popular than sedans (two-door or four-door) or SUVs, but more popular than minivans or pickups as EVs, despite their relative newness in the vehicle marketplace. This suggests that a good market for such vehicles may exist in North Natomas.

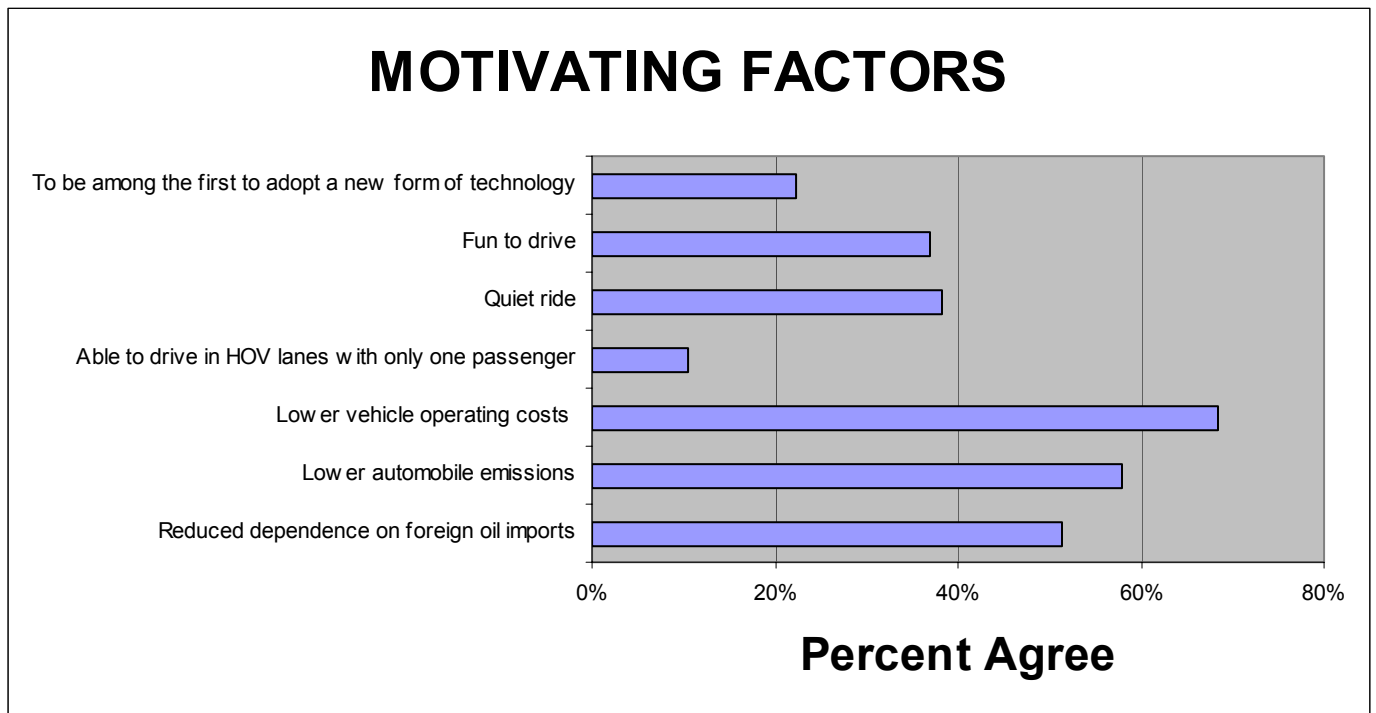
Station cars were the least popular vehicle type overall, but the concept was not actually demonstrated at the event, even if it was discussed. This concept is foreign to most people's current thinking about personal mobility based on motor vehicle ownership and use. It is only reasonable to expect that fewer persons would express an interest in such an idea without additional information.

### Motivating factors

Respondents were asked to identify which factors would motivate them to acquire an EV:

1. To be among the first to adopt a new form of technology
2. Fun to drive
3. Quiet ride
4. Able to drive in HOV lanes with only one passenger
5. Lower vehicle operating costs
6. Lower automobile emissions
7. Reduced dependence on foreign oil imports

Of these, the most popular reasons were lower costs (68%), lower emissions (58%), reduced dependence on foreign oil (51%), quiet ride (38%), and fun to drive (37%). These results show that cost is the primary motivating factor, followed by air quality, energy conservation, and the quality of the ride provided.

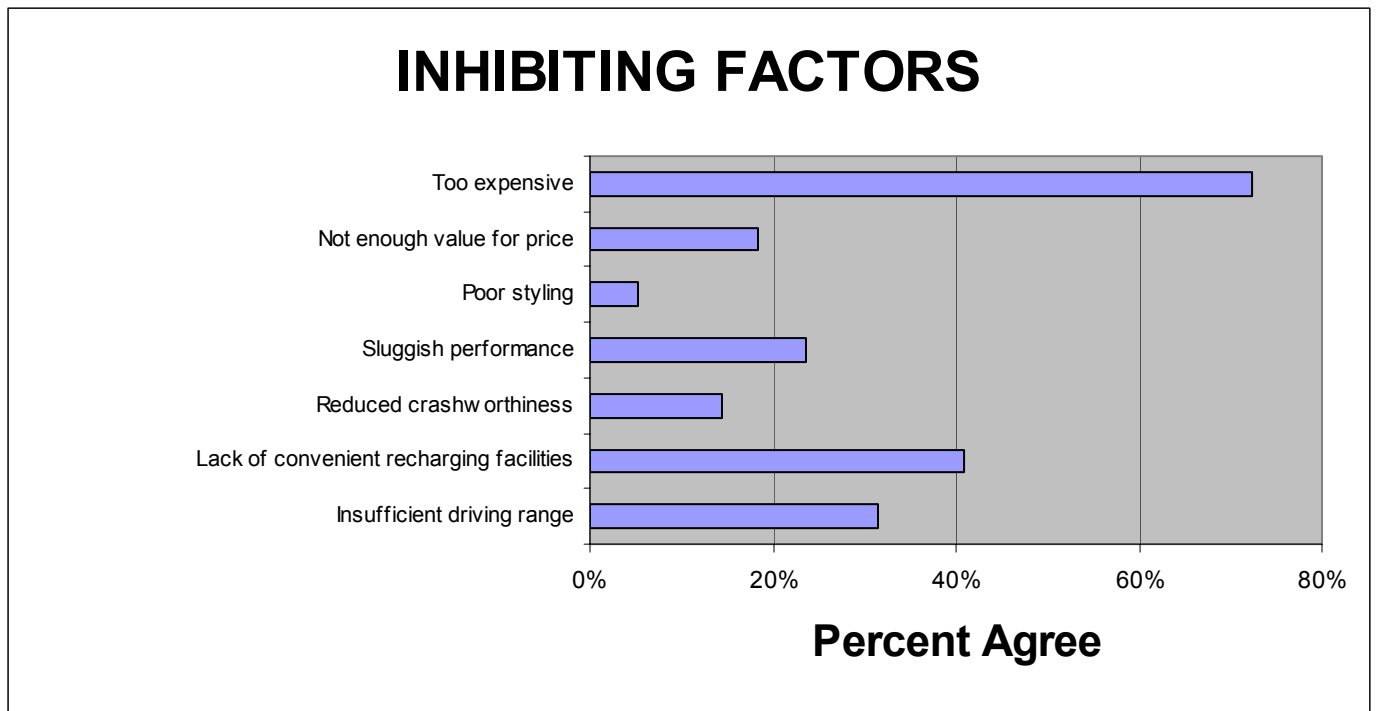


### ***Inhibiting factors***

Respondents were asked to identify which factors would prevent them from acquiring an EV:

1. Too expensive
2. Not enough value for price
3. Poor styling
4. Sluggish performance
5. Reduced crashworthiness
6. Lack of convenient recharging facilities
7. Insufficient driving range

Of these, the most frequent obstacles mentioned were too expensive (72%), lack of recharging facilities (41%), insufficient range (32%), and sluggish performance (24%). These results confirm the importance of cost, and point to other potential drawbacks EVs may face in the marketplace.



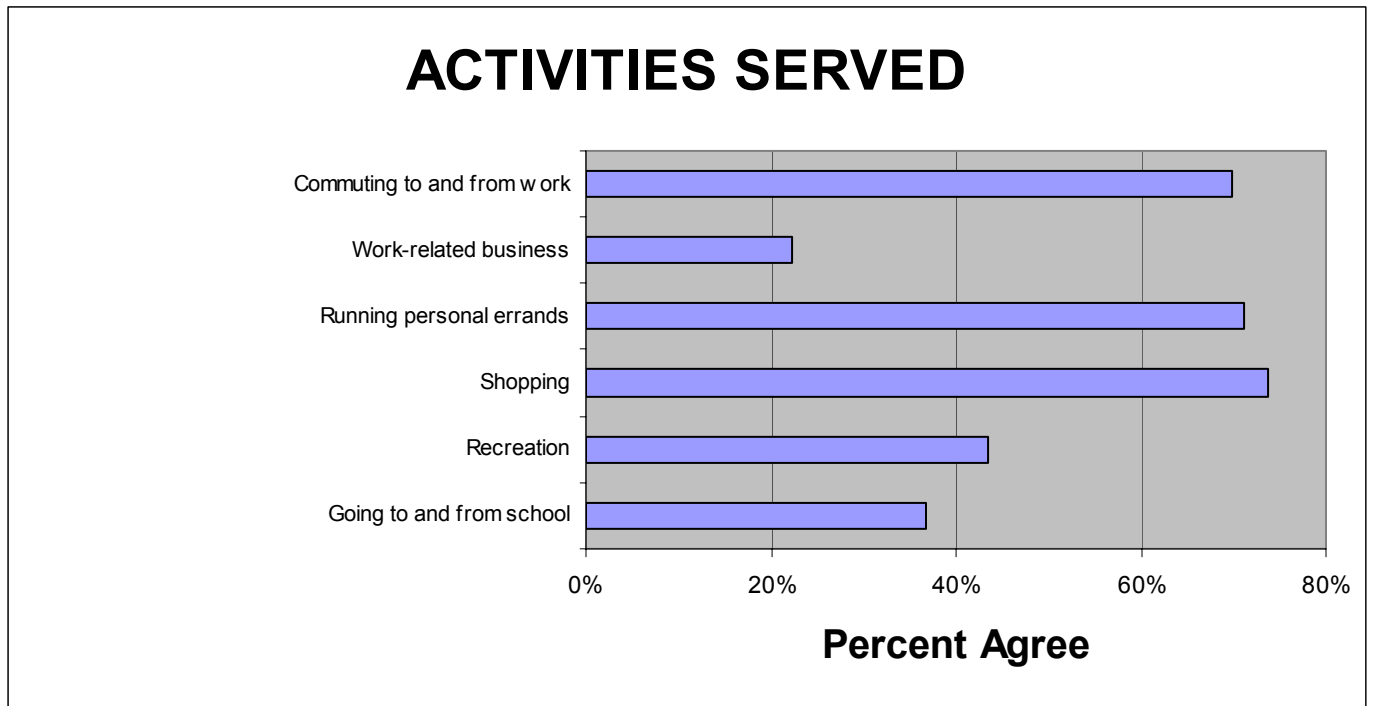


**Activities served**

Respondents were asked to identify the types of trips they would use an EV for, if they had one:

- 1. Commuting to and from work
- 2. Work-related business
- 3. Running personal errands
- 4. Shopping
- 5. Recreation
- 6. Going to and from school

Of these, the most frequently mentioned were shopping (74%), personal errands (71%), and commuting (70%). These results show that EVs may do particularly well in serving short, local trips. To the extent that jobs-housing balance is achieved, commuting trips may be served by EVs. Commercial activities, including both shopping and other personal errands, are another strong potential market for EVs in North Natomas.



## Important Variable Relationships

Maximum daily driving requirements increased with income. Men reported higher maximum daily driving requirements than women. Both of these findings were as expected.

The most important variables in relationship to reported interest in neighborhood vehicles and station cars were maximum daily driving requirements and gender. Interest in neighborhood cars was less sensitive than interest in station cars to these variables.

	N Observations	Neighborhood Car	Station Car	Station Car / Neighborhood Car
Overall	76	26%	7%	25%
SEX				
Female	44	25%	9%	36%
Male	32	28%	3%	11%
MAXIMUM DRIVING DISTANCE				
<50 miles/day	27	26%	11%	43%
>50 miles/day	41	32%	2%	8%

## Conclusions and Recommendations

Interest in electric vehicles appears to be quite high in North Natomas, based on these survey results:

- All survey respondents owned at least one household vehicle at the time the survey was conducted.
- Almost all survey respondents expressed some interest in replacing one or more household vehicles with electric vehicles. This should not be interpreted as a commitment to purchase electric vehicles, only an expressed willingness to consider doing so.
- Approximately one in four survey respondents expressed an interest in the neighborhood vehicle concept.
- Relatively few survey respondents expressed an interest in the station car concept. Women and people who drove less than 50 miles per day maximum were significantly more interested in the station car concept.
- Cost is the primary motivating factor in determining the level of interest in electric vehicles, although emissions reductions and fuel conservation are also important.
- Price is the primary inhibiting factor, although the availability of recharging facilities and maximum driving range are also important.
- Commuting, personal errands and shopping are the most likely activities to be served by electric vehicles. This makes the EV concept particularly useful in relationship to job-housing balance. Shorter vehicle trips can be served by a wider range of potential EV concepts.

Local residents are primarily interested in replacing an existing gasoline-powered vehicle with an EV at present. Neighborhood vehicles and station cars seem relatively untried and untested by comparison. A demonstration program might be useful in improving consumer awareness of alternative vehicle types, modes of operation, and ownership possibilities.