FACULTY OF ENGINEERING AND TECHNOLOGY

PO BOX 63

BUEA, SOUTH WEST REGION

DEPARTMENT OF COMPUTER ENGINEERING

COURSE TITLE/CODE: INTERNET PROGRAMMING AND MOBILE PROGRAMMING, CEF440

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TOPIC: TASK 5

UI DESIGN AND IMPLEMENTATION

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1. Introduction

This report presents the user interface (UI) design and front-end implementation of the RoadEX mobile application, which is designed to improve road safety in Cameroon. The interface prioritizes clarity, simplicity, real-time feedback, and support for multiple languages, considering the diversity of drivers and the need for quick navigation during driving. It includes visual designs and actual UI components using Flutter and Dart.

2. App Identity

- **App Name:** RoadEX
- **Slogan:** "Your Smart Road Companion"
- **Logo:**

Fig1: Logo

- **Color Scheme:**

  - **Primary Color:** 🔵 Blue #007BFF – Indicates trust and reliability.
  - **Secondary Color:** 🟠 Orange #FF6F00 – Represents alertness and energy.
  - **Accent Color:** 🔴 Red #DC3545 – Used for critical alerts or danger indicators.
  - **Background:** White #FFFFFF – Clean and professional.

- **Typography:**

  - Titles: Roboto Bold
  - Body Text: Open Sans or Roboto Regular

- **Icon Style:** Flat icons with rounded edges to ensure simplicity and mobile-friendliness.

3. Visual Design

Screens Included:

1. **Welcome Page**
   - Logo in center
   - Slogan: "Your Smart Road Companion"
   - "Get Started" Button

Fig2: Welcome Page

2. Sign-Up / Login Page
- o Fields: Name, Email Address, Phone Number, Password
- o Buttons: Login / Sign Up

Fig3 Left: Sign up   **Right:** Login

3. Home/Dashboard Page
- o Map view with live updates
- o Alert summary list (potholes, traffic, weather)
- o Report Button (Floating Action Button)
- o Bottom Nav Bar: Home | Alerts | Report | Learn | Settings
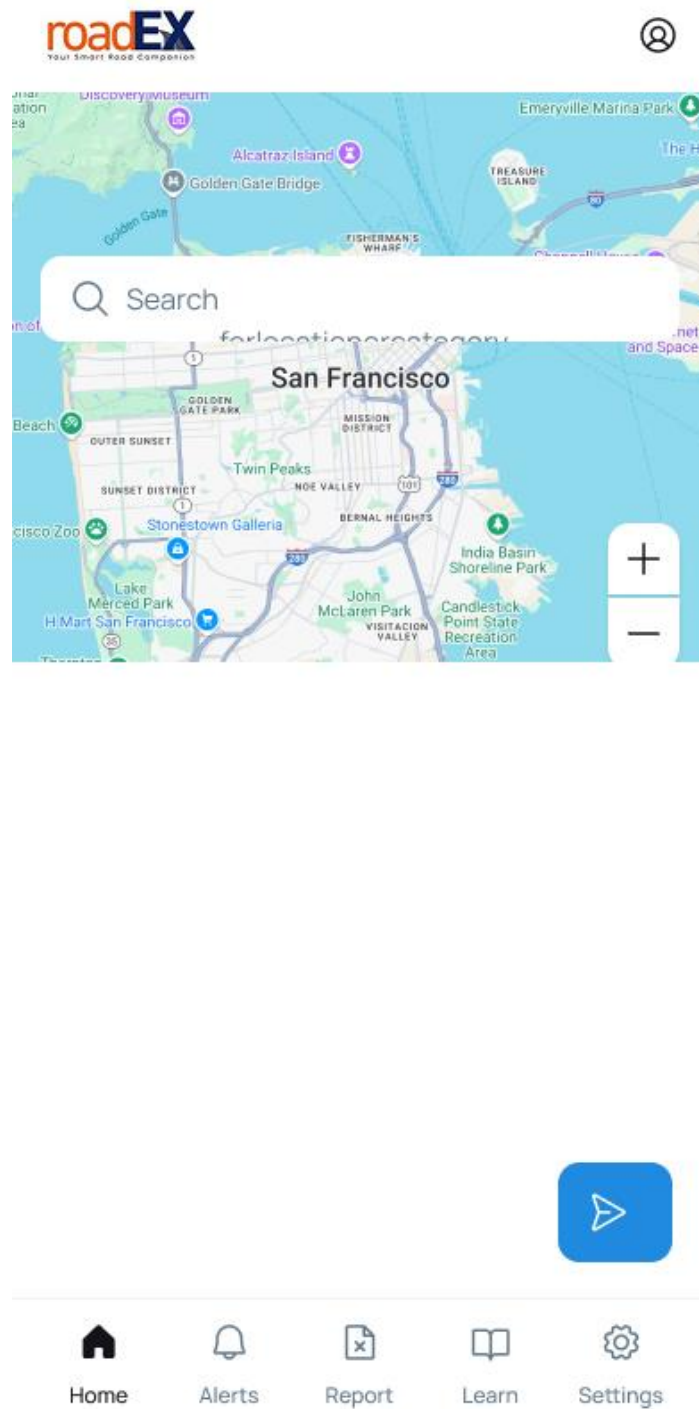
Fig4: Home Page

4. **Alert Page**
   - List of alerts in colored cards:
     - 🔴 Red – High severity
     - 🟡 Yellow – Medium
     - 🟢 Green – Resolved
   - Each card shows:
     - Icon
     - Short description
     - Location & time
     - View on Map button

← **Live Road Alerts**

🚗 Accident Ahead
2 minutes ago ●

🌧 Heavy Rainfall
5 minutes ago ●

🛣 Road Closure
10 minutes ago ●

⚠ Traffic Congestion
15 minutes ago ●

💼 Construction Zone
20 minutes ago ●

View on Map   **Filter**

Fig5: Alert Page

5. **Settings Page**

- o Notification toggles (on/off)
- o Language preferences
- o Profile management
- o Privacy & Terms

⚙ **Settings**

Notifications

Enable Alerts
Receive real-time alerts about road conditions

Voice Alerts
Hear alerts spoken aloud for hands-free awareness

SMS Notifications
Get alerts via SMS for critical updates

Alert Sound Options
Choose a sound for new alert notifications

Language

Language Preferences

Location

GPS Access
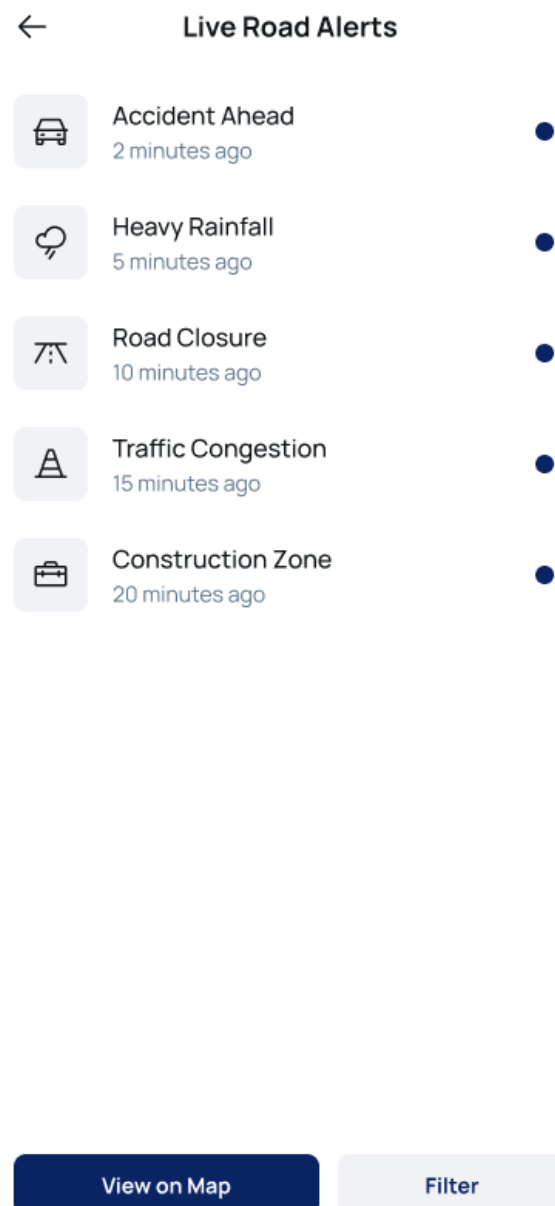Allow the app to access your GPS location

Preferred Travel Zones
Set zones for relevant road condition updates

Edit Profile

Edit Profile

Sign Out

Privacy & Permissions

Data Usage Policy

Manage App Permissions

Background Data Sync
Control background data synchronization

Help & Support
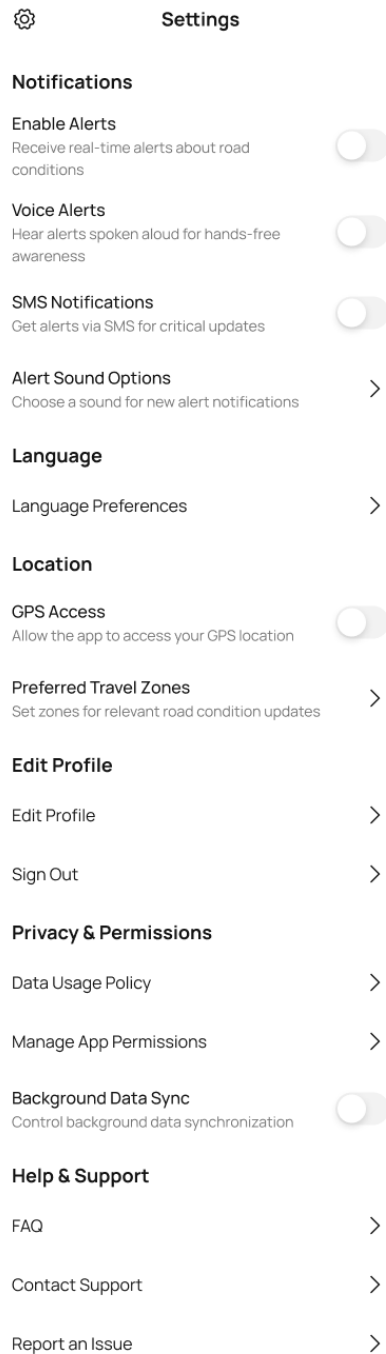
FAQ

Contact Support

Report an Issue

Fig6: Setting Page

6. Report Page

- **Purpose:** Allow users to report road issues.
- **Layout:**
  - Title: "Reports"
  - Dropdown to select issue type (e.g., pothole, accident, traffic jam)
  - GPS location auto-filled or selectable
  - Text input for description
  - Upload image (optional)
  - Submit button
- **Colors:** White background with blue button (#0052CC), red alert icon accents
- **UX Features:** Large icons, clear instructions, quick tap input, offline mode alert
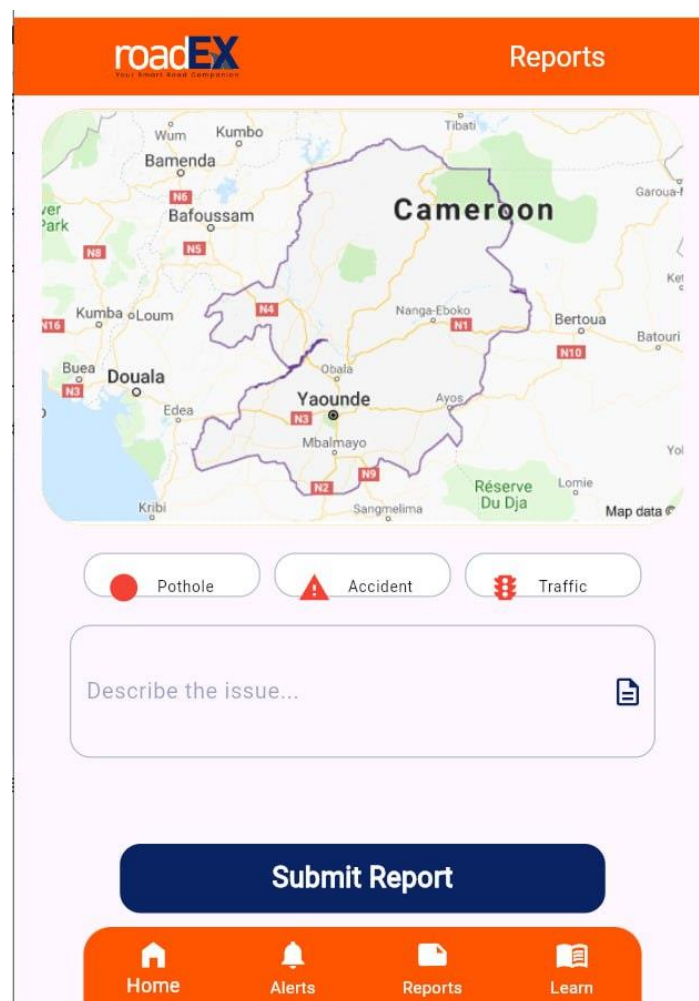

Fig7: Report Page

7. Learn Page

- **Purpose:** Educate users on road signs through categorized learning.
- **Layout:**
    - Title: "Road Signs"
    - Search bar at top
    - Three sections:
        1. **Regulatory Signs** (Stop, No Parking, etc.)
        2. **Warning Signs** (Slippery Road, Curve Ahead, etc.)
        3. **Guide Signs** (Hospital, Parking, Fuel Station, etc.)
    - 2-column grid layout for each section
    - "View All >" link under each category
- **Card Elements:**
    - Sign icon
    - Label
- **Design Notes:**
    - Rounded cards
    - Consistent spacing
    - Multilingual labels
    - White background with navy blue or gray text
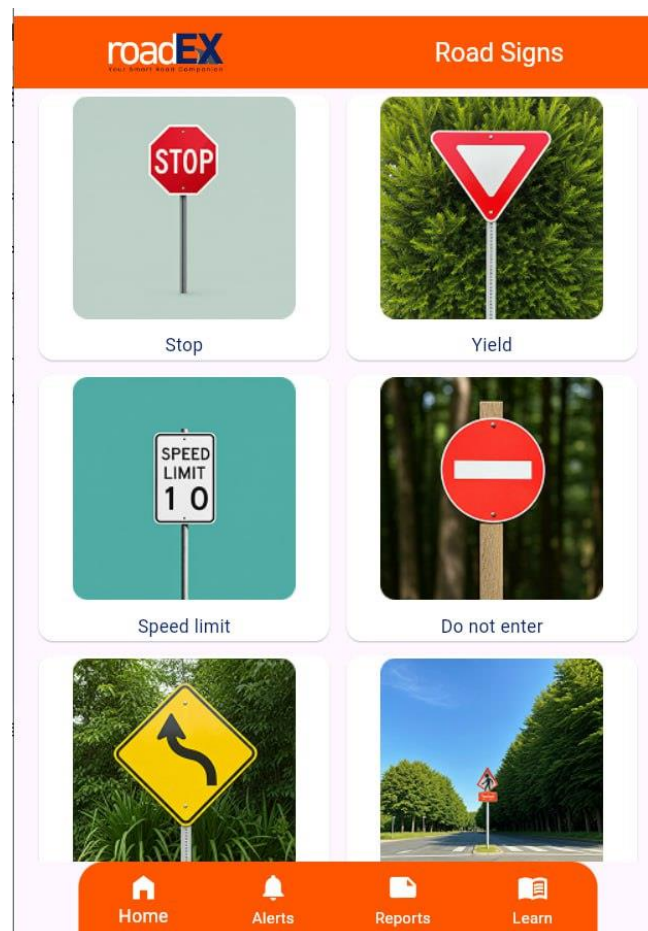- **Bottom Nav Highlight:** "Learn" is highlighted blue when active

Fig8: Learning Page

4. Frontend Implementation

I.   Frameworks and Tools Used

- **Framework:** Flutter
- **Language:** Dart
- **UI Libraries:** Google Fonts, Material Icons

II.   Implementation Summary

- **Navigation:** Implemented using Navigator.push() and BottomNavigationBar.
- **State Management:** Used setState for simple page updates.
- **Localization:** Multilingual support enabled using JSON-based translation files.
- **UI Logic:**
  - Real-time alert list updates from Firebase backend
  - Voice alert feature designed (to be connected in Task 6)
  - UI adjusts based on user preference and screen size

III.   Special Features

- Offline mode with data caching
- Language switch button on home page
- Alert color-coding for immediate understanding
- Voice accessibility (text-to-speech planned)

5. Accessibility and Design Principles

- **Multilingual Support:** English, French, and Pidgin included
- **Simple Navigation:** 3-screen max access to any feature
- **Large Fonts and Icons:** For easy reading while driving
- **Voice Alerts:** Planned to reduce screen distraction
- **Responsive Design:** Works on low-end Android phones

6. Challenges Faced

- Choosing fonts that support multiple scripts
- Balancing simplicity with functionality
- Ensuring UI responsiveness across screen sizes
- Implementing mock GPS data without backend

7. Recommendations

- Integrate dark mode for nighttime driving
- Add user tutorial on first launch
- Include voice command input
- Improve icon accessibility with colorblind-safe palette

8. Conclusion

This task successfully delivered a clean, functional, and responsive UI for the RoadEX app. With a strong identity, color logic, and multilingual design, the interface aligns with the app's goal of promoting safer and smarter road travel. The design is now ready for backend integration in Task 6.