FACILITATING LOW INCOME UTILIZATION OF ELECTRIC VEHICLES: A FEASIBILITY STUDY

Puget Sound Clean Air Agency

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The following organizations were consulted and provided input during this study:

- BlueLA
- City of Seattle, Office of Sustainability & Environment
- Compass Housing Alliance
- ECOSS
- Envoy Technologies
- Everett Housing Authority
- Greenlining Institute
- King County Housing Authority
- Lopez Community Land Trust
- Mt. Baker Housing Village
- OPAL Community Land Trust
- Opportunity Council
- Puget Sound Energy
- Sacramento Metropolitan Air Quality Management District
- Seattle City Light
- Seattle Department of Transportation
- Seattle Housing Authority
- Shared Use Mobility Center
- South Park Information and Resource Center, Mujer al Volante Program
- South Park Neighborhood Association
- Tacoma Public Utilities
- Washington State Department of Transportation
- ZipCar

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EXECUTIVE SUMMARY

INTRODUCTION

Transportation is the number one source of air and climate pollution in the Puget Sound region, accounting for over 40 percent of greenhouse gas (GHG) emissions into the atmosphere. Outdoor air pollution can cause heart attacks, asthma, strokes, cancer, and premature death. An estimated 1,100 people die prematurely each year in Washington State due to outdoor air pollution. Air pollution disproportionately impacts underserved communities and people of color.

In our region, the communities that bear the highest impact of air pollution also tend to be those with greater socioeconomic challenges. For example, housing developments near high traffic areas are often occupied by lower-income residents and people of color. These communities face higher exposure to diesel exhaust. These communities have been frequently left out of finding solutions to air quality issues.

Electric vehicles (EVs) offer one solution to reducing GHG emissions and health impacts. These vehicles draw electricity directly from the grid and store it in batteries. All-electric cars produce no tailpipe emissions. Electricity generation in the Pacific Northwest has a large portfolio of renewable sources of power, making it one of the cleanest grids in the nation. Therefore, driving electric is one of the cleanest options for vehicle travel. In addition, the cost of “fueling” with electricity is considerably less than the cost of gasoline – Washington has the least expensive electricity in the nation – so families can save money over time by driving EVs instead of gas-powered cars.

Although EVs significantly reduce air and climate pollution and save money, there is unequal access to the technology. There are barriers that make the vehicles less accessible to some drivers, including low-income communities. New EVs can have higher up-front costs than traditional vehicles and can be out of reach for those in lower-income brackets. Access to charging infrastructure is another barrier, especially for those who live in multi-unit dwellings that lack somewhere to plug in. Other barriers associated with adopting EVs include the cost of insurance, lack of financing options, range anxiety, and lack of model availability.

A car-sharing program could address some of these barriers. Car-share refers to services that offer drivers access to a shared vehicle for short-term rentals. A study at the University of California, Berkeley that surveyed 9,500 car-share users documented several benefits from car-sharing:

• 25 percent of members sold a vehicle and 25 percent postponed a vehicle purchase.
• Each car-sharing vehicle replaces between nine and 13 vehicles.

Other research indicates that households save $154 to $435 monthly after joining a car-share program. These savings benefit families that spend a disproportionate share of their income on transportation.\(^5\)

According to the Shared Use Mobility Center\(^6\), car-sharing can also:

- Provide more mobility choices
- Offer last mile and fire mile solutions
- Reduce traffic congestion
- Mitigate various forms of pollution
- Reduce transportation costs
- Create accessible mobility options for those with limited physical ability

Most car-share programs primarily offer vehicles with internal combustion engines. Incorporating electric vehicles into a car-share program can further increase some of these benefits, such as reducing pollution and transportation costs.

Other research indicates that households save $154 to $435 monthly after joining a car-share program. These savings benefit families that spend a disproportionate share of their income on transportation.\(^7\)

**PURPOSE**

The Puget Sound Clean Air Agency (PSCAA) undertook this study to identify opportunities and barriers pertaining to the use and purchase of electric vehicles by low-income residents of Washington State, and to design a pilot project to address these barriers.

This study:

- Evaluated incentives and programs that promote electric vehicles, with a specific focus on low-income populations.
- Assessed the mobility needs of low-income communities associated with nine organizations in the Puget Sound region and San Juan Islands.
- Conceptualized an electric car-sharing pilot program for low-income communities. This project focused efforts on areas where public transportation is limited. This included:
  - Identifying and evaluating prospective low-income housing sites.
  - Developing a project framework, budget, and timeline, and exploring partnerships with community stakeholders.

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\(^6\) “What Is Shared Mobility?” Shared-Use Mobility Center, sharedusemobilitycenter.org/what-is-shared-mobility/.
**Methodology**

We began by conducting an extensive review of existing programs and incentives that support electric vehicle adoption, and also examined car-share models across the country. This included a literature review, and in-person conversations with organizations that are designing, implementing, and evaluating shared mobility programs. Primary questions asked of these organizations were:

- What have you identified as barriers?
- What ideas do you have to overcome barriers?
- What incentives, policies, and actions have worked?

Our findings are summarized in Section 1.

For the next phase of the study, we reached out to organizations that provide resources to lower-income and underserved populations throughout western Washington. The following nine organizations opted to participate in our study:

- Compass Housing Alliance
- Everett Housing Authority
- King County Housing Authority
- Lopez Community Land Trust
- Mt. Baker Village Housing
- OPAL Community Land Trust
- Seattle Housing Authority
- South Park Neighborhood Association
- South Park Information and Resource Center

These organizations span urban and suburban areas in King, Pierce, and Snohomish Counties and rural areas in San Juan County, and collectively serve over 1,000 residents.

Working with these partner organizations, we developed an approach to learn more about the transportation realities of people living in these communities. We wanted to understand their needs and challenges, and whether a car-share program would be useful. We further wanted to probe the feasibility of an electric car-share.

To that end, we created a mobility needs assessment (survey), which was translated into 7 languages and distributed to 2,500 residents. We also conducted several focus group discussions in select communities. Over 600 residents completed the survey.

Based on this research, we then conceptualized two potential electric car-share project models that could be piloted in several low-income communities.

**Key Findings**

This report’s key findings:

**Findings from Affordable Housing Organizations**
• **Affordable housing organizations are interested in the idea of an electric car-share program.** Car ownership comes with a lot of expenses. Most of the organizations we engaged with liked the idea of a car-share program to provide residents a transportation option less expensive than owning a car. There are also many other stakeholders who are supportive of this concept.

• **Housing authorities face funding challenges.** In most cases, their budgets are already allocated to other programs. Through our discussions, we heard frequently that there is little funding or extra staff capacity to add a new program to their properties.

**FINDINGS FROM LITERATURE REVIEW**

• **Access to charging is essential to electric vehicle adoption.** The most convenient and affordable method of charging is to charge at home. People who live in multi-family housing, however, may not have a garage, carport, or other location to plug in a car. This could be partially addressed by requiring all new construction to include charging infrastructure and providing incentives for retrofits for existing development.

**FINDINGS FROM SURVEYED COMMUNITIES**

• **Driving alone is the most common mode of travel.** Nearly 50 percent of respondents indicated they take six or more trips per week driving solo.

![Car alone each week](chart.png)

- **0 to 2 trips per week alone in a car** (25%)
- **3 to 5 trips per week alone in a car** (27%)
- **6 or more trips per week alone in a car** (48%)

• **Transporting family and buying groceries are top reasons for needing a car.** Most respondents indicated that they primarily need a car for running errands, taking family to medical appointments, transporting children to activities, and grocery shopping.
A large percentage of respondents are comfortable with the idea of driving electric vehicles. While knowledge of electric vehicles is low, there is higher interest in driving them. Nearly half of respondents said they’d feel comfortable taking an EV for a spin. Targeted education and outreach to low-income communities could enhance their understanding of electric vehicles and their potential benefits.
• **Most people are unfamiliar with electric vehicles.** More than half of survey respondents expressed unfamiliarity with electric cars. For electric vehicle adoption to increase in the low-income sector, community-based education and outreach is essential.

![Pie chart](image1.png)

**Would You Be Comfortable Driving An Electric Car?**

- Yes 47% (201)
- No 53% (231)

• **Car-sharing should be affordable and convenient.** When asked what concerns they had about using a car-sharing service, respondents cited cost, unfamiliarity with how car-share works, and whether a car would be available when needed.

• **Car-sharing is of greater interest in locations that are not well-served by public transportation.** Respondents in communities with less convenient public transportation options were somewhat more interested in the idea of a car-share program.

• **A majority of respondents have never used a car-share service.** Only 16 percent reported using a car-share service. Nearly 40 percent, however, indicated they would try it, if it was close by.

![Pie chart](image2.png)

**Would You Use A Car-Sharing Service If It Was Close By?**

- Yes 37% (164)
- No 63% (275)
• **Older residents less likely to try car-sharing.** Respondents over the age of 65 were significantly less interested in taking advantage of a car-sharing program.

![Graph showing percent of age group that would use a car-share service that hasn't before.](image)

**RECOMMENDATIONS**

Our research concludes that a car-share program would be a useful service for many of the low-income housing communities we surveyed. A car-share program would augment existing transportation options, and provide an affordable alternative to car ownership. Offering an electric car share provides additional cost-savings over the long run, in the form of reduced operating, maintenance and fuel costs. An electric car share program would also support regional air quality and climate protection goals. Familiarity with electric cars is low, however many participants in our study expressed openness to driving electric vehicles.

Based on input gathered through this study, we developed two car-share model concepts that could be piloted. One model entails a community-owned, shared vehicle. Management of the vehicle would be the responsibility of the host property and its community members. In the second model, the host property would commission a third party car-sharing service that owns and manages the vehicle. Both models emphasize outreach and education as an essential component of success.

We found four organizations that are ready to move forward:

- South Park Information Resource Center has a transportation need that can be filled with electric vehicles.
- Lopez Community Land Trust already has charging infrastructure installed and is interested in developing a car-sharing program.
- King County Housing Authority is installing an electric charging station on-site.
- OPAL Community Land Trust is in the planning phase for a new community that will include an electric car-share option.

These properties range in transportation needs and have the ability to fill a transportation gap in properties that are not served well by transit. Seattle House Authority properties also generated a lot
of interest in a car-sharing service, although not every property we surveyed was interested.

The other organizations that we spoke with are interested but do not yet have the capacity to take on this type of project at this time. For these properties, we recommend additional outreach to residents and evaluation of different properties before a car-share pilot program is launched. There are many properties at these organizations and have the opportunity to expand a pilot project to many other communities.

PILOT PROJECT MODEL RECOMMENDATIONS

Based on our research, we conceived of two possible models for an electric car-share project that we believe meet the needs of the communities we consulted.

PILOT PROJECT MODEL A: SUBSIDIZED COMMUNITY-OWNED SHARED VEHICLE

There are two primary barriers to the utilization of electric vehicles in low-income communities: the initial cost and lack of understanding of the technology. This model seeks to address both. In it, the housing authority or community organization would own and manage an electric vehicle that would be shared amongst residents/community members. Participants would pay a modest fee for the use of the vehicle that would offset the cost of charging, insurance, maintenance, and replacement cost.

Primary benefits of this model include:

1. Lower cost for drivers. Current car-share programs in the Puget Sound area have rates ranging from $0.15 a minute to $9 an hour. This may be outside the reach of many people living at the poverty level. By having its own vehicle, the housing authority could design a rate/fee schedule that the community can afford.
2. More decision-making power for community members.
3. Increased awareness about EVs. Not only will members of the community become more familiar with EVs every time they take a drive, but they will also become ambassadors of the technology within their social networks.

A primary challenge of this model is capacity, as it requires the organization to administer and be responsible for the vehicle. Most affordable housing communities run on tight budgets without a lot of extra staff time or funding.

PILOT PROJECT MODEL B: MOBILITY AS AN AMENITY

Model B addresses the capacity challenge, by involving a third-party company to install, maintain, and manage a car-share program at the housing site. Drivers will pay by the minute. The rate is set by the third-party company.
Key benefits of this approach include:

1. Turnkey solution, which eases the burden from the property. The third-party handles everything, including installing charging infrastructure, procuring and maintaining the desired vehicles, and managing the use.
2. Reduced upfront costs of installation and procurement. The third-party makes the initial capital investment. The third party company then charges the properties for vehicles, maintenance, insurance, and other expenses associate with managing the program.
3. Flexibility. Cars can be swapped for other models, based on community needs.
4. Revenue cost-sharing potential. Site hosts will be able to share revenues and can be invested back into the community.

A challenge to this approach is the host organization will have less control over the rates for the cars, likely resulting in a higher fee structure for low-income drivers. Another potential challenge is payment, as this model requires users to pay by credit card. This could pose a barrier for unbanked drivers.

POLICY RECOMMENDATIONS

There are several state-wide policy recommendations that could greatly enhance access to electric vehicles on a large scale for low to middle-income communities. These include the following:

- Multi-Family Housing Infrastructure Requirements: Modify building codes to require the installation of electric vehicle charging infrastructure for all new multi-family housing.
- Electric Vehicle Charging Stations: Authorize utilities to provide and incentivize construction and operation of EV charging stations.
- Zero Emission Vehicle (ZEV) Standard: Require automakers to make a broad range of ZEVs available in our state, which would greatly enhance the variety of electric cars available to consumers. Ten states currently have a ZEV Standard. This will increase the number of ZEVs in our state and make electric vehicles more accessible for everyone.
- Electric vehicle incentives: Provide incentives to low-income drivers for the purchase of electric cars.
- Clean Fuel Standard. Implement a Clean Fuel Standard that will incentivize cleaner transportation fuels, such as electricity. This will support additional charging infrastructure and, through the credit market, could provide incentives for lower-income buyers.

Lastly, we recommend continued dialogue amongst all stakeholders interested in advancing electric mobility within low-income communities. Community-based organizations can help educate about car-sharing programs and electric vehicles. These programs are intended to be sustainable and create a sense of ownership by the community. Providing multi-language services and working with the communities at large can help strengthen the benefits of an electric car-sharing program.