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

Date	18 June 2025
Team ID	LTVIP2025TMID40962
Project Name	**TrafficTelligence: Advanced Traffic Volume Estimation with Machine Learning**
Maximum Marks	4 Marks

Technical Architecture:

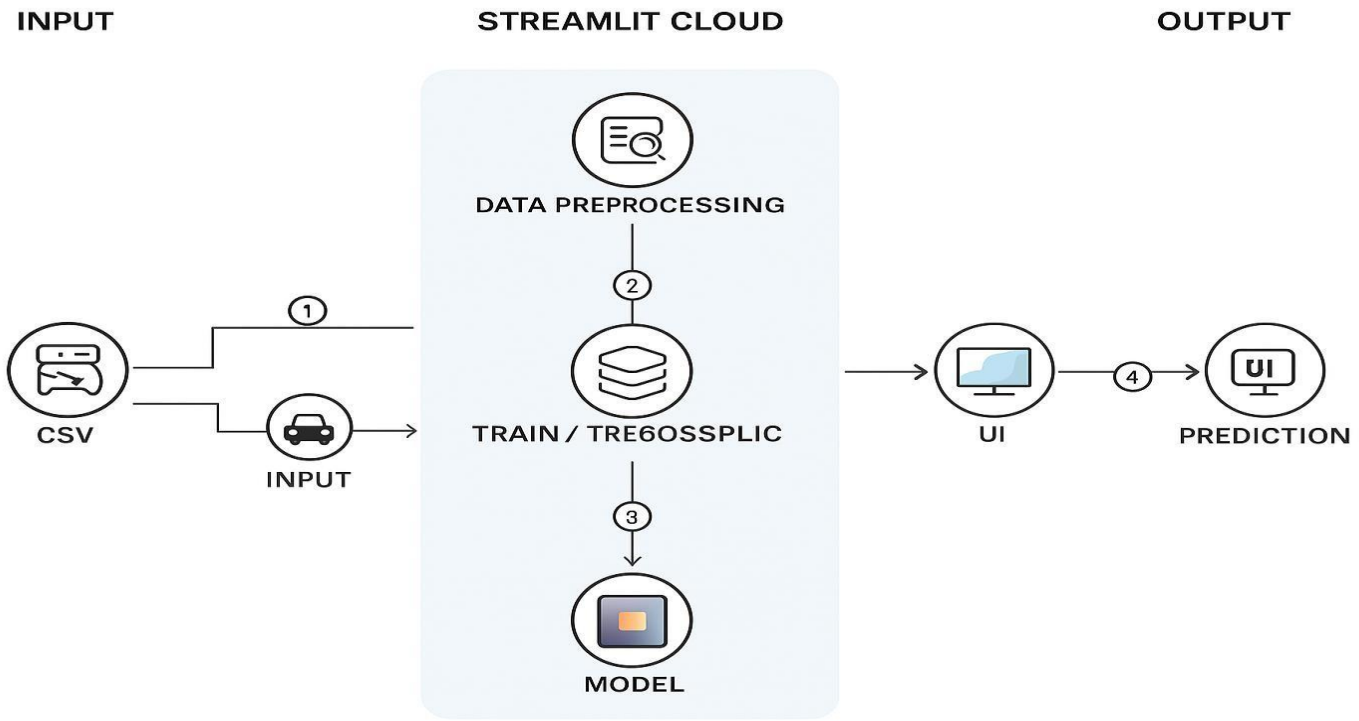

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web-based input forms, result display, visualization	Streamlit (Python), HTML, CSS
2.	Application Logic-1	Traffic volume prediction using ML models	Python, scikit-learn
3.	Application Logic-2	Data preprocessing and feature engineering	Pandas, NumPy
4.	Database	Historical trip data stored and processed as CSV	CSV file (local/cloud)
5.	Cloud Database	Future scalability via cloud data storage	AWS S3 / Google Cloud Storage.
6.	File Storage	Storage of datasets and model files	Local filesystem / Cloud storage.
7.	External API-1	Geocoding and mapping for routes	Google Maps API
8.	Machine Learning Model	Predictive model for trip duration estimation	Linear Regression (scikitlearn)
9.	Infrastructure (Server / Cloud)	Hosting and application deployment	Streamlit Cloud / Local Server

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Entire solution developed using open-source libraries	Python, scikit-learn, Streamlit
2.	Security Implementations	API key protection, restricted model access, cloud-level IAM (if deployed in cloud)	Basic API key handling, IAM (future).
3.	Scalable Architecture	Modular design, scalable via retraining models with different datasets, cloud deployable	Streamlit Cloud, Cloud Storage
4.	Availability	High availability via cloud deployment (Streamlit Cloud), minimal local resource dependence	Streamlit Cloud,
5.	Performance	Fast response (0.1s prediction time), lightweight model, efficient data handling	Python, scikit-learn, pandas