

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

Date	20 July 2025
Team ID	LTVIP2025TMID20285
Project Name	TrafficTelligence – Advanced Traffic Volume Estimation with Machine Learning
Maximum Marks	4 Marks

Technical Architecture:

The following table describes the technical architecture and the technology stack used in the TrafficTelligence project.

Table-1: Components & Technologies

S.No	Component	Description	Technology
1	User Interface	Frontend for user to enter traffic input	HTML, CSS, JavaScript (Jinja2)
2	Application Logic-1	ML Inference and preprocessing	Python (Flask, Pandas, Sklearn)
3	Application Logic-2	Web application routing and form handling	Flask
4	Database	CSV Dataset for traffic logs	Local CSV (via Pandas)
5	File Storage	Model files (.pkl), logs	Local filesystem / S3 (optional)
6	External API-1	Weather integration	OpenWeatherMap API
7	External API-2	Optional location metadata integration	Google Maps / GPS metadata
8	Machine Learning Model	Predict traffic volume level (Low, Medium, High)	ResNet50 + LSTM, Random Forest
9	Infrastructure	Deployment and execution	Localhost / Flask / Heroku-ready

Table-2: Application Characteristics

S.No	Characteristic	Description	Technology
1	Open-Source Frameworks	Flask, Pandas, Scikit-learn, Matplotlib, Seaborn	Python libraries
2	Security	Data validation, local file access only,	Flask validation, HTTPS (Heroku)

		optional HTTPS support on deployment	
3	Scalable Architecture	Modular Flask + model pipeline, easy to scale or containerize	Flask, Gunicorn (Heroku/AWS)
4	Availability	Can be hosted on free/paid cloud instances, accessible via web	Heroku / AWS EC2 / Localhost
5	Performance	Low-latency response (<1.1s), uses efficient model serialization	joblib, Fast Flask API