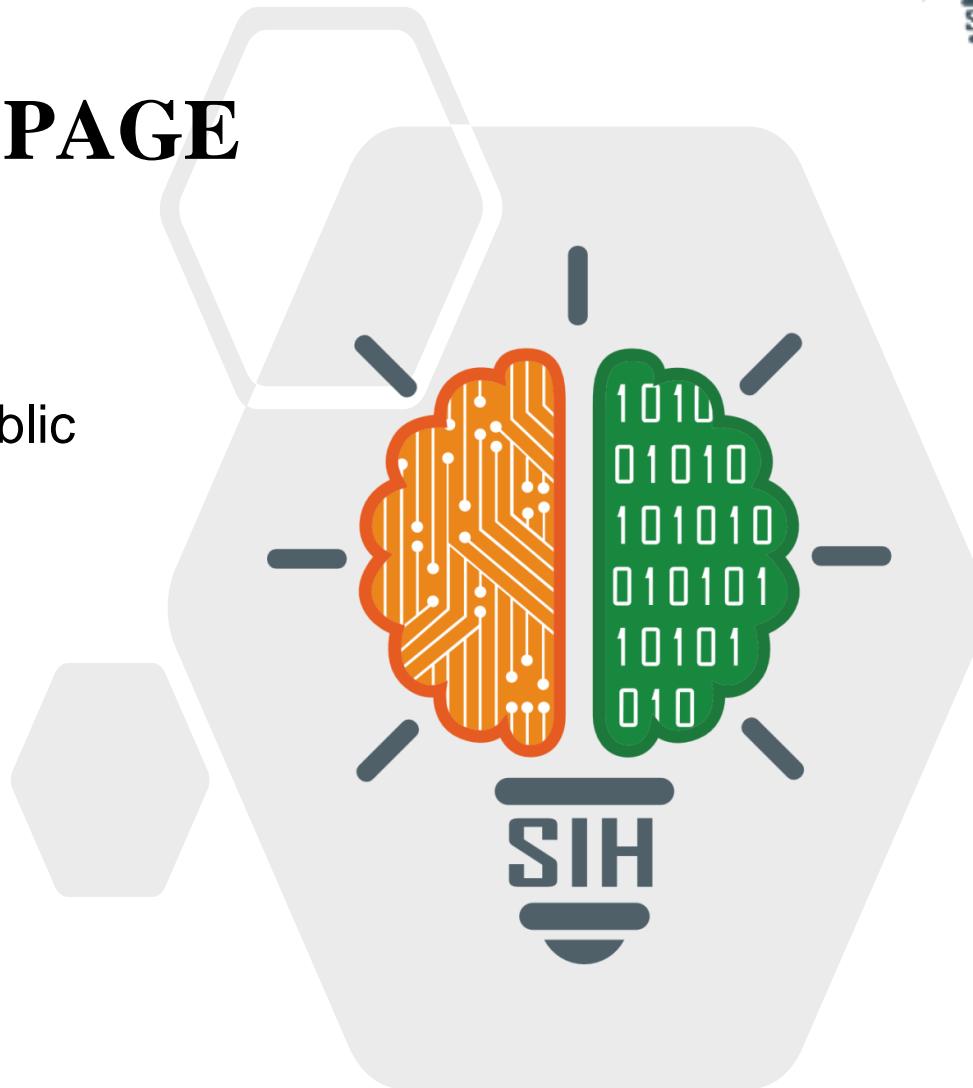


SMART INDIA HACKATHON 2025



TITLE PAGE

- **Problem Statement ID** – 25013
- **Problem Statement Title** – Real-Time Public Transport Tracking for Small Cities
- **Theme** – Transport & Logistics
- **PS Category** – Software
- **Team ID** –
- **Team Name** – NUVIRA



SMART – BUS



“Every year, more than **60%** of commuters in rural cities suffer from **unpredictable bus timings, overcrowding, and lack of real-time updates.**

To counter this growing challenge, we present **Smart-Bus**, a simple yet powerful mobile app to make public transport **smarter, safer, and more reliable.**”



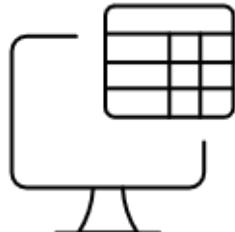
Passenger Portal

Search bus stops
live bus tracking
ETA predictions
SOS alerts
ratings.



Driver Portal

Start trip (GPS Share)
report delay status
SOS directly to Admin.



Admin Portal

Manage routes &drivers
real-time monitoring
analytics dashboard SOS
verification.

Proposed Solution

- Mobile app with **3 portals**
- (Passenger, Driver, Admin).
- Real-time GPS bus tracking.
- AI-powered ETA (Google Maps Traffic API).
- SOS emergencies (Medical, Police, Women Safety, Breakdown).
- Passenger ratings (bus, driver, experience).
- Rural-friendly flashy UI with animations.

Innovation / Unique Value Proposition

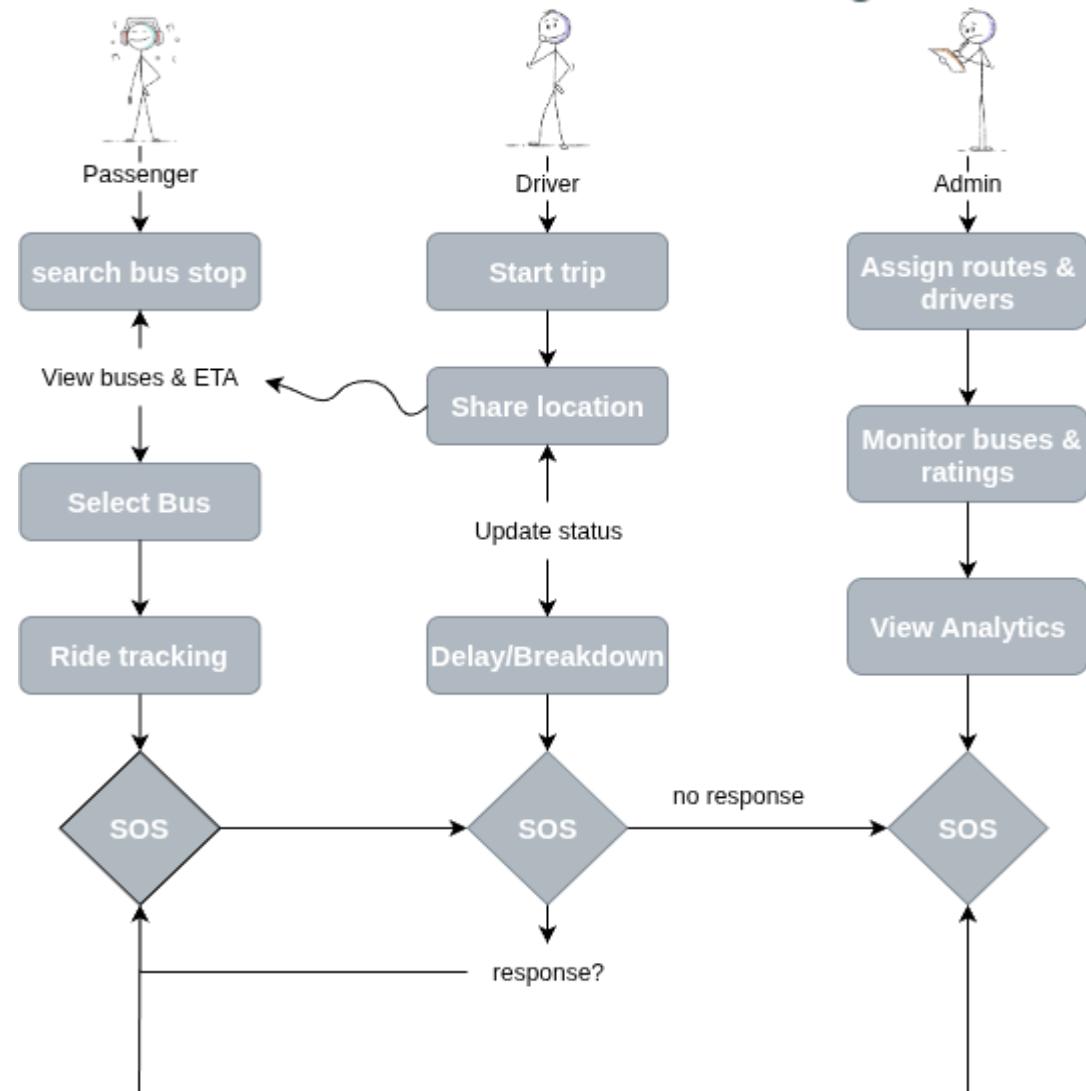
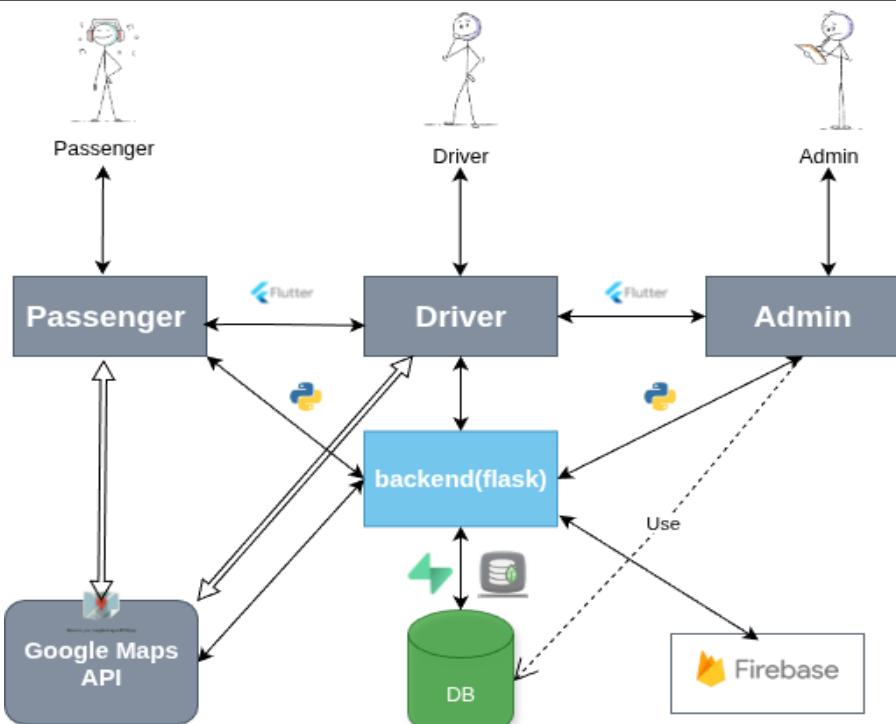
- Multi-portal design.
- SOS escalation logic.
- Analytics for admins.

TECHNICAL APPROACH



Tech Stack

- **Frontend:** Flutter / React.js
- **Backend:** Flask (Python REST)
- **Database:** MongoDB / supabase
- **Maps:** Google Maps API
- **Authorisation :** Firebase



Feasibility

- Feasible with existing tech (Google Maps + Firebase).
- Optimized for low-bandwidth 3G/4G.
- Scalable for future Scope.
 - Add **multi-language support** (Hindi, Punjabi, Telugu, etc.).
 - **AI-powered route optimization** (predict delays, suggest alternate buses).
 - AI powered **SOS informer**

Strategies

- - **Simple driver interface**
- - **Offline caching & low-data mode**
- - **AI ETA + static fallback**
 - If (GPS/Internet) isn't available the app doesn't just "break". Instead, it falls back to static, pre-stored data

Challenges Faced

Driver Adaptation – Driver Might be new to this modern UI

Rural Area Network Issues – Might not work on below 2G/3G networks

ETA inaccuracy – Wrong Estimated Times in Heavy Traffic

IMPACT AND BENEFITS



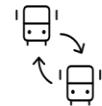
IMPACT ON ALL USERS

- **Commuters:** Save time, reliable & Safe travel.
- **Drivers:** Better coordination.
- **Govt:** Data-driven planning.

Business Potentials

- **Scalable Product** – Once developed, the same system can be replicated to hundreds of cities with minimal changes.
- **Data as a Service** – Provide valuable transport analytics to government bodies for planning new routes and reducing congestion
- **In-App Revenue** – Ads from local businesses (shops, hospitals, services near bus stops).

Benefits of Our App



Social Benefits

Safer travel and improved safety for women passengers. Less stress for all passengers.



Economic Benefits

Increased bus ridership and fuel efficiency. Overall cost reduction for transportation.



Environmental Benefits

Lower pollution levels and reduced traffic congestion. Promotes sustainable transportation options.



REFERENCES

- Khan, M. A., et al., "GPS and GSM Based Bus Tracking," IEEE International Conference on Communication and Signal Processing (ICCSN), 2016
 - Link - <https://www.ijert.org/gps-and-gsm-based-real-time-bus-monitoring-system>
- Carol L. Schweiger, "Real-Time Bus Arrival Information Systems - A Synthesis of Transit Practice" Transportation Research Board, 2003
 - Link - https://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_syn_48.pdf

Demo Link - <https://smartbus-transport.netlify.app>

(NOTE – This is only a **demo** of how our app “might” look like ...it demonstrates the UI and flow. Backend integration And Live tracking and API & AI integration will be connected in the later implementation

Comparision With Popular Apps

Features	TSRTC Gamyam	Smart - Bus
Live Bus Tracking	✓	✓
Estimated Arrival Time (ETA)	✓	✓
Bus Routes Search	✓	✓
SOS / Emergency	✗	✓
Admin Analytics DashBoard	✗	✓