

# Real-Time Bus Tracking App

**"Introducing a Game-Changer: Real-Time Bus Tracking App"**

**"Our Goal: Revolutionizing Public Transportation for Enhanced Efficiency and User Experience"**

## **Key Features:**

- "Bus Names"
- "Live GPS Tracking"
- "User-Friendly From And To Selection"
- "Accurate Bus Timings"
- "Real-Time Bus Speed Monitoring"

# **APP WORKFLOW** (Admin, Driver, and User)

## **Admin panel workflow**

### **Bus and Stop Management:**

- 1) Admins can add, edit, or remove bus names and bus stops.
- 2) These updates are reflected in both the user and driver portals.

### **Driver and Conductor Management:**

- 1) Admins create login credentials for drivers and conductors.
- 2) This ensures secure access to the driver portal.

# **Driver Portal Workflow**

## **Driver Login:**

- 1) Drivers log in to their portal using their credentials.
- 2) Authentication ensures that only authorized drivers can access the portal.

## **Attendance and GPS Activation:**

- 1) Drivers mark their attendance.
- 2) Drivers activate GPS location on their mobile phones.
- 3) This step ensures that the driver's presence and location are recorded accurately.

## **Bus Unique Name Display:**

- 1) Drivers enter the departure and destination locations.
- 2) The app displays the unique names of buses available for the selected route.
- 3) Drivers can choose the appropriate bus based on their assigned route.

## **Start Journey:**

- 1) Drivers initiate their journey by confirming the start.
- 2) The app begins tracking the bus's real-time location.

## **Data Synchronization:**

- 1) All driver actions and information are synchronized with the user portal for passenger visibility.

# **User Portal Workflow**

## **User Registration:**

- 1) Users register on the app by creating their accounts.
- 2) Registration ensures personalized user experiences.

## **From and To Location Selection:**

- 1) Users select their departure and destination locations.
- 2) The app suggests available buses based on the user's chosen route.

## **Bus Selection:**

- 1) Users see a list of buses that match their selected route.
- 2) Bus names and timings are displayed to aid decision-making.

## **Bus Route and Location Tracking:**

- 1) After selecting a bus, users can view its route on a map.
- 2) Real-time tracking shows the current bus location and progress.
- 3) Driver and conductor profiles are visible to users.

## **Onboard GPS Activation:**

- 1) Once on the bus, users can activate GPS tracking to monitor speed and location.
- 2) This feature enhances safety and provides real-time journey information.

# "Behind the Scenes: The Technical Framework of the Real-Time Bus Tracking App"

## **Frontend (Android App):**

- Language: (Java or Kotlin) Powers the user interface.
- Development: Created with Android Studio.

## **Backend:**

- Language: (Java with spring boot) Handles app functionality.
- Database: (PostgreSQL) Stores and organizes data.
- Communication: (HTTP for APIs) Manages data transfer.
- Authentication: (JWT) Ensures secure access.
- Scalability: (Google cloud) Supports growth and user demand.

## **Role of Google Play Services:**

- Location: (Google's Fused Location Provider) enables accurate GPS data for real-time tracking.

# Conclusion

## **Benefits for Passengers:**

- Real-time bus location and accurate arrival times.
- Hassle-free journey planning.
- Intuitive user experience.

## **Benefits for the Government:**

- Efficient public transportation management.
- Data-driven route optimization.
- Enhanced public satisfaction and usage.

## **Future Steps:**

- Development Refinement.
- Rigorous Testing & Quality Assurance.
- Potential Expansion to Serve More Communities.