Institute of Transportation Studies
UNIVERSITY OF CALIFORNIA

Electric Vehicles Could Reduce Costs for Low-Income Drivers if Structural Barriers are Addressed

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June 2025

Issue

Battery-electric vehicles (BEVs) are central to California's strategy to reduce transportation-related emissions; however, low-income households face significant structural barriers to adoption. These barriers include the high upfront purchase costs of new BEVs, limited supply of used BEVs, limited access to home charging, and low awareness of BEVs. To better understand these obstacles and identify effective policy responses, our research team analyzed survey data collected from 2,051 priority population households throughout California between December 2023 and June 2024. The survey asked households about their vehicle purchasing behavior, ownership costs, and socio-demographics.

Key Research Findings

There are significant income disparities in BEV ownership and new car buying. High-income households dominate BEV ownership and are more likely to purchase new cars. However, the relationship between new-car buying and owning a BEV is stronger as income increases. For example, households with incomes below $75,000 account for 34% of all new vehicle purchases in our sample, but just 10% of BEV ownership. In contrast, households with annual incomes over $250,000 make up only 7% of new vehicle purchases overall, yet they own nearly 25% of all BEVs. This disparity in BEV ownership rates indicates that barriers to adoption go beyond availability of new BEVs. Simply expanding the number of BEV models on the market may not be sufficient without targeted incentives or financing support; many households remain priced out of the transition.

Vehicle-related costs place a heavy burden on low-income households. Households earning less than $50,000 annually spend, on average, between 17% and 70% of their income on vehicle-related expenses, with fuel costs alone accounting for upward of a third of these costs. Alternatively, households earning over $100,000 spend on average 3% - 5% of their annual income on vehicle-related expenses (Figure 1).While BEVs could offer lower fuel and maintenance costs, the average BEV purchase price reported by respondents is over $55,000, almost $20,000 more than the average reported new vehicle price.

BEV incentives are misaligned with where lower-income households typically buy and maintain vehicles. Targeted programs such as Clean Cars 4 All and the Clean Vehicle Assistance Program provide point-of-sale grants and financing assistance to low-income buyers, but these incentives are only accessible through participating, eligible dealerships. In contrast, low-income households are more likely to buy used vehicles from independent dealerships or private sellers. They also tend to maintain their vehicles at home or through an independent auto shops or dealerships–locations that often lack access to BEV-related resources or rebates.

Access to home charging complicates BEV adoption for lower-income households. Home charging remains the most affordable and convenient charging option. Over half of households with incomes below $50,000 lack access to home charging. In contrast, less than a third of households with incomes of $150,000 or more face this barrier. Without affordable and accessible charging options, BEVs may be more

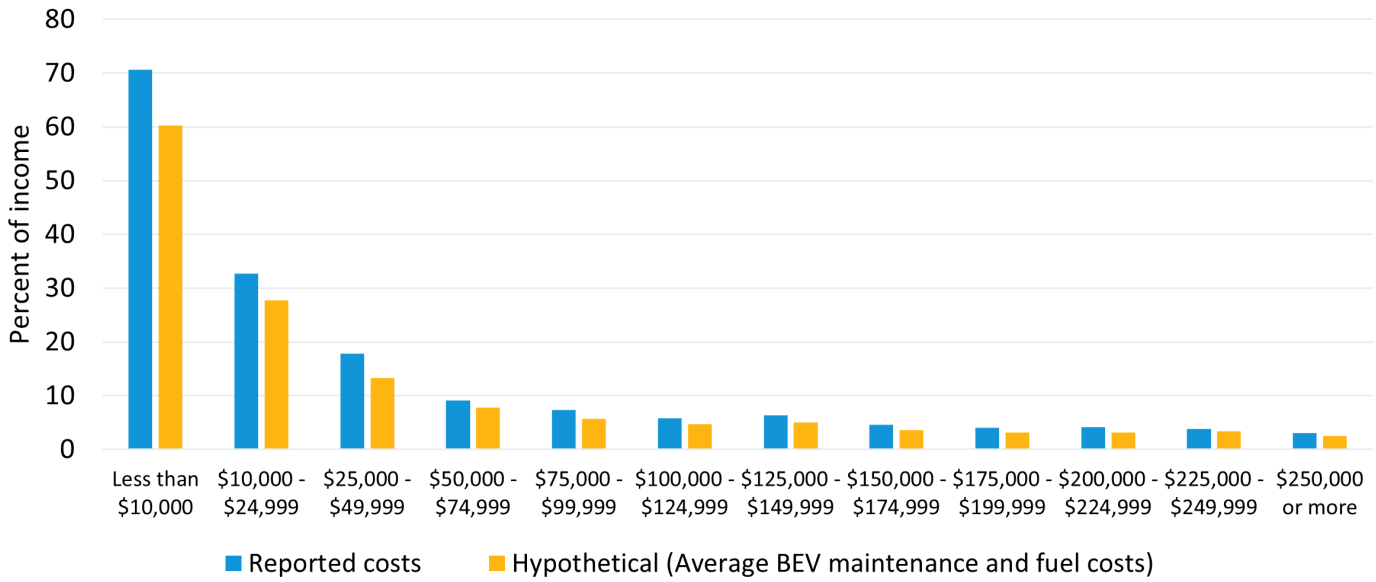

Figure 1. Annual vehicle-related expenses as percent of household annual income for costs reported by survey respondents and hypothetical costs for BEVs.

expensive to own and operate compared to a conventional vehicle, compounded by higher financing and insurance costs.

Used BEVs may fall outside warranty coverage for low-income buyers. Low-income households typically purchase older, higher-mileage vehicles. In our sample, households with incomes below $50,000 report purchasing used vehicles that are, on average, over eight years old with nearly 75,000 miles. If similar patterns hold when switching to BEVs, nearly 55% of these households would have one year or less of remaining warranty coverage, assuming a standard 8-year or 100,000-mile warranty. However, research shows that BEV batteries may last 20 years–comparable to or longer than the average lifespan of conventional vehicles–offering a potential better value if risks can be addressed.

Policy Implications

Long-term strategies are needed to make BEVs more affordable, accessible, and practical for low-income households and used-car buyers. Key recommendations include:

1. Expand financial incentives to include locations where low-income buyers typically purchase vehicles, particularly independent dealerships.
2. Offset high upfront and finance costs of BEVs through targeted subsidies and other strategies.
3. Support home charging for renters and residents in multi-unit dwellings with financial, technical, and regulatory support.
4. Increase transparency and consumer protections in the used BEV market by providing information on battery state of health.
5. Explore alternative mobility solutions, such as public transit or car-sharing, to reduce cost burdens for those whom private BEV ownership is not feasible.

More Information

This policy brief is drawn from the report "Vehicle Purchasing Behavior, Expenditure, and Potential Barriers to Uptake of Battery Electric Vehicles in Underserved Communities" prepared by Kelly Hoogland and Scott Hardman with the University of California, Davis. The report can be found here: https://www.ucits.org/research-project/2024-16/. For more information about findings presented in this brief, please contact Scott Hardman at shardman@ucdavis.edu.

Research presented in this policy brief was made possible through funding received by the University of California Institute of Transportation Studies (UC ITS) from the State of California through the Public Transportation Account and the Road Repair and Accountability Act of 2017 (Senate Bill 1). The UC ITS is a network of faculty, research and administrative staff, and students dedicated to advancing the state of the art in transportation engineering, planning, and policy for the people of California. Established by the Legislature in 1947, the UC ITS has branches at UC Berkeley, UC Davis, UC Irvine, and UCLA.

Project ID UC-ITS-2024-16 | DOI: 10.7922/G2H993KB