

Background

There is little electric vehicle (EV) consumer data to properly forecast market growth and model EV travel patterns

It is important for policymakers and practitioners seeking to expand the EV market to understand how consumers perceive and use EVs as the market progresses. How will consumers decide what range works for their lifestyle? Once a consumer selects a certain range, how will they utilize it? One challenge to understanding how consumers might assess EV technology and range is that their evaluation will unfold over a long period of personal experience and social interactions.

Methodology

Our study involved multiple surveys and interviews over a year with real EV drivers, allowing us to observe consumers' lifestyles and behavior change over time

BMW converted 450 MINI Coopers to all-electric drive (named the MINI E) and leased them to fleets and 235 private households in the Los Angeles and New York/New Jersey regions from Summer 2009 to Summer 2010. Through the course of the one-year lease, UC Davis researchers conducted multiple online surveys, in-home interviews, and administered weeklong driving diaries. Figure 1 below shows the sample sizes and deployment time window for each of the surveys. This paper explores the reactions of MINI E drivers to the range of the MINI E through the framework of a Lifestyle Learning Process.

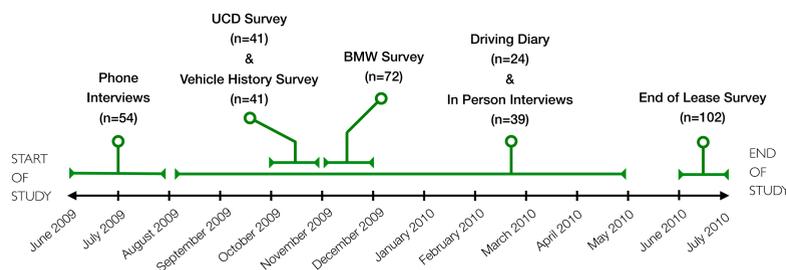


Figure 1 – MINI E Consumer Study timeline with survey names and sample sizes.

Research Framework

Consumers' perceptions, values and use of EVs are shaped by their experiences, and change over time through lifestyle exploration

Electric vehicles differ from gasoline vehicles along many dimensions--from drive feel, energy and refueling systems to economics and social meanings. MINI E drivers went through a learning process with their EV. The analysis in our study is framed around understanding this learning process by splitting it into three phases: Discovery, Translation, and Application (seen in Figure 2). The following MINI E driver quote exemplifies this learning process the drivers go through with their EV.

"After living with the car for a while I learned I could go further with the same amount of energy if I simply changed my driving style a little. I think that got me thinking that I could also do more and use less at home by making some simple changes." – Household 2

Lifestyle Learning Process

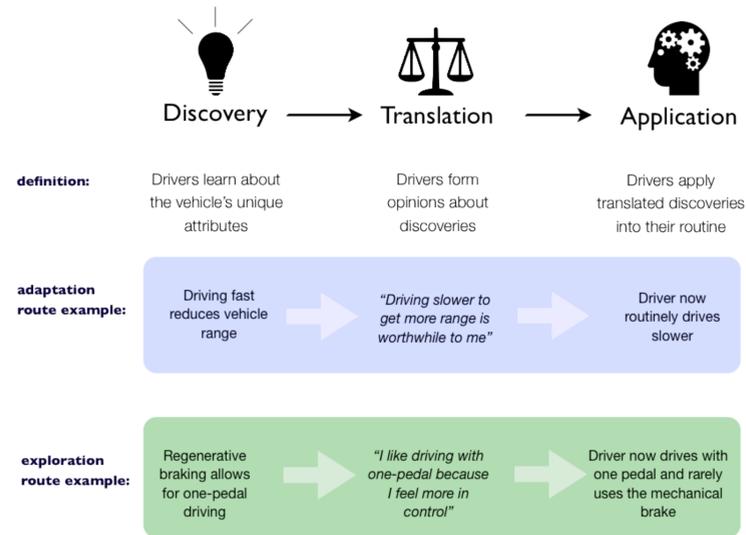
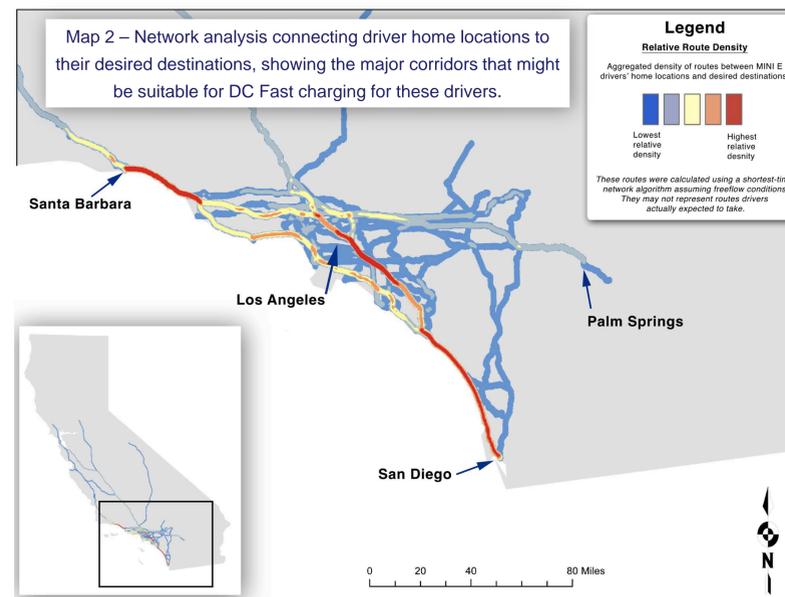
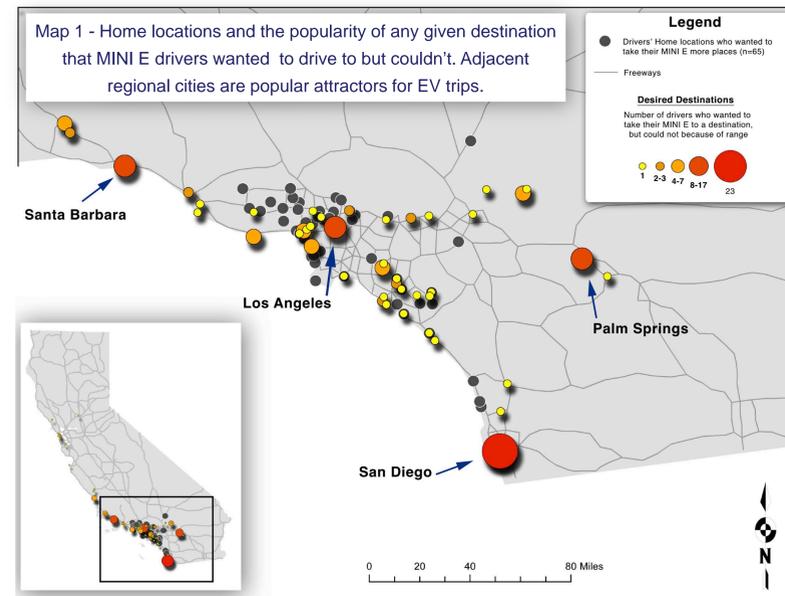


Figure 2 – Lifestyle Learning Process illustration. Drivers went through a learning process we simplify into three stages for ease of discussion and understanding.

Drivers Exploring Range

Drivers discovered the range of the MINI E to be suitable for daily use. Most drove it more than they expected, eventually valuing the expansion of their EV territory as they mastered energy use and learned what their vehicle range was capable of

Vehicle range was a key learning area for Drivers. They would have initial perceptions of how they would use their EV and where they could drive it.



After experience with exploring where they could take their electric vehicle (what we call their EV territory), drivers learned about distances to destinations and how topography, routes and driving speed effect vehicle range. Drivers that needed to take their car further mastered their energy use to maximize their EV driving. As drivers' EV territory expanded, they would substitute other vehicle trips for the MINI E. In our End of Lease Survey, 81% of respondents wanted to take their MINI E to a destination but couldn't because of range. The maps and figures show detailed information about where drivers wanted to take their EV. Most desired destinations were for family, friends, recreation and entertainment purposes and regionally close to home with 88% of desired destinations being less than 160 miles one-way.

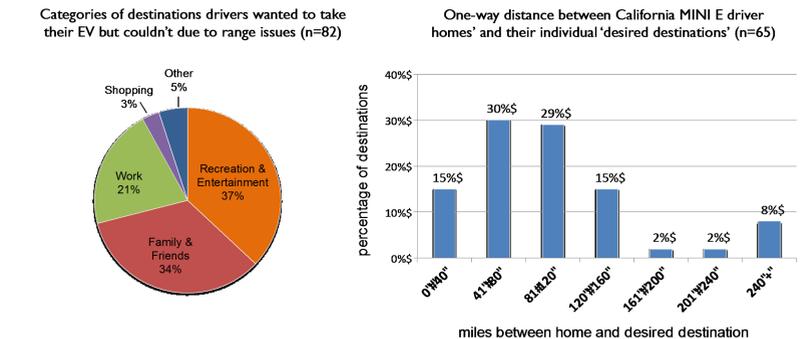


Figure 3 – Charts showing information on the types and distances (California drivers only) of their desired destinations from the End of Lease Survey.

Conclusions

The learning process is contextual, drivers adapt and explore new sets of values and driving behaviors into their lifestyle

Over the lease period, MINI E drivers went through a learning process to understand how the MINI E's range fit into their lifestyle and even discovered areas of added value not apparent before their experiences. When necessary, drivers adapted and explored driving techniques and charging behaviors to maximize their use of the MINI E. Without a similar trial period, consumers may overestimate the range required to meet their driving needs and undervalue other characteristics realized through experience. It is important to study this early market and better understand how consumers perceptions and use of these vehicles for better policy and planning around EV readiness.