



Electric Vehicle Studies: Battery Electric Vehicles

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WHAT'S A BATTERY ELECTRIC VEHICLE?

- Battery Electric Vehicles (BEVs) are **full-battery zero-emission vehicles**.
- The vehicles **run on battery power alone**, requiring charging as the fuel source.
- BEVs are **full-speed vehicles, but are limited to the range of their battery pack** (on average, a 80 to 90-mile range).

STUDY PURPOSE

This study aimed to determine if a **battery electric vehicle can substitute for one household's internal combustion engine vehicle (ICE)**.

STUDY STRUCTURE

Similar to the Neighborhood Electric Vehicle study, BEVs were placed in 50 households for a period of 3 months. GPS units were placed in the BEVs and other household vehicles to capture total household travel. **More than 20,000 trips were catalogued** into a database that include origin and destination, length, speed, fuel type, stop time, route and charging time, place, and duration. Combined, the NEV and BEV studies created more than 40,000 catalogued South Bay trips.

STUDY FINDINGS

- **The average household reduces their emissions by 40% when a BEV is introduced.**
- **BEVs are completely substitutable for ICE (internal combustion engine) vehicles**, as households made the same types of trips in a BEV as in an ICE in terms of destinations and frequencies. However, **perceptions and fears about the need to drive longer distances** made many drivers reluctant to purchase a BEV.
- Findings from the charging analysis demonstrated that **a 110-volt outlet (common household outlet) was sufficient for charging**. Most participants used their homes or workplaces to charge their vehicle.
- The speed analysis illustrated that in a high percentage of cases, **a NEV could have been substituted for the BEV on routes taken**. Thus, the perceived route speed limitation of NEVs is not a reality.

To view the full study, visit www.southbaycities.org/programs/electric-vehicles/sbccog-ev-initiatives