

PHASE 2: Development / Reflection Phase

TITLE: WOMAP (Women Safety Route Companion)

The design and implementation phase focused on transforming the conceptual plan into a fully functional web based safety application. The system architecture follows a modular design to ensure scalability, maintainability and clear separation of concerns between frontend, backend and database layers. The backend was developed using **Flask (Python)** as a lightweight RESTful API framework that handles route safety analysis, user authentication and integration with third party services. **PostgreSQL** serves as the database and backend as a service (BaaS) platform, providing secure storage for user data, reported incidents and safety metrics.

For real time communication, the **Twilio API** was integrated to send instant WhatsApp and SMS alerts in case of emergencies. The machine learning component uses **scikit learn's RandomForestRegressor** supported by **NumPy** and **Pandas** to predict route safety based on parameters such as crime rate, lighting conditions and distance.

The **frontend** was implemented using **HTML5**, **CSS3** and **JavaScript** designed to be responsive and user-friendly. The **Google Maps JavaScript API** and **Geolocation API** enable route visualization and live tracking.

For deployment, I have used **AWS**. **Git** was used for version control to ensure traceability of code changes. Throughout development, source code was well documented and accompanied by detailed architecture diagrams, ensuring the application aligns with user requirements, supports maintainability and can be easily scaled for future enhancements.