PLUG-IN ELECTRIC VEHICLES IN DISADVANTAGED COMMUNITIES
Distribution of Disadvantaged Communities in California
WHAT IS A DISADVANTAGED COMMUNITY?

- Census tracts that score in top 25th percentile for poor environmental conditions, low socioeconomic status, and at-risk populations (e.g. elderly and very young)

National Center for Sustainable Transportation
INCOME DISTRIBUTION
PLUG-IN ELECTRIC VEHICLES?
PLUG-IN ELECTRIC VEHICLES

CONS
- More expensive than traditional vehicles at initial purchase
  - Many incentives and rebates to help with cost, but still costly

PROS
- Fewer greenhouse gas and particulate emissions → higher air quality
- Lower cost of fuel – electricity not gasoline
- Lower maintenance cost over car lifetime – fewer moving parts

Tesla = $68,000+
SUSTAINABILITY GOALS

- 1.5 million zero-emission vehicles on the road by 2025
- Reductions in greenhouse gases
- Transportation equity and accessibility

To make gains in any of these areas, PEVs need to be accessible to lower-income populations as well as the wealthy
WHAT IS PEV ADOPTION LIKE IN DISADVANTAGED COMMUNITIES?
Locations of PEV owners from large study done by PH&EV Center
- Not all PEV owners in California, but shows trend

Trend: PEV owners seem to be concentrated in metropolitan areas and non-disadvantaged communities
GOAL: quantify what PEV adoption is like in DACs

- Data
  - US Census (income and socioeconomic information)
  - Clean Vehicle Rebate Project (new PEVs)
  - DMV records (used PEVs)
  - Survey responses of new- and used-PEV owners (existing PH&EV studies)

- GIS analysis
  - Geolocation by lat/long to bin PEV owners by census tract
  - Visualized distribution across California

- Statistical analysis
  - MS Excel and JMP
  - Share of new and used PEVs across DACs and non-DACs
  - Relationship with income brackets
SELECTED RESULTS
Slightly more of the used-PEV owners were found in DACs. Used PEVs are less expensive than new PEVs.
FEWER PEVS PER 100 HOUSEHOLDS IN DACS

- **New PEVs**
  - Average # of PEVs per 100 Households?
    - 1.6 in non-DACs
    - 0.37 in DACs
  - Maximum # of PEVs per 100 Households?
    - 21.7 in a non-DAC
    - 3.9 in a DAC

- **Used PEVs**
  - Average # of PEVs per 100 Households?
    - 0.09 in non-DACs
    - 0.03 in DACs
  - Maximum # of PEVs per 100 Households?
    - 1.5 in a non-DAC
    - 0.4 in a DAC

- Lower numbers for used PEVs is because there are less on the market overall
Los Angeles

- Higher density outside DACs
Bay Area/SF
Sacramento Area/Central Valley
Most PEV owners in DACs have high incomes

- Only 3.3% of new-PEV owners have a household income $50,000 or below (Source: eVMT survey, PH&EV Center)
- But, the incomes of PEV owners in DACs do tend to be lower than the incomes of PEV owners in non-DACs
  - Average HH income of new-PEV owner in DAC: $135,102
  - Average HH income of new-PEV owner in nDAC: $153,175
There are greater concentrations of lower-priced PEVs in DACs
- Ford Fusion Energi
- Fiat 500e

Average price paid for a PEV:
- In DACs: $39,197
- In nDACs: $43,240
CONCLUSIONS

- This research provides a needed benchmark for PEV adoption in DACs

- Adoption of PEVs in disadvantaged communities is low, as expected

- Need for more policies, programs, and outreach that can make buying a PEV easier for low- and middle-income people
How important are purchase incentives for buyers in DACs?
- Federal Tax Credit
- State Rebates

What about incentives like discounted energy rates from energy utilities?

What policies would be most effective for increasing PEV adoption in low-income areas?
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