

Data Analysis on Electric Vehicle Population Dataset Using Tableau

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Abstract - Electric vehicles (EVs) are getting Popular throughout the world as they help to conserve fuel and reduce emissions. To encourage the purchase and use of electric vehicles, governments around the world advertise and educate people about electric vehicles by providing incentives and support schemes, and conducting awareness programs. This paper offers the electric vehicle registration figures across the world, using Tableau visualizations like bar chart, line graph and map. Using the data, it is much more convenient and straightforward to analyse the trends on the growth of EVs as well as where these electric vehicles are located. Different kinds of chart were used to compare how many were used by states and cities. One interesting finding of the survey was the explosion in numbers of EVs In particular in urban environments with plentiful chargers. There is no doubt that many areas have much progress to make for the availability of charging points and the design of area plans needs to seriously take this into account.

Keywords: Electric Vehicles, Data Visualization, EV Adoption, Charging Infrastructure, Sustainable Transportation, Geographic Distribution Geographic Distribution, Renewable Energy, Infrastructure Planning, Spatial Analysis, Carbon Emissions Reduction.

I. INTRODUCTION

Vehicles are increasingly regarded as a way to decrease the emissions of greenhouse gases and air pollution emitted by transports. Governments worldwide have been promoting vehicles and battery technology is improving [1], [2].

As this growth electric vehicle adoption is not the same everywhere. Some regions have more charging stations than others, this influences the adoption of electric vehicles [2], [3].

Locating electric vehicles and understanding their proliferation is of interest to Policy makers and Urban planners as they need to decide on the expansion of charging facilities and sustainable mobility approaches [4].

Studies use EV Population Data to examine electric vehicle distribution and growth. The study project tries to draw conclusions that can help planning transportation system.

II. LITERATURE SURVEY

Electric vehicle adoption and data trends have been examined by numerous authors. One study examined the role of infrastructure accessibility in electric vehicle ownership.

This research found that electric vehicle adoption is related to the number of fast chargers and workplace chargers.

A second article analyzed electric vehicle charging infrastructure planning. The article highlighted the importance of analysis to clarify where charging stations should be distributed.

A study looked at the environmental and policy implications of adoption of electric vehicles. It found that integrated analysis that can bring together all the issues of infrastructure, policy and the trend of adoption is still limited.

In India, a bibliometric analysis of electric vehicle research published between 2014 to 2024 was conducted it indicates how electric vehicle research has picked up pace these days owing to supportive policies and technological developments.

A previous review looked at adoption and charging behavior from the view-point of the consumer. It looked at the adoption of electric vehicles and how factors and the availability of charging points effected consumers.

III. MATERIALS AND METHODS

What comes next explains the dataset and the used tool/methods to analyse the electric vehicle population and to produce conclusions based on the use of Tableau.

3.1 Materials

1. The study uses the Electric Vehicle Population Data dataset, which contains information on vehicles registered across multiple regions.
2. The dataset includes vehicle type, registration year, location, make/model and additional attributes like charging station availability and vehicle range.

3.2 Methods

1. The methodology follows an approach to analyse the electric vehicle population dataset using Tableau.
2. The Electric Vehicle Population Data was downloaded in CSV format from an open data source.
3. The data was. Pre-processed by removing missing values standardizing city and state names and removing duplicate records.
4. The dataset was prepared for visualization by aggregating data by year, region and vehicle type.

3.3 Data Visualization

Using Tableau the dataset was visualized through time-series analysis, comparison charts and geospatial analysis.

3.4 Interpretation

Insights were derived from the visualizations to identify trends in electric vehicle population growth recognize regions with high or low electric vehicle adoption and compare adoption patterns between vehicle types.

3.5 Limitations

Charging data, regional variability and external influences like government incentives and socio-economic conditions were not directly analyzed.

3.6 Software

Tableau is a data visualization and business intelligence software that allow users to connect to datasets analyse trends and share insights in a way..

IV. DATA VISUALIZATION

4.1 EV Adoption by City

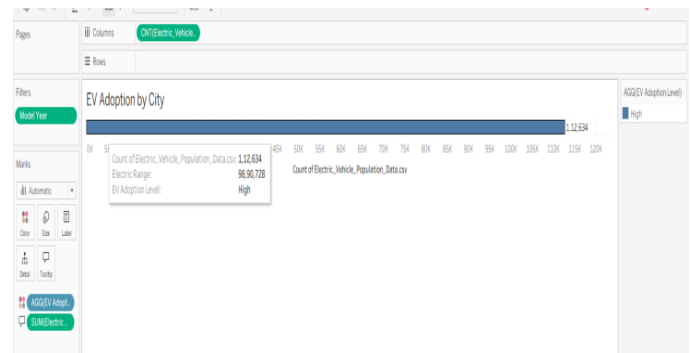


Figure 1: EV Adoption by City

4.2 EV Growth Over Time

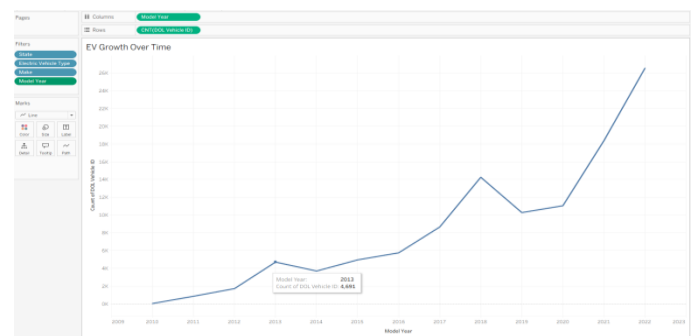


Figure 2: EV Growth Over Time

This line chart shows the trend of electric vehicle registrations over years. The number of vehicles increases year by year with significant growth observed after government incentives and infrastructure development.

4.3 EV Distribution by Vehicle Type

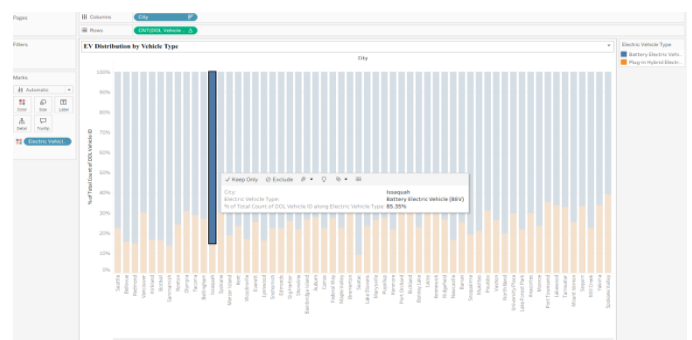


Figure 3: EV Distribution by Vehicle Type

A stacked bar chart represents the proportion of Battery Electric Vehicles versus Plug-in Hybrid Electric Vehicles across regions.

4.4 Geographic Distribution of EVs

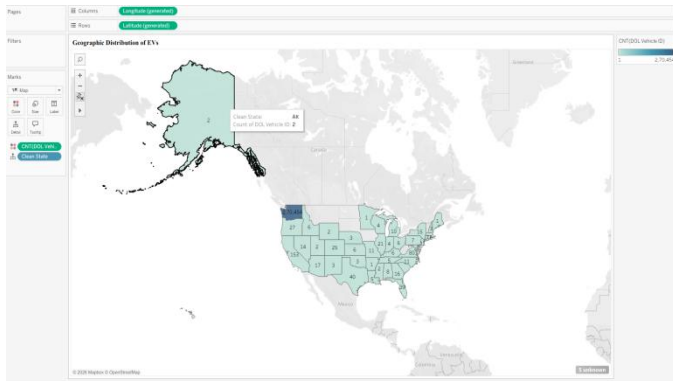


Figure 4: Geographic Distribution of EVs

V. CONCLUSION

Electric Vehicle Population Data from the study was analyzed in Tableau to find out vehicle adoption patterns and the most sought after population distribution and vehicle type. Arguably from the visuals that the preference for EV is mostly limited to densely populated areas. The adoption is quitting quickly smaller cities or other places.

The time-series analysis demonstrated that registration of electric vehicle is growing with a significant jump on 2018. When comparing Battery Electric Vehicles to Plug-in Hybrid Electric Vehicles, it was obtained that Battery Electric Vehicles are purchased more places, where Plug-in Hybrid Electric Vehicles are less purchased, on suburban. Geospatial data showed some locations that have EVs and some locations that have a little or no EVs.

So, policies are needed specific policy to deal with locations that have this extent of EVs. This research has provided that interactive data visualizations were useful in Data Analysis.

They are also useful in helping to decision make throw to plan the sustainability livable transportation. Much further research is needed to reach any definitive conclusion as to the pattern of EV adoption

ACKNOWLEDGEMENT

We would like to say a very big thanks to Ms Sana Mateen, Assistant Professor (Dept. of Computer Science and Engineering) for her encouragement, continuous guidance, and massive support for this project till the end. Her suggestions and technical knowledge helped us for critiquing us and steer us on the most fruitful way. We are very much thankful to her for sparing her precious time and considering our progress.

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Citation of this Article:

Panza Samatha, Rodda Manasa, & K.Muralidhar. (2026). Data Analysis on Electric Vehicle Population Dataset Using Tableau. *International Research Journal of Innovations in Engineering and Technology - IRJIET*, 10(5), 430-432. Article DOI <https://doi.org/10.47001/IRJIET/2026.105059>
