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

**PHASE 1**

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**LINK :**

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