Google Developer Group
On Campus

TechSprint

Leveraging the power of AI

Team Details

Team name: Anti-Gravity
Team leader name: Niranjan Reddy P R
Problem Statement: Open Innovation

Google Developer Group
On Campus

Brief about your solution and problem statement addressing

Problem Statement

- Campus students often miss buses due to no real-time visibility
- No information on bus location, ETA, or delays
- Long waiting times and daily uncertainty at bus stops
- Inefficient bus usage during low crowd situations
- Limited monitoring and control for campus management
- Parents lack assurance about student commute safety

Our Solution – CambusTracker

- A real-time campus bus tracking system
- Live bus location with accurate ETA to stops
- Arrival alarms to notify users before the bus arrives
- Dedicated driver app for automatic GPS updates
- Admin controls for dynamic bus–route allocation
- Smart route optimization to reduce empty buses
- Improves punctuality, efficiency, safety, and peace of mind

Google Developer Group
On Campus

Opportunities

a. How is it different from existing ideas?

- Designed specifically for campus transportation, not generic city buses
- Combines student, driver, and management workflows in one ecosystem
- Focuses on arrival alerts, nearest stop ETA, not just live location
- Supports dynamic bus-to-route allocation based on daily demand
- Optimizes operations by combining routes during low crowd situations

b. How does it solve the problem?

- Provides real-time bus location and ETA, eliminating uncertainty
- Notifies students before bus arrival, preventing missed buses
- Enables drivers to share location automatically with minimal effort
- Helps management monitor, optimize, and allocate buses efficiently
- Improves safety, punctuality, fuel efficiency, and parent confidence

Google Developer Group
On Campus

List of features offered by the solution

🚍 Student Features

- Live bus location tracking on map
- Accurate ETA to nearest bus stop
- Walking route guidance to nearest stop
- Arrival alarm notifications to avoid missing buses
- Route and stop visibility in real time

👨‍👧 Parent & System Benefits

- Improved student safety and punctuality

👨‍✈️ Driver Features

- Dedicated driver app
- One-tap trip start/stop
- Automatic background GPS location sharing
- Minimal interaction for safe driving

🏫 Management Features

- Admin dashboard for buses, routes, and drivers
- Dynamic bus-to-route allocation
- Real-time monitoring of all active buses
- Improved fuel and resource optimization

Google Developer Group
On Campus

Google Technologies used in the solution

📱 Application & Platform

- Flutter – Cross-platform UI development for Android apps
- Android SDK – Native Android features and foreground services

🔐 Backend & Data

- Firebase Authentication – Secure user and driver authentication
- Cloud Firestore – Real-time database for bus, route, and location data

🗺️ Maps & Location Services

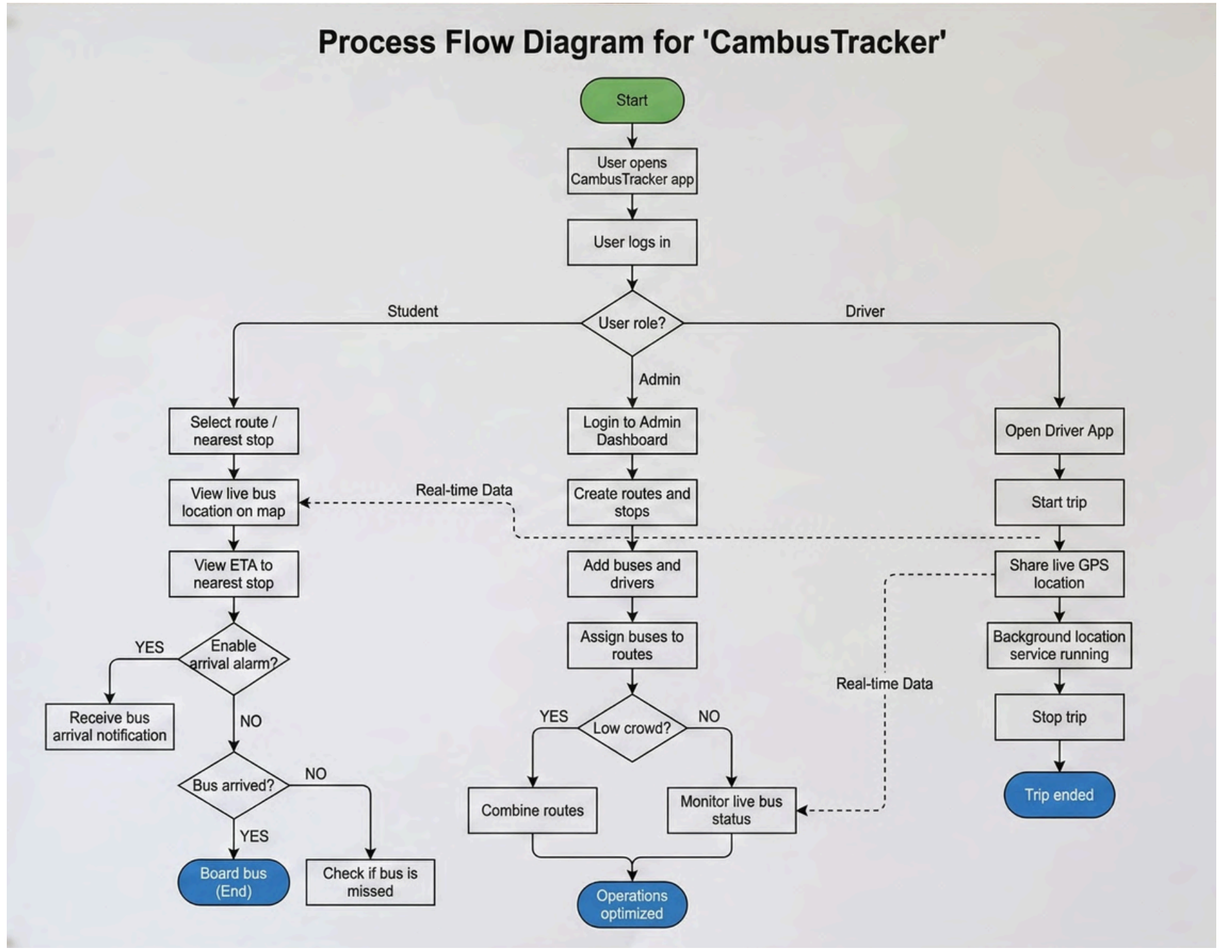
- Google Maps SDK for Android – Live map display and bus tracking
- Google Directions API – Walking route to nearest bus stop
- Android Location Services (GPS) – Real-time bus location and speed

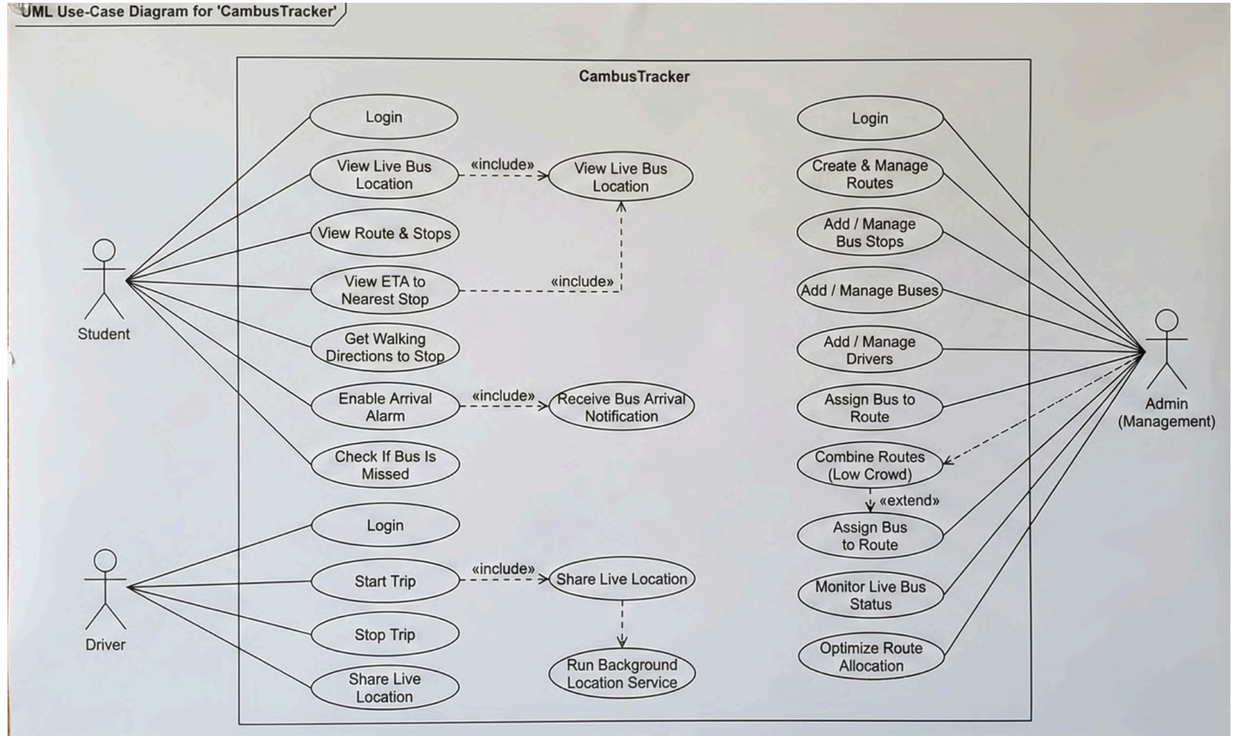
⚙️ System & Performance

- Android Foreground Services – Continuous background location tracking
- Google Cloud Platform (GCP) – API management and scalability

Google Developer Group
On Campus

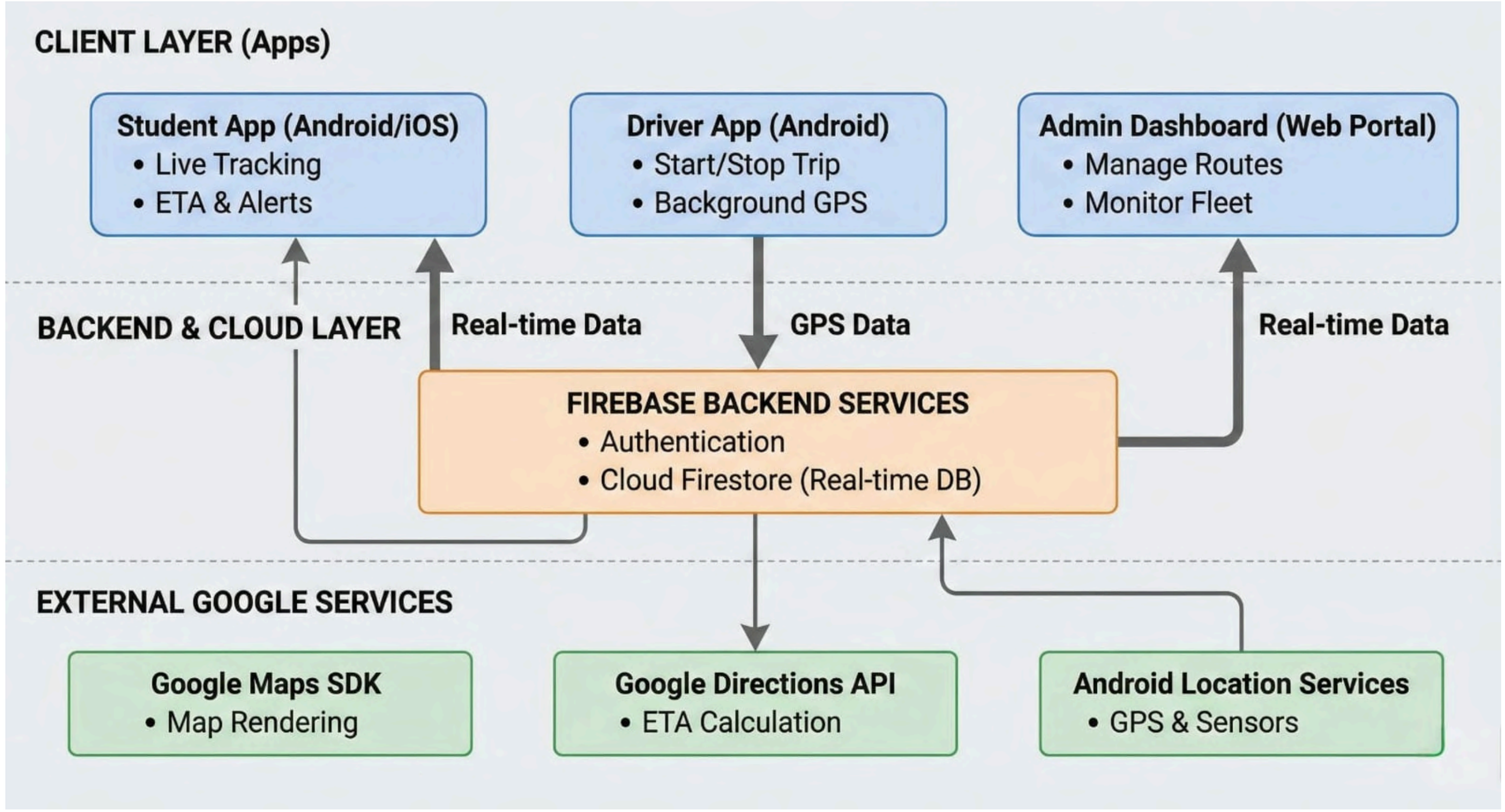
Process flow diagram or Use-case diagram





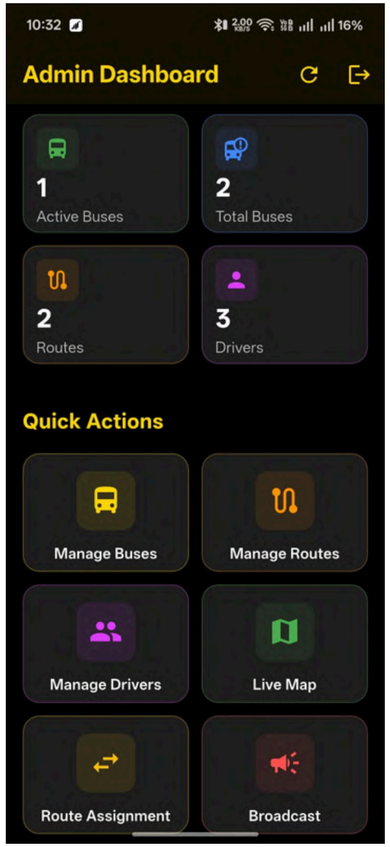
Google Developer Group
On Campus

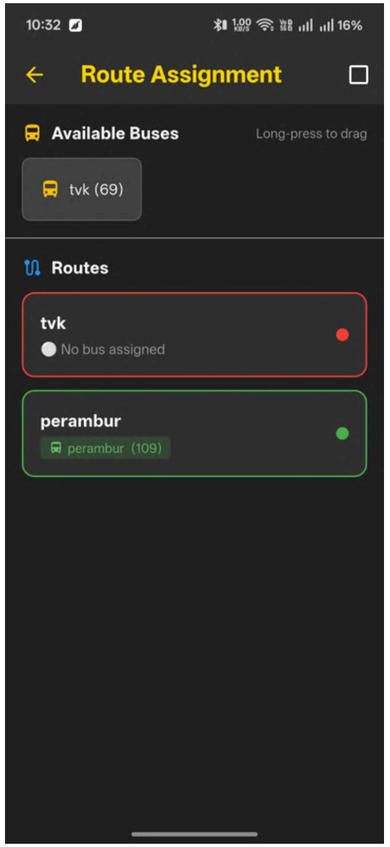
Architecture diagram of the proposed solution

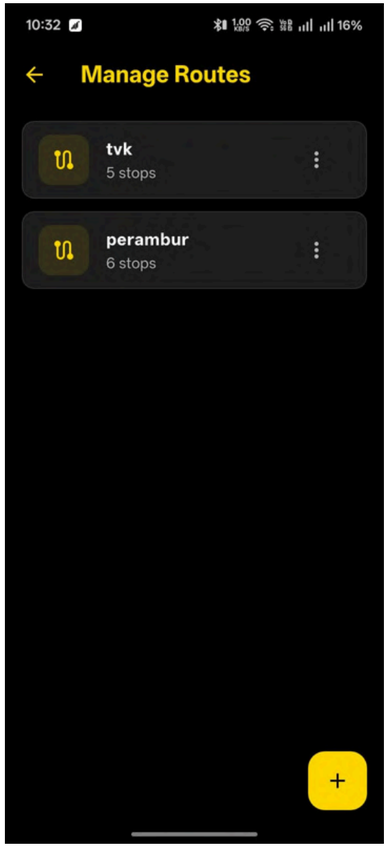


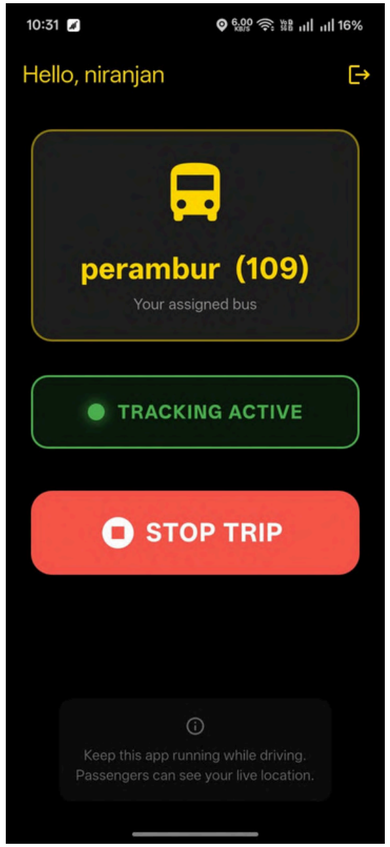
Google Developer Group
On Campus

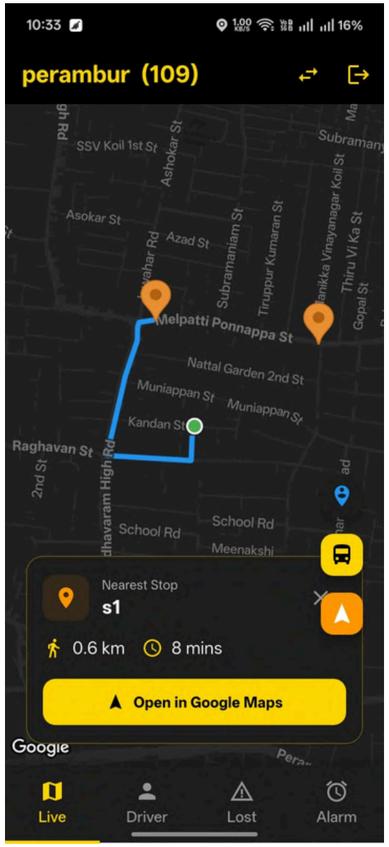
Snapshots of the MVP

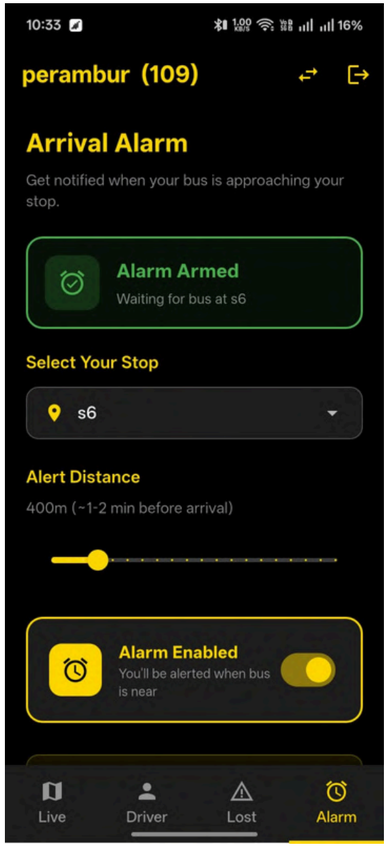












Google Developer Group
On Campus

Additional Details/Future Development (if any)

🔔 Safety & Communication

- Emergency alerts and SOS feature
- Parent notifications for bus arrival and delays
- In-bus passenger count estimation

📊 Advanced Analytics

- Daily and monthly route performance reports
- Bus utilization and fuel efficiency analytics
- Driver performance and punctuality insights

🌐 Platform Expansion

- Web dashboard for management and parents
- iOS support for students and drivers
- Multi-campus and city-wide scalability

Google Developer Group
On Campus

🔗 GitHub Public Repositories

Student App:

https://github.com/Niru-26016/cambustracker

Driver App:

https://github.com/Niru-26016/cambustracker_driver

📽️ Demo Video (3 Minutes)

https://drive.google.com/drive/folders/1q-mpOT1Pi9ENsiVVMGnyeQlXr4XcGpW2?usp=sharing

🚀 MVP Link

https://drive.google.com/drive/folders/1q-mpOT1Pi9ENsiVVMGnyeQlXr4XcGpW2?usp=sharing

Google Developer Group
On Campus

TechSprint

Leveraging the power of AI

Thank you!