# Project Report: EV Charging Demand Forecasting using Tableau

## Introduction

The growing adoption of Electric Vehicles (EVs) in India necessitates effective forecasting of charging demand across cities and seasons. This project aims to create a comprehensive Tableau dashboard to analyze, visualize, and forecast EV charging demand to support planning and decision-making for infrastructure and operations.

## Abstract

This project uses Tableau to build a multi-layered interactive dashboard that predicts EV charging demand based on factors like time of day, city, weather patterns, and festivals. The dashboard is designed for stakeholders to monitor real-time usage, analyze station performance, and plan capacity expansion or pricing strategies.

## Tools Used

- Tableau (for dashboard creation and data visualization)
- CSV and SQL data files (EV charging, weather, festival data)
- ARIMA and Prophet (for forecasting models)
- Python (for pre-processing, if needed)
- APIs (weather, traffic, IoT)

## Steps Involved in Building the Project

1. Data Collection: Gathered EV charging data, weather information, and festival calendar.
2. Data Preparation: Cleaned and processed the data, created calculated fields (e.g., utilization, peak hours).
3. Dashboard Design: Created dashboards for Executive Summary, Forecasting, Weather Impact, Festival Analysis, Station Performance, and Optimization.
4. Forecasting: Applied ARIMA and Prophet models with confidence intervals to predict demand.
5. Interactivity: Added filters, parameters, and actions (highlight, cross-filtering, scenario planning).
6. Optimization: Implemented dynamic pricing and load balancing strategies.
7. Publishing: Uploaded to Tableau Public and integrated for mobile and web access.

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## Conclusion

The EV Charging Demand Forecasting Dashboard empowers decision-makers with actionable insights, allowing them to plan station capacity, adjust pricing strategies, and understand seasonal usage patterns. This scalable and interactive dashboard framework supports data-driven planning for India's EV infrastructure.