Project Design Phase
Solution Architecture

Date	28 June 2025
Team ID	LTVIP2025TMID40870
Project Name	TrafficTelligence: Advanced Traffic Volume Estimation with Machine Learning.
Maximum Marks	4 Marks

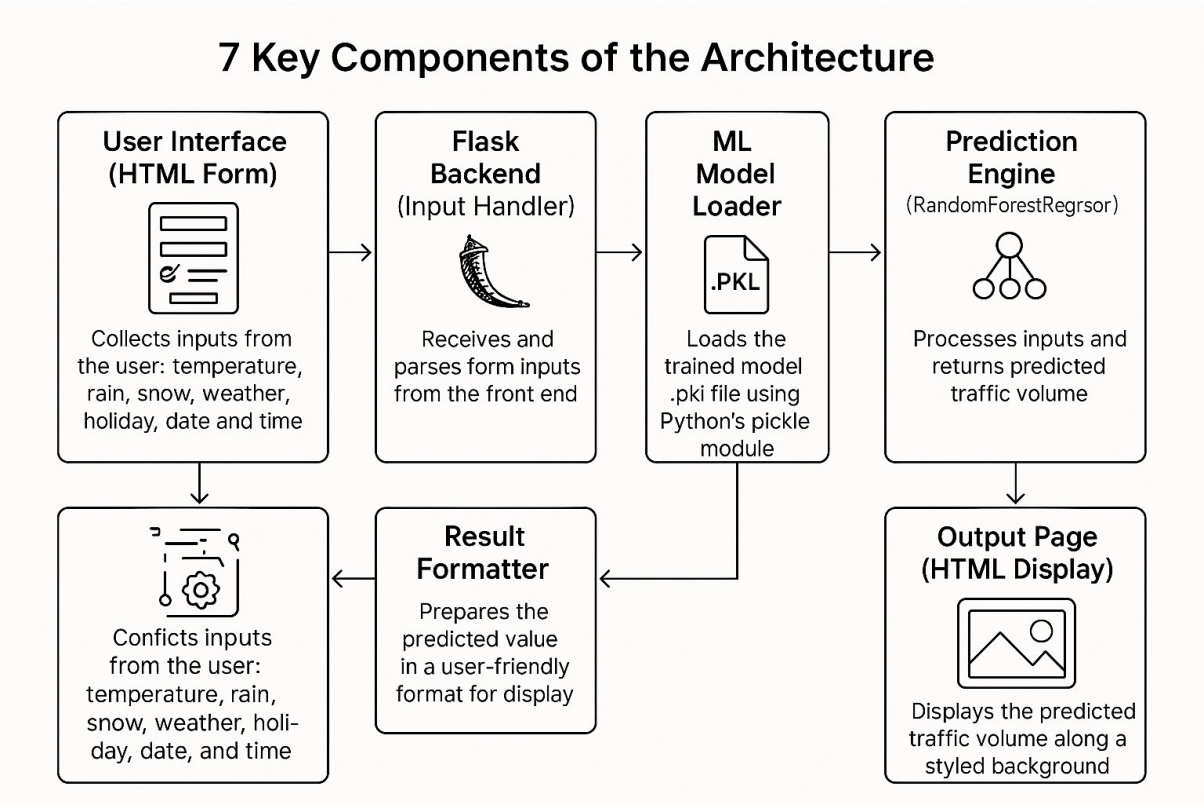
Solution Architecture-Traffic Telligence

- The solution architecture of *TrafficTelligence* integrates a user-friendly HTML interface with a Flask backend that processes input data. The system loads a pre-trained machine learning model to predict traffic volume based on weather and time features. Results are rendered dynamically on a styled output page for user feedback. This modular setup ensures scalability, maintainability, and ease of deployment.

Example - Solution Architecture Diagram:

Components of the Architecture

1. User Interface (HTML Form)
    - Collects inputs from the user: temperature, rain, snow, weather, holiday, date, and time.
2. Flask Backend (Input Handler)
    - Receives and parses form inputs from the front end.
3. Data Preprocessing Unit
    - Performs transformations: missing value handling, encoding, and type conversion.
4. ML Model Loader
    - Loads the trained model.pkl file using Python's pickle module.
5. Prediction Engine (RandomForestRegressor)
    - Processes inputs and returns predicted traffic volume.
6. Result Formatter
    - Prepares the predicted value in a user-friendly format for display.
7. Output Page (HTML Display)
    - Displays the predicted traffic volume along with a styled background



Technical Architecture: