Electric Vehicle Studies: Neighborhood Electric Vehicles

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WHAT'S A NEIGHBORHOOD ELECTRIC VEHICLE?

- Neighborhood electric vehicles (NEVs) are zero-emission vehicles limited to a speed of 25 miles per hour and restricted to streets with speeds of 35 miles per hour or less. They generally have a 30-mile range.
- They include cargo trikes, electric bikes, electric scooters, and segways, amongst other smaller range electric vehicles.
- NEVs have an advantage over full-battery electric vehicles because they are cheaper, smaller, and can be charged more easily using a common 110 outlet.

STUDY PURPOSE

The study aimed to understand if NEVs can replace a household’s second or third vehicle, since NEVs can accommodate many short trips. 70% of a household’s trips are under three miles – too long to walk and too short to take public transit, but ideal for short-range vehicles, including bicycles.

STUDY STRUCTURE

NEVs were placed in 50 households for a period of 3 months. GPS units were placed in the NEVs and in the 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, and route.

One of the benefits of this study, apart from showing the utility of NEVs, is that the South Bay Cities Council of Governments now has a rich database on travel patterns in the South Bay. These have been used in the emissions modeling for the South Bay Climate Action Plan.

STUDY FINDINGS

- The average household reduces their emissions by 20% when an NEV is introduced. If there were 100,000 NEVs on the road, 10-15 million gallons of gas would be saved per year.
- More than 40% of participants rated their experience driving a NEV with a 5 out of 5. While some drivers were apprehensive, most came to understand the utility, flexibility, and advantages of the vehicles.
- Many drivers underestimated the number of short trips they regularly take.

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