

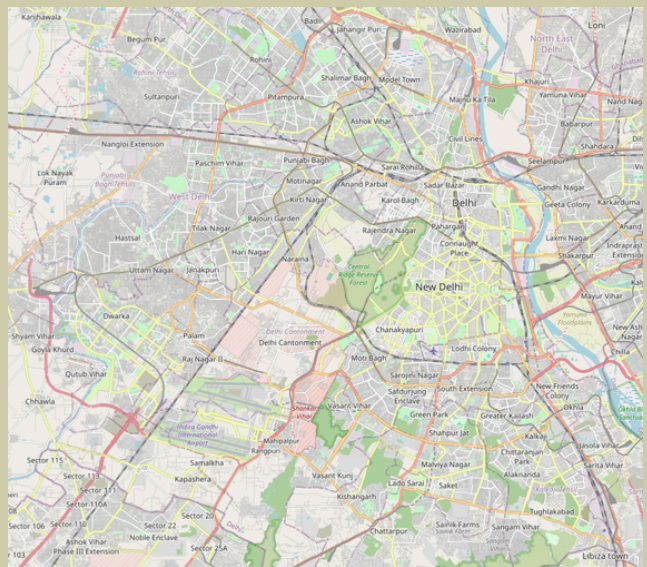
# Air Scan

## Smart Route Planning Based on Air Quality Index (AQI)

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### Project Overview

Air Scan is a full-stack web application that helps users choose the safest travel route by analyzing live air quality data. It minimizes exposure to polluted zones by calculating routes with the lowest Air Quality Index (AQI).



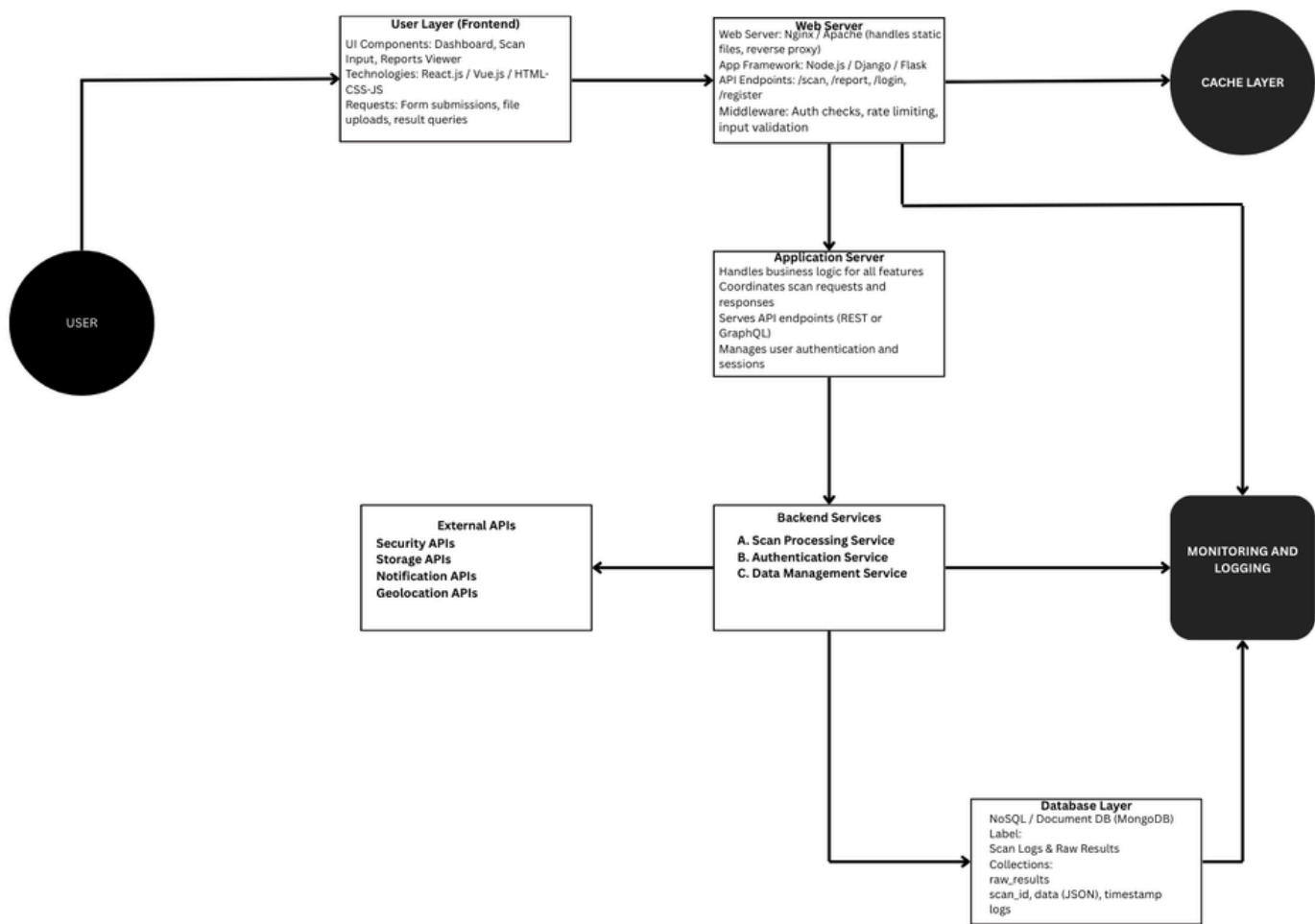
### Key Features

- Route planning with lowest pollution
- Live air quality integration
- Clean, user-friendly React UI
- REST API built with Node.js + Express
- MongoDB for storing user searches (optional)
- Future roadmap: User accounts, mobile view, health tips

Air Scan is designed with public health in mind. With increasing levels of pollution in urban environments, daily commuting can unknowingly expose people to harmful air. This app:

- Helps people choose safer routes to reduce health risks
- Encourages eco-awareness
- Can be used by cyclists, joggers, delivery workers, or anyone walking/biking to work or school

# ARCHITECTURE DIAGRAM



## Key Components:

**Frontend:** Built with modern web technologies (e.g., React/Vue), enabling users to initiate scans, view reports, and manage their profiles.

**Web & Application Server:** Handles incoming requests, routes them to appropriate services, and manages API endpoints, user authentication, and business logic.

**Backend Services:** Includes scanning engine integration, user authentication, data management, and report generation. Each service is isolated for better modularity and scaling.

**Database Layer:** Consists of a relational database for structured user and scan data, a NoSQL store for raw scan results and logs, and a Redis cache for fast access to frequent data.

**External APIs:** Integrates with third-party services like VirusTotal, S3, and SendGrid for scanning, storage, and notifications.

**Infrastructure:** Load balancer and CDN handle performance and scalability, while monitoring tools ensure observability and reliability.

## Data Flow Summary:

User requests go from the frontend to the backend via secure APIs. The backend coordinates with services and databases, leveraging external APIs for advanced scanning and reporting. Responses are returned to the frontend for real-time interaction.

## TECH STACK

FRONT END	BACK END	DATA BASE	API
React Js	Node Js	MongoDB	OpenWeatherMap AQI (or WAQI)
Leaflet / Mapbox	Express.js		Google Maps Directions API
Axios	Socket.io		Google Maps Directions API or Mapbox Directions

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## CONCLUSION

Air Scan aims to empower users to make healthier travel decisions and raise awareness of environmental factors that affect daily life.