

# **PROJECT TITLE: Enhancing Road Safety with AI-Driven Traffic Accident Analysis and Prediction**

## **PHASE 1**

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**GITHUB REPOSITORY**

**LINK : <https://github.com/your-username/ai-traffic-accident-prediction>.**

### **1. Problem Statement:**

Road traffic accidents are a major public safety concern, leading to loss of life, injury, and economic damage. Traditional analysis methods fail to proactively identify high-risk zones or predict future accidents. There is a critical need for an intelligent system that leverages AI to analyze accident data, detect patterns, and forecast potential incidents to enhance preventive measures.

### **2. Objectives of the Project:**

- Analyze historical accident data to uncover contributing factors.
- Identify accident hotspots and high-risk zones.
- Predict the likelihood and severity of future traffic accidents.
- Provide actionable insights for urban planners, traffic authorities, and emergency services.
- Support development of AI-powered early warning and traffic control systems.

### **3. Scope of the Project:**

- Geographic focus on urban and high-density traffic zones.
- Integration of multiple data sources: traffic records, weather, road infrastructure, etc.
- Use of machine learning for classification (accident vs. non-accident) and regression (severity prediction).
- Development of dashboards/visualizations for stakeholders.
- Excludes real-time vehicular control or autonomous vehicle implementation.

### **4. Data Sources:**

- Government traffic accident databases (e.g., police reports, transport departments)

- GPS and telematics data
  - Road condition and layout data (OpenStreetMap, municipal data)
- Real-time traffic feeds (e.g., from sensors or cameras)
- Weather data (e.g., from APIs like OpenWeatherMap)

## 5. **High-Level Methodology:**

1. Data Collection & Integration
2. Data Cleaning & Preprocessing
3. Exploratory Data Analysis (EDA)
4. Feature Engineering
5. Model Training & Evaluation
6. Visualization & Insights

## 6. **Tools and Technologies:**

- Programming Language: Python
- Data Handling: Pandas, NumPy
- Machine Learning: scikit-learn, XGBoost, TensorFlow/Keras
- Visualization: Matplotlib, Seaborn, Plotly, Tableau/Power BI
- GIS Tools: QGIS, Folium
- APIs: OpenWeatherMap, Google Maps API
- Deployment (Optional): Flask/Django, Docker