



VIT
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Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

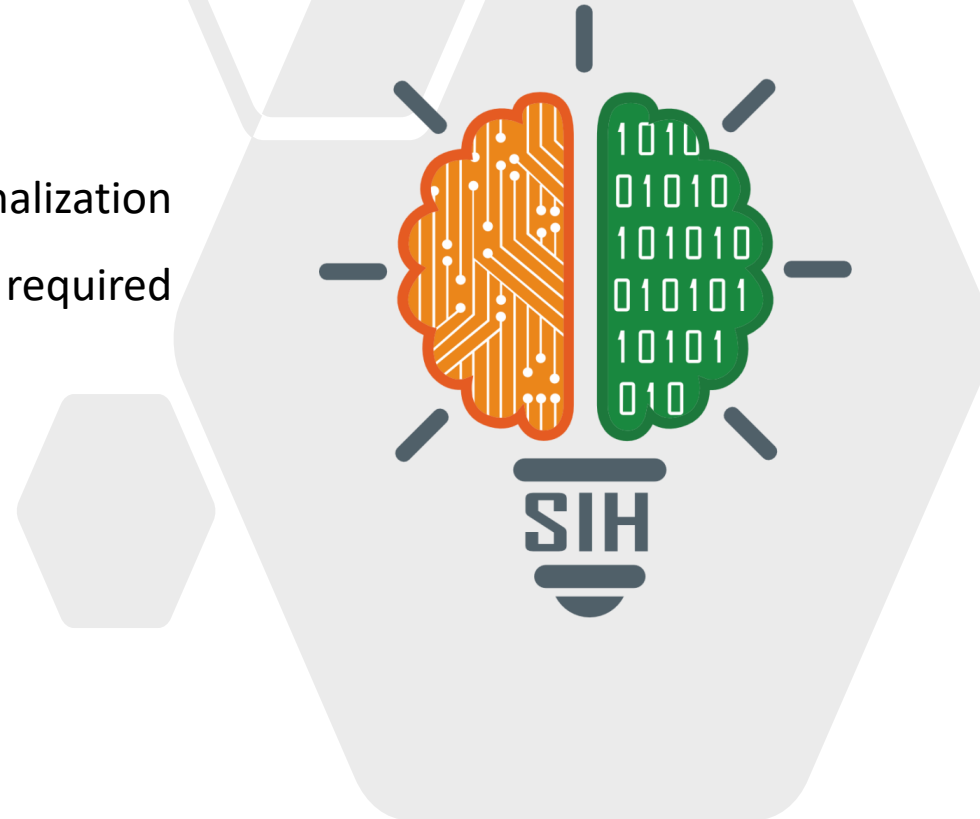


**SMART INDIA
HACKATHON
2024**



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

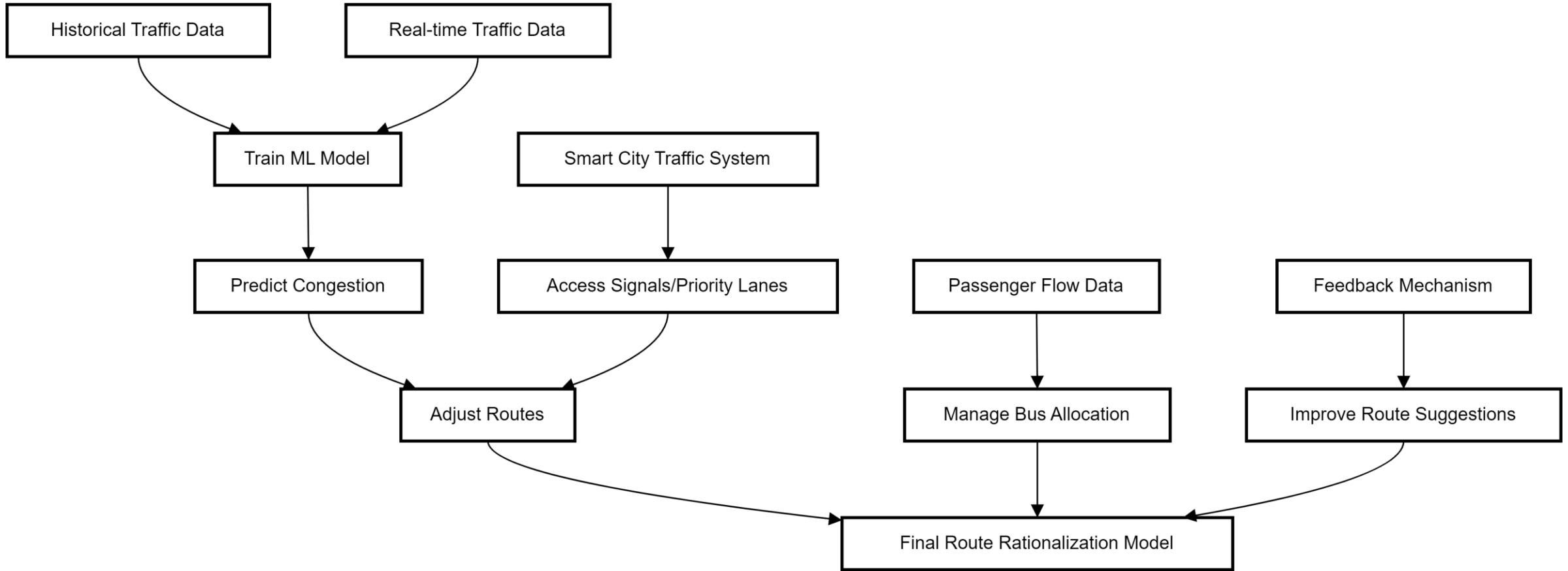
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TECHNICAL APPROACH

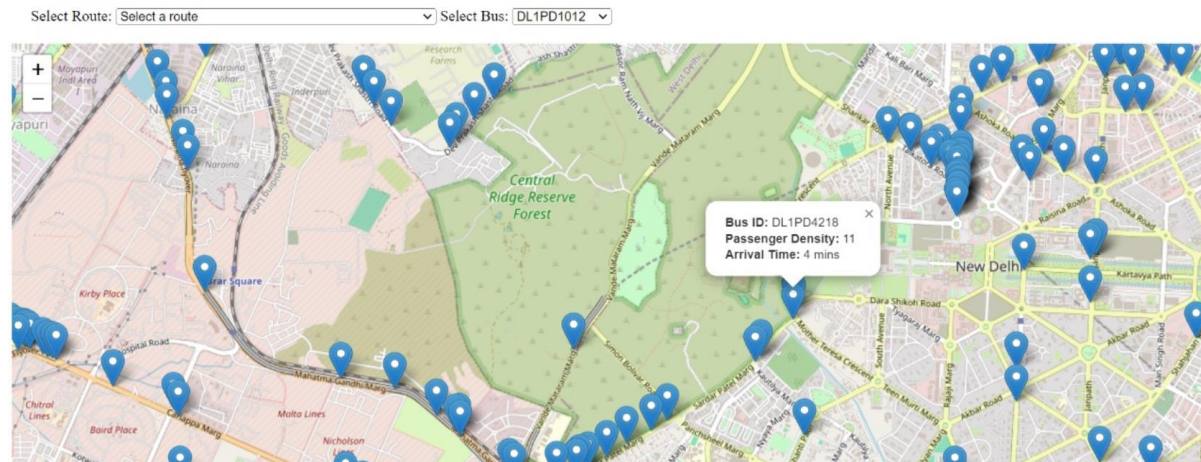
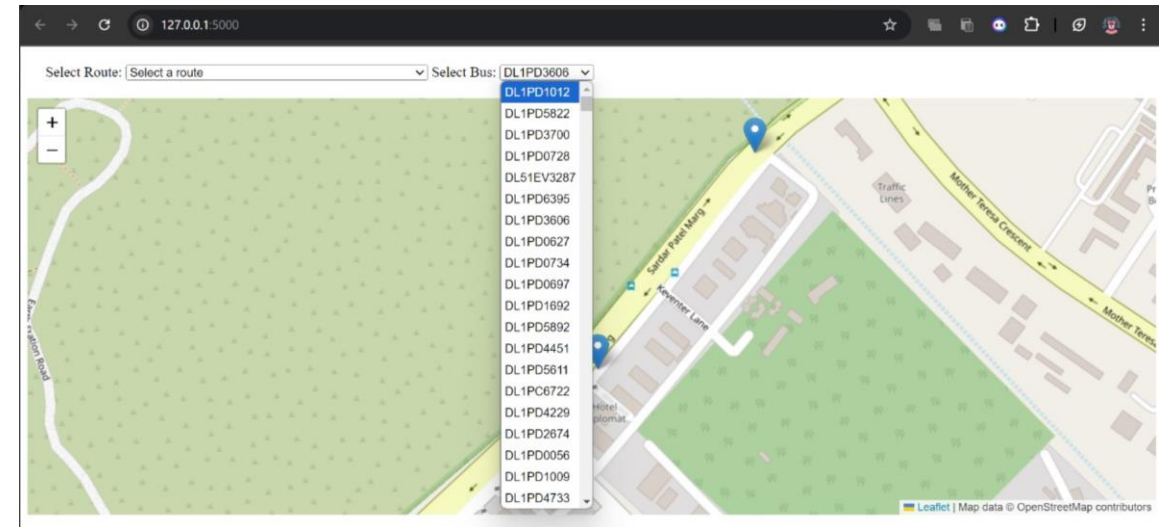
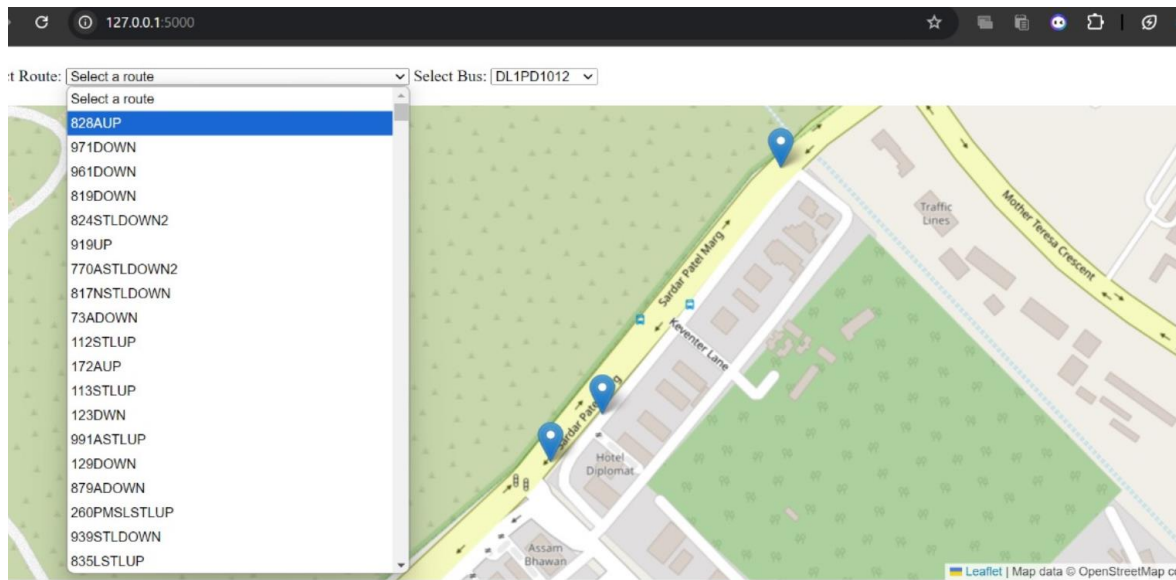


- Tech Stack used: Python, Folium, Flask, Pandas, HTML, JSON, JavaScript, Figma
- Area of implementation: Machine Learning

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Here is the flow of the project:



CHECK BUS ROUTE USING BUS NUMBER...

 **Know Your Bus**

Advanced Search

Bus No.	From	To	Route
957	Shivaji Stadium	Rohini Sec-22 Terminal	1. SHIVAJI STADIUM 2. CHITRA GUPTA RD. 3. 3 D.B.GUPTA MARKET 4. SARAI ROHILLA 5. ZAKHIRA 6. P.BAGH TERMINAL 7. MOHINDARA PARK 8. JD-BLK PITAM PURA 9. C-BLK.SARASWATI VIHAR 10. 3,4,5,6 ROHINI CROSSING 11. MANGOL PUR KHURD 12. BUDH VIHAR 13. ROHINI SEC-20/21 PKT-9 14. ROHINI SEC-22 TERMINAL.

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



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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



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- 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

 **Plan Your Journey**

From

GGG KASHMIRI GATE

To

PS CIVIL LINES

Gender

Female

▼

Bus Type

AC


▼

Leaving

Now

Change Time

Advanced Filter


 Route

Distance: 2.64 km

Fare: ₹6

[Reset](#)

Show Route & Fare

 **Plan Your Journey**

From

LAXMI NAGAR

To

GGG KASHMIRI GATE

Gender

Male

▼

Bus Type

AC


▼

Leaving

Now

Change Time

Advanced Filter

 Route

Distance: 6.06 km

Fare: ₹25

[Reset](#)

Show Route & Fare

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

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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

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