

Electric Vehicle Sales Trends in India

This presentation analyzes Electric Vehicle (EV) sales trends across Indian states, providing insights for market planning, infrastructure investment, and policy development.

D by Dhruv



Project Objectives

Identify Trends

Analyze EV sales trends across different states.

Analyze Vehicle Categories

Explore popular vehicle categories and types.

Predict Future Sales

Predict future EV sales using machine learning models.



Tools & Technologies Used

Programming

Python

Libraries

Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn

Data Analysis

SQL, Excel

Machine Learning

Random Forest Regressor

Dataset Overview

1 State

Name of the state where sales occurred.

2 Year & Month

Date of sales.

3 Vehicle Type

2-Wheelers, 4-Wheelers, etc.

4 Vehicle Category

Passenger, Commercial, etc.

5 EV Sales Quantity

Number of EVs sold per state.



Data Cleaning & Preprocessing Steps



Missing Values

Filled numerical data with median and categorical data with mode.



Date Conversion

Converted date columns to proper DateTime format.



Encoding

Encoded categorical variables for analysis.



Data Removal

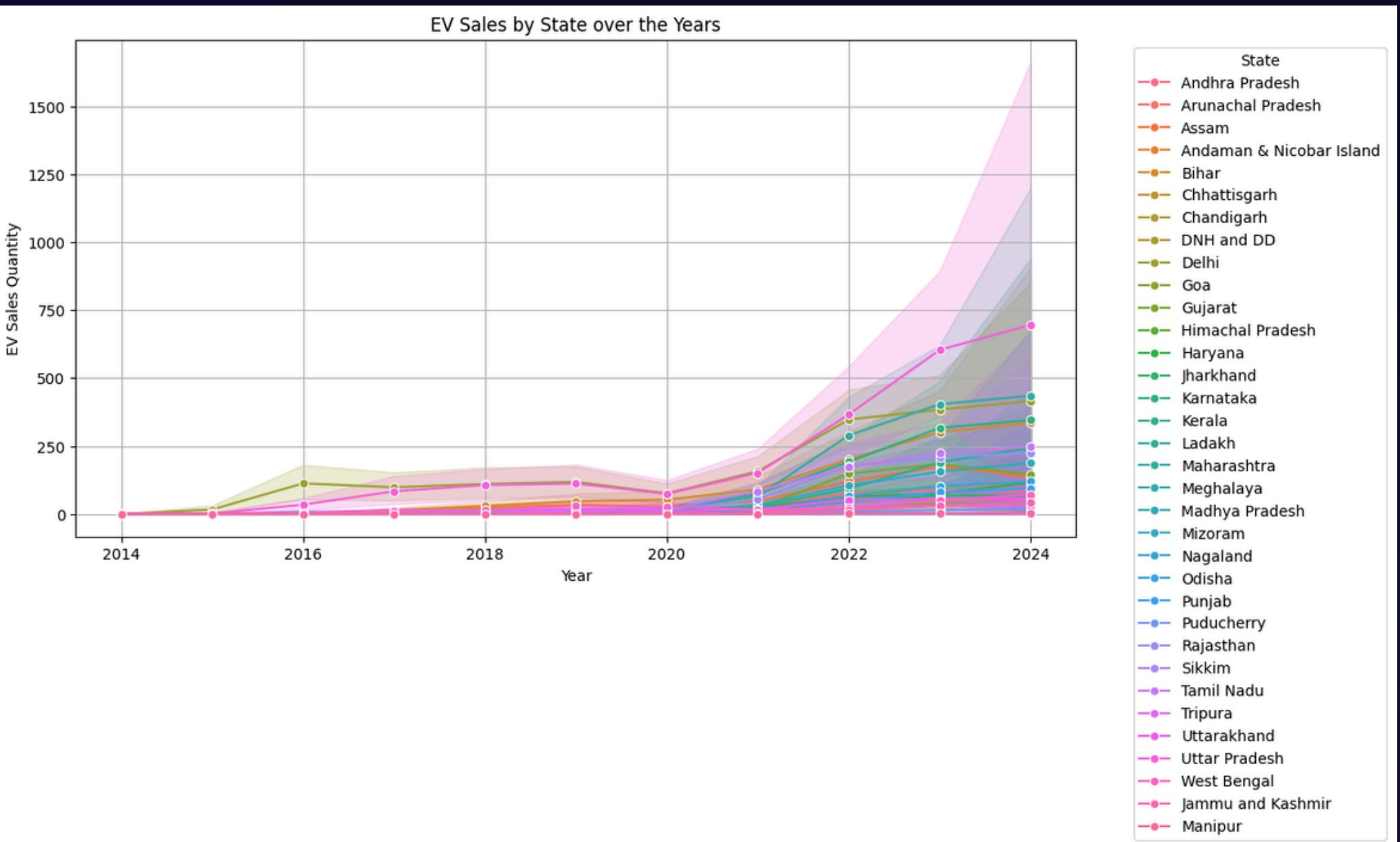
Removed duplicates and unnecessary columns.

EV Sales Trends Over the Years

EV sales have been increasing significantly over the years.

2 Major growth observed after 2018 due to government incentives and rising demand.

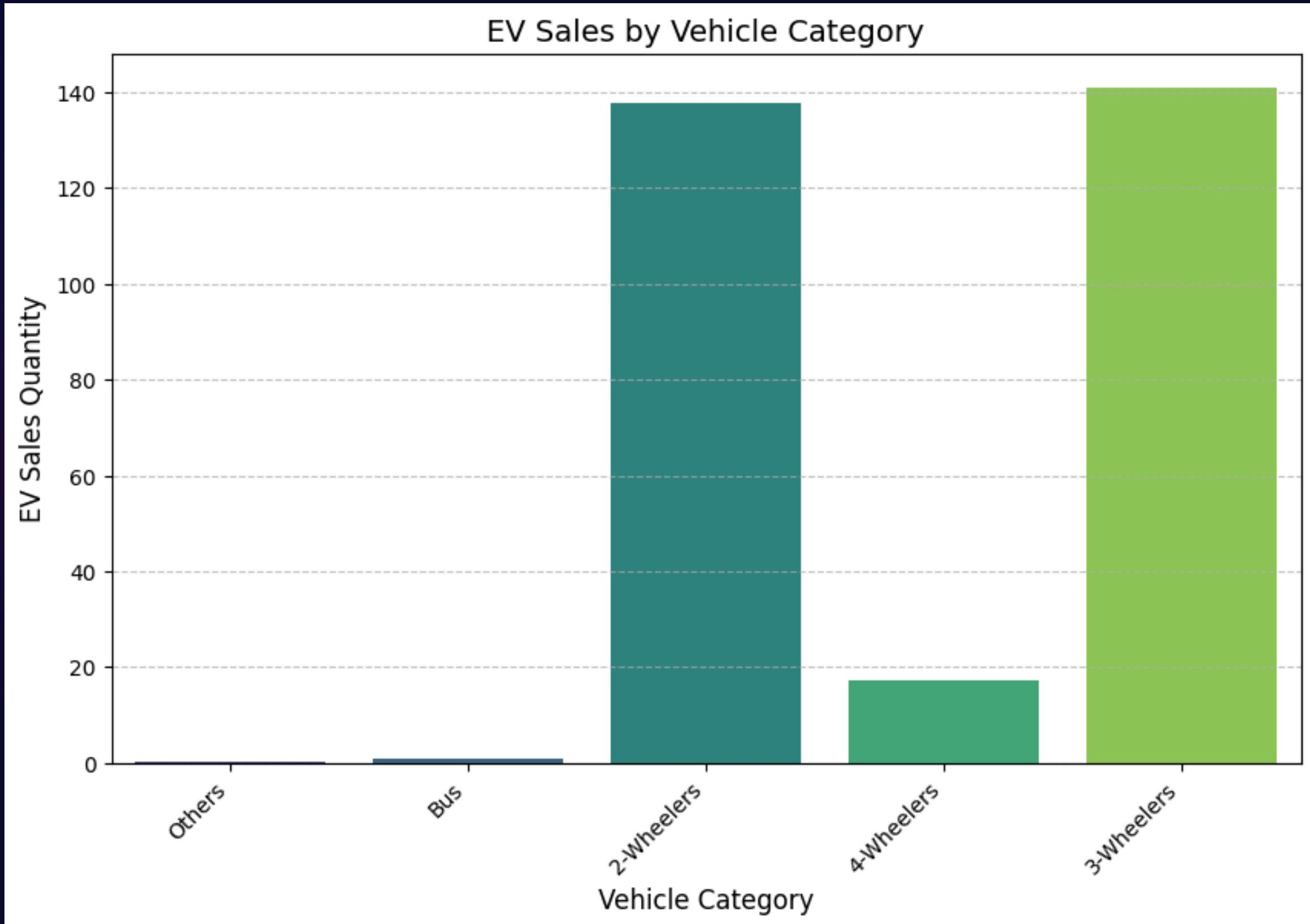
3 Seasonal trends identified: Certain months show higher sales due to policy announcements.



Sales By Vehicle Category

Key Insights :

- Top States for EV Sales:
Maharashtra, Karnataka, Uttar
Pradesh, Gujarat.
- Reason for high sales:
 - 1.Government policies, infrastructure,
and incentives.
 - 2.Some states show lower adoption
due to lack of infrastructure and
incentives.





Predictive Analysis (Machine Learning Model)

- 1
- 2
- 3
- 4

Model Selection

Used a Random Forest Regressor Model to predict EV sales.

Model Training

Trained the model using historical data and encoded categorical features.

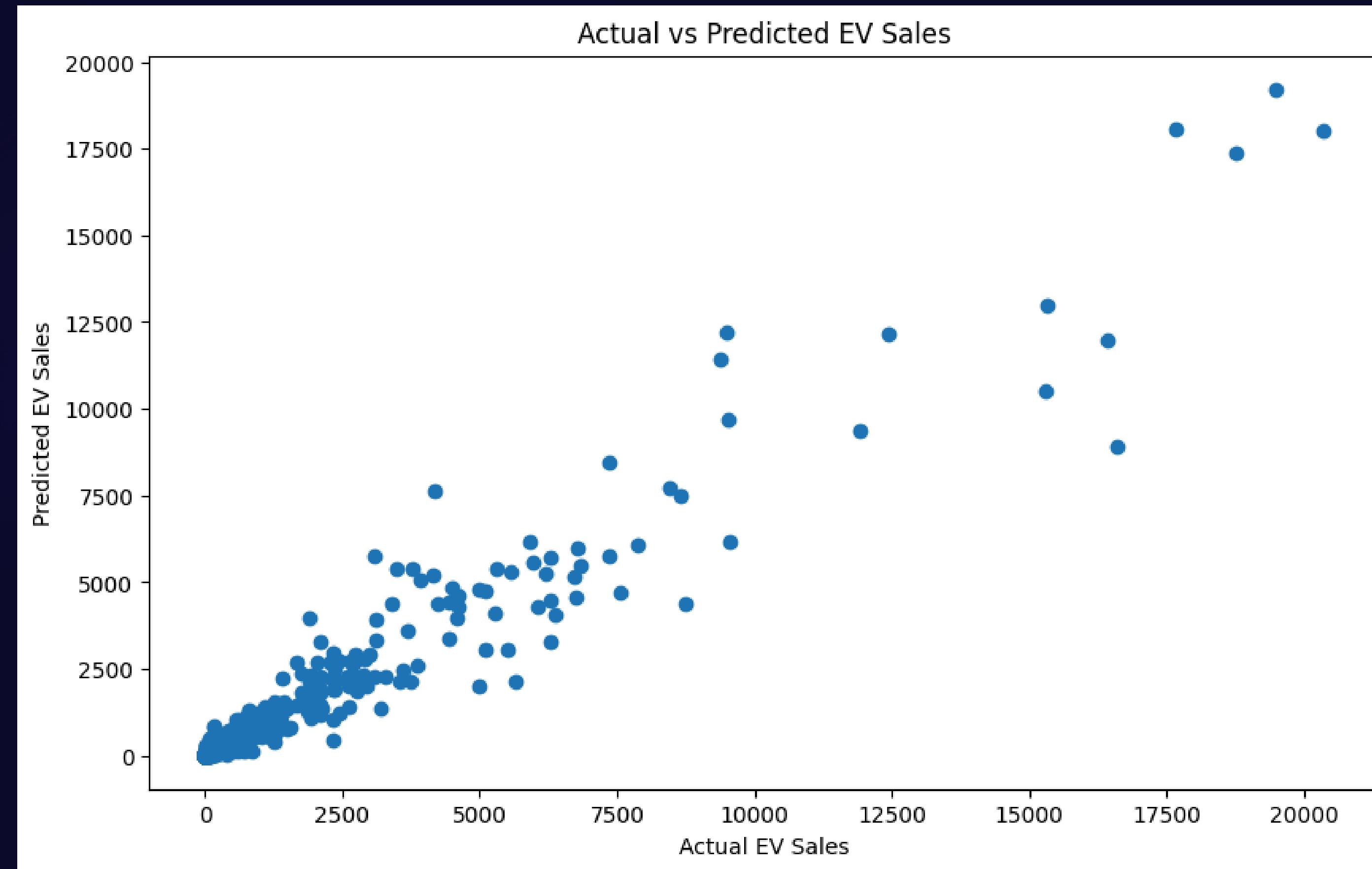
Model Performance

Model achieved high accuracy in predicting sales trends.

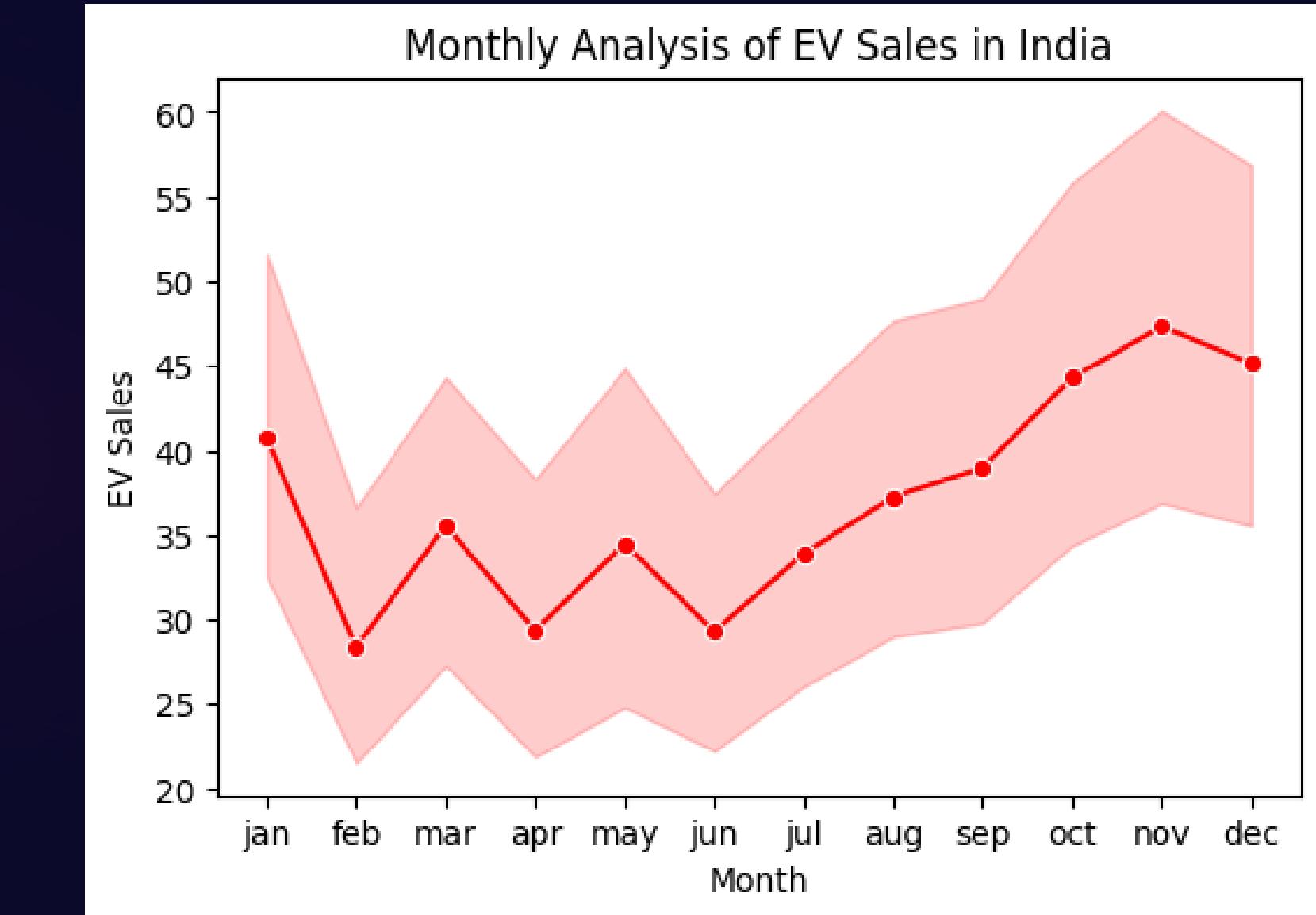
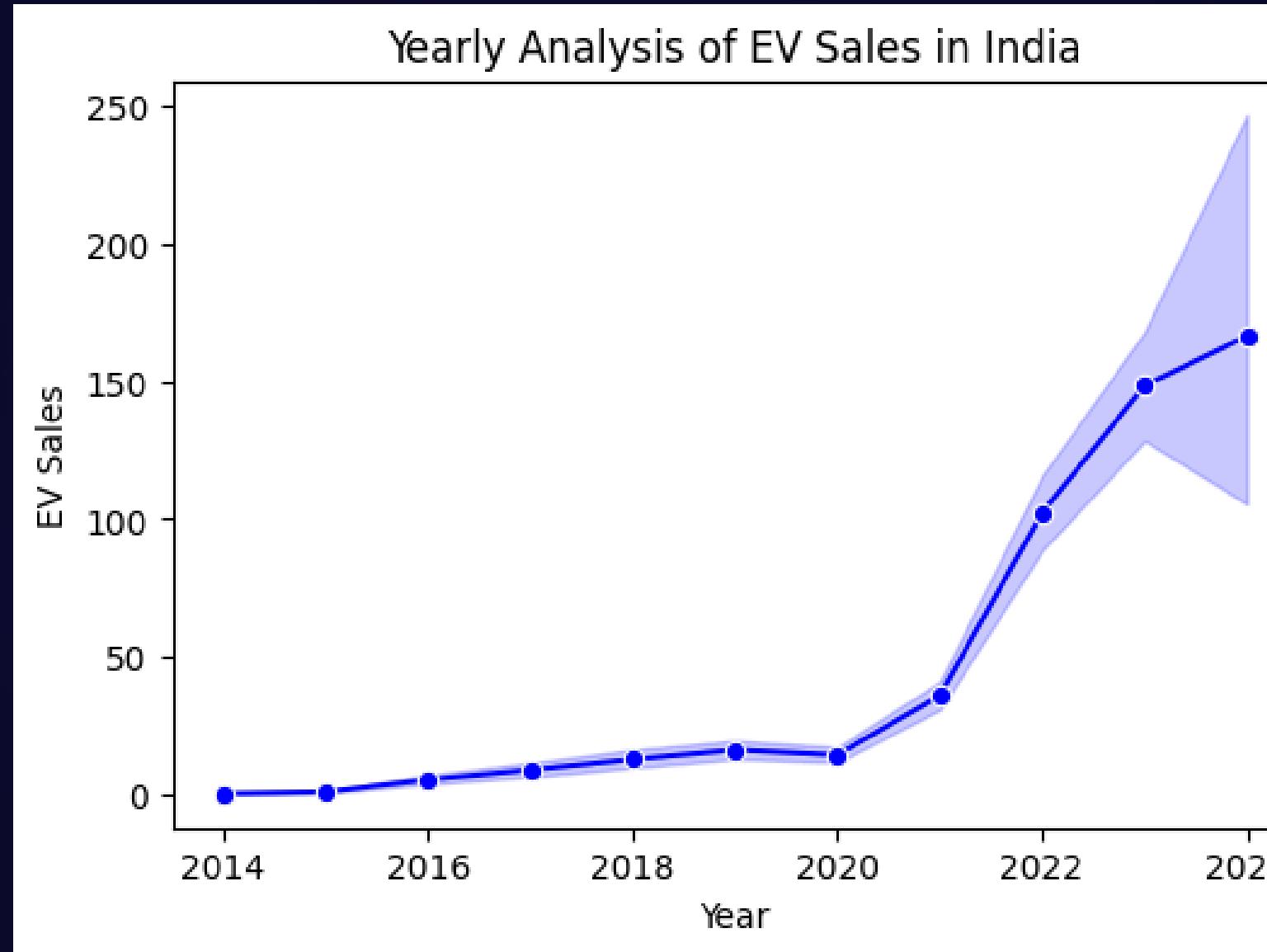
Feature Importance

State and Vehicle Type were the most important factors in predicting EV sales.

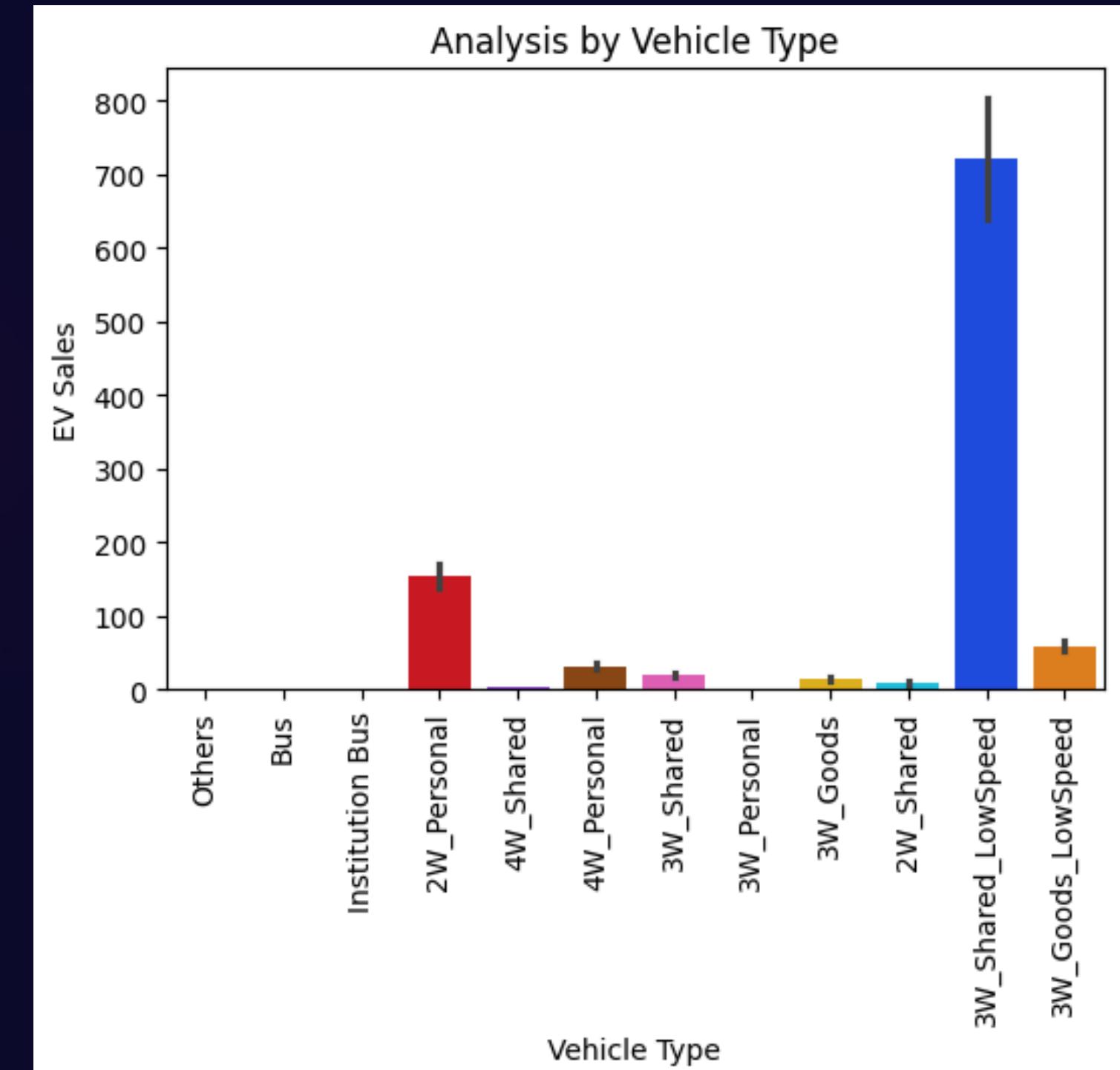
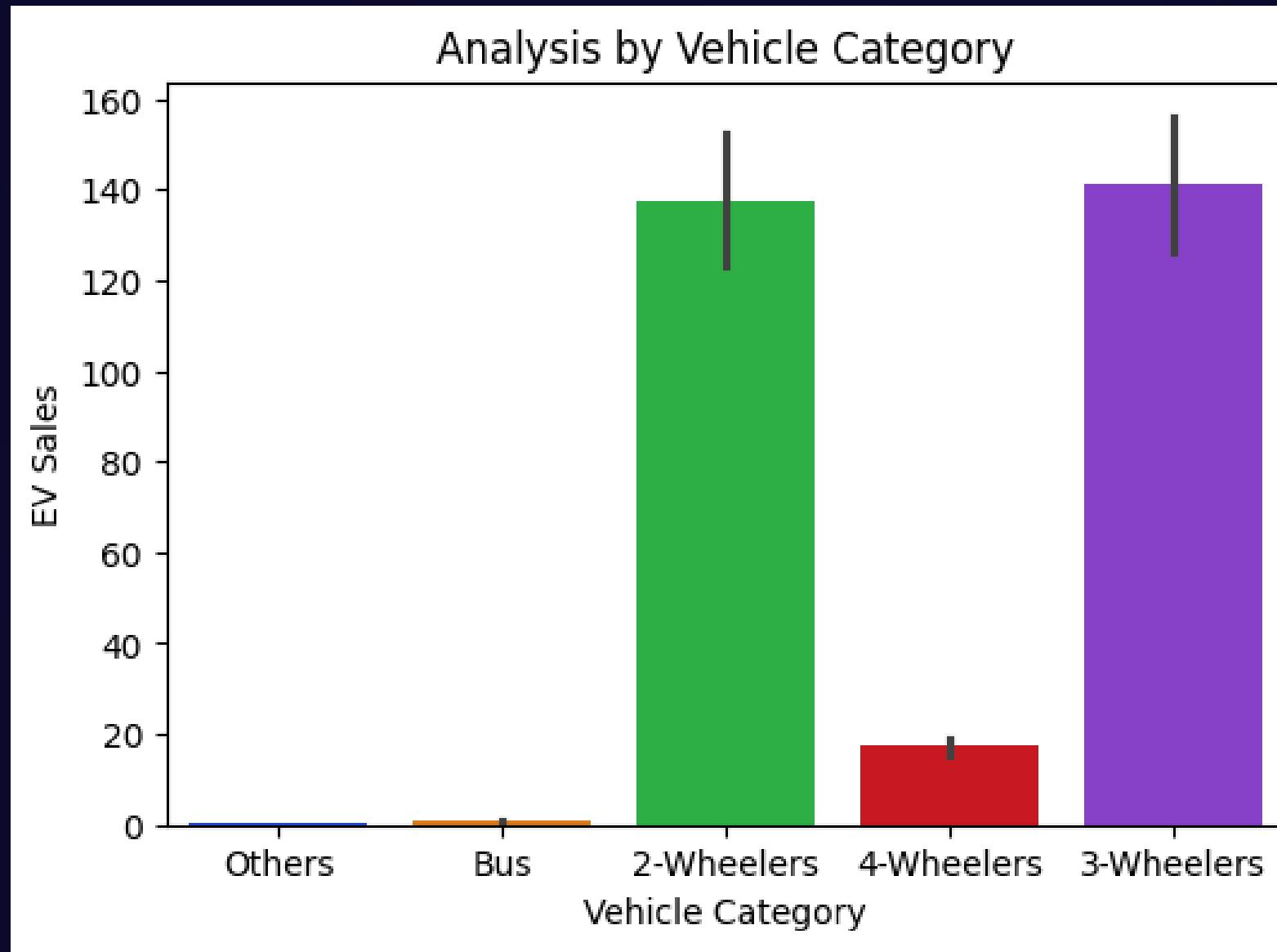
Actual vs Predicted EV Sales



Monthly and Yearly EV Sales Analysis



Analysis by Vehicle Category and Type



Model Performance & Feature

Prediction Accuracy

The model successfully predicts EV sales with reasonable accuracy.

Model Evaluation

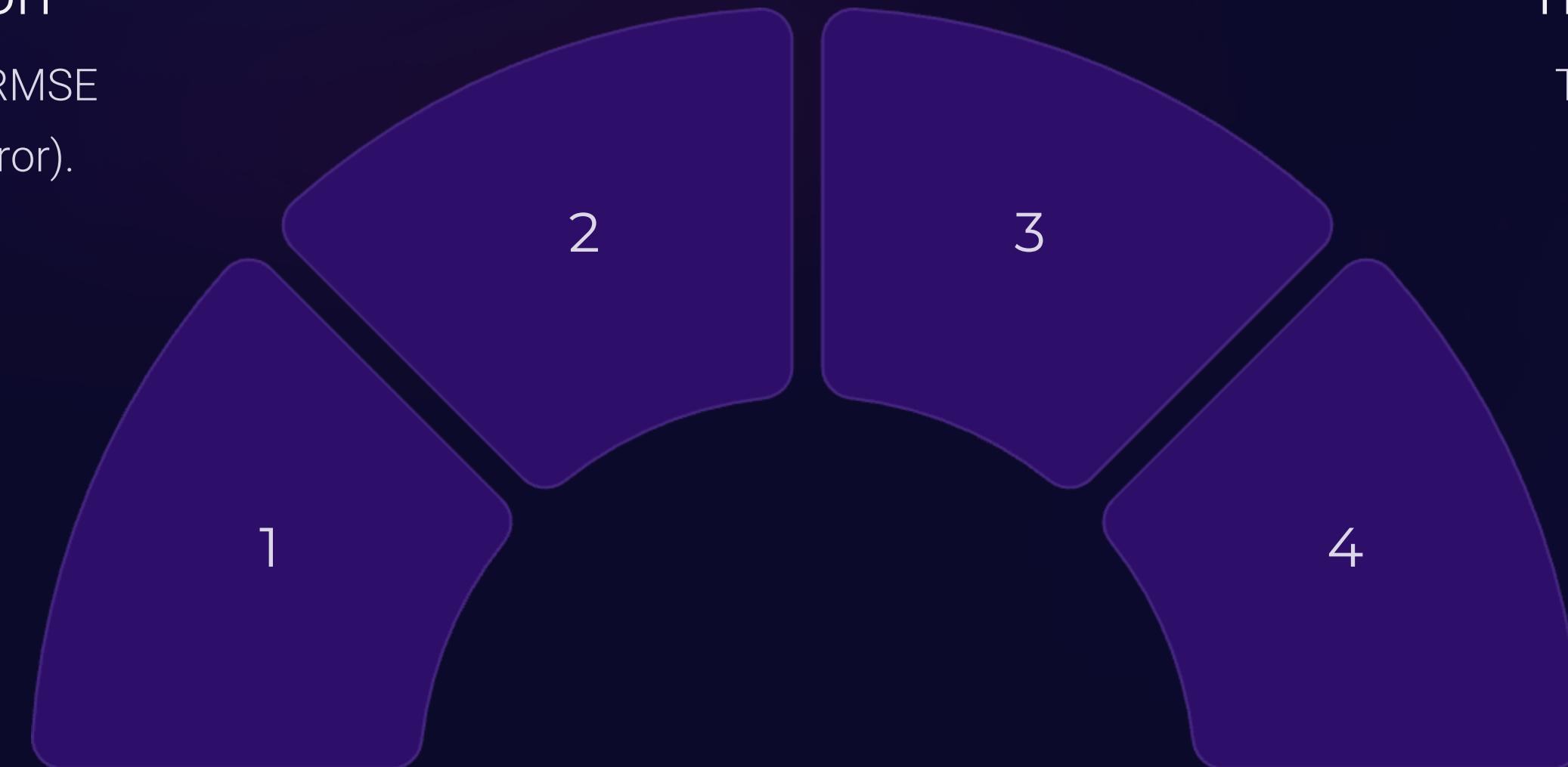
Model evaluation using RMSE (Root Mean Squared Error).

Feature Importance

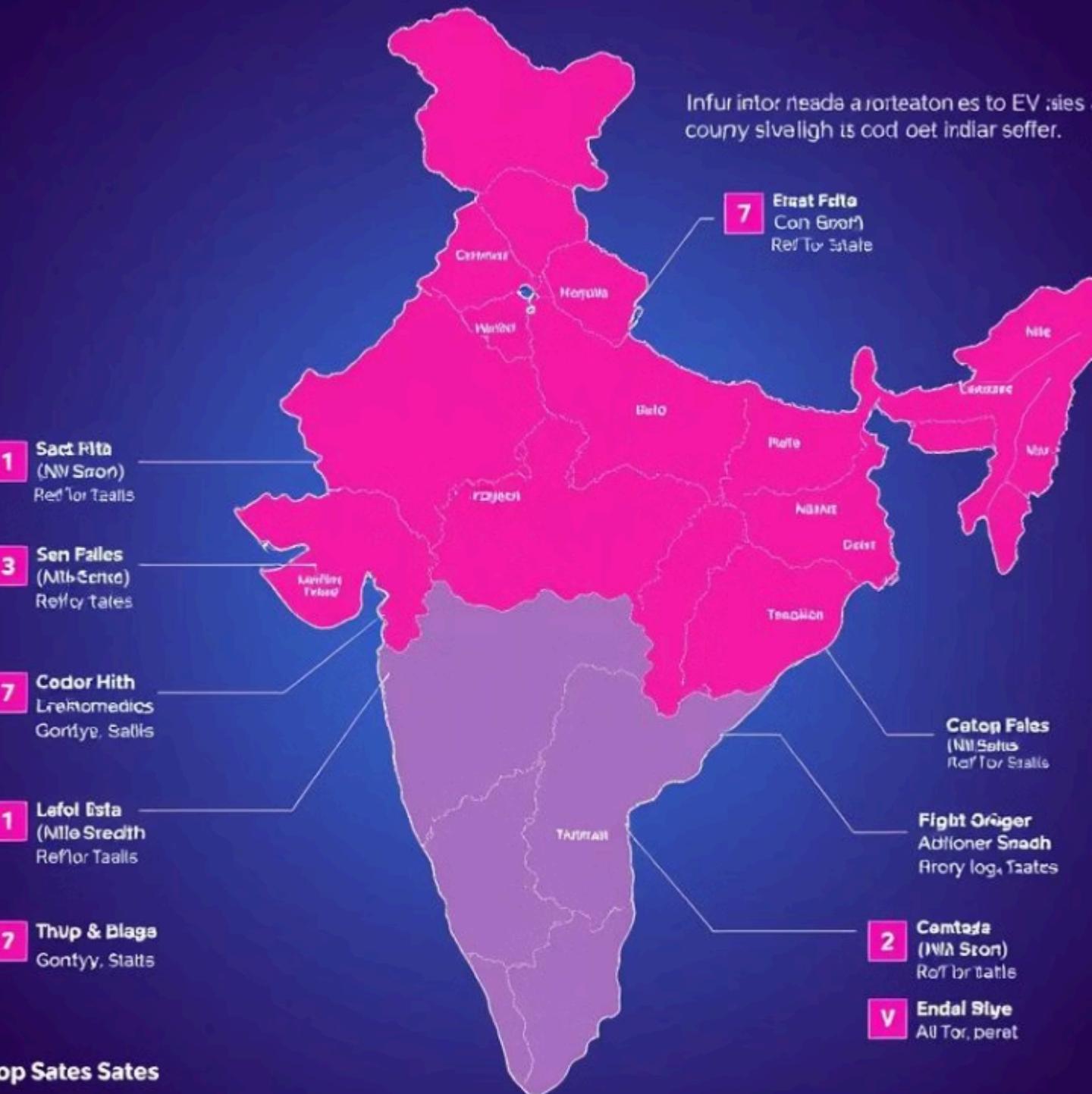
State and Vehicle Category have the highest impact.

Time-based Factors

Time-based factors (Year, Month) influence trends.



EV SALES



Summary of Insights

1

Top States

Maharashtra, Karnataka, and UP lead in EV sales.

2

Dominant Category

2-Wheelers dominate the market, followed by commercial 3-Wheelers.

3

Growth Post-2018

Sales have increased significantly post-2018 due to government incentives.

4

Predictive Modeling

Predictive modeling helps estimate future EV demand.



Next Steps & Further Analysis

Enhance Model

Use Deep Learning for better prediction accuracy.

Include Macroeconomic Factors

Include macroeconomic factors (fuel prices, policies, etc.).

Expand Dataset

Expand dataset to recent years (2024 & beyond).

Real-time Data

Use real-time data to track ongoing EV sales trends.

**THANK
YOU!**

THIS IS THE END OF THE DOCUMENT THAT WAS DRAFTED BY THE STATE COUNSEL FOR THE PLEA AND THE DRAFTING ATTORNEY IS GOING TO FILE IT WITH THE HONOURABLE COURT AND THE HONOURABLE JUDGES ARE GOING TO DECIDE WHETHER THIS DOCUMENT IS A LEGITIMATE PLEA OR NOT.



contact me

Email : ds075156@gmail.com

LinkedIn :

<https://www.linkedin.com/in/dhruvsingh-data-analyst/>

GitHub :

https://github.com/dhru07/Electric_Vehicle_Sales_Analysis_UM