PEV Consumer Behavior in Practice

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VAN015

Overview

Timeline

- Mid 2014
- Mid 2016
- 0% Percent complete

Budget

- Total project funding
  - $400,000
- $0 Funding received in FY13
- $200K Funding for FY14

Barriers

- Barriers addressed
  - Infrastructure: Show how consumers are using infrastructure in order to identify gaps
  - Constant advances in technology: Provide input to models in the rapidly developing PEV market. Calibrate models with in-use data.

Partners

- CARB is funding data collection
- DOE is funding analysis
- ORNL, NREL, Argonne will be able to use anonymized data
- Project Lead: Thomas Turrentine and Michael Nicholas

Relevance and Objectives

- Provide most accurate and complete study of PEV usage and charging behavior
  - Monitor **all** vehicles in PEV households. PEVs: Leaf, Volt, Prius Plug-in, (C-Max?)
  - 108 households

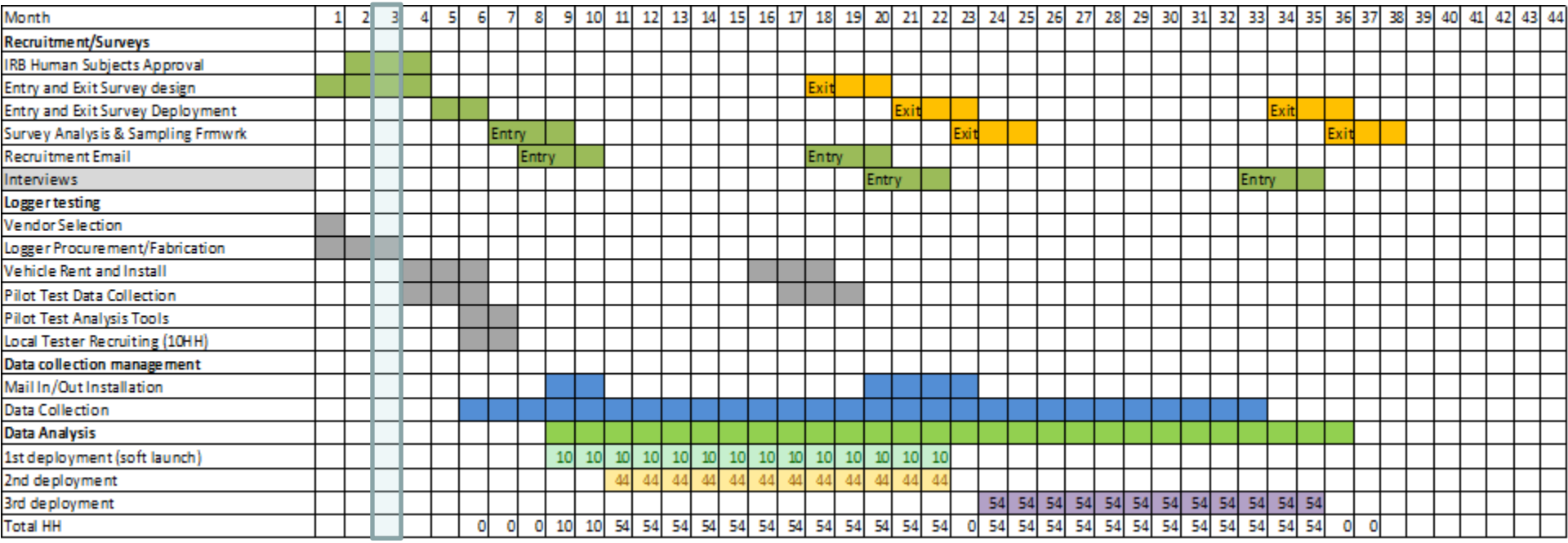
  - Monitor OBD driving and charging parameters along with location
  - Determine PEV household travel dynamics. How is the PEV used compared to other cars? EVMT impacts?
  - Determine charging frequency and location. L1, L2, QC location.

Objectives

- Calculate electric vehicle miles traveled (eVMT) per vehicle and household
- Determine vehicle patterns and how plug-in electric vehicles (PEVs) are being used
- Determine recharging patterns – how much is being used vs how much is needed
- Determine gasoline refueling patterns for comparison to EV charging patterns
- Determine household differences – How do households with the same car behave differently? Is PEV use maximized?
- Determine change over time – as customers become more comfortable with the car and familiar with operation, how does behavior change?

Milestones

- DOE funded data analysis portion not started
- CARB funded data collection effort is progressing
- RFP for logger manufacturers created
- Recruitment survey tool and draft survey created



Approach: Recruitment and Surveys

Sent invitation by mail

Fill out survey

Want to participate

Chosen households

- Use the survey to characterize the market and recruit respondents
  - 108 households selected from the sample
  - Favor households with newer than 1996 vehicles (OBD II)
  - Incentive is $500
  - Select for geography variation

Approach/Strategy

- Use second by second data on battery state of charge, location, charging, efficiency, temperature etc to construct:
  - Vehicle profiles to highlight the differences between BEVs and PHEVs of varying size
  - Household fleet profiles in miles per year by vehicle
  - Trip profiles on distance and energy use
  - Charging profiles to see the difference that charging makes in travel choices

Technical Accomplishments and Progress

- DOE portion has not started yet
- Loggers being tested and RFPs in process
- Survey tool and draft survey made

Collaboration and Coordination with Other Institutions

- This project uses data collected for the California Air Resources Board
- Currently coordinating with NREL, ORNL, Argonne and others to make cleaned data available for modelers

Remaining Challenges and Barriers

- Data collection and data cleaning remain a looming challenge
- Preserving privacy per University regulations while providing useful data is a careful balance

Proposed Future Work

- Rest of FY14
  - Recruit participants
  - Begin Data collection
- FY15
  - Complete Year 1 data collection
  - Provide interim results
- FY16
  - Complete Year 2 data collection
  - Provide final results

Summary Slide

- PEVs are a new and fast growing segment of the market. They are used in unanticipated ways and understanding these dynamics is important to planning for the future.
- Modelers and policy makers need better data to make decisions.
- Data from all vehicles in the household allows a more complete picture of true eVMT, not just what's available by studying only the PEVs. E.g. How much are the other cars driven in the household? Leaf + Hummer = Green?