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E-Mobility for Unrepresented Communities

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Summary

Underserved community electric vehicle adoption is key to widespread adoption of electric vehicles in the United States and to meet climate change goals. Forth has taken steps through demonstration pilot projects in the Pacific Northwest to introduce electric vehicles and electric bicycles in communities that are generally not targeted by mainstream markets. Beyond Forth's current projects, Forth is working directly with a community based transportation advocacy organization to determine the needs of local underserved communities and how best to meet those needs.

Keywords: underserved communities, sustainability, case-study, electric vehicles, electric bicycles

1 Introduction

Many low-income communities and communities of color are disproportionately more exposed to negative environmental health risks, such as air pollution, due to living near busy roads and exposure to older cars that produce higher levels of emissions[1]. When these communities suffer from environmental health risks, they are more likely to miss school and work as a result of having to tend to their health needs[2].

Underserved communities also can have fewer transportation options such as public transportation, bicycle infrastructure, and car sharing. As costs of living in central cities rise, low-income families are forced relocate to outer regions of cities and suburbs where public transit is less frequent. One study found that those forced to live in suburbs and the outskirts of cities are further away from jobs and are forced to spend a higher percentage of their income on transportation[3].

To meet aggressive greenhouse gas reduction goals, it will be vital to target the transportation sector. By including underserved communities in the electric vehicle market through targeted education and rebates, electric vehicle sales can increase electric vehicle adoption[4].

In Oregon, Forth has begun targeting demonstration pilot projects in collaboration with community-based organizations to explore possible solutions to issues low-income communities face. Forth's Community Electric Vehicle (C-EV) project is expanding the types of transportation options in NE Portland by hosting a car share using electric vehicles. The Community Electric Bicycle (C-EB) project is aiming to limit barriers for individuals who are unable to attain a license by testing the usage of electric bicycles with thirty participants. Finally, Forth contracting with two organizations to increase equity within the organization and to complete a Community Transportation Needs Assessment to better determine where to focus future projects and resources.

2. Community Electric Vehicle Project

The Community Electric Vehicle project was started after Forth began conducting outreach and research in low-income communities and learned about the lack of transportation options for these communities. Forth elected to collaborate with Hacienda CDC, an affordable housing nonprofit, located in the Cully neighborhood of Northeast Portland to design and trial a used electric vehicle car sharing pilot. Hacienda CDC focuses on providing affordable housing, economic development opportunities, and community support to the predominantly Latino community in NE Portland. Within the Cully neighborhood, approximately 17% of the population in 2010 was below poverty compared to 13% citywide[5].

Hacienda CDC agreed to be the host site for Forth Community Electric Vehicle (C-EV) project and run the program for its staff and residents. In March of 2017, three Blink Level 2 chargers were installed near Hacienda's main office and central to Hacienda's nine multi-family housing units. At the project site, there are three Honda Fit EVs that are available to Hacienda employees and residents. This site was chosen due to the fact that it was previously empty before the project and therefore would not be taking away any parking spaces for Hacienda's residents.

C-EV's goal is to introduce a new mode of transportation to the Cully community and demonstrate the economic benefits of driving electric vehicles. Transportation options in Cully are limited and make traveling to the city difficult and lengthy. There are currently only four bus lines that run through Cully and no nearby limited light rail service. Several car-sharing companies, mainly Car2Go and ReachNow, enter Cully but do not service the entire area leaving many without the option to use car-share services. C-EV is structured around two Honda Fit EVs stationed at Hacienda that are available community members to rent through the peer-to-peer car-sharing app Turo. Through this app, community members have access to a low cost daily rental with car insurance and free charging.

Before C-EV, Hacienda employees were dependent on their own vehicles or transit to accomplish work related activities such as picking up supplies or attending meetings. Hacienda uses the U.S. federal mileage reimbursement rate of 53.5¢ per miles to reimburse their employees and spent a total of $20,000 in 2016 for all local mileage and parking. The C-EV project provides one Honda Fit EV for employees to use for work related job functions and related activities and to reduce the amount of reimbursements to Hacienda employees.

2.1 C-EV Outreach

Forth primarily conducted outreach and education for the C-EV project at Cully events and other nearby community events. Total outreach from November 2016-July 2017 includes 18 community tabling events in the NE Portland area, Forth Workshops, and community meetings. All C-EV specific outreach materials were translated into both Spanish and English. Forth also made Spanish translator available at all outreach events to better be foster a dialogue with community members.

Despite attending and hosting almost 20 outreach events, knowledge of the project was still not widespread. For the second half of the project Forth is looking to collaborate with additional community-based organizations

within Cully to inform more people about the project and the benefits of electric vehicles. Hacienda CDC is also going to play a larger role is outreach with hiring a Resident Services Coordinator who will be in direct contact with all residents. This new hire will start work in their role in August 2017.

Figure 1. Sample Spanish Language EV 101 Infographic

2.2 Electric Vehicle Utilization

From the beginning of the project in March 2017 till July 2017 there have been over 60 rental requests for the electric cars through the Turo platform. Each reservation has varied in length from 1 day to 5 days. Through the Turo platform we are not able to determine if all of these reservation requests are from the Cully community and we are unable to set geographic restrictions within the platform. Of these 60 reservations, only 25% of them were responded to before the requests expired by our community partner Hacienda CDC. A feature of the app is that each request needs to be responded to within 8 hours or they will expire. Due to a lack of capacity and limited office hours, the majority of these requests have not been responded to.

To combat low vehicle utilization Forth is focusing on increasing outreach efforts by working more closely with Hacienda and other nearby and likeminded community-based organizations. Forth is also assisting on training the new Resident Services Coordinator on C-EV procedures. Hacienda will conduct a survey of all residents to see if they have heard of the project and what is preventing them from renting the vehicles. Forth and Hacienda will use the results to improve the project design and increase utilization.

2.3 Funding

C-EV is funded through the grant funds made available by the Meyer Memorial Trust, 11th hour Project, Pacific Power, and Forth Mobility Fund. Additionally, Blink Charging Group provided discounted Blink Level 2 chargers and American Honda loaned five Honda Fit EVs for the project. Forth has also committed to support

Hacienda with a $10,000 stipend to help cover the extra work associated with hosting the C-EV project. Costs for this project include: outreach materials, a car seat, insurance, and employee wages. This project and the related Community Bike Share project both represent low cost scalable projects that can be modeled with a limited amount of funding and resources.

Figure 2. Used Electric Vehicle Car Sharing Project With Hacienda CDC

2.4 Lessons Learned

Forth and Hacienda have gained insight on how best to improve the C-EV from the first half of the project. There were few examples of similar programs resulting in planning for the project to be done by researching issues facing underserved communities and interacting with the community. The planning of the project incorporated flexibility as adaptations were expected to occur as both organizations learned how to host a programmatic car-share for low-income residents.

2.4.1 Challenges with Reservation Platform

When first deciding what app to use to facilitate reservations for the project, the requirements were that 3rd party insurance was issued through the app and there was a streamlined process for reservation management. Our first choice of application, Getaround, refused to work with our project due to our vehicles being electric cars and not operating in the zip code of our project. Getaround was initially selected as the app of choice the platform allows for rentals without the owner being present and for some short-term rental periods making it sound ideal for meetings and unplanned trips.

The project ultimately decided to move forward with Turo, a peer-to-peer car-sharing platform that facilitates car rentals for as low as $10 per day. One limitation with Turo is the in person key hand off for the beginning and ending of each rental. Rentals are also pre-determined as having a daily rate and not an hourly rate. This

has required our rentals to only take place Monday-Friday from 9am-5pm when Hacienda staff have been available. This has been difficult for individuals who need a car over the weekend but are not able to rent from Friday afternoon until Monday morning. A further limitation to all available apps is their lack of Spanish language and other non-English options.

2.4.3 Organizational Capacity

During the first half of the project there was a lack of capacity to fully meet the needs of the project. At Hacienda, there were originally three employees assigned to help facilitate the project but these tasks were added on top of their full-time positions. In the span of two months, the primary organization contact on the project left Hacienda and one of the supporting employees left for maternity leave. Due to a lack of capacity, many of the reservation requests were left unanswered. At Forth, there were three employees overseeing the project and doing outreach at community events but were unable to assist with reservations. For the second half of the project, the new Resident Services Coordinator, who will be point on the project at Hacienda, will be trained on C-EV procedures and lead outreach efforts within the community. It is expected that utilization and responsiveness to rental requests will increase with the new staff and additional Hacienda staff capacity.

2.4.2 Community not having a driver's license

Some of the community members that have given us information about the project shared that they do not have a driver's license and are unable to legally drive. Many of them like the idea of the project but can't participate themselves. For families who do have someone with a driver's license, many have a vehicle that they can access and borrow. Forth and Hacienda are conducting a mid-point survey of all Hacienda residents to determine what barriers residents are facing from participating in the project. From these results, we will better be able to determine how to overcome the barriers of the project.

3. Community Electric Bicycle Project

The Community Electric Bicycle (C-EB) project was created in response to learning that many people do not have access to driver's license in our project community NE Portland Oregon. In 2008, Oregon passed a law requiring that proof of citizenship or documents proving legal residency were required to obtain a driver's license[6]. Due to a lack of driver's license, many community members in Cully were unable to participate in the C-EV project.

Forth partnered with the Community Cycling Center (CCC) to host the C-EB project throughout Portland. CCC is a local and well trusted nonprofit that provides communities with access to bikes. Their programs include bike drives for children, bike safety, and bike repair in Portland[7]. Their involvement within the community allowed them to find participants for the project.

Forth received 10 e-bikes from Mahindra GenZe on loan to be used for C-EB. Each bike was outfitted with fenders, two bike locks, panniers, lights, and each participant was given a helmet. The participants were separate into three cohorts of 10 with the requirement being that they did not have a driver's license. Each participant was given a total of three surveys to complete at the beginning, middle, and end of their time with the e-bikes. The survey asked for demographic information, familiarity with bicycles, and their experience with the e-bikes. There is limited data from these surveys because the project is still occurring and not all participants have completed their surveys.

The Community Cycling Center used their relationships with the community to find participants without driver's licenses who would be interested in participating. The first cohort consisted of a random group of people varying in age, gender, and bicycling experience. The second cohort consisted Portland Community

College students. There are five campuses spread throughout the Portland Metropolitan region causing some students having to travel long distances to different campuses each week. The third cohort begins in August and consists of members of Andando en Bicicletas en Cully (ABC). ABC is group of families from Hacienda CDC who advocate for bike safety in that area.

3.1 Challenges with C-EB

CCC faced several issues while hosting the C-EB project. The most significant issue for CCC was recruiting individuals who felt comfortable participating in the project. Many potential participants expressed they were not interested in participating due to fear of being responsible for the expensive e-bike. Despite having Forth taking full liability for the e-bikes, many participants were intimidated by the price of the bikes and possibility of being responsible for the bike if it was damaged or stolen.

Another difficulty for CCC has been maintaining contact with all participants. To allow for maximum privacy of participants, Forth and CCC did not put GPS trackers on the bikes or collect sensitive demographic information. During the project, CCC has tried to stay in contact with the participants to check on the bikes and their experience. From the first two cohorts, one bike was damaged, and one bike was stolen. The participant who had a damaged bike was hesitant to return the bike damaged and CCC had to contact other members of his family to retrieve the bike. CCC is currently investigating how the e-bike was stolen and is contacting the participant.

3.2 Feedback from Participants

Data from the first cohort of participants was male dominated with eight male participants, two female participants, and one non-binary participant. All participants spoke English and ranged in age between 18-59. Although more than half of the participants owned a bike, only three stated that they rode their bikes every day. Only three of the participants from the first cohort completed their third survey. Two of the three agreed that they disliked their heavy weight of the e-bikes. However, all participants agreed that they would like to continue to use an e-bike. The most common uses of the e-bike were for recreation, general shopping or errands, and commuting to work.

4. Community-based Assessment of Transportation Needs

Many decisions relating to transportation and mobility options for the underserved and low-income communities are done with limited engagement and with little community input. As part of an effort to understand and plan for new mobility solutions Forth partnered with a community advocacy organization, OPAL Environmental Justice, to conduct a large-scale community-based assessment of transportation needs to ensure that proposed solutions will meet the needs of low-income and traditionally underserved residents in Portland Oregon.

This work was developed in collaboration with key groups representing underserved and environmental justice communities and included strategies such as listening sessions, focus groups, surveys, and interviews. Forth specifically relied on OPAL who has strong relationships within underserved communities and advocates for transportation justice. In their work surveys and forums, they touched on a range of new mobility strategies including car and bike sharing, electric car ownership, and ride sharing.

Results have shown that barriers to mobility options are often culturally specific in addition to being dependent on geographical location. Findings show that there is often a dependency of low-income alternative housing locations being in area of the Portland Metropolitan region that contained fewer transportation options, and often were more than a mile from the nearest public transit stop.

The action plan developed from this work included several recommendations for interacting with communities that are demographically often representing low-income communities including how to identify "nodes of trust" so that educational material and information can be disseminated. Additional recommendations included how to work with community-based organizations, rough costs projections for future projects, and potential future barriers to advancing new transportation options with these audiences.

5. Planning for New Mobility

A known barrier to electric vehicle ownership among low-income community members has been access to electric vehicle charging at the home or place of employment. With an increasing trend of urbanization, a large amount of our population lives in multi-unit housing units creating an enormous challenge for how to support drivers of electric vehicles. Two ways to mitigate this are through planning for charging in new development through codes, incentives, and regulation, and through workplace charging programs. The Portland Housing Bureau has draft policy now under consideration that requires new building be "EV Ready" which can help minimize costs to building owners in the future.

Portland Oregon has the highest concentration of employer organizations that support workplace charging in the United States[8]. These chargers support a growing number of employees who do not have regular access to home charging at their garage or driveway.

Work with the City of Portland, and other cities planning staff in the U.S., particularly for affordable housing, can directly influence planning for and the application of conduit, charging, and interventions in the planning process that can affect what and how transportation is used.

6. Conclusion

Underserved communities are disproportionately more affected by the results of climate change. These communities also lack reliable modes of public transit, bike infrastructure, and ride sharing. By focusing on underserved communities in electric vehicle adoption, quality of life and health can be improved while also creating a stronger electric vehicle market.

The C-EV and C-EB projects are the first of many transportation equity pilot demonstration projects for Forth. From the midpoint case studies and reviews of these two projects, there is evidence that community organizations and underserved communities can benefit from having access to electric cars and electric-assist bicycles. While piloting these projects, issues such as not having a driver's license or intimidation of expensive items, has shed light to many larger problems that traditionally underserved communities face.

For future project Forth will continue to partner with trusted community-based organizations, such as Hacienda CDC and the Community Cycling Center, to build strong projects that benefit a variety of communities. Using community advocates and leaders are key to gaining trust within the community and having a successful project. Forth plans on using the results from the needs assessment to determine where they should continue to have projects and what kind of projects are needed to improve transportation for all.

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