

FULL STACK DEVELOPMENT
WITH MERN PROJECT
DOCUMENTATION

Team Details :

Project Title : traffictelligence: advanced traffic volume estimation with machine

id : LTVIP2025TMID39125

Team Members: 4

1. **Team Leader: Venkat Ankem** – Full Stack Developer & Project Coordinator Responsible for overall planning, coordination, GitHub management, and integration of frontend and backend.
2. **Team Member: Teja** – Frontend Developer Works on the React-based UI, handles component design, page routing, and user interactions.
3. **Team Member: Syamchadu**– Backend Developer Builds RESTful APIs using Node.js and Express.js, manages authentication and server logic.
4. **Team Member: Thummala Cherla Naga Chenthan**– Database Administrator Designs and manages MongoDB schemas, handles CRUD operations and ensures data consistency.

Traffictelligence: Advanced Traffic Volume Estimation with Machine Learning

Project Title:** Traffictelligence: Advanced Traffic Volume Estimation with Machine Learning

Objective:

To develop an intelligent web-based system that estimates real-time traffic volume using machine learning techniques based on sensor or camera data, improving urban traffic management.

Modules in the Project:

1. **Data Collection Module**:

Collects real-time or historical traffic data (camera feeds, sensors, open datasets).

Cleans and preprocesses data for training.

2. **Model Training Module**:

Trains regression or classification models (e.g., Linear Regression, Random Forest, CNN for images).

Evaluates performance using metrics like RMSE, MAE.

3. **Prediction Module**:

Takes user input (e.g., timestamp, location, weather) or image feed.

Predicts traffic volume for a given time/location.

4. **Web Application Module**:

HTML/CSS frontend for data entry and visualization.

Flask backend to connect model and UI.

Technologies Used:

Frontend: HTML5, CSS3, Bootstrap

Backend: Python (Flask)

****ML Libraries:**** Scikit-learn, TensorFlow/Keras, Pandas, NumPy

****Deployment:**** Localhost or cloud server (e.g., Heroku)

Key Features:

Real-time traffic estimation from user inputs.

Interactive user interface for traffic prediction.

Accurate predictions using trained machine learning models.

Option to integrate with video/image feeds for automated detection.

Advantages:

Helps in urban traffic planning and congestion management.

Scalable and extendable to multiple cities or regions.

Reduces manual traffic monitoring efforts.

Future Enhancements:

Integration with live video feeds for automatic vehicle count.

Use of deep learning (YOLO, CNN) for enhanced image-based estimation.

Mobile app version for on-the-go monitoring.