Introduction

Overview of the Project

Date	26 June 2026
Team Id	LTVIP2025TMID35978
Project Name	Traffictelligence

Overview:

The Traffic Volume Estimation System is a web-based application designed to predict traffic volume using machine learning techniques. Developed as part of the `TrafficTelligence` initiative, this project leverages a pre-trained RandomForestRegressor model to analyze user-provided data, including weather conditions, time, and holiday information, to estimate hourly traffic volume in vehicles. The solution is built using Flask for the web framework, with data processing handled by libraries such as Pandas, NumPy, and Scikit-learn.

Key Components:

- **Data Input**: Users enter weather (temperature, rain, snow), time, and holiday details via a simple HTML form.
- **Processing**: The system preprocesses data using ColumnTransformer and StandardScaler, then applies the trained model to generate predictions.
- **Output**: Results are displayed on the web page, with error handling for invalid inputs and navigation options to return to the input form.
- **Technology Stack**: Flask, Python, Scikit-learn, XGBoost, HTML/CSS, deployed locally.

Development Phases:

- **Ideation**: Identified user needs (commuters, managers, drivers) and defined the problem statement.
- **Design**: Planned architecture, requirements, and user stories.
- **Development**: Built and trained the model, developed the web app.
- **Testing**: Evaluated model performance (e.g., R2 ~0.85) and user interface usability.
- **Deployment**: Launched on localhost (http://127.0.0.1:5000/) with plans for future scalability.
- Future Scope: The project can be extended by integrating real-time weather APIs, adding a mobile app, and deploying on cloud platforms (e.g., AWS) to handle increased traffic and users.

Stakeholders:

- **Users**: Commuters, traffic managers, delivery drivers.
- **Developers**: Project team (replace with names if applicable).
- **Beneficiaries**: Urban communities and local authorities.