

Requirements Document for GoTime

Never arrive late again

Version	Description of Change	Author	Date
1.0	Original version	Stefanie Van Geel	03/02/2025
1.1	Fine tuning of the document	Sofie Brys	10/02/2025
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INTRODUCTION

Purpose

The purpose of this document is to define the functional and non-functional requirements for the development of a software application that integrates with Waze, Google Maps or other GPS apps to provide real-time travel time calculations and alarm adjustments based on traffic conditions. The software will allow users to input their destination, arrival time, and preparation time, and will periodically check traffic conditions to ensure the user arrives on time and adjust their alarm if traffic conditions indicate they will be late.

Second phase: the link between the software application and applications of public transport (NMBS, De Lijn...) with the possibility of having multiple transportation options.

Scope

This document outlines the requirements for the software, including user requirements, functional requirements, interface requirements, and operational requirements. The software will be designed to work on mobile devices and wearable devices, integrating with Waze, Google Maps and other GPS apps APIs to fetch real-time traffic data and periodically check for changes in traffic conditions.

Background

This document is produced by AppelBLAUWzeegroen Group to define the requirements for a new system designed to improve trip planning and time management for users. The system will be developed by AppelBLAUWzeegroen Group and is intended for use by individuals who rely on GPS navigation and smart devices.

References

- Waze API documentation (<https://developers.google.com/waze>)
- Google maps API documentation (<https://developers.google.com/maps/documentation>)
- Apple Watch Developer Guidelines (<https://developer.apple.com/design/human-interface-guidelines/designing-for-watchos>)
- iOS Developer Guidelines ([Human Interface Guidelines | Apple Developer Documentation](https://developer.apple.com/design/human-interface-guidelines/))
- Android Developer Guidelines ([Developer guides | Android Developers](https://developer.android.com/guide))
- User Interface Design Guidelines: To ensure the app follows best practices for usability and accessibility.

Assumptions and Constraints

Assumptions

- The user's device will have internet access to fetch real-time traffic data.
- The user will have a compatible smartphone or wearable device, which can receive alarm notifications.
- The user needs to have granted permission for the software to access the alarm.
- The user gives access to personal data as a calendar, location services...

Constraints

- The software must comply with data privacy regulations (e.g., GDPR).

- The software must be compatible with both Android and iOS platforms.
- Integration with external APIs must comply with Waze and Google Maps usage terms.
- The budget for this project is 0 €.
- The project should be completed in 6 months.

Document Overview

This document is organized into sections that describe the functional and non-functional requirements of the software. It includes user requirements, interface requirements, and operational requirements, as well as a glossary of terms.

METHODOLOGY

- Start with Design Thinking to understand how users want their agenda or wearable to interact with a route planner (e.g., real-time travel suggestions based on calendar appointments).
- Use Scrum for development, allowing you to work in short sprints and receive feedback after each iteration (e.g., testing how a wearable alarm syncs with a route planner).
- Ensure Continuous Integration/Continuous Delivery (CI/CD) to test and deploy connections with external APIs (e.g., Google Maps, Garmin).

FUNCTIONAL REQUIREMENTS

Context

The software will interact with the user and with API's of GPS apps to provide real-time traffic updates every 10 minutes and adjust the user's alarm based on travel conditions. If a user's preset alarm will result in arriving late due to unexpected traffic incidents (e.g., accidents or roadblocks), the software adjusts the alarm to ensure the user leaves in time.

User Requirements

User Requirement ID	Requirement Definition
U1.0	The system shall allow the user to input their destination , arrival time , preparation time and departure point .
U1.1	The system shall propose , after the user finished the input, an alarm time to the user.
U1.2	The system shall allow the user to set or detect their alarm time .
U1.3	The system shall fetch real-time traffic data through API connection with GPS apps based on the user's destination.
U1.4	The system shall calculate whether the user will arrive on time based on the current traffic conditions and the user's alarm time.
U1.5	The system shall periodically check traffic conditions every 10 minutes to detect any changes that may affect the user's arrival time.
U1.6	The system shall automatically adjust the user's alarm if traffic conditions require an earlier leave time.
U1.7	The system shall notify the user with real-time updates on traffic conditions and estimated travel time.

U1.8	The system shall be compatible with smartphones and wearable devices (e.g., smartwatches).
U1.9	The system shall ensure user privacy and data security when handling location and alarm data.

Data Flow Diagrams

- User: Provides input (destination, arrival time, preparation time) and receives alarm adjustments.
- GPS apps: Provide real-time traffic data and estimated travel time.
- Alarm System: Adjusts the alarm based on software calculations.

Logical Data Model/Data Dictionary

The logical data model will include the following entities:

- User: Contains user information (e.g., name, device ID, OS-system).
- Destination: Contains destination details (e.g., addresses, coordinates, arrival time, preparation time).
- Traffic Data: Contains real-time traffic information (e.g., estimated travel time, traffic conditions).
- Alarm Settings: Contains alarm details (e.g., time, adjustments).

Functional Requirements

Functional Requirements Group 1: User Input and Data Handling

Requirement ID	Requirement Definition
FR1.0	The system shall provide a user interface for inputting the departure point, destination, arrival time, and preparation time.
FR1.1	The system shall detect the user's alarm time from their smartphone or wearable device.
FR1.2	The system shall store the user's input data (departure point, destination, arrival time, preparation time, and alarm time) in a local database .
FR1.3	The system shall validate user input to ensure all required fields are provided and are in the correct format.

Functional Requirements Group 2: Traffic Data Integration

Requirement ID	Requirement Definition
FR2.0	The system shall integrate with APIs of GPS apps to fetch real-time traffic data.
FR2.1	The system shall calculate the estimated travel time based on the user's departure point, destination and current traffic conditions.
FR2.2	The system shall compare the estimated travel time with the user's arrival time and preparation time to determine if the user will arrive on time.

FR2.3	The system shall store fetched traffic data (e.g., estimated travel time, delays) in a temporary data store .
FR2.4	The system shall periodically check traffic conditions every 10 minutes to detect any changes that may affect the user's arrival time.
FR2.5	The system shall fetch updated traffic data from GPS app API's during each periodic check.
FR2.6	The system shall recalculate the required alarm time during each periodic check based on the updated traffic data.

Functional Requirements Group 3: Alarm Adjustment and Notifications

Requirement ID	Requirement Definition
FR3.0	The system shall calculate the required alarm time based on the estimated travel time, preparation time, and arrival time.
FR3.1	The system shall compare the required alarm time with the user's current alarm time .
FR3.2	If the current alarm time is insufficient to arrive on time, the system shall adjust the alarm to an earlier time.
FR3.3	The system shall send a notification to the user informing them of the alarm adjustment.
FR3.4	The system shall notify the user during each periodic check if updated traffic data indicates they have to leave earlier. The user can stop the notifications at any time.

Functional Requirements Group 4: System Integration and Compatibility

Requirement ID	Requirement Definition
FR4.0	The system shall integrate with the user's smartphone alarm system to set and adjust the alarm time.
FR4.1	The system shall be compatible with wearable devices (e.g., smartwatches) to adjust alarms and send notifications.
FR4.2	The system shall support Android and iOS platforms.

Functional Requirements Group 5: Security and Privacy

Requirement ID	Requirement Definition
FR5.0	The system shall encrypt all user data (e.g., departure point, destination, arrival time, alarm time) during transmission and storage.
FR5.1	The system shall comply with GDPR and other relevant data privacy regulations.
FR5.2	The system shall not share user data with third parties without explicit user consent.

Functional Requirements Group 6: Error Handling and Reliability

Requirement ID	Requirement Definition
FR6.0	The system shall handle errors gracefully (e.g., the API's of the GPS apps are unavailable) and notify the user.
FR6.1	The system shall ensure that periodic traffic checks are performed every 10 minutes without fail.
FR6.2	The system shall notify the user if periodic traffic checks cannot be performed due to an error (e.g., no internet connection).

OTHER REQUIREMENTS

Interface Requirements

Hardware Interfaces

The software will interface with the user's smartphone or wearable device to adjust alarms.

Software Interfaces

The software will integrate with **APIs of GPS apps** to fetch real-time traffic data.

Communications Interfaces

The software will communicate with external APIs over the internet.

Hardware/Software Requirements

The software will require a smartphone or wearable device running **Android** or **iOS**.

Operational Requirements

Security and Privacy

The software must ensure user data is encrypted during transmission.

The software must comply with GDPR and other relevant data privacy regulations.

Recoverability

In the event of a failure, the backend system must be able to restore functionality within 1 hour.

System Availability

The system must be available 24/7, with maintenance windows scheduled during low-usage periods.

General Performance

The system must provide a response time of less than 2 seconds for alarm adjustments.

Capacity

The system must be scalable in order to support any required capacity.

Error Handling

The system must notify the user of any errors in fetching traffic data or adjusting the alarm.

Validation Rules

The system must validate user input (e.g., destination, arrival time) before processing.

APPENDIX A - GLOSSARY

- API: Application Programming Interface.
- GDPR: General Data Protection Regulation.
- GPS apps: Google maps, Waze, Maps of Apple
- Wearable device: smartwatch