

Ben Rosensweig
Project 1, Group 2
Write Up

I created visualizations for our third hypothesis that involved two questions: 1) is there a correlation between model years and annual car registrations, and what are the comparisons between BEVs and PHEVs, and 2) is there a correlation between increase in battery range and annual car registrations?

I used several types of plots to visualize registrations by Model Year. Using a count plot and a donut chart, I was able to see that for BEVs there is a strong correlation between model year and registrations. Of all the 141,705 registrations in fiscal year 2023, starting from model year 1997 to 2023, 92% fall within the model years 2015-2023. Model Years 2022 and 2023 take up over 52% of registrations alone. Starting with Model Year 1999, it almost seems to be an exponential increase. There is definitely a preference for newer models. Why is that?

For hybrid registrations in 2023, although there doesn't seem to be as much of a preference for newer models, there does seem to be some. There is even some bimodality. Further work would be needed to study exactly why there are spikes for 2017, 2018, and 2023 model years.

At this point we realized that many BEVs had a range of 0, and had to clean the dataset even further. We went from around 181,000 rows to 86,500 - dropping approximately 94,500 rows, or over 52% of the data, all of which were BEVs from 2013-2024.

We were still able to get valuable insights from this new dataset that focused on range. After plotting a few histogram violin, and scatter plots, we were able to see that hybrids have much lower range than BEVs. Most hybrids fell between a range of 20-30 miles, while the majority of BEVs had ranges over 200 miles. For BEVs there is a clear correlation of range increase with newer models, but a very weak correlation for newer hybrids.

We can safely conclude that people prefer BEVs over hybrids, as the ranges for newer model BEV have continued to grow and have far outpaced the ranges of newer model hybrids. In the future, it will be interesting to see whether hybrids are either completely phased out, or if manufacturers increase hybrid range.