

High-Level System Design



Travel Project

An application for providing travelers with real-time neighborhood safety ratings and local safety news alerts.

Use Cases and User Stories

1. **Use case name:** Watching the area, which is the red zone, to go into the area that you will be going (Scouting mode for observing the situation)
 - **Primary Actor:** User
 - **Secondary Actors:** System (Safety Map), Data Provider (for safety information and alerts)
 - **Preconditions:**
 - The user has opened the application.
 - The system has access to updated non-safety data for the target area.
 - The user has selected or entered the area they plan to visit.
 - **Mainflow:**
 1. The user selects "Scouting Mode" in the application.
 2. The system displays the target area on the map.
 3. The system highlights any red-zone (unsafe) areas within or near the selected location.
 4. The user taps on a red-zone area to view more details (e.g., type of risk, time of report, severity).
 5. The user reviews the information and decides whether to proceed or change their route/plan.
 - **Postconditions (optional):**
 - The user becomes aware of red-zone risks in the target area.
 - **User Story:**
 - As a user, I want to see highlighted red zones on the map so that I can avoid unsafe locations when traveling.
Acceptance Criteria: Given that the user has a location in mind, when they search for it, the system should display a map with any unsafe areas highlighted as red zones.
 - As a user, I want to tap on a red zone to view details about what is happening in that location so that I can understand the situation before deciding to travel there.
Acceptance Criteria: Given that the system displays a map with highlighted red zones, when the user taps on a red zone, the system should display detailed information such as whether the area is affected by construction, a protest event, an accident, and the time of the report.

2. **Use case name:** News Announcement in the Map for the Area You Plan to Visit

- **Primary Actor:** User (Traveler or Rural Resident)
- **Secondary Actors:** System (Safety Map), News Provider / Local Authority (for live news and updates)
- **Preconditions:**
 - The user has opened the application.
 - The system is connected to real-time/local news feeds.
 - The user has selected or entered the area they plan to visit.

- **Mainflow:**

Viewing News:

1. The system retrieves recent news announcements related to the selected location (e.g., safety incidents, weather alerts, traffic updates).
2. The user selects the target area on the map.
3. The system displays news announcements on the map as markers or pins.
4. The user taps on a news marker to read detailed reports.
5. The system provides additional context, including the time of report, news source, and recommended actions.
6. The user decides whether to continue with their travel plans, adjust their route, or postpone their visit to the area.

Posting News (Rural Community Contribution):

1. The user selects the option to create a new announcement.
2. The system displays a form for the user to enter the news title, description, location, and reference source.
3. The user submits the news.
4. The system validates the submission and posts the news as a marker on the map, visible to other users.
5. The system confirms successful posting and logs the news with time and user information.

- **Postconditions (optional):**

- The user stays updated with the latest news related to their destination.
- The system logs viewed news for future relevance/personalization.
- The user may adjust travel plans for improved safety and convenience.

- **User Story:**

- As a user, I want to tap on a news marker to read detailed reports so that I can stay informed.

Acceptance Criteria: Given that a detailed news report is displayed when the user is reading it, the system should provide a clear option to close the report and return to the map view.

- As a user, I want to see the time and source of each news update so that I know how reliable and recent the information is.

Acceptance Criteria: Given that the system retrieves news announcements for the selected location, when the user views a news update on the map or in a pop-up, then the system should display the time of the report and the source of the news. And the system should ensure that the displayed information is visible and easy to identify.

- As a user living in a rural area, I want to post news or updates about my area on the map so that other users can stay informed about local events or safety issues.

Acceptance Criteria: Given that the user wants to post a news update, the system should provide a form to enter the news title, description, location, and optional media.

3. Use case name: Notify When Entering a Red Zone During Travel

- **Primary Actor:** User (Traveler or Rural Resident)
- **Secondary Actors:** System (Safety Map), News Provider / Local Authority (for live news and updates)
- **Preconditions:**
 - The user has opened the application and enabled location tracking.
 - The system has access to real-time GPS location and red-zone data.
 - The user has selected a destination or started navigation.
- **Mainflow:**
 1. The user begins traveling with the app running in the background or active navigation mode.
 2. The system continuously tracks the user's GPS position.
 3. The system checks the user's location against known red-zone boundaries.
 4. If the user approaches or enters a red-zone area:
 - The system triggers a notification (sound/vibration + pop-up alert).
 - The system displays details about the red zone (type of risk, severity, and report time).
 - The system suggests safer alternative routes if available.
 5. The user decides whether to continue traveling through the red zone or reroute.
- **Postconditions (optional):**
 - The user becomes aware immediately upon entering or approaching unsafe zones.
 - The system logs red-zone alerts for the trip history.
- **User Story:**
 - As a traveler, I want the app to notify me if I enter or get close to a red zone so that I can make safer decisions during my journey.

Acceptance Criteria: Given that the user is traveling with GPS tracking enabled
When the user enters within a defined radius of a red zone Then the system must notify the user immediately.
 - As a traveler, I want the app to notify me with sound, vibration, and a visual pop-up so that I don't miss the warning in noisy or distracting

environments.

Acceptance Criteria: Given GPS tracking is enabled, when the user enters or approaches within X meters of a red zone Then the system must immediately display a notification with sound, vibration, and a visual pop-up alert.

- As a traveler, I want the red-zone notification to override “Do Not Disturb” mode (with my consent) so that safety-critical alerts always reach me.

Acceptance Criteria: Given the user has explicitly granted permission for critical safety alerts When the user’s device is in “Do Not Disturb” or silent mode and they enter a red zone Then the system must override the mode and trigger the red-zone notification with at least vibration and visual alert.

SRS Outline

1. Introduction

1.1. Purpose: This document defines the requirements for the Travel Project application, which provides real-time neighborhood safety ratings and local safety news to help travelers make safer decisions.

1.2. Scope: The system will allow users to:

- 1.2.1. View unsafe (red zone) areas on a map.
- 1.2.2. Access safety details (risk type, severity, time, source).
- 1.2.3. Get local news alerts displayed on the map.
- 1.2.4. Receive push notifications for nearby risks.
- 1.2.5. Post news or alerts about their area (for rural community contributions).

1.3. Definitions

- 1.3.1. **Red Zone:** Area marked unsafe due to incidents or alerts.
- 1.3.2. **Scouting Mode:** A map view highlighting unsafe areas.
- 1.3.3. **News Marker:** A pin or pop-up showing local safety-related news.

2. Overall Description

2.1. Product Perspective

- 2.1.1. Mobile application (Android/iOS) using map APIs and third-party safety/news data.
- 2.1.2. An interactive map is the main interface.

2.2. User Characteristics

- 2.2.1. Travelers or commuters seeking safety information.
- 2.2.2. Users may have a low technical background; UI must be simple.

3. Functional Requirements

- 3.1. The system shall let users search or select an area on the map.
- 3.2. The system shall allow users to enable Scouting Mode.
- 3.3. The system shall highlight unsafe areas as red zones.
- 3.4. The system shall display details of a red zone when tapped.

- 3.5. The system shall fetch and display news updates for the selected area.
- 3.6. The system shall display news as map markers and in a list.
- 3.7. The system shall show details (title, source, time, summary) when a news item is opened.
- 3.8. The system shall allow filtering of alerts/news by type, severity, or time.
- 3.9. The system shall allow users to post news or alerts, including title, description, location, and optional media.
- 3.10. The system shall validate user-submitted news before displaying it on the map.
- 3.11. The system shall continuously track the user's GPS location during travel when tracking is enabled.
- 3.12. The system shall detect when a user approaches or enters a red zone.
- 3.13. The system shall notify the user immediately with a visual, audio, or vibration alert when they are within a defined radius of a red zone.
- 3.14. The system shall display contextual information in the notification (risk type, severity, time reported).
- 3.15. The system shall allow users to configure notification preferences (e.g., only high-severity zones, adjustable radius sensitivity).
- 3.16. The system shall continue to deliver red-zone notifications even when the application is minimized or running in the background.
- 3.17. The system shall allow the user to enable or disable overriding "Do Not Disturb" mode for critical safety alerts.
- 3.18. The system shall provide suggested alternative routes when a user's path enters a red zone (if available).
- 3.19. The system shall log red-zone alerts and viewed news for future personalization or user review.
- 3.20. The system shall verify the authenticity of news submissions using metadata (time, source, user ID) before displaying to others.

4. Non-Functional Requirements

- 4.1. **Performance:** Map and overlays load within 3 seconds; details load within 2 seconds.
Trigger red-zone notifications within 2 seconds of detecting entry into the danger radius.
- 4.2. **Security:** Data transfer utilizes encryption; location data is stored for no longer than 24 hours.
- 4.3. **Usability:** Clear map overlays; readable text; supports color-blind users.
- 4.4. **Portability & Availability:** Works on Android 10+ and iOS 15+; core services available 99.5% of the time.

5. Use Cases & User Stories

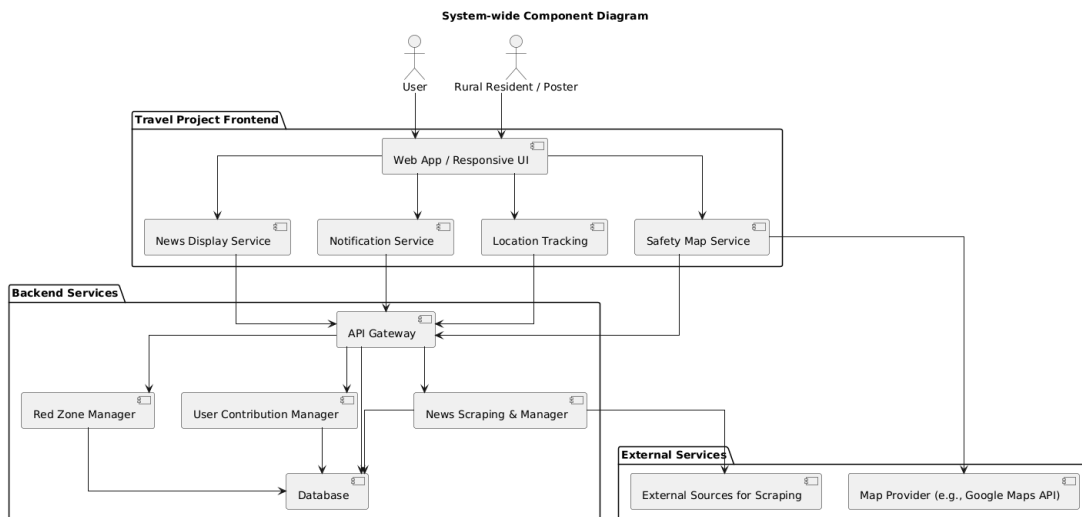
- 5.1. UC-1 Scouting Mode (Red Zones) with 2 user stories.
- 5.2. UC-2 News Announcements with 3 user stories.
- 5.3. UC-3 Notify When Entering a Red Zone During Travel 3 user stories.

6. Assumptions and Dependencies

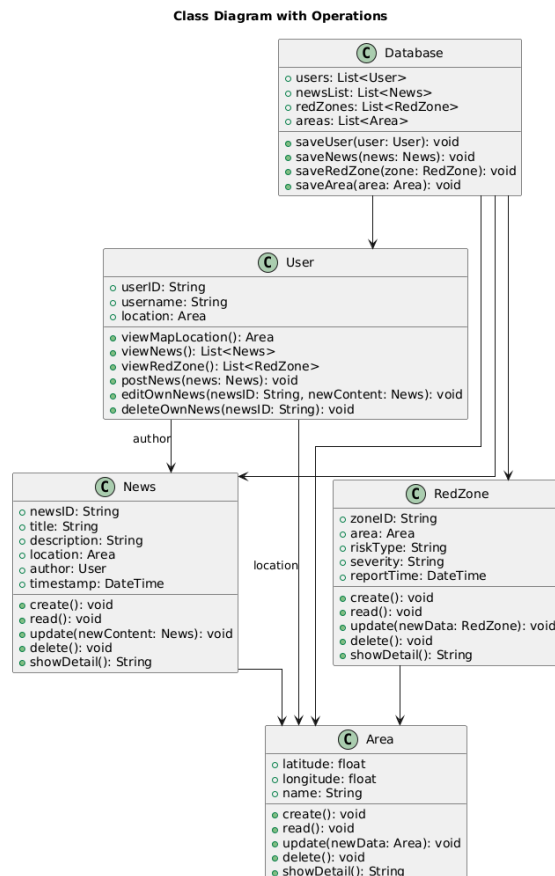
- 6.1. Relies on third-party map SDKs and safety/news data providers.
- 6.2. Requires a stable internet connection.
- 6.3. System accuracy depends on the timeliness of external data sources.

7. System Architecture

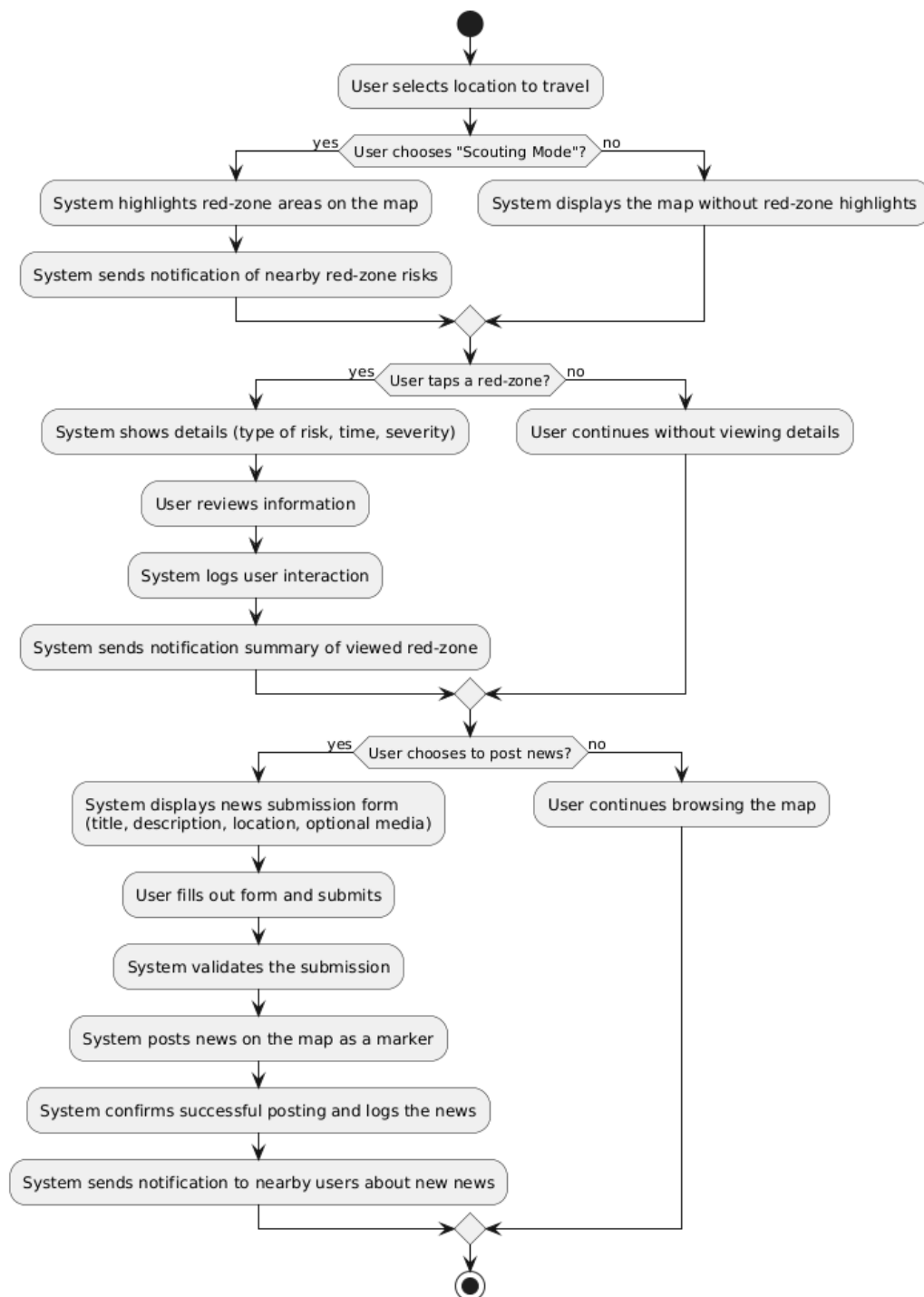
7.1. Component Diagram (system-wide)



7.2. Class Diagram (domain model)

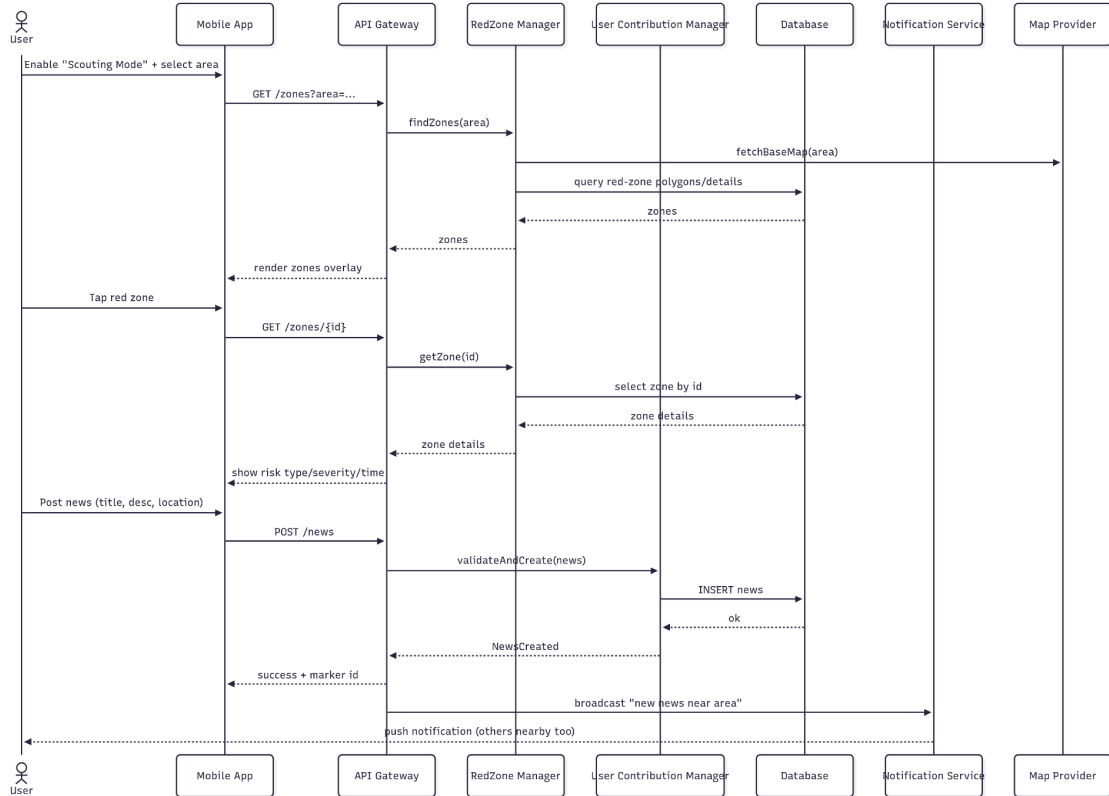


7.3. Activity Diagram (workflow)

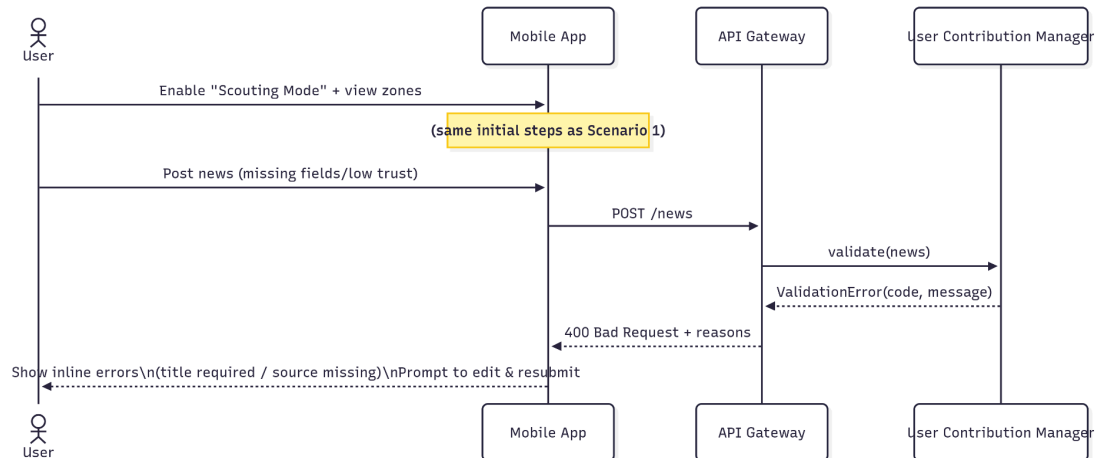


7.4. Sequence Diagrams

7.4.1. Scenario 1 (Happy Path: view red zone & post news)



7.4.2. Scenario 2 (Alt/Error: news submission fails validation)



Reflection

Writing this SRS highlighted that while functional requirements were straightforward, defining non-functional requirements like performance, responsiveness, and accessibility was more challenging. Balancing real-time safety alerts, GPS tracking, and battery usage required careful consideration. Ensuring the app is usable, reliable, and inclusive for all users was essential, especially since accurate and timely information directly affects user safety. Overall, the SRS helped clarify how critical performance and usability are for a safety-focused travel app.