

- The analysis shows the EV market in India, focusing on distribution by state and vehicle type.
- It seems likely that 2-wheelers and 3-wheelers dominate, with totals of 202,117 and 92,479 respectively.
- Research suggests regional disparities, with Maharashtra and Uttar Pradesh leading in adoption.

Total EV Numbers

The total number of electric vehicles (EVs) in India, based on the data, is:

- 2-wheelers: 202,117
- 3-wheelers: 92,479
- 4-wheelers: 8,017
- Buses: 684

This indicates a strong presence of smaller vehicles in the market, possibly due to cost and infrastructure factors.

State-wise Distribution

Key states with high EV numbers include:

- **2-wheelers:** Maharashtra (38,558), Karnataka (32,844), Tamil Nadu (25,642)
- **3-wheelers:** Uttar Pradesh (42,881), Assam (11,547), Bihar (10,783)
- **4-wheelers:** Maharashtra (1,895), Delhi (1,578), Karnataka (589)
- **Buses:** Uttar Pradesh (197), Maharashtra (186), Delhi (186)

This distribution highlights regional variations, with urban and economically developed states showing higher adoption.

Comprehensive Analysis of the EV Market in India

This detailed report expands on the analysis of the electric vehicle (EV) market in India, derived from the provided Jupyter Notebook, "ev.feynn_lab.ipynb". The notebook contains exploratory data analysis (EDA) and visualizations, focusing on the distribution of EVs across states and vehicle types, without including predictive models or forecasts. The following sections provide a thorough examination of the data, insights, and implications for the EV market.

Data Overview and Sources

The analysis is based on a dataset loaded from a CSV file (1_ev_charger_dataset.csv) into a pandas DataFrame (df1), which includes columns for 'Region', '2W' (2-wheelers), '3W' (3-wheelers), '4W' (4-wheelers), and 'Bus', representing the number of electric vehicles of each type in each state. The notebook does not specify the exact source or collection method of this dataset, but it covers 24 regions, likely corresponding to Indian states.

Total EV Numbers

The total number of each type of EV across India, calculated by summing the values for all regions, is as follows:

Vehicle Type Total Number

2-wheelers	202,117
3-wheelers	92,479
4-wheelers	8,017
Buses	684

This table highlights that 2-wheelers and 3-wheelers constitute the majority, with 202,117 and 92,479 respectively, compared to 8,017 for 4-wheelers and only 684 for buses. This suggests a market

dominated by smaller, possibly more affordable and practical vehicles for urban and rural use.

State-wise Distribution Analysis

The notebook includes bar plots to visualize the distribution of EVs by state for each vehicle type, created using Seaborn with a 'viridis' color palette and standardized fonts for clarity. The plots are titled "Statewise Electric Vehicles (2 Wheelers) in India," "Statewise Electric Vehicles (3 Wheelers) in India," "Statewise Electric Vehicles (4 Wheelers) in India," and "Statewise Electric Vehicles (BUS) in India," with states sorted in ascending order on the y-axis and the number of vehicles on the x-axis.

Key findings from these visualizations include:

- **2-wheelers:** Maharashtra leads with 38,558, followed by Karnataka (32,844) and Tamil Nadu (25,642). States like Jammu & Kashmir and Assam have significantly lower numbers (187 and 357, respectively), indicating regional disparities possibly linked to economic development and infrastructure.
- **3-wheelers:** Uttar Pradesh has the highest at 42,881, followed by Assam (11,547) and Bihar (10,783). This suggests higher adoption in northern and eastern states, potentially due to utility in transportation or commercial activities.
- **4-wheelers:** Maharashtra again tops with 1,895, followed by Delhi (1,578) and Karnataka (589). Many states, such as Sikkim and Jammu & Kashmir, have fewer than 500, with some as low as 12 and 27, respectively, indicating concentration in urban, wealthier regions.
- **Buses:** Uttar Pradesh leads with 197, followed by Maharashtra and Delhi (both at 186). Most other states report zero electric buses, with only a few like Bihar (36), Karnataka (57), and

Gujarat (22) having any, suggesting limited adoption possibly due to high costs and infrastructure challenges.

The following table summarizes the top three states for each category:

Vehicle Type	Top State 1 (Number)	Top State 2 (Number)	Top State 3 (Number)
2-wheelers	Maharashtra (38,558)	Karnataka (32,844)	Tamil Nadu (25,642)
3-wheelers	Uttar Pradesh (42,881)	Assam (11,547)	Bihar (10,783)
4-wheelers	Maharashtra (1,895)	Delhi (1,578)	Karnataka (589)
Buses	Uttar Pradesh (197)	Maharashtra (186)	Delhi (186)

Observations and Implications

The data reveals significant regional disparities in EV adoption, with Maharashtra, Uttar Pradesh, and Delhi emerging as leaders across multiple categories. This could be attributed to factors such as higher economic activity, urban population density, and possibly better EV infrastructure in these states. Conversely, smaller or less developed states, particularly for buses, show minimal adoption, which may reflect challenges like cost, lack of charging infrastructure, or lower demand.

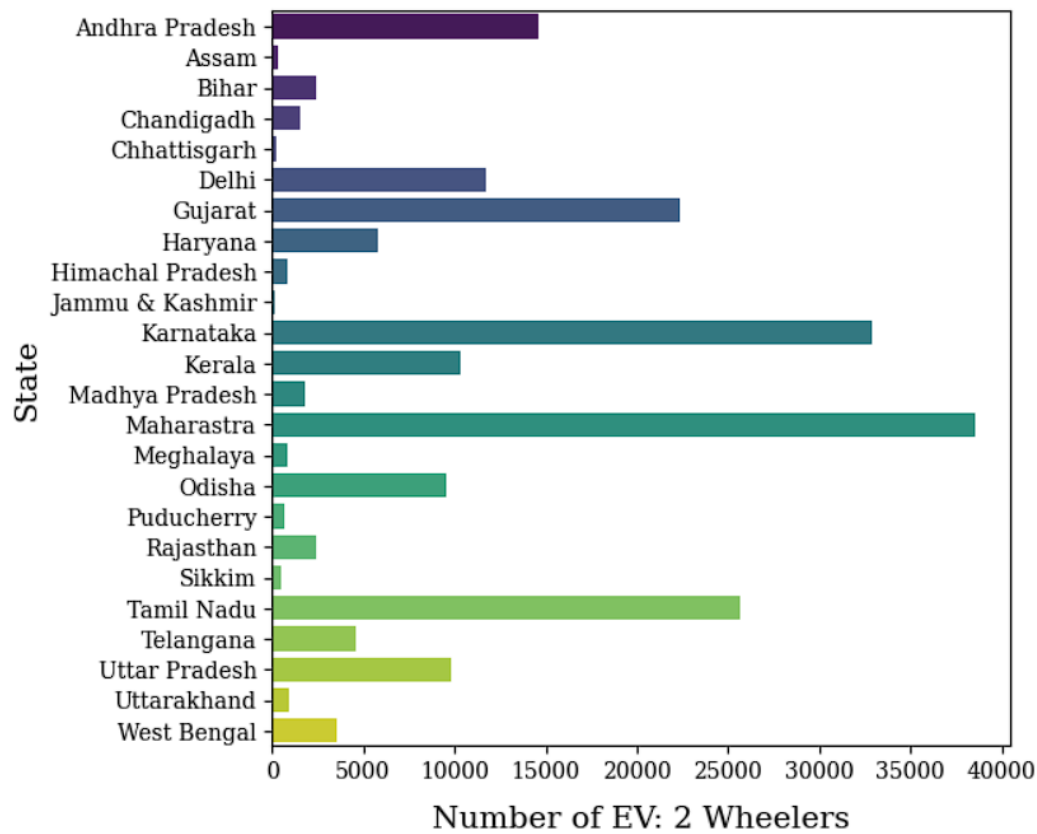
The dominance of 2-wheelers and 3-wheelers suggests that cost and practicality are key drivers in the Indian EV market, aligning with the needs of a large, price-sensitive population. The low number of buses (684 total) indicates that electric bus adoption is still nascent,

potentially due to higher upfront costs and the need for specialized infrastructure.

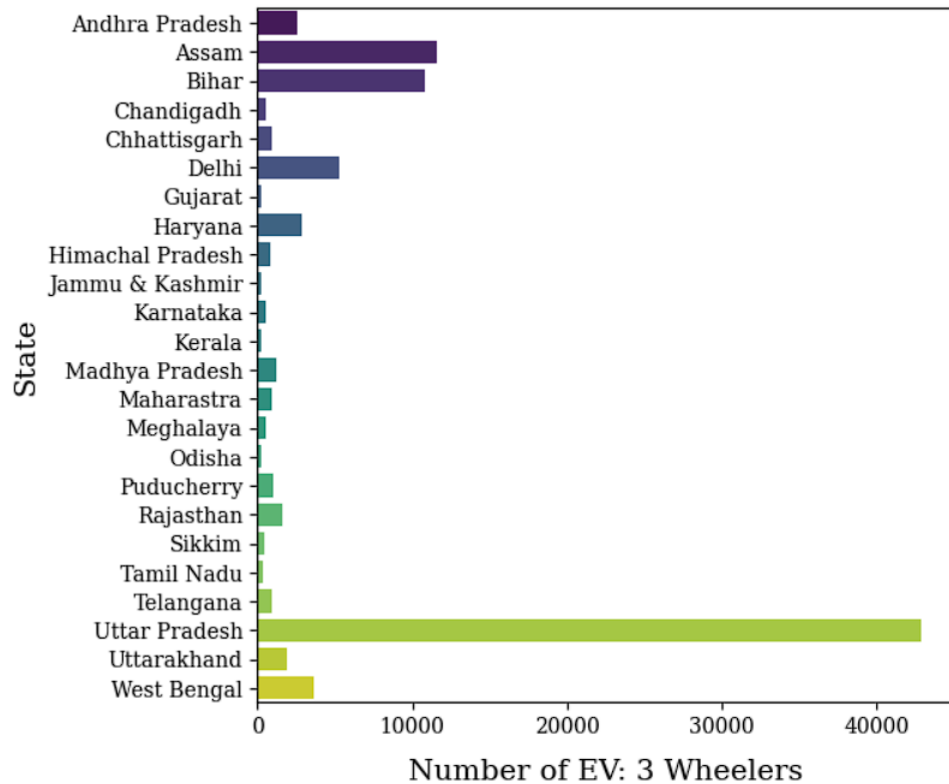
Conclusion

This analysis provides a detailed snapshot of the EV market in India, highlighting the dominance of 2-wheelers and 3-wheelers, significant regional variations, and the early stage of electric bus adoption. States like Maharashtra, Uttar Pradesh, and Delhi are key markets, but disparities suggest opportunities for targeted policy interventions to boost EV adoption in lagging regions. Further studies could leverage predictive models to forecast market trends and assess the impact of infrastructure development.

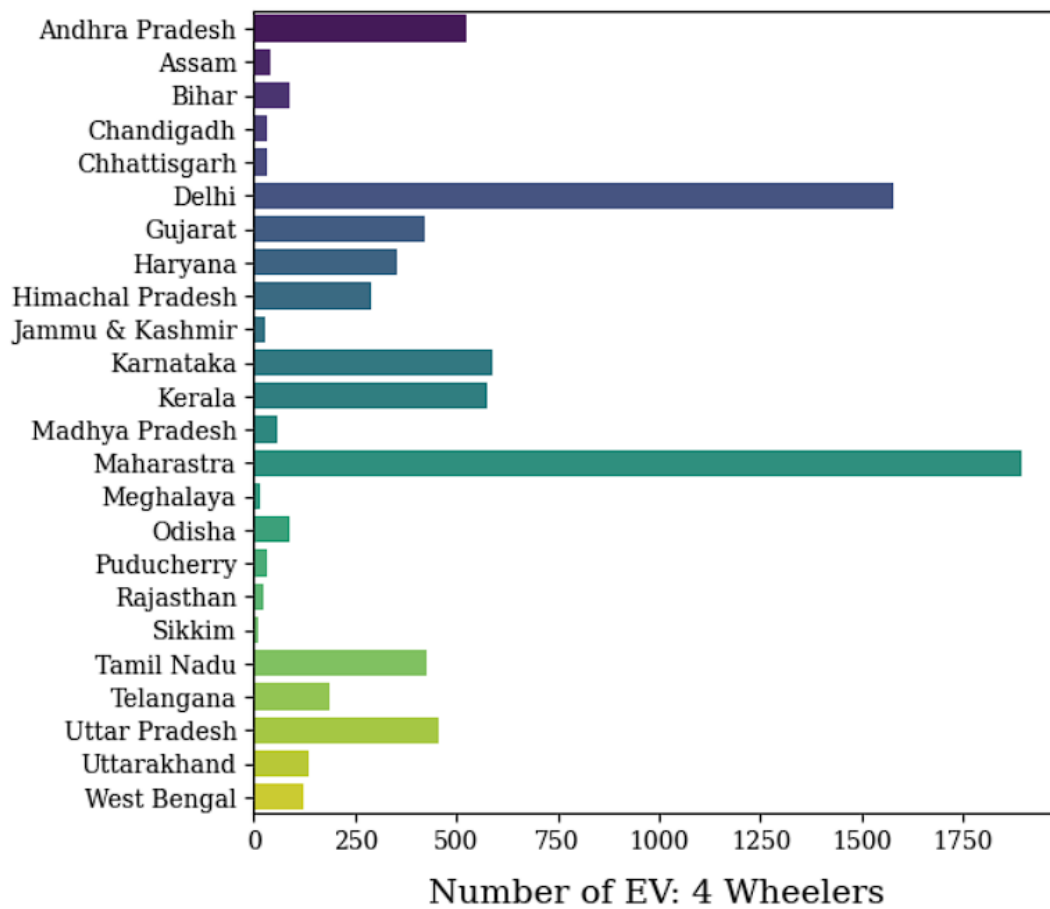
Statewise Electric Vehicles (2 Wheelers) in India

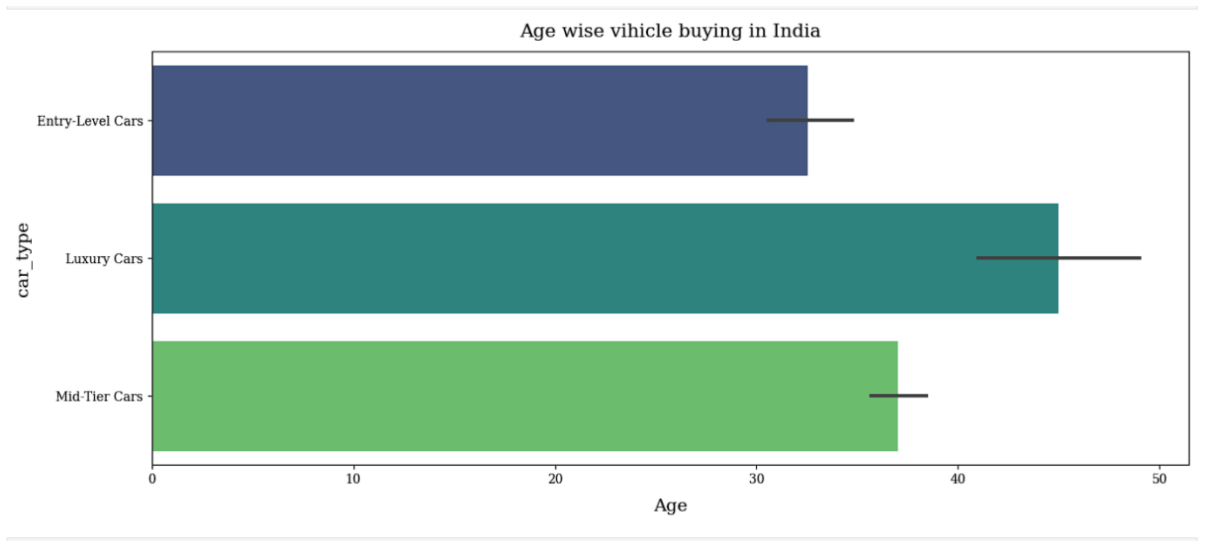
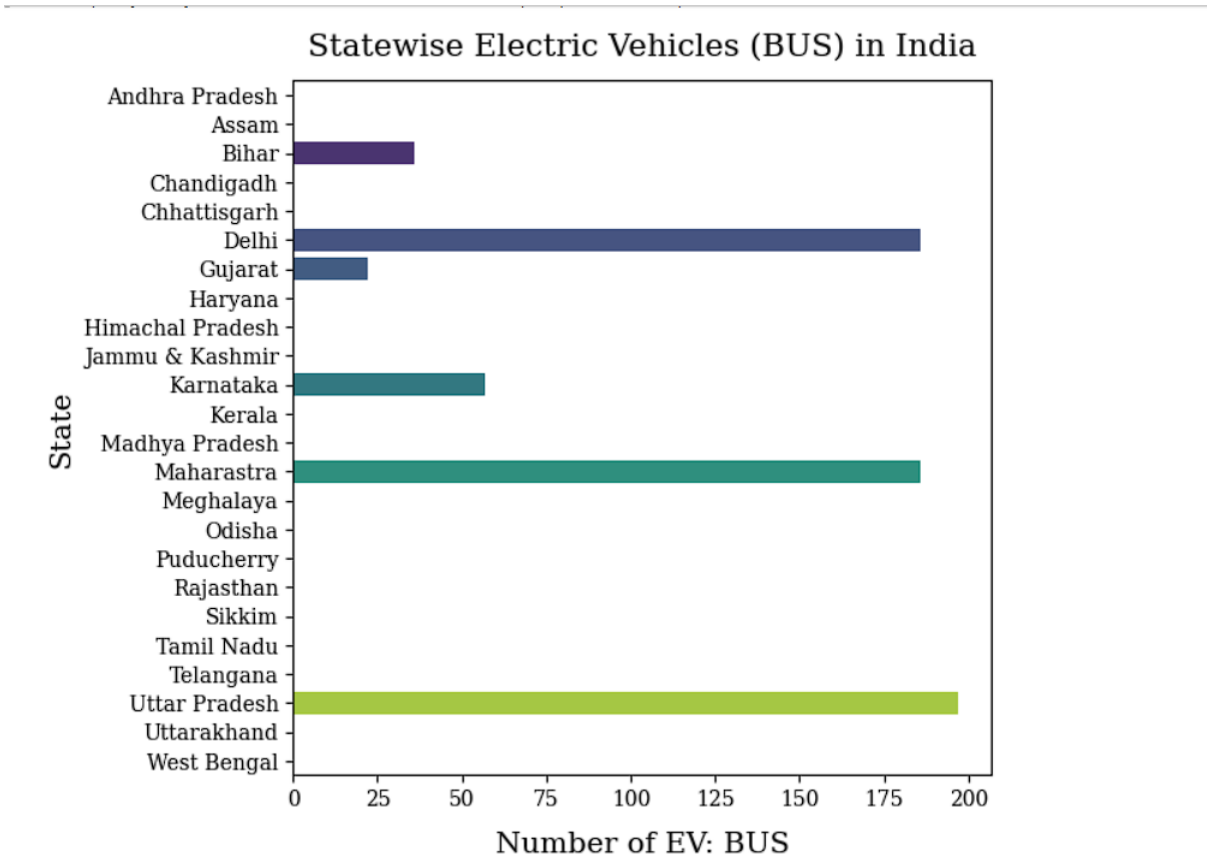


Statewise Electric Vehicles (3 Wheelers) in India

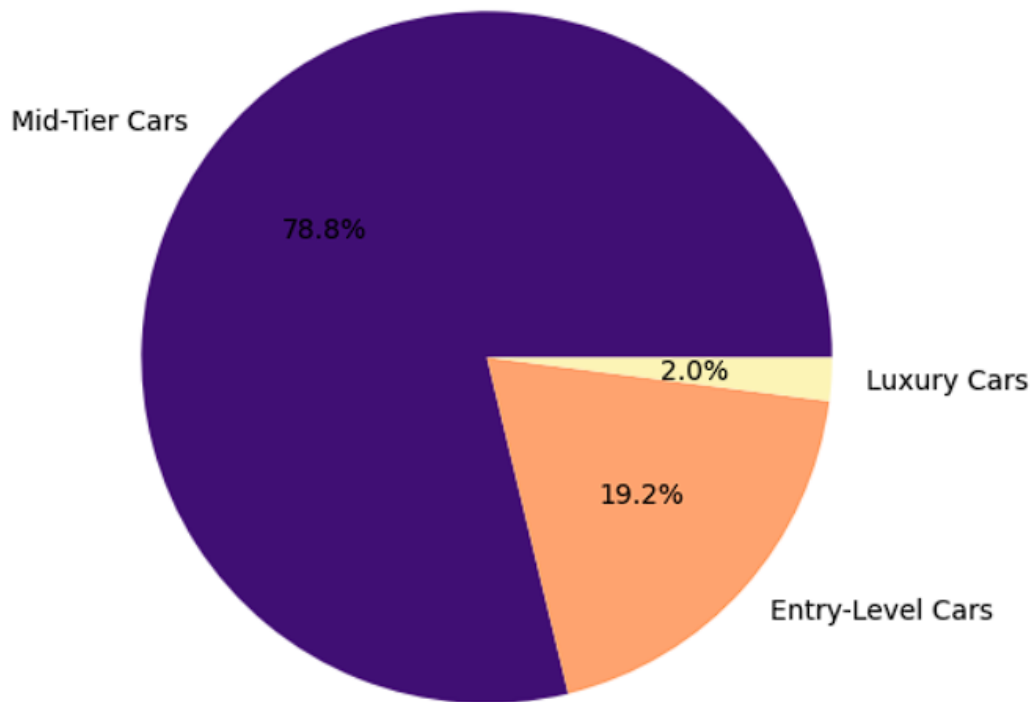


Statewise Electric Vehicles (4 Wheelers) in India





Distribution of car types



Distribution Category of age person

