Project Design Phase-II
Technology Stack(Architecture & Stack)

Date	25 June 2025
Team ID	LTVIP2025TMID32460
Project Name	Traffic Telligence: Advanced Traffic Volume Estimation with Machine Learning
Maximum Marks	4Marks

Technical Architecture:

TrafficTelligence, The deliverable includes the architectural diagram and the required technical specifications as per Table 1 and Table 2 for the TrafficTelligence system, an AI-powered solution for traffic volume estimation.

Table 1: Architecture Components

S.No	Component	Description	Technology
1	User Interface	Web-based interface for data input and result display	HTML, CSS, JavaScript
2	Application Logic - 1	Data preprocessing and feature engineering	Python (Pandas, NumPy)
3	Application Logic - 2	Model training and tuning logic	Python (Scikit-learn, XG Boost
4	Application Logic - 3	Prediction API using Flask	Flask Framework
5	Database	Stores structured datasets and model metadata	SQLite / Postgre SQL
6	Cloud Database	Optional storage for scalable deployments	MongoDB Atlas / Firebase

7	File Storage	Storage for model files and logs	AWS S3 / Local File System
8	External API - 1	Weather data integration to improve predictions	OpenWeatherMap API
9	External API - 2	Location services for map-based interaction	Google Maps API
10	Machine Learning Model	Predict traffic volume from multi-source inputs	Regression, XG Boost Model
11	Infrastructure	Deployment platform for hosting the application	Heroku / Render / Localhost

Table 2: Application Characteristics

S.No	Characteristics	Description	Technology
1	Open-Source Frameworks	Frameworks and libraries used in development	Flask, Scikit-learn, Pandas
2	Security Implementations	Security practices for data and access control	HTTPS, API Keys
3	Scalable Architecture	Designed to support modular scaling and APIs	3-Tier Architecture (UI – Logic)
4	Availability	Ensures access and deployment reliability	Cloud Hosting (Heroku/Render)
5	Performance	Efficient prediction, caching, and fast load	Joblib, Flask-Caching, Optimizer