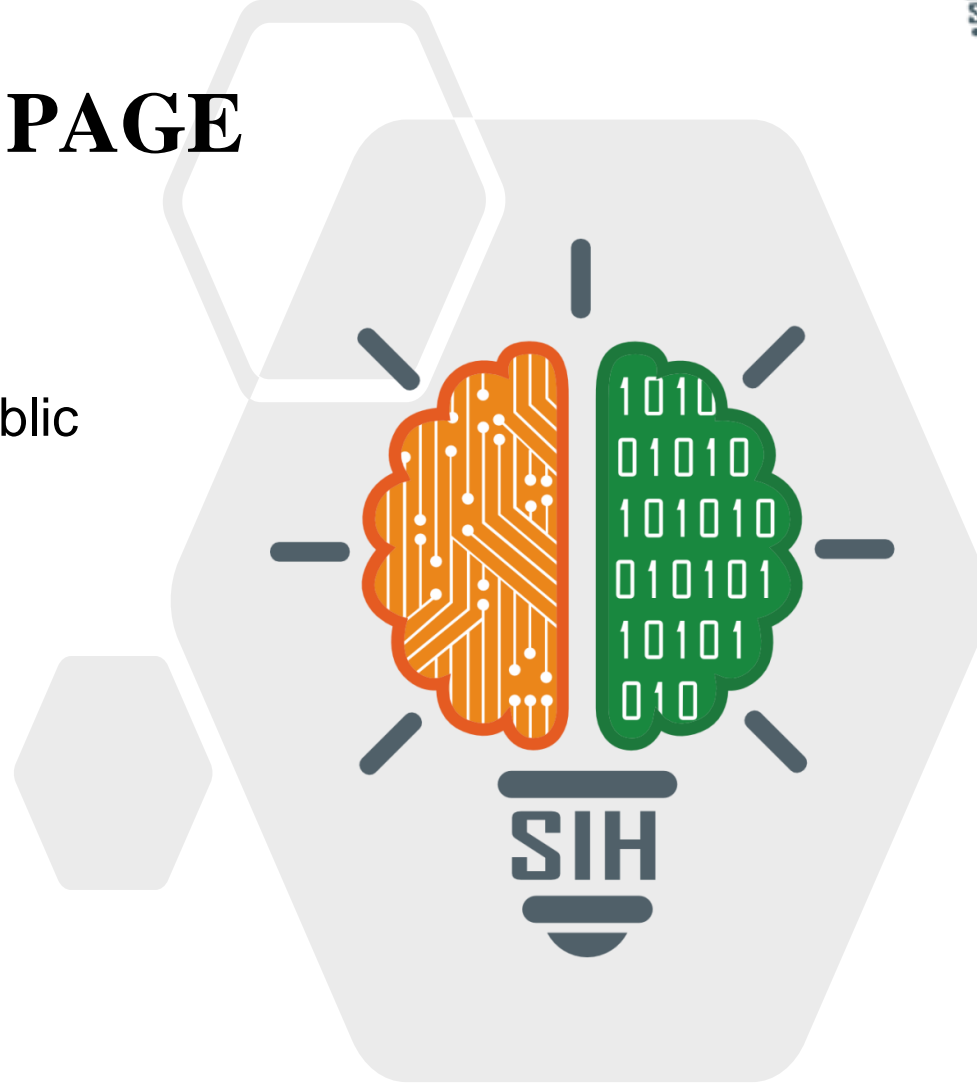


## TITLE PAGE

- **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



“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.**”



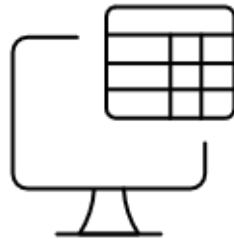
## Passenger Portal

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

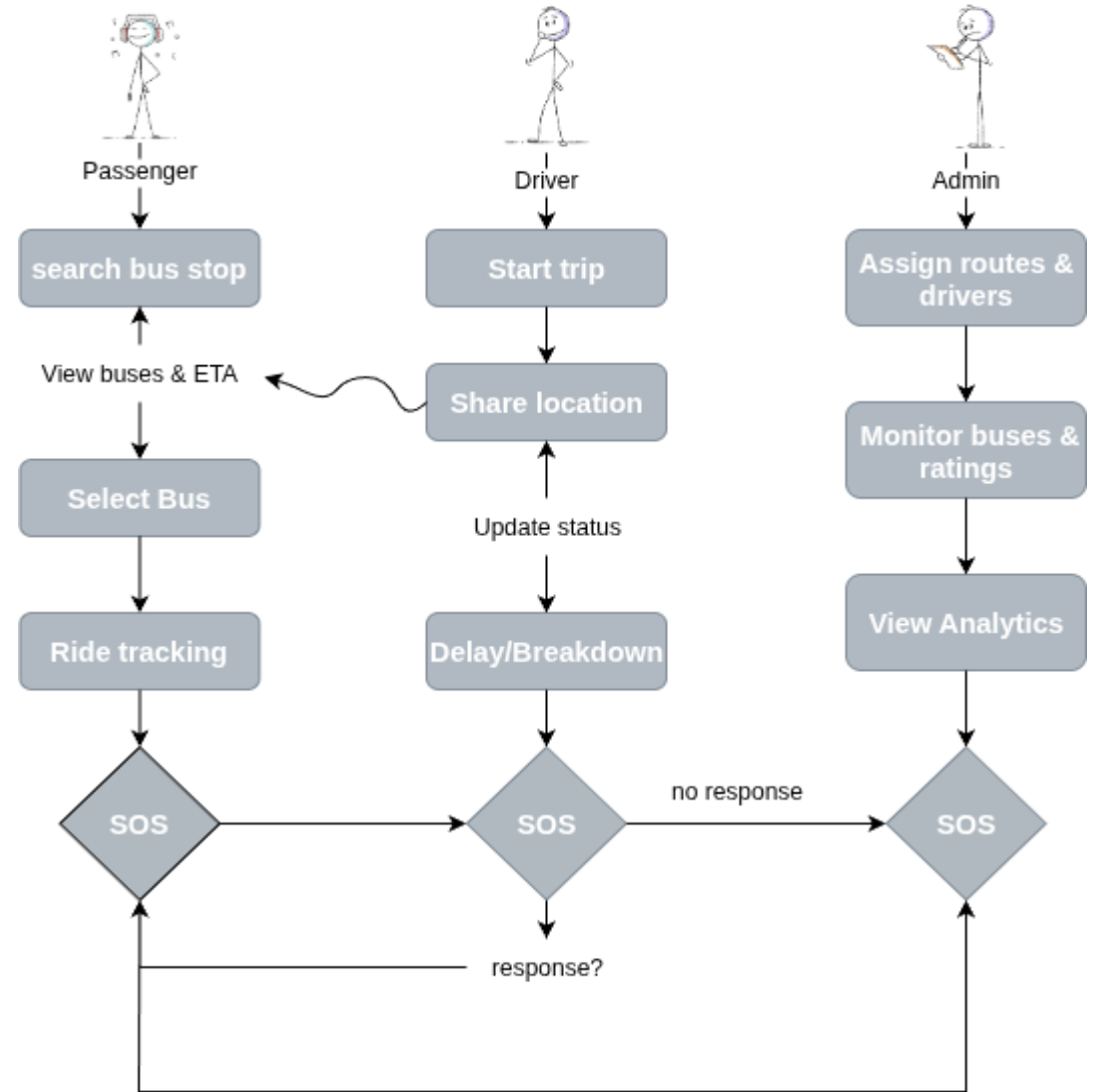
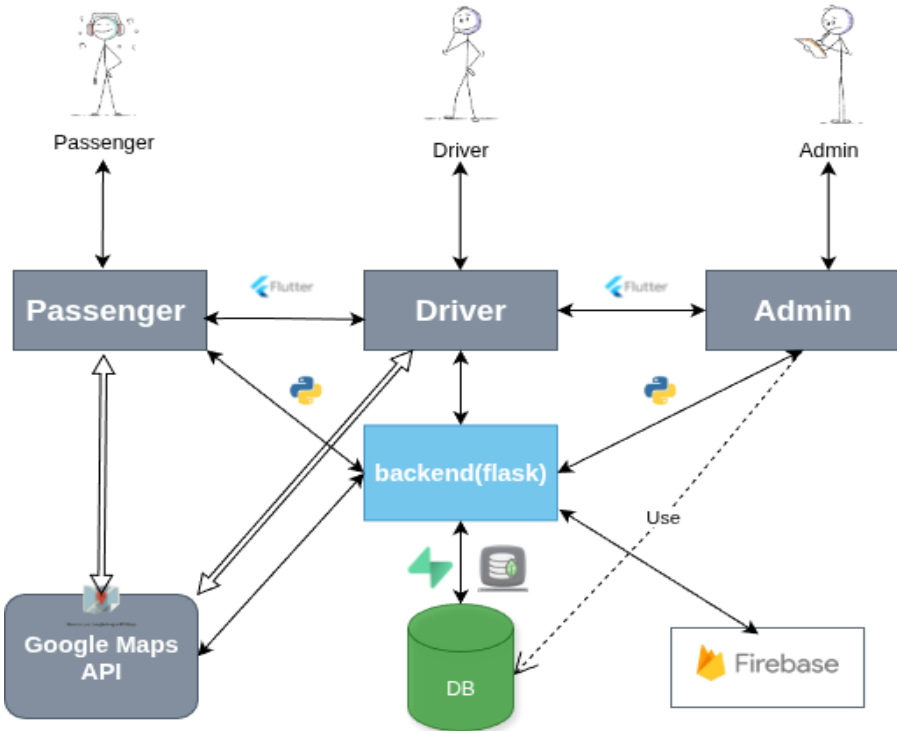
- Mobile app with **3 portals**
- (Passenger, Driver, Admin).
- Real-time GPS bus tracking.
- AI-powered ETA (Google Maps Traffic API).
- SOS emergencies (Medical, Police, Women Safety, Breakdown).
- Passenger ratings (bus, driver, experience).
- Rural-friendly flashy UI with animations.

## Innovation / Unique Value Proposition

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

## 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

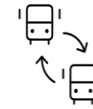
## IMPACT ON ALL USERS

- **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](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	✗	✓