MIS771 – Descriptive Analytics and Visualisation

Trimester 2 2024 Assessment Task 1

224389999

Swastik Airee

**INTRODUCTION**

This report investigates several critical aspects of the behaviors and attitudes of electric vehicle (EV) owners in Australia. With the increasing adoption of EVs, understanding the nuances of how different groups of owners use and perceive their vehicles is essential for shaping future policies and infrastructure developments. This analysis focuses on five key areas: the differences in travel distances between metro and regional EV owners, the prevalence of towing among these groups, the impact of household type on fuel cost savings, the frequency of home charging based on motivation for EV purchase and the changing attitudes toward public EV charging infrastructure over time. The goal is to provide insights that are not only data-driven but also accessible to a broad audience, ensuring that the findings can inform both policymakers and the general public.

**ANALYSIS AND FINDINGS**

**Q1. Do metro EV owners travel more than their regional counterparts?**

One of the primary questions addressed in this report is whether EV owners in metro areas tend to travel more than those living in regional areas. To answer this question, the report analyzed the average annual distance traveled by EV owners in both metro and regional settings.

The data suggests that metro EV owners generally travel slightly more than their regional counterparts. However, the difference is minimal and falls within the range of natural variation or chance. This finding indicates that, while there may be a slight tendency for metro owners to drive more, it is not a consistent or significant difference. The reasons behind this could be varied, including factors such as shorter commutes in regional areas or different lifestyle patterns. Nonetheless, based on the data available, we cannot definitively conclude that metro EV owners consistently drive more than regional EV owners.

This finding has implications for infrastructure planning, particularly in ensuring that both metro and regional areas are equally equipped to support EV owners, considering their similar travel demands.

**Q2. Are fewer metro EV owners using their vehicles for towing compared to regional EV owners?**

Another important aspect of EV ownership is the vehicle's utility for tasks such as towing. The report examines whether metro EV owners are less likely to use their vehicles for towing compared to their regional counterparts.

The analysis reveals that the number of metro EV owners who use their vehicles for towing is almost identical to that of regional EV owners, with 36 metro owners and 37 regional owners engaged in towing. This negligible difference suggests that towing is equally common among both groups.

Further statistical examination shows that there is no significant difference between the two groups in their towing habits. This finding indicates that, regardless of whether an EV owner lives in a metro or regional area, the likelihood of using their vehicle for towing remains consistent. This insight is particularly relevant for manufacturers and marketers of EVs, who might consider the utility needs of EV owners across different geographic locations when promoting vehicle features.

**Q3. Do average fuel cost savings vary significantly across different household types?**

Fuel cost savings are a significant factor for many EV owners and this report explores whether these savings differ across various household types. The analysis compares the average fuel cost savings among four distinct groups: couples with children, couples without children, single parents and single individuals.

The results show that couples with children tend to save more on fuel compared to single parents. This difference is statistically significant, indicating that it is unlikely to be due to random chance. The greater fuel savings for couples with children could be attributed to a variety of factors, such as more frequent or longer trips that lead to greater efficiency gains from EV use.

However, when comparing other household groups, such as couples without children and single individuals, the differences in fuel savings are much smaller and could be attributed to normal variations or chance. In practical terms, this means that while couples with children may experience more significant fuel savings with their EVs, the differences among other household types are not substantial enough to stand out.

These findings suggest that household composition does play a role in the economic benefits derived from EV ownership, particularly for families with children. This could inform targeted incentives or marketing strategies aimed at maximizing the appeal of EVs to specific household types.

**Q4. Does the frequency of home charging differ based on the reason for purchasing an EV?**

The motivation behind purchasing an EV can vary widely, from environmental concerns to cost savings or health reasons. This report investigates whether these different motivations influence how frequently EV owners charge their vehicles at home, particularly focusing on those who charge more than five times per week.

The analysis compared the charging habits of EV owners with different motivations, including environmental protection, economic savings and other reasons. The results indicate that there is no significant difference in the frequency of home charging based on the reason for purchasing an EV. In other words, regardless of the motivation, EV owners tend to charge their vehicles at home with similar frequency.

This finding suggests that once an EV is purchased, the practical considerations of maintaining battery levels and ensuring the vehicle is ready for use outweigh the initial reasons for choosing an EV. This insight could be valuable for EV manufacturers and energy providers in understanding the consistent charging needs of EV owners, regardless of their underlying motivations.

**Q5. How do locality and trip type impact distances traveled in EVs?**

The relationship between location and the type of trips undertaken by EV owners is another key area of interest. This report analyzes how the combination of these factors affects the distances traveled by EVs.

The data reveals that, on the whole, there is little difference in the driving distances between urban and rural residents. However, when the type of trip is considered—whether it’s for holiday, private, or work-related purposes—the combination of location and trip type does have a significant impact.

For example, rural EV owners tend to drive longer distances for private trips, possibly due to the greater distances between destinations in rural areas. On the other hand, urban EV owners tend to cover more distance for work-related trips, which may reflect the higher concentration of job opportunities and the potential for longer commutes in urban settings.

This finding highlights the importance of considering both the location and the purpose of trips when analyzing EV usage patterns. It also underscores the need for tailored infrastructure solutions that cater to the specific needs of urban and rural EV owners, particularly in supporting longer trips for private purposes in rural areas and work-related travel in urban areas.

**Q6. Has the attitude of EV owners toward public EV charging infrastructure changed between 2022 and 2023?**

As the adoption of EVs continues to grow, public EV charging infrastructure becomes increasingly critical. This report investigates whether the attitudes of EV owners toward public EV charging stations have changed between 2022 and 2023.

To assess this, the report compares the "Attitude Index" scores from these two years, which measure the level of support for the government's approach to public charging infrastructure. The analysis of 12 EV owners' attitudes reveals a notable increase in the average scores in 2023 compared to 2022, indicating that support for public EV charging stations has grown over the past year.

This change in attitude suggests that EV owners are becoming more positive about the availability and effectiveness of public charging options, likely reflecting improvements in infrastructure and greater awareness of the benefits of public charging stations. The increasing support for public EV charging infrastructure underscores the importance of continued investment in this area to meet the needs of a growing EV market.

**CONCLUSION**

In conclusion, this report provides valuable insights into the behaviors and attitudes of electric vehicle owners in Australia, with a focus on differences between metro and regional owners, household types, charging behaviors and attitudes toward public EV charging infrastructure. The findings indicate that while there are some differences in behaviors based on location, household composition and other factors, these differences are generally subtle.

The report highlights the consistent charging habits of EV owners, regardless of their motivation for purchase and the growing support for public EV charging infrastructure. These insights are crucial for policymakers, manufacturers and infrastructure providers as they plan for the future of EV adoption in Australia.

As the EV market continues to expand, understanding these nuances will be key to ensuring that infrastructure, policies and incentives are aligned with the needs of diverse EV owners. The positive shift in attitudes toward public EV charging infrastructure, in particular, suggests that continued investment in this area will be essential in supporting the growth and sustainability of the EV ecosystem in Australia.