VITISH 2024
(SIH Internal Hackathon)

- **Problem Statement ID –** 1617
- **Problem Statement Title-** Dynamic route rationalization model based on machine learning/AI would be required based on real-time traffic and road parameters.
- **Theme-** Smart Automation
- **PS Category-** Software
- **Team ID-** VITISH034
- **Team Name (Registered on portal) -** Fluke

DYNAMIC ROUTE RATIONALIZATION MODEL

Proposed Solution:

To solve this, the problem calls for a dynamic route rationalization model that adjusts in real time, using data from:

- Real-time traffic feeds (e.g., Google Maps API, GPS).
- Bus tracking data (via GPS).
- Road quality/condition data/Weather forecasts.

The solution should use Machine Learning (ML) and Artificial Intelligence (AI) to:

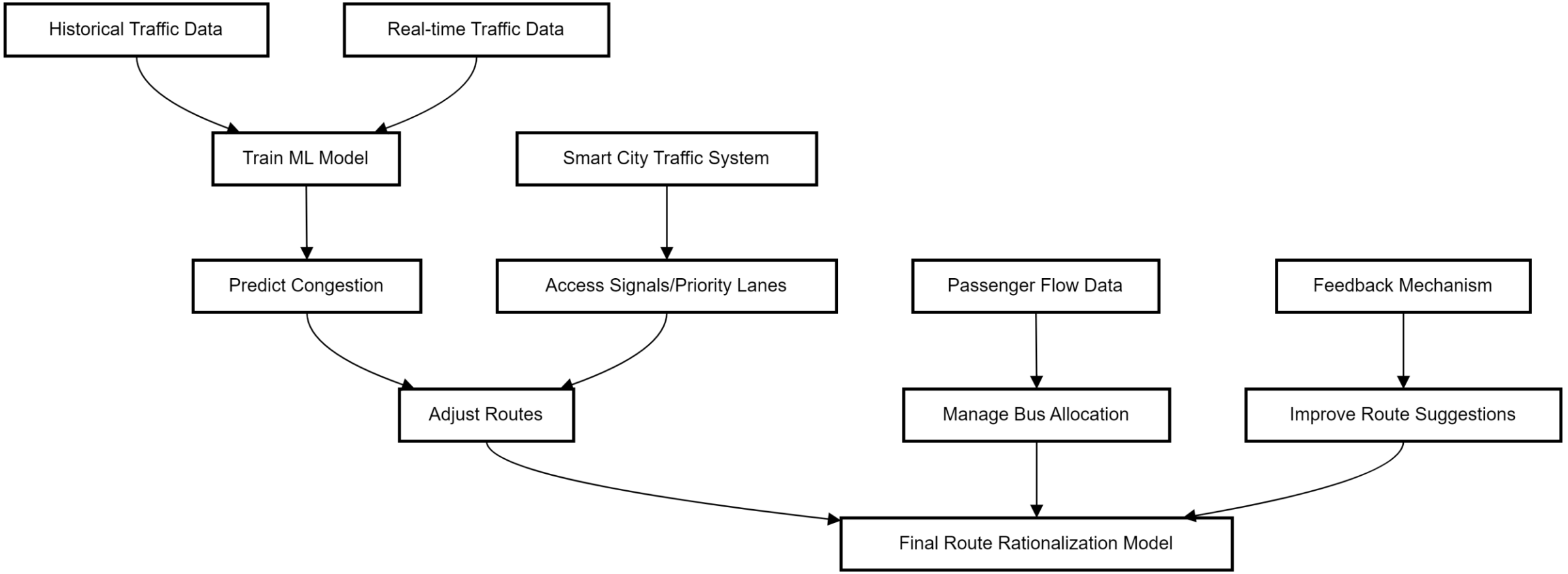
- Predict traffic patterns and adjust bus schedules/routes accordingly.
- Optimize bus allocation to avoid bunching and reduce delays.
- Monitor and adjust routes in real-time to react to sudden changes in road conditions or traffic

Fluke

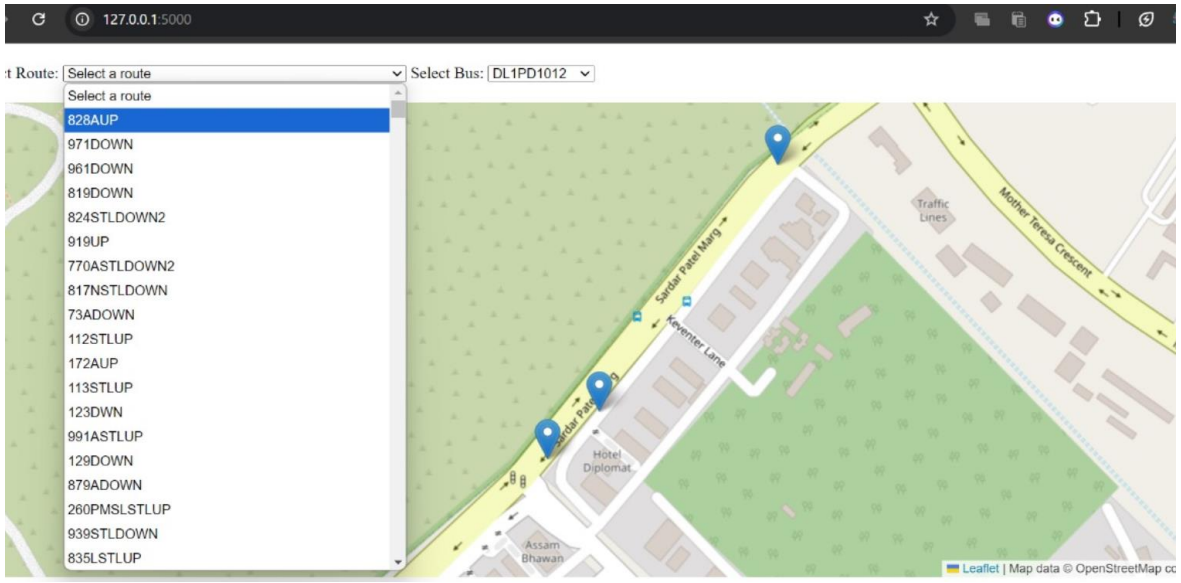
TECH STACK

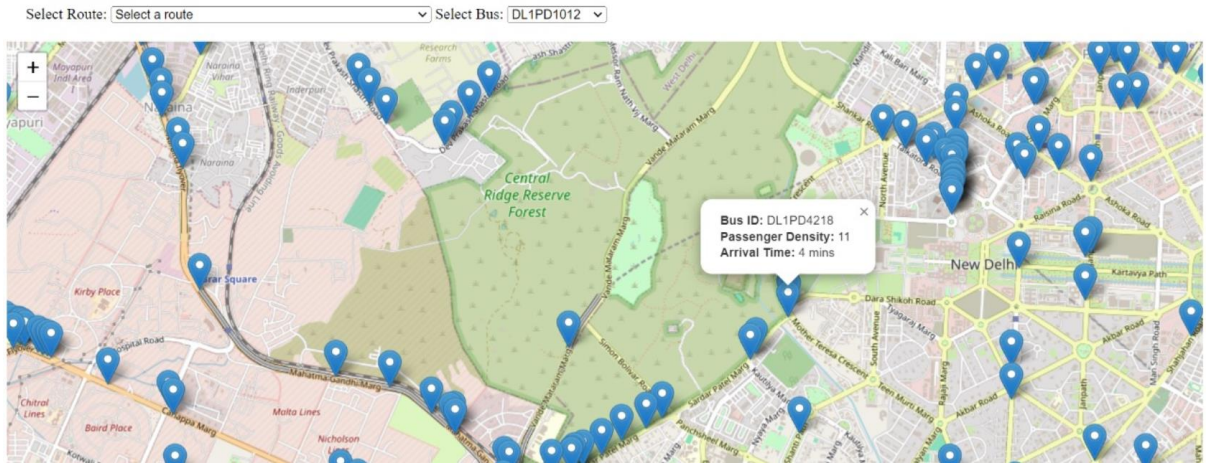
- Tech Stack used: Python, Folium, Flask, Pandas, HTML, JSON, JavaScript, Figma
- Area of implementation: Machine Learning

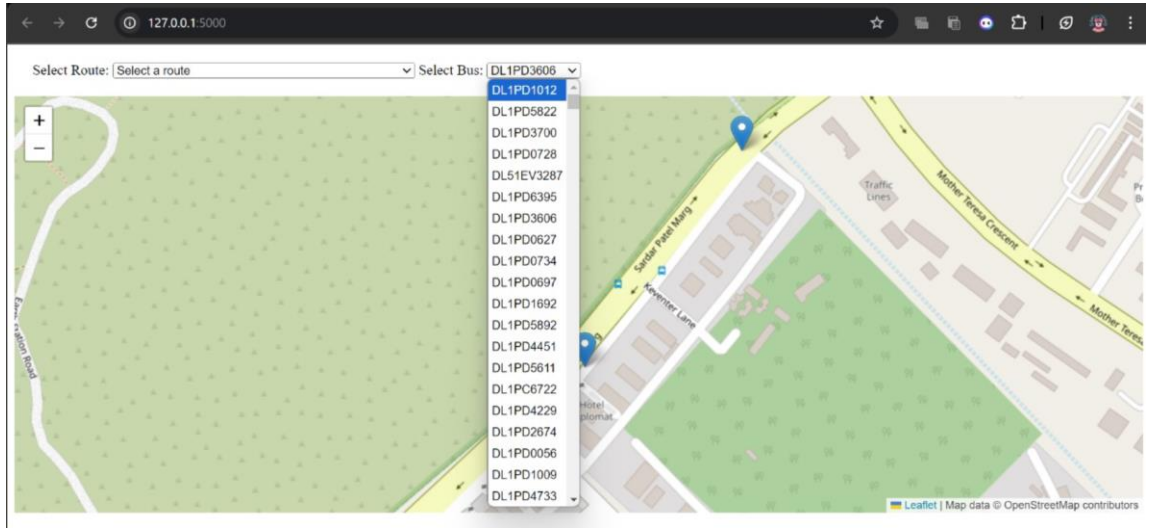
Fluke



Here is the flow of the project:







References: Open street map, Open transit Delhi

CHECK BUS ROUTE USING BUS NUMBER…

KNOW YOUR STOP…

Know Your Stop

Kashmere Gate

Advanced Search

Bus Stop: Kashmere Gate
Distance from your location: 1783.59 km
Address: Northern Railway Administrative Office, Kashmere Gate, Delhi 110006, India

Know Your Stop

KALYANVAS

Advanced Search

Bus Stop: KALYANVAS
Distance from your location: 1777.15 km
Address: C/10A, Pocket C, Mayur Vihar Phase 2, Delhi 110091, India

- Using **HAVERSINE CURVATURE DISTANCE**, we find the shortest route between two stops
- Based on the distance, estimated price has been shown.
- AC

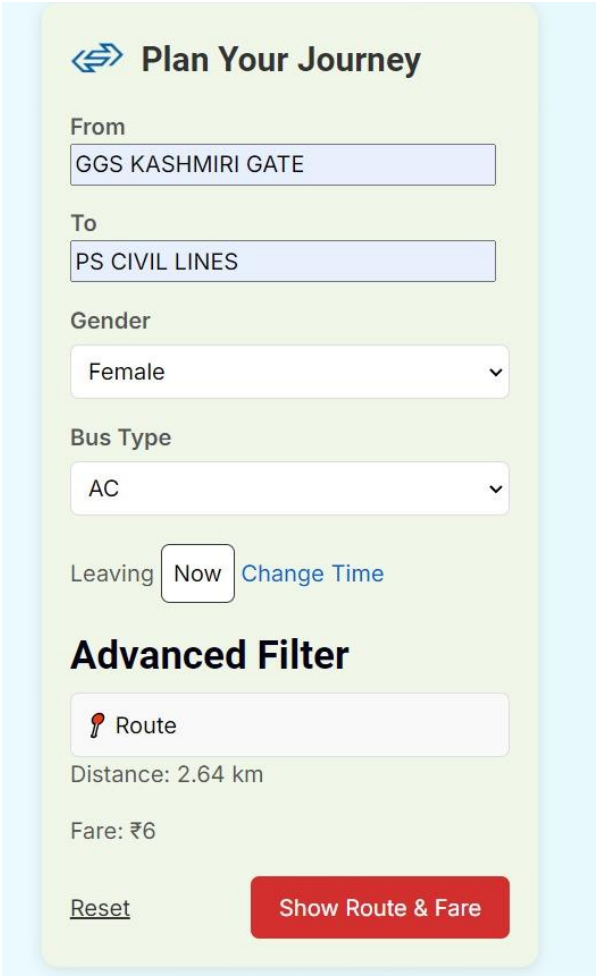
Male: Rs. 4/- per km

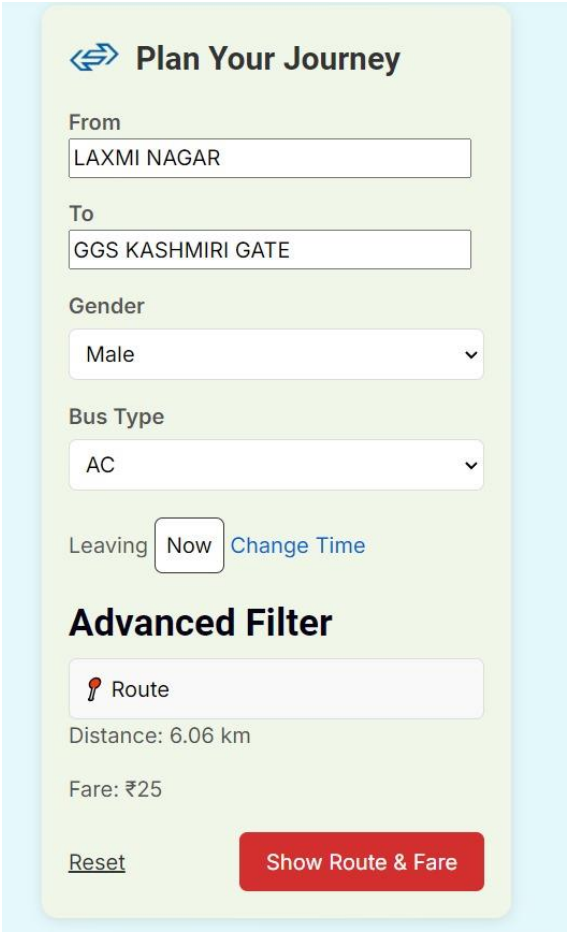
Female: Rs. 2/- per km

- NON-AC

Male: Rs. 3/- per km

Female: FREE





FEASIBILITY AND VIABILITY

- Feasibility: The feasibility of implementing a dynamic route rationalization model for DTC using real-time monitoring and machine learning depends on several factors
- Data Availability :Bus GPS Data, Passenger Data, Historical Data
- Technology Requirements: Real-Time Monitoring, Machine Learning Models, Integration with Existing Systems
- Infrastructure: Sensors and IoT Devices, Bus connectivity
- Human Factors: Bus drivers

- Viability: For a solution to be viable, it must offer measurable benefits that outweigh the costs, and it must be sustainable in the long term.
- Cost Considerations: Operational Costs, Cost of Retraining
- Impact on Operations: Cost Savings, Scalability, Reduced delays
- Long-Term Sustainability: Reduced Environmental Impact, Passenger Satisfaction, Adaptability
- Risk Factors: Technical Challenges, Adoption Resistance, Data Privacy & Security

Fluke

IMPACT AND BENEFITS

Social Benefits:
Reduced Travel Time,
Increased Safety,
Enhanced Accessibility

Economic Benefits:
Cost Efficiency,
Boosted Productivity,
Job Creation

Environmental Benefits: Reduced Emissions, Lower Fuel Consumption

Technological Impact:
Smart City Integration,
Scalability

Measurable Benefits:
Efficiency Gain,
Revenue Generation

Fluke