Internship Project Report

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# Project Title: Smart City Traffic Forecasting

# Company: UCT

## 1. Background of the Project

As cities grow, managing traffic becomes a major challenge. Governments are transforming cities into smart cities to improve service efficiency. A key part of this is forecasting traffic patterns at major junctions, especially during holidays, peak hours, and special events. This helps in planning, reducing congestion, and improving infrastructure.

## 2. Problem Statement Relevance

The government wants to build a robust traffic system for the smart city. Understanding and predicting traffic at four key junctions will help prepare for traffic peaks. The goal is to analyze historical traffic data and predict future trends to aid infrastructure and urban planning.

## 3. Design & Implementation Details

The dataset includes timestamped traffic data across four junctions. Python and pandas were used for data preprocessing. We explored trends across weekdays, weekends, and holidays. Prophet and ARIMA models were used for time series forecasting. Graphs were plotted to visualize predictions and trends. The project was implemented on Google Colab.

## 4. Results

The model successfully forecasted traffic variations for future dates. It identified peak hours and abnormal traffic spikes. Visual results helped interpret trends easily. These forecasts can help city planners manage congestion more effectively.

## 5. Learnings

Through this project, I learned time series forecasting using Prophet and ARIMA, how to work with real-world traffic data, and how to visualize and interpret patterns. I also practiced feature engineering and model evaluation techniques.