12. Configuration Guide

This section explains how the system is configured. Most of the configuration is handled by the **system administrator**, and regular users do not need to set anything up. Once the system is deployed, users can just open the website and use it normally.

12.1 System Administrator Configuration

The system administrator is responsible for setting up and maintaining the backend environment.

The backend requires:

- Java **JDK 17**

- Apache **Tomcat 9**

- Maven for building the project

Tomcat must be restarted anytime configuration changes are made.

Google API Configuration

The backend uses several Google APIs, so a valid Google Maps API key is required. The key must have billing enabled and the correct APIs turned on.

APIs used by the system include:

- Google Places API

- Google Geocoding API

- Google Routes API

- Google Weather API

The API key is stored as an **environment variable** on the server and is never exposed to the frontend.

Example:

```
GOOGLE_MAPS_API_KEY=your_api_key_here
```

If the API key is changed or updated, Tomcat needs to be restarted for the backend to pick it up.

Backend Deployment Setup

The backend is built into a WAR file using Maven and deployed to Apache Tomcat.

In most cases, no additional server configuration is required beyond deploying the WAR file. If the backend behaves strangely or does not update, doing a clean redeploy (removing old WAR files and caches) usually fixes the issue.

CORS handling is already included in the backend so the frontend can communicate with it during local development.

12.2 User Configuration

There is no configuration required for end users.

Users:

- Do not install any software

- Do not configure API keys

- Do not need technical knowledge to use the system

They simply open the application in a browser, fill out the trip form, and view the results.

12.3 Local Development Configuration (Optional)

If the system is being run locally for development or testing, both the frontend and backend must be running at the same time.

The backend must:

- Have the Google API key set as an environment variable

- Be running on Tomcat

The frontend must:

- Be started using the development server

- Point to the correct backend API endpoint

No manual configuration inside the frontend code is required.

12.4 Configuration Notes

- Environment variable changes do not apply until Tomcat is restarted

- API changes on Google's side may take a few minutes to start working

- Most configuration problems show up as backend errors rather than frontend issues