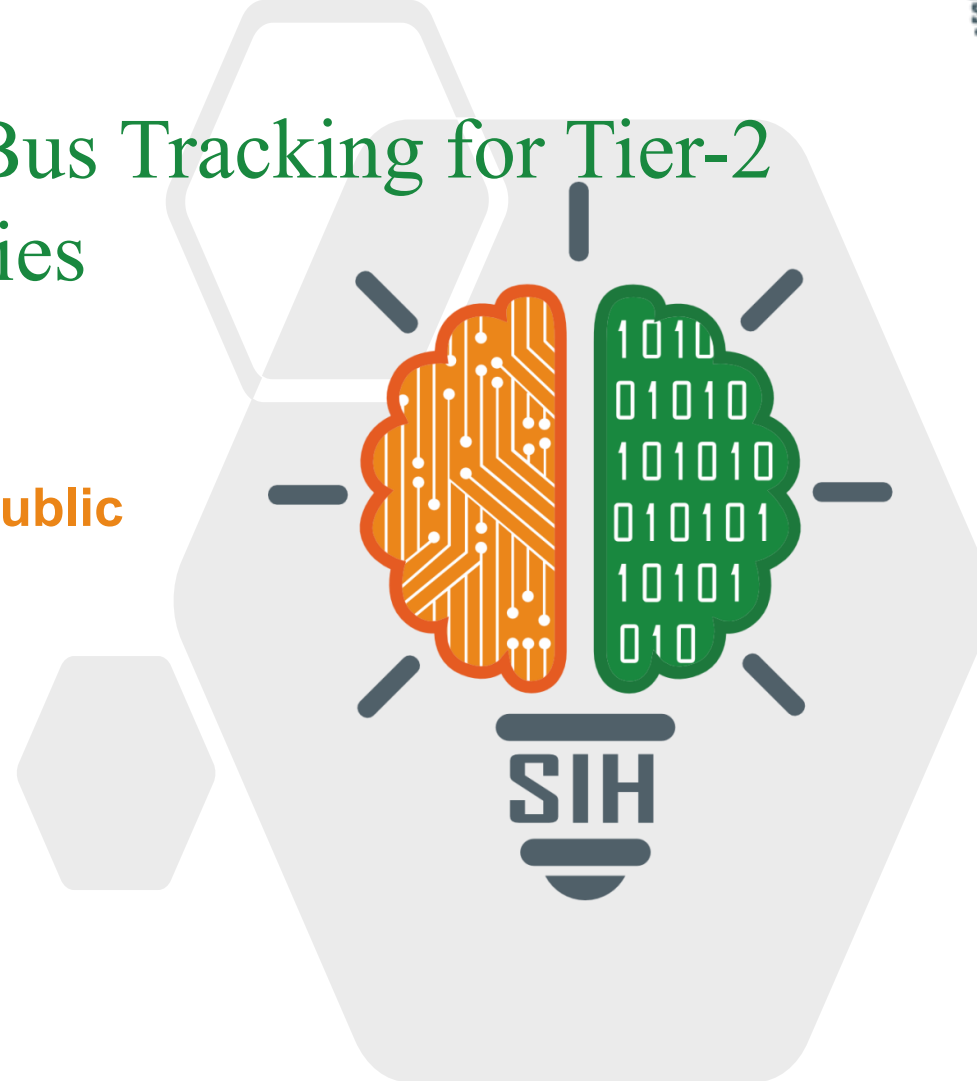


SMART INDIA HACKATHON 2025



YatraLive: Real-Time Bus Tracking for Tier-2 Cities

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





YatraLive

YatraLive bridges the gap between commuters and unpredictable bus services in India's tier-2 cities. By leveraging driver smartphones, cloud services and local mapping providers, it delivers real-time bus locations, estimated arrival times and service alerts—even when network connectivity is poor

❖ Proposed Solution

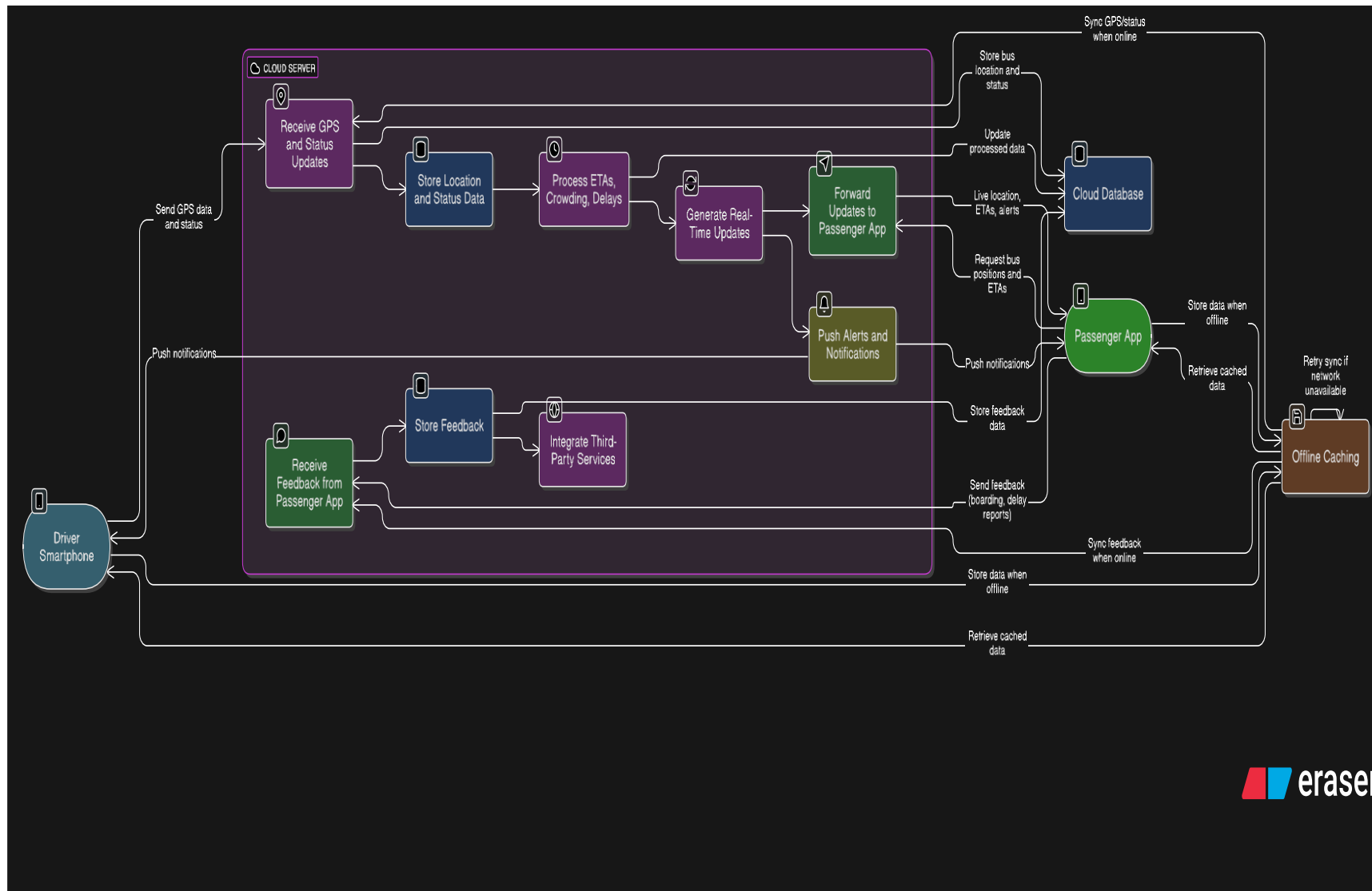
- **Smartphone-based driver app:** Each bus uses a lightweight Flutter app to capture GPS data and send periodic updates to a cloud database.
- **Passenger app:** Commuters view live bus positions and ETAs on a map (powered by **Ola Maps** or another Indian provider), with offline schedule fallback when connectivity drops.
- **Two-way feedback:** Riders can confirm **boarding or report delays**, improving data accuracy and crowding estimates.
- **Real-time notifications:** Firebase Cloud Messaging enables targeted alerts to individuals, groups or topic subscribers for diversions, breakdowns or approaching buses.
- **Low-bandwidth design:** Data payloads are small; the system caches information locally and resends writes when the network returns

❖ Uniqueness

- **No Extra Hardware:** The solution works entirely with driver **smartphones**, eliminating hardware costs and simplifying deployment.
- **Regional Focus:** Uses Indian mapping solutions and **supports local languages** to ensure accuracy across diverse cities.
- **Offline Resiliency:** Built-in caching and optional cell-tower/SMS fallback ensure the app remains useful when data connections fail.
- **Passenger Participation:** Boarding confirmations and delay reports enrich data and empower commuters to improve service.
- **Push-Alert Architecture:** FCM supports notifications to single devices, groups or topics, enabling highly targeted alerts



TECHNICAL APPROACH



Tech Stack





FEASIBILITY AND VIABILITY



❖ Feasibility of Idea

- **Technologically Viable:** Utilizes existing smartphone hardware and mature cloud services; offline caching keeps data available during outages.
- **Clear Demand:** Many transport systems suffer from lack of real-time updates, inefficient route planning and safety concerns, signaling strong need for such a solution.
- **User Friendly:** Simple mobile apps make adoption easy for drivers and commuters; no specialized equipment is required.
- **Scalable:** Cloud-native architecture can expand from a few buses to entire city fleets without major changes.
- **Policy Alignment:** Supports Smart City and Digital India initiatives promoting modern, inclusive public transport services.

❖ Potential Challenge & Overcomes

- **Accuracy & Connectivity:** GPS drift and network outages could affect precision; local caching and fallback techniques mitigate these issues.
- **Real Time Processing:** Frequent updates may strain devices; optimized code and efficient scheduling help maintain responsiveness.
- **Adaption & Training:** Drivers may resist new tools; provide intuitive UI, simple training and small incentives to encourage usage.
- **Data Privacy:** Protect user data with secure authentication and encryption; store only necessary location information.
- **Localisation:** Regional routes and languages vary; design the app to support multiple languages and region-specific customizations.



IMPACT AND BENEFITS



❖ Potential Impact

- **Reliable Commutes:** Accurate arrival times reduce waiting and anxiety, leading more people to trust public buses.
- **Greener Cities:** Increased public transport use lowers traffic congestion and emissions.
- **Operational Insights:** Authorities gain visibility into delays, bottlenecks and performance, enabling smarter route planning.
- **Inclusive Mobility:** Offline features ensure access for users in areas with poor connectivity, preventing exclusion.
- **Community Empowerment:** Commuters participate in service improvement by reporting issues and providing feedback.

❖ Potential Challenge & Overcomes

- **Real-Time Communication:** Continuous updates and targeted push notifications keep everyone informed.
- **Ease of Use:** Simple apps for drivers and passengers mean minimal training and quick onboarding.
- **Flexible & Scalable:** Works on existing smartphones; easily extends to other vehicle types or additional cities.
- **Cost-Effective:** Eliminates the need for specialized tracking hardware; low data usage keeps operational expenses down.
- **Wide Reach:** Suitable for both rural and urban contexts; offline mode ensures usefulness even in low-bandwidth areas.



RESEARCH AND REFERENCES



- Urban Mobility Report 2024
- [Gap in Real-Time Transit Data](#)
- APSRTC Live Track (Gov App)