



MyWay

EUROPEAN SMART
MOBILITY RESOURCE
MANAGER

MyWay: European Smart Mobility Resource Manager

D2.1 Requirement specification and analysis

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EXECUTIVE SUMMARY

This document reports the functional and non-functional requirements on the MyWay platform. To gather them, after an introduction about the MyWay architecture, a requirements elicitation methodology has been defined and followed. So, different sources for the requirements have been used as the result of the interaction among 3 work packages:

- In the deliverable D1.1 (Scenarios), the WP1 (Mobility Behavior) has produced a set of user scenarios that shows the most relevant functionalities of MyWay using a short story for each one.
- WP4 (Living Labs Setup) provides their custom requirements for each living lab following the specifications and the ambitions reported in the deliverables D4.2.1 for Catalonia, D4.3.1 for Berlin and the D4.4.1 for Trikala.
- Finally, WP2 (Reference Design & Architecture) also produces specific requirements gathered during the system design process.

The process of requirements gathering has been as follows. User scenarios defined in WP1 have been elaborated into structured user stories and then derived into requirements. In parallel with this process, WP2 and WP4 partners have been adding other requirements based on their experience with the domain.

In that way, more than 100 functional requirements have been gathered and classified in 14 different main functionalities previously identified which have been grouped in the following macro categories:

- Journey planning and tracking
- Mobility services and resources awareness
- User profiling
- System management

From the list of main functionalities, "Plan a journey", "Book a service", "City information" and "User" profiling are identified as the key functionalities of MyWay.

The set of requirements for the "Journey planning and tracking" specifies a fully-intermodal journey planner that combines public and private transport modes with booking support. This feature allows the user to book the services before the journey planning (pre-trip) as well as during the trip (on-trip).

Because of the characteristics of MyWay, for the non-functional requirements the most relevant categories identified have been "privacy" and "interoperability" with external systems.

Furthermore, selected use-cases capturing MyWay relevant functionalities from the end user's point of view are presented.

Regarding the requirements prioritization, a first step has been performed in this document. This prioritization could be adjusted in the task T2.3 (Architecture and Components design) after the analysis and final definition of the MyWay architecture. In addition, final conclusions from the user research done by the WP1 (Mobility Behaviour) across the Focus Groups in the T1.1 as well as further results from the task T1.3, have to be considered for possible adjustments of the requirements.

Therefore, the resulting requirements specification has to serve as a basis for the definition and design of the MyWay components in the reference architecture. Finally, the requirements will also be used as a basis of assessing the MyWay approach in WP6 (Evaluation, Governance & Business Models).

LIST OF ABBREVIATIONS

| Abbreviation | Description |
|--------------|----------------------------------|
| APP | Mobile Application |
| B2B | Business to business |
| E2E | End to end |
| EU | European Union |
| EV | Electric Vehicle |
| FE | Front end |
| GPS | Global Positioning System |
| H-L | High Level |
| HMI | Human Machine Interface |
| IE | Internet Explorer |
| ITS | Intelligent Transport System |
| KML | Keyhole Markup Language |
| KMZ | Keyhole Markup Language (Zipped) |
| P+R | Park and ride |
| POI | Point of Interest |
| WMS | Web Map Service |
| WFS | Web Feature System |
| WPx | Work package number x |

1. INTRODUCTION

For many decades, urban planning and transport evolved around the private car, which has resulted in problems such as congestion, noise, pollution, etc. To tackle these adverse impacts and improve the liveability of Europe's cities, citizens today can benefit, from a variety of new more sustainable and complementary mobility schemes, including dynamic vehicle sharing, real-time carpooling, demand-responsive transport, Electric Vehicles (EVs) or bicycle sharing, in addition to the private vehicle, public transport and non-motorised modes. The on-line interaction between users and the transport environment prior to and during travel has also greatly improved. However, despite these advances, the integration of such schemes in the overall urban mobility picture has not attained the desired level, with cars still remaining the preferred and prevailing choice of the users.

1.1 About MyWay

MyWay will investigate, develop and validate an integrated platform, the European Smart Mobility Resource Manager, including cloud-based services and facilities to support community supplied information collection and processing. The purpose is to holistically address the efficient and seamless integration and use of complementary, capacity-limited mobility services in the overall urban travel chain, including all transport modes (motorized and non-motorized, EVs, public transport, flexible services such as transport on-demand) and mobility sharing schemes (e.g. car sharing, motorbike sharing and carpooling). The platform will be tested in three European areas – Barcelona and Catalonia Region (ES), Berlin (DE), and Trikala (GR) – setting up Living Lab demonstrations involving local users and stakeholders.

The approach gives priority to the egocentric vision of the user, finding the right compromise for each single traveller and offering a solution closest to his/her personal needs and preferences, making the frequent use of it (as an alternative to an ideal but not always practical solution) a main contribution to the sustainability of urban transport.

1.2 Scope of the document

The document reports the functional and non-functional requirements of the MyWay platform. To gather them, the user scenarios identified in D1.1 (Scenarios) and site-specific functional and non-functional requirements elicited in WP4 (Living Labs Setup) have been abstracted into generic use cases, requirements and design guidelines. The resulting requirements specification has to serve as a basis for the definition and design of the MyWay components in the reference architecture. Finally, the requirements will also be used as a basis of assessing the MyWay approach in WP6 (Evaluation, Governance & Business Models). More information regarding the requirements elicitation methodology and the dependencies with the other work packages is reported in section 3.

2. ARCHITECTURE INTRODUCTION

This chapter gives an overview of the MyWay initial architectural concept, to set the context for the requirements and detailed use cases following afterwards. During the detailed system design reported in the D2.3, some of the concept details will be adjusted further.

The MyWay architectural design respects the following general ideas and rules:

- Open design, flexible enough to integrate MyWay with other services
- Compliance to standards in the area of software design and engineering, in the area of transport domain and respective EU standard
- Scalable application with flexible deployment model, respecting the particular living labs and possible further dissemination of the system

From the high-level conceptual point of view, MyWay consists of the following components and modules:

Front-end application - main user interface to MyWay services:

- **Web front-end application** - WEB version of user interface for PC / notebook / mobile devices
- **APP front-end application** - APP version of user interface for mobile devices
- **Trip follower (front-end part)** - Tracks the trip by GPS position and traffic situation / constraints and adjusts the trip itinerary. Front-end part of the module.

User manager - responsible for management of user profile data:

- **Trip memory** - stores history of user trips
- **User profiler** – consists of two basic parts. The first part is responsible for basic use cases in user profile management: registration of users, editing user profile, adding user's own transportation devices and travel preferences. The second part learns about patterns in usage of mobility services by a specific user.

Trip planner - finds and follows the trip for the user:

- **Planning graph maintainer** - Creates and maintains a planning graph from the external city data. The planning graph is used for trip computation.
- **Trip organizer** - Computes the trip for the user, using the sub-planners
- **Reservation manager** - ensures booking of services selected as part of user trip itinerary and their billing (if processed by MyWay)
- **Trip follower (back-end part)** - Tracks the trip by GPS position and traffic situation / constraints and adjusts the trip itinerary. Back-end part of the module.
- **Sub-planner interaction manager** – Processes the requests to specialized sub-planners during the trip planning

Analytics - performs analysis on data used (or generated) by MyWay:

- **Demand analytics** - Provides modelling capabilities to model demand for service, looks for patterns in space, time and traveller segments
- **Communities monitor** - Aggregates and processes information from communities (social media) linked to the MyWay service and trip planning (for example events influencing the traffic situation)

Data provider - aggregates and provides input data for journey planning (map, context, services, feedback and other relevant inputs):

- **Service data manager** - imports, stores and provides general service data to further processing. Ensures updates of the data and tracking of their changes.
- **Map & infrastructure manager** - imports, stores and provides city map and infrastructure data
- **Infrastructure state & context monitor** - imports, stores and provides data about context (weather, state of the infrastructure, ...)
- **Feedback collector** - collects feedback data to user trip (online feedback)

Service end-to-end (E2E) orchestrator – responsible for calling of the functionalities of the other modules. The orchestrator is chaining the functionalities to E2E processes to have the core modular and easily extensible. The part of this service orchestrator is:

- **Logging** - collects data for offline analysis (required by WP6/WP5)

Interfaces – connection of MyWay to data sources, front-end application and other third party systems (transport operators, social networks and other relevant systems):

- **Service interfaces** - interfaces for:
 - Service data from transport services providers (including real-time data)
 - B2B services (trip booking)
- **Map & infrastructure data interfaces** - interfaces for:
 - Map tiles - visual rendering of an underlying cartographic map
 - Transport network data (elevation, speed profiles, road / bike / footpath / railway network, public transport physical stops and related data)
 - Points of Interest (POIs)
- **Context data interfaces** - interfaces for:
 - State of the infrastructure
 - Events influencing the infrastructure
- **Open interface** - interfaces for:
 - Connecting the MyWay front-end application
 - Services available for alternative front end applications (created by a third party)
 - User's trip positioning data (GPS)
 - Online feedback to the user's trip plan
- **Communities data interface** - interfaces for:
 - Collection of communities data (for example events influencing the traffic situation)
- **Sub-planner interface** - interfaces for:
 - Connecting the various specialized sub-planners, which are used to plan a trip

The overview of structuring and interactions of the components is described in the following figure:

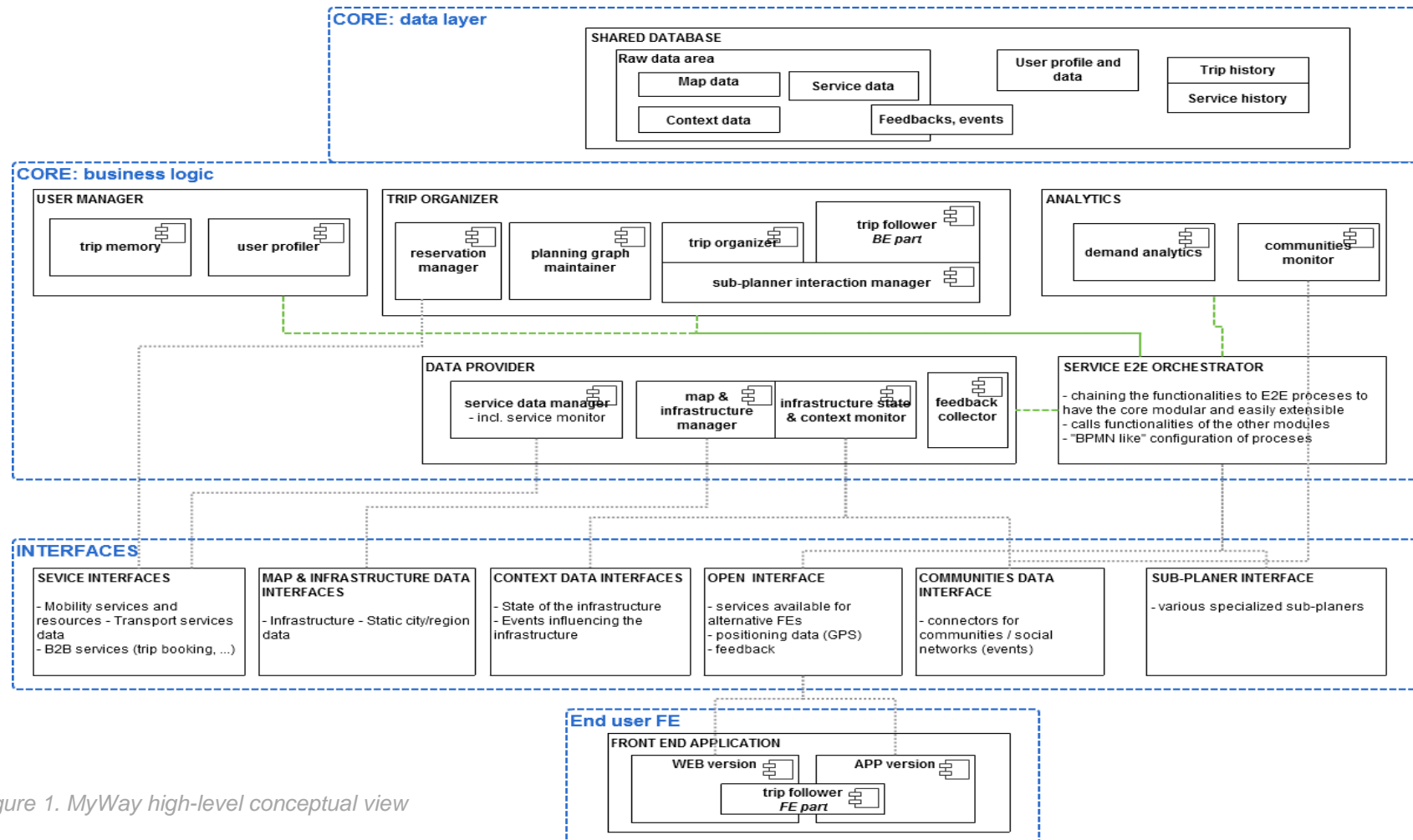


Figure 1. MyWay high-level conceptual view

3. REQUIREMENTS ELICITATION METHODOLOGY

The requirements for the MyWay system are defined by a list of functional and non-functional requirements and detailed use cases for the system key functionality. To gather them, different sources have been used as the result of the interaction among 3 Work Packages:

- In the deliverable **D1.1**, the **WP1** has produced a set of user scenarios that shows the most relevant functionalities of MyWay using a short story for each one.
- **WP4** provides their custom requirements for each living lab following the specifications and the ambitions reported in the deliverables **D4.2.1** for Catalonia, **D4.3.1** for Berlin and the **D4.4.1** for Trikala
- Finally, **WP2** also produces specific requirements gathered during the system design process

The process of requirement gathering has been as follows. User scenarios defined in WP1 have been elaborated into structured user stories and then derived into requirements. So, they have been included in chapter 4, *Scenarios and user stories*. In parallel with this process, WP2 and WP4 partners have been adding other requirements based on their experience with the domain.

These activities have used an iterative process where the interaction and the cooperation among all partners have been essential for the requirements elicitation. In that sense, the collected requirements have been reviewed and commented by WP2 and WP4 partners in two rounds using different cooperative tools.

After gathering the requirements, a prioritization process has been performed with cooperation between WP2 and WP4. So, the partners of the WP4 have prioritized each requirement taking into consideration their interest in the living labs. After that, the WP2 partners have performed a second round to define the overall importance of each requirement taking into account the previous living labs prioritization and the general project scope.

After summarization of the requirements a last round of review and feedback has been performed. The chapter 5, *Requirements*, shows the current list of requirements with their prioritizations, and the relationship with the user stories and the living labs where they are applicable. Finally, the chapter 6 introduces a set of selected uses cases for some key functionalities introduced by the requirements.

The requirements and detailed use cases are stored in the issue tracker provided in the MyWay repository, based on the Redmine application.

The following diagram resumes the process described above and shows the interactions between the work packages:

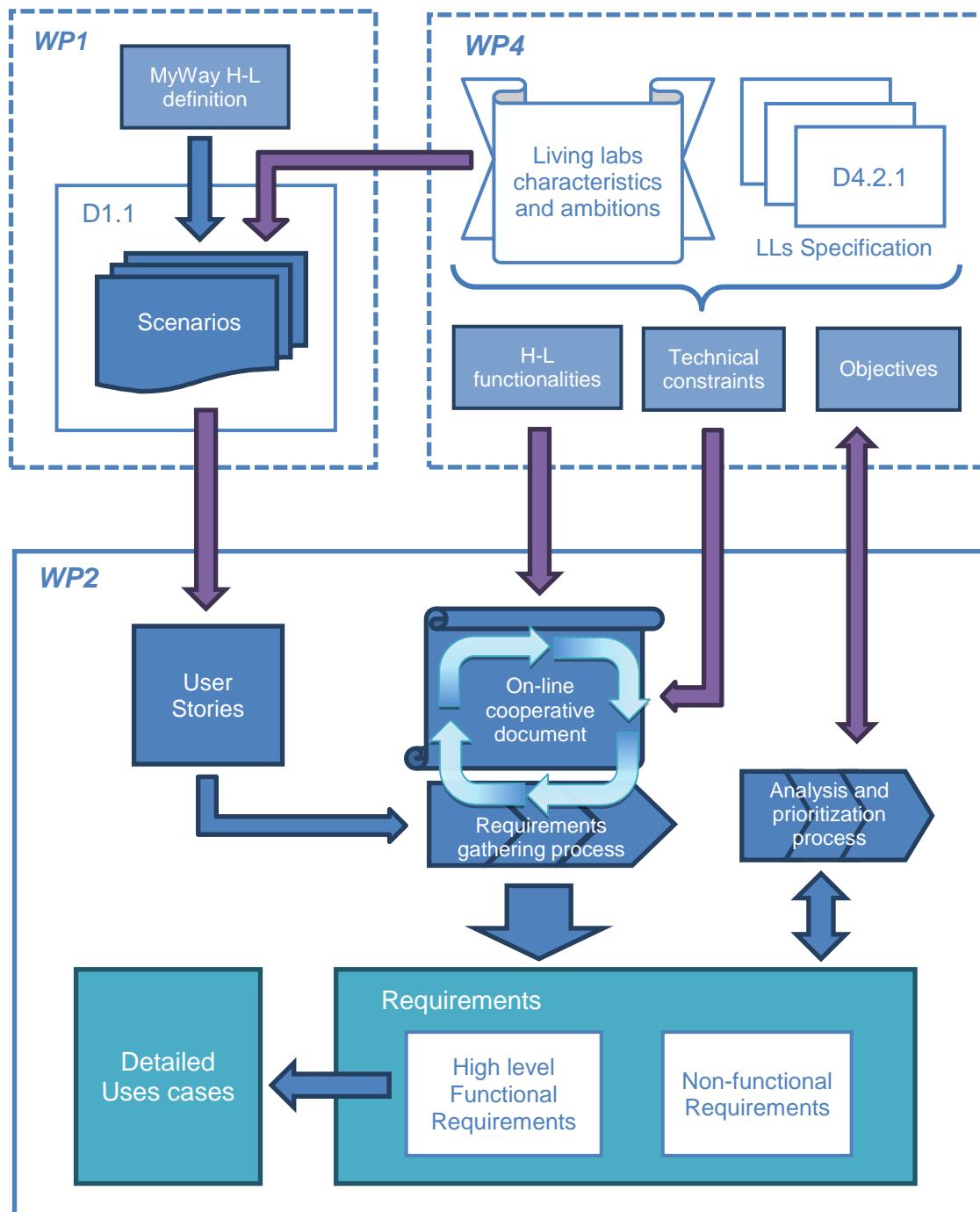


Figure 2. Requirements elicitation process

4. SCENARIOS AND USER STORIES

As previously described in the methodology, the first relevant source for the requirements elicitation is the Scenarios produced in the WP1 and reported in D1.1.

4.1 Scenarios

A Scenario is a narrative short story which describes how the actors could use a system or application. It serves to introduce a set of functionalities in a common language in order to be easily understandable by all the different stakeholders during the product development. The scenarios, which are not written in a technical way, help also to show to the end users which functionalities could be performed by the system.

In that way, the scenarios produced in the WP1 and reported on the deliverable D1.1 are good candidates as a source for the MyWay requirements gathering process. All the 16 scenarios from the D1.1 have been used for the elicitation process:

- S1 – Mr. Pepper and Mrs. Ginger. Regular car-pooling to save money
- S2 – Mrs. Peach. Public transport disruption
- S3 – Mr. Sugar. Cycle commuter in bad weather
- S4 – Angela. The visiting foreign business executive
- S5 – Sebastian. Newly-arrived exchange student
- S6 – Jordi and Núria. Elderly couple from rural village
- S7 – Lluís. Cyclist with flat tyre
- S8 – Joan and Pere. Wheelchair user
- S9 – Bill and Kostas. Elderly non-driver accessing essential healthcare
- S10 – Eleni. Car-pooling to save money
- S11 – Eleonora. Keen cyclist making a tourist visit for sightseeing
- S12 – Sophia. Office worker with many appointments
- S13 – George. Public transportation interconnection mode
- S14 – Marco. Dissatisfied car commuter
- S15 – Regina. Person with reduced mobility
- S16 – John. MyWay data manager

4.2 User stories

According to the definition of user story from the Agile Modelling: “A user story is a very high-level definition of a requirement, containing just enough information so that the developers can produce a reasonable estimate of the effort to implement it”.

In other words, a user story synthesizes ideally in one sentence a specific functionality that an end user may perform in the system. The user stories are written in a common business language in order to be easily understandable by the technical and non-technical stakeholders in the development process. This is the reason why the user stories are used as the basis for the definition of the system functionalities and to facilitate the requirements elicitation process in some software development methodologies like Agile.

As it has been explained in the Methodology chapter, in MyWay all the user stories have been extracted directly from the D1.1 Scenarios introduced above and used as an intermediate analysis for the requirements elicitation process.

During the analysis, they have been merged into the unique requirements presented in the tables of chapter 5. The requirements also include its relationship with the source scenarios.

The user stories have been codified with the notation: USX-SY which identify the User Story number X from the Scenario Y. Following, the list of the user stories that composes each scenario is provided:

Scenario S1 – Mr. Pepper and Mrs. Ginger. Regular car-pooling to save money

- US1-S1 - Mr. Pepper travels by car.
- US2-S1 - Mrs. Ginger travels by train, tram, bus.
- US3-S1 - Both register to MyWay and use it in carpooling-mode
- US4-S1 - Both share the final part of their journey.
- US5-S1 - MyWay connects both of them so as to share the car.
- US6-S1 - Mr. Pepper receives a notification when to start driving to pick Mrs Ginger up at the railway station (time dynamically calculated).
- US7-S1 - Mrs. Ginger receives a notification where to meet him (real-time location).
- US8-S1 - MyWay app does the *cost-sharing* (charges her and pays him)

Key words: car, train, tram, bus, carpooling, payment

Scenario S2 – Mrs. Peach. Public transport disruption

- US1-S2 - Mrs. Peach is travelling by tram and it is stopped due to an accident
- US2-S2 - Mrs. Peach and other tram user use MyWay to check alternative methods to get home
- US3-S2 - Mrs. Peach has two alternatives: carpooling and a rental bike
- US4-S2 - For the other user, there is only the possibility for a rental bike
- US5-S2 - Both want to use a bike
- US6-S2 - MyWay assigns a bike in travel-direction for each user to optimize overall travel time

Key words: tram, accident, alternative, carpooling, rental bike

Scenario S3 – Mr. Sugar. Cycle commuter in bad weather

- US1-S3 - Mr. Sugar usually travels by bike
- US2-S3 - Mr. Sugar asks the MyWay App for a low emission trip to his office (in a rainy day)
- US3-S3 - Mr. Sugar has some appointments, so he informs the MyWay App about his time constraints
- US4-S3 - The App ranks the possible alternatives with a particular focus on emissions
- US5-S3 - He chooses a multi-modal trip with bus and train
- US6-S3 - The emissions are calculated and assigned to his MyWay profile

Key words: rain, emissions, constraints, multi-modal trip, ranking

Scenario S4 – Angela. The visiting foreign business executive

- US1-S4 - Angela uses MyWay app to look for best option to go to the restaurant
- US2-S4 - MyWay shows her the chance of booking electrical scooters
- US3-S4 - MyWay shows her a nice touristic route
- US4-S4 - Angela uses MyWay to help her plan her itinerary for the following day
- US5-S4 - MyWay uses her stored profile to search for the closest match in Barcelona

- US6-S4 - MyWay takes into account Angela's heavy bag
- US7-S4 - MyWay shows a very fast option that is going by metro and then take the bus express line
- US8-S4 - MyWay gives a map with the stop location information for the bus express line and the train station, as well as the timetables
- US9-S4 - Angela knows how much time she can spend on her visit
- US10-S4 - MyWay sends her a real-time update to show that there are no problems with her planned schedule

Key words: touristic routes, fast routes, electric scooters, time, real-time

Scenario S5 – Sebastian. Newly-arrived exchange student

- US1-S5 - Sebastian used to use MyWay in Berlin
- US2-S5 - Sebastian uses MyWay to look for Barcelona local informations to decide the area to live in that city
- US3-S5 - He see Public Transport stops/stations and POIs on a map and compare well-connected versus poorly connected areas
- US4-S5 - Sebastian uses MyWay in German language
- US5-S5 - Sebastian uses MyWay to know how to reach his accommodation
- US6-S5 - MyWay plans the journey taking into account Sebastian has a large piece of wheeled luggage
- US7-S5 - MyWay informs Sebastian about the best ticket to use for the journey
- US8-S5 - Sebastian uses MyWay to find a nice touristic walking path
- US9-S5 - Sebastian uses MyWay to reach his friends (he is tired and in a hurry)
 - MyWay calculates a quick route where Sebastian has to walk as little as possible

Key words: language, places of interest, accessibility, tourist routes, walking

Scenario S6 – Jordi and Núria. Elderly couple from rural village

- US1-S6 - Andreu does park & ride (private car + train)
- US2-S6 - Jordi and Núria ask MyWay how to reach a city location they decide to visit (from the train)

- US3-S6 - Jordi and Núria use MyWay to book a bus on demand for the return trip (only few hours in advance)
- US4-S6 - MyWay informs them the closest stop and the time the bus will collect them
- US5-S6 - MyWay sends them a reminder
- US6-S6 - MyWay manages the nearby requests for bus on demand (by time and location) and combines them into one journey

Key words: points of interest, bus on demand, reminder, routing

Scenario S7 – Lluís. Cyclist with flat tyre

- US1-S7 - Lluís uses MyWay to find out the state of shared bicycle
- US2-S7 - Lluís see there are lots of available bicycles in a slot near his house
- US3-S7 - Lluís checks if he will have no trouble returning the bicycle to a slot near his destination
- US4-S7 - Lluís goes with the shared bicycle
- US5-S7 - Lluís uses MyWay to find a faster way than bicycle to go home
- US6-S7 - MyWay recommends electric scooter
- US7-S7 – Lluís books an electric scooter through MyWay

Key words: bike-sharing, capacity, electric scooter, booking

Scenario S8 – Joan and Pere. Wheelchair user and friend

- US1-S8 - Joan uses MyWay to plan a trip to the cinema with suitable physical accessibility
- US2-S8 - MyWay suggests a route by metro with adapted entrances and few changes
- US3-S8 - Joan uses MyWay to book an adapted taxi to get home
- US4-S8 - Pere downloads the App onto his own smartphone
- US5-S8 - Pere plans his own journey home
- US6-S8 - Pere selects the bike-sharing option

- US7-S8 - MyWay gives him a good route from the cinema to the empty bike slots nearest to his home

Key words: reduced mobility, accessibility, adapted taxi, bike-sharing, instant user registration

Scenario S9 – Bill and Kostas. Elderly non-driver accessing essential healthcare

- US1-S9 - Kostas registers in MyWay and creates a user profile
- US2-S9 - Bill has a severe impairment to walk
- US3-S9 - Kostas indicates that he is looking for a car-pooling arrangement on behalf of his father Bill
- US4-S9 - MyWay indicates that there are three alternative trips via car-pooling from Trikala to Larissa and two alternative trips via car-pooling for the return journey
- US5-S9 - Kostas selects the preferred option for both trips with the note that Bill has to depart from and return exactly at his home

Key-words: car-pooling, reduced mobility, third party

Scenario S10 – Eleni. Car-pooling to save money

- US1-S10 - Eleni has to travel every day to the University which is about 5 kilometers away
- US2-S10 - From spring to late autumn, she makes this journey using her bicycle
- US3-S10 - During the winter Eleni uses MyWay to find a low-priced way to travel to her destination
- US4-S10 - MyWay suggests sharing a ride through the car-pooling service
- US5-S10 - Eleni is able to find a match with a driver who will be driving to the university
- US6-S10 - MyWay seamlessly arranges the fair sharing of costs through Eleni and the driver accounts.

Key-words: low cost, car-pooling, recommendation, matching, cost-sharing

Scenario S11 – Eleonora– Keen cyclist making a tourist visit for sightseeing

- US1-S11 - Eleonora joins MyWay to find active ways to get about the locality

- US2-S11 - Eleonora sets 'cycling' as a preference in her user profile
- US3-S11 - MyWay informs her that local community of bike-owners has a sharing system
- US4-S11 - MyWay platform gives her the chance to preview several types of bicycles, and specify the pick-up and drop-off times and locations for her rides
- US5-S11 - Eleonora books a total of ten hours biking using bikes belonging to different Trikala residents

Key words: tourist routes, preferences, cycling, community bike-sharing, booking

Scenario S12 – Sophia. Office worker with many appointments

- US1-S12 - Sophia is informed about various parking spots near her client premises, multiple times within a day.

Key words: parking availability, times, locations

Scenario S13 – George. Public transportation interconnection mode

- US1-S13 - George has started to use MyWay to plan the best way to reach the nearest city by bus or by train
- US2-S13 - MyWay informs about the timetables of all the services in the area
- US3-S13 - George enters the time he wants to leave or arrive and the date
- US4-S13 - George gets information about the bus from his village to the train station, about the train times and bus times to Athens, and about his return trip
- US5-S13 - George saves his planned journey in his account
- US6-S13 - MyWay sends a reminder to his phone from MyWay

Key words: SMS notification, journey planning, saved journeys

Scenario S14 – Marco. Dissatisfied car commuter

- US1-S14 - Marco looks for a cheap way to go to the university
- US2-S14 - MyWay across the Marco's profile recognizes that it will be difficult to convince him to switch to public transport immediately
- US3-S14 - MyWay makes two alternative suggestions

- to car-pool with other people travelling to the same destination
 - to park a little further away and walk the remaining distance
- US4-S14 - MyWay uses parking location data to suggest that Marco parks his car in a street a couple of blocks away from the university
- US5-S14 - MyWay helps to persuade him by showing the safe walking route on a map
- US6-S14 - MyWay gives him feedback through his account on his reduced carbon and increased walking

Key words: car-pooling, personalized recommendations, emissions tracking, fitness tracking, feedback, parking locations, walking routes, map

Scenario S15 – Regina. Person with reduced mobility

- US1-S15 - Regina can tell MyWay about her travel plans
- US2-S15 - MyWay notifies her when something has changed in the normal situation
- US3-S15 - MyWay seamlessly integrates flexible and adapted forms of transport with normal ones
- US4-S15 - MyWay arranges for an on-demand bus/taxi to pick her up from home and bring her to the railway station
- US5-S15 - MyWay informs the driver she may need help with steps
- US6-S15 - Regina misses her train on the way back, and takes the next train
- US7-S15 - MyWay changes the return journey booking on the mini-bus/taxi

Key words: accessibility, notification of disruption, booking, bus on demand, automated rebooking

Scenario S16 – John. MyWay data manager

- US1-S16 - John adds new lines of public transport
- US2-S16 - John modifies itineraries of existing lines
- US3-S16 - John modifies schedules of existing lines
- US4-S16 - John adds intercity lines of public transport

- US5-S16 - John adds information about a new lift to an existing metro stop
- US6-S16 - John programs changes to be effective from a particular date
- US7-S16 - MyWay detects proximity between two stops
- US8-S16 - MyWay allows aggregating two stops from different transport operators into a unique stop
- US9-S16 - John adds a new Touristic Point of Interest

Key words: manage (add, modify) data, program changes, detect / aggregate stops

5. REQUIREMENTS

In MyWay, the requirements describe the single functionalities to perform in the system. The requirements, classified in functional and non-functional, have been gathered, analysed and prioritized following the methodology described in chapter 3.

The next sections report the full list of functional and non-functional requirements. Each requirement is specified with the following description fields:

- **ID:** Unique MyWay identifier for the specific requirement following the notation, AA-BB-NNN, where:
 - **AA:** Represents the identifier type. In the requirements case: FR for the functional requirements and NF for the non-functional requirement
 - **BB:** Requirement category. In MyWay, requirements are classified in 14 categories for the functional category and in 6 categories for the non-functional ones
 - **NNN:** Incremental unique number for each AA-BB category
- **Requirement:** Short description of the requirement.
- **Level:** Requirement level. It could be *requirement* (low level) or *main requirement* (high level).
- **Region:** Region or living lab where the requirement will be applied. It is directly related to the interests and scopes of the living labs specified in deliverables D4.2.1, D4.3.1 and D4.4.1. The value could be one or more among Barcelona, Berlin and Trikala. For the non-functional requirements this information is not provided since they are applied to the whole system and not only to a specific set of functionalities.
- **Scenarios:** List of the scenarios to which the requirement is related. This field is empty for the functional requirements coming from the WP2 or WP4. For the non-functional ones this information does not apply.
- **Barcelona, Berlin, Trikala:** Level of the requirement importance for the living lab of Barcelona, Berlin and Trikala respectively. For each requirement, the living labs have expressed their own prioritization indicated in three different grades (High, Medium and Low)
- **Importance:** It expresses the overall importance for the requirement. As explained in the requirements elicitation methodology, the overall importance has derived in the second round of the prioritization process taking into account both the prioritization of the living labs and the general project scope. This overall importance is reported using the *MoSCoW* notation that uses the following 4 different values:

- **Must** - Features that absolutely have to be done are categorized as Must.
- **Should** - Features that are important to the success of the project, but are not absolute musts (they have a workaround) are categorized as Should.
- **Could** - Features that are nice to have but are not core features are categorized as Could.
- **Won't** - Features that are not going to be implemented this time are marked as Won't.

It is important to note that this overall importance does not take into consideration the technical feasibility of the requirements. To have the definitive requirements prioritization, the relation between the overall importance and the technical feasibility will be analyzed later in context of the architecture definition in the D2.3.

All the requirements reported in these chapters are stored and managed on the MyWay cooperative issue tracker application that is based on the Redmine application.

5.1 Functional Requirements

The functional requirements specify the functionalities that have been analysed to perform in MyWay following the methodology described in the chapter 3. In that way, more than 100 functional requirements have been gathered and classified in 14 different main functionalities previously identified.

These 14 main functionalities have been grouped in the following macro categories:

- Journey planning and tracking
- Mobility services and resources awareness
- User profiling
- System management

5.1.1 Journey planning and tracking

All requirements related with the user mobility including the journey planning, the booking services and mechanism for tracking or feedback are described below.

5.1.1.1 Plan a Journey

Requirements for the fully-multimodal journey planning with mobility services and context real-time information have been analysed for the MyWay system. More than 35 requirements are classified in this main functionality indicating that this is one of the most crucial functionalities in MyWay.

Table 1. Requirements for plan a journey

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|-------------------------------------------------------------------------|------------------|----------------------------|----------------------|-----------|--------|---------|------------|
| FR-JP-001 | User can use POIs to plan a journey | requirement | Barcelona, Berlin, Trikala | S4, S6, S11 | High | High | High | Must |
| FR-JP-002 | User can use addresses to plan a journey | requirement | Barcelona, Berlin, Trikala | S3, S4, S5, S13, S14 | High | High | High | Must |
| FR-JP-003 | User can use his/her GPS position to plan a journey (with mobile phone) | main requirement | Barcelona, Berlin, Trikala | S2, S5, S8 | High | High | High | Must |
| FR-JP-004 | User can choose a point on a map to plan a journey | main requirement | Barcelona, Berlin, Trikala | S12, S14 | High | High | High | Must |
| FR-JP-005 | MyWay provides intermodal routes | main requirement | Barcelona, Berlin, Trikala | S1, S3, S4, S13 | High | High | High | Must |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|------------------|-----------|--------|---------|------------|
| FR-JP-006 | MyWay provides trip alternatives for the users by request (ON TRIP triggered by user) | requirement | Barcelona, Berlin, Trikala | S2 | High | Medium | Medium | Should |
| FR-JP-007 | MyWay provides trip alternatives for the users by changing context conditions (ON TRIP) | requirement | Barcelona, Berlin, Trikala | S4, S15 | Medium | Medium | Medium | Should |
| FR-JP-008 | MyWay reflects context information conditions for journey planning (PRE TRIP) | requirement | Barcelona, Berlin, Trikala | S4, S10, S14 | High | High | High | Should |
| FR-JP-009 | MyWay reflects traffic information limitations for journey planning | requirement | Barcelona, Berlin, Trikala | S4 | Medium | High | Medium | Should |
| FR-JP-010 | MyWay takes into account Real-Time information about service disruptions in scheduled mobility services for journey planning | main requirement | Barcelona, Trikala | S2, S4 | Medium | Medium | Medium | Must |
| FR-JP-011 | MyWay takes into account Real-Time information about the vehicle location (time to next stop) in scheduled mobility services for journey planning | main requirement | Barcelona, Trikala | S2 | High | High | Medium | Must |
| FR-JP-012 | MyWay plans a Journey taking into account the user profile | main requirement | Barcelona, Berlin, Trikala | S7, S8, S14, S15 | High | High | High | Must |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|-------------------------------------------------------------------------------------|------------------|----------------------------|--------------|-----------|--------|---------|------------|
| FR-JP-013 | MyWay plans a Journey taking into account one's time preferences | main requirement | Barcelona, Berlin, Trikala | S4, S5, S8 | High | High | High | Must |
| FR-JP-014 | MyWay plans a Journey taking into account previous user choices | main requirement | Barcelona, Berlin, Trikala | S7, S14 | High | Low | High | Must |
| FR-JP-015 | MyWay plans a Journey taking into account environmental emissions | requirement | Barcelona, Berlin, Trikala | S3, S7 | Medium | High | Medium | Should |
| FR-JP-016 | MyWay plans touristic routes across nice touristic walking path and touristic roads | requirement | Barcelona, Berlin, Trikala | S4, S5 | Medium | Low | Medium | Could |
| FR-JP-017 | MyWay plans touristic routes between interesting monuments and touristic POIs | requirement | Barcelona, Berlin, Trikala | S4, S5, S11 | Medium | Low | Medium | Should |
| FR-JP-018 | MyWay plans touristic routes through non-touristic areas | requirement | Barcelona, Berlin, Trikala | - | Low | Low | Low | Won't |
| FR-JP-019 | MyWay provides a usable interface with a quick access to the main functionalities | requirement | Barcelona, Berlin, Trikala | S9, S13, S15 | Medium | Medium | Medium | Must |
| FR-JP-020 | For journey planning, MyWay will consider Walking mode | main requirement | Barcelona, Berlin, Trikala | S5, S9 | High | High | High | Must |
| FR-JP-021 | For journey planning, MyWay will use a private own car | main requirement | Barcelona, Berlin, Trikala | S1, S12, S14 | High | High | High | Must |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|-----------------------------------------------------------------------------------|------------------|----------------------------|---------------------|-----------|--------|---------|------------|
| FR-JP-022 | For journey planning, MyWay will use a private own motorbike / scooter | requirement | Barcelona, Berlin, Trikala | - | Medium | Medium | Medium | Should |
| FR-JP-023 | For journey planning, MyWay will use a private own bicycle | requirement | Barcelona, Berlin, Trikala | S11 | Medium | Medium | Medium | Should |
| FR-JP-024 | For journey planning, MyWay will use public scheduled mobility services | main requirement | Barcelona, Berlin, Trikala | S1, S3, S4, S6, S13 | High | High | Medium | Must |
| FR-JP-025 | For journey planning, MyWay will use Bus-on-demand services | main requirement | Barcelona | S6, S15 | High | Low | Low | Must |
| FR-JP-026 | For journey planning, MyWay will use Vehicle sharing services with fixed stations | main requirement | Barcelona, Berlin | S2, S3, S7, S8 | High | High | Low | Must |
| FR-JP-027 | For journey planning, MyWay will use Free Floating Vehicle sharing services | main requirement | Barcelona | S4, S6 | High | Medium | Low | Must |
| FR-JP-028 | For journey planning, MyWay will use Taxi services | requirement | Barcelona | - | Medium | Low | Low | Could |
| FR-JP-029 | For journey planning, MyWay will use Carpooling services/communities | requirement | Berlin, Trikala | S1, S2, S9, S10 | Low | High | Medium | Should |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|---------------------------------------------------------------------------------------------------------------|------------------|----------------------------|-------------|-----------|--------|---------|------------|
| FR-JP-030 | For journey planning, MyWay will use Taxi sharing services (ridesharing) | requirement | - | - | Low | Low | Low | Could |
| FR-JP-031 | MyWay provides trip itinerary to the user with all indications to achieve a point | main requirement | Barcelona, Berlin, Trikala | S4, S5, S13 | High | High | Medium | Must |
| FR-JP-032 | MyWay provides a Fuel Effective trip itinerary between N points | requirement | Trikala | - | Low | Low | Low | Won't |
| FR-JP-033 | For Bus on Demand, MyWay informs user about the closest stop and the time the bus will collect him/her | requirement | Barcelona | S6, S15 | High | Low | Low | Must |
| FR-JP-034 | For Bus on Demand, MyWay sends a reminder to the user informing the stop and the time the bus collect him/her | requirement | Barcelona | S6, S15 | High | Low | Low | Should |
| FR-JP-035 | For Carpooling, MyWay informs the driver user when to start driving so as to pick the carpoolers up | requirement | Berlin, Trikala | S1, S9, S10 | Low | Medium | High | Could |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|--------------------------------------------------------------------------|------------------|-------------------|-------------|-----------|--------|---------|------------|
| FR-JP-036 | For Carpooling, MyWay notifies the carpooler users where to meet the car | requirement | Berlin, Trikala | S1, S9, S10 | Low | Medium | High | Should |
| FR-JP-037 | For Vehicle sharing, MyWay informs where to pick up the vehicle | main requirement | Barcelona, Berlin | S1, S9, S10 | High | High | Low | Must |

5.1.1.2 Book/Reserve a service

Another important group of requirements in MyWay are related to the booking services. It is important to note that the booking service could be done as a single activity at any moment or integrated during the journey planning. In this last case, having the possibility to book a service with limited availability, such as the vehicle sharing, it is an important condition to have a fully intermodal journey planning.

Table 2. Requirements for Book/reserve a service

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|-----------------------------------------------------------------|------------------|-----------------|------------|-----------|--------|---------|------------|
| FR-BS-001 | User books a scheduled service (Train, Inter-city bus) | requirement | Barcelona | - | Low | Low | Low | Won't |
| FR-BS-002 | User books a Taxi | requirement | Barcelona | - | Medium | Low | Low | Could |
| FR-BS-003 | User can request a taxi adapted to people with reduced mobility | requirement | Barcelona | S8, S15 | Medium | Low | Low | Could |
| FR-BS-004 | User books an electric scooter | main requirement | Barcelona | S4, S6, S8 | High | Low | Low | Must |
| FR-BS-005 | User books a Bus on demand | requirement | Barcelona | S6, S15 | High | Low | Low | Must |
| FR-BS-006 | User books a parking spot | requirement | Trikala | S12 | Medium | Low | Low | Could |
| FR-BS-007 | User does payment for carpooling via MyWay | requirement | Berlin, Trikala | S1 | Low | Low | Low | Won't |

5.1.1.3 Track a Journey

Tracking the user in their journeys is a precondition for the user profiling and also for the journey recalculation so as to cater for planning or context changes.

Table 3. Requirements for Track a Journey

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|---------------------------------------------------------------------------------------------------------------|-------------|----------------------------|-----------|-----------|--------|---------|------------|
| FR-TJ-001 | MyWay is tracking a journey by user's device GPS and storing the data for route re-calculations and feedback. | requirement | Barcelona, Berlin, Trikala | S2, S15 | Medium | High | High | Must |
| FR-TJ-002 | MyWay stores the journey tracking for route re-calculations and feedback. | requirement | Barcelona, Berlin, Trikala | S15 | Medium | Medium | Medium | Should |

5.1.1.4 Online feedback to “road conditions and limitations”

Following, the functionalities about the crowd sourcing for the traffic and road conditions or limitations are described:

Table 4. Requirements for Online feedback to the road conditions

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|-------------------------------------------------------------------------|-------------|----------------------------|-----------|-----------|--------|---------|------------|
| FR-OF-001 | User can report a limitation on the road (e.g. accident, heavy traffic) | requirement | Barcelona, Berlin, Trikala | - | Medium | Medium | Medium | Should |

5.1.1.5 Feedback to journey

Following, the requirements about the user feedbacks from the journey itinerary or plan are described:

Table 5. Requirements for feedback to journey

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|---------------------------------------------------------------------------------------------------|-------------|----------------------------|-----------|-----------|--------|---------|------------|
| FR-FJ-001 | User can express feedback to the journey itinerary proposed by MyWay. | requirement | Barcelona, Berlin, Trikala | - | Medium | Medium | Low | Could |
| FR-FJ-002 | MyWay compares the trip itinerary with data from journey tracking and evaluates the journey plan. | requirement | Barcelona, Berlin, Trikala | S15 | Medium | Medium | Medium | Should |

5.1.2 Mobility services and resources awareness

This chapter contains the functional requirements related with the mobility services to integrate in MyWay for the three living labs in terms of the information to provide about them as well as the user feedback.

5.1.2.1 City information

This main category includes the requirements that offer information, in real-time or not, about the city services or resources, that have been identified as interesting for the MyWay platform.

Table 6. Requirements related with the city information

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|---------------------------------------------------------------------------------------------------|-------------|----------------------------|-----------|-----------|--------|---------|------------|
| FR-CI-001 | MyWay provides points of interest in the map | requirement | Barcelona, Berlin, Trikala | S5 | Medium | Medium | Medium | Could |
| FR-CI-002 | MyWay provides information about parking spots | requirement | Barcelona, Berlin, Trikala | S12 | Medium | Medium | Medium | Should |
| FR-CI-003 | MyWay provides information about restaurants | requirement | Barcelona, Berlin, Trikala | S4 | Low | Low | Low | Won't |
| FR-CI-004 | MyWay will load restaurants information and their rating from foursquare or other social networks | requirement | Barcelona, Berlin, Trikala | S4 | Low | Low | Low | Won't |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|------------------------------------------------------------------------------------------------------------|-------------|----------------------------|-----------|-----------|--------|---------|------------|
| FR-CI-005 | MyWay provides information in the map about Scheduled mobility services city network | requirement | Barcelona, Berlin, Trikala | S4, S5 | Medium | Medium | Medium | Should |
| FR-CI-006 | MyWay provides information about Timetables for Scheduled mobility services city | requirement | Barcelona, Berlin, Trikala | S5 | Medium | High | Medium | Should |
| FR-CI-007 | MyWay provides Real-Time information in the map about mobility services disruptions | requirement | Barcelona | - | High | Medium | Low | Should |
| FR-CI-008 | MyWay provides Real-Time information in the map about departure times for scheduled services | requirement | Barcelona, Trikala | - | Medium | Medium | Medium | Must |
| FR-CI-009 | MyWay provides Real-Time information in the map about Vehicle location for free floating sharing resources | requirement | Barcelona | S4 | High | Medium | Medium | Must |
| FR-CI-010 | MyWay provides Real-Time information in the map about Vehicle location for carpooling resources | requirement | Berlin, Trikala | - | Low | High | Medium | Could |
| FR-CI-011 | MyWay provides Real-Time | requirement | Barcelona, | - | Medium | Low | Low | Should |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|----------------------------------------------------------------------------------------------------------------|-------------|----------------------------|------------|-----------|--------|---------|------------|
| | information in the map about Free parking spots | | Trikala | | | | | |
| FR-CI-012 | MyWay provides information in the map about Fixed-stations for vehicle sharing | requirement | Barcelona, Berlin | S2, S5, S7 | High | High | Medium | Must |
| FR-CI-013 | MyWay provides Real-Time information in the map about vehicles availability in fixed stations sharing services | requirement | Barcelona, Berlin | S2, S7, S8 | High | High | Medium | Should |
| FR-CI-014 | MyWay provides Real-Time information in the map about parking free spaces in fixed stations sharing services | requirement | Barcelona, Berlin | S7, S8 | High | Low | Low | Should |
| FR-CI-015 | MyWay provides information about available transport tickets/services prices | requirement | Barcelona, Berlin, Trikala | S5 | Medium | High | Medium | Should |
| FR-CI-016 | User can tag points of interest by "I have been there" | requirement | Barcelona, Berlin, Trikala | - | Low | Low | Low | Won't |

5.1.2.2 Paneuropean experience

MyWay will be deployed initially in 3 different areas that correspond with the 3 living labs. The users will be able to use the platform in all the different areas in the same way having a unique experience.

Table 7. Requirements related with the paneuropean experience

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|------------------------------|------------------|-----------|------------------------|-----------|--------|---------|------------|
| FR-PE-001 | User uses MyWay in Catalonia | main requirement | Barcelona | S4, S5, S6, S8, S16 | High | Medium | Medium | Must |
| FR-PE-002 | User uses MyWay in Berlin | main requirement | Berlin | S1, S2, S3 | High | High | Medium | Must |
| FR-PE-003 | User uses MyWay in Trikala | main requirement | Trikala | S9, S10, S11, S12, S13 | High | Medium | High | Must |

5.1.2.3 Feedback to the MyWay services

Requirements for the user feedback to the mobility services of MyWay

Table 8. Requirements for feedback to the MyWay services

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|------------------------------------------------|------------------|----------------------------|-----------|-----------|--------|---------|------------|
| FR-FS-001 | User gives feedback on MyWay mobility services | main requirement | Barcelona, Berlin, Trikala | - | Medium | High | Medium | Should |

5.1.3 User profiling

This chapter contains the requirements that group functionalities of user customization like user profile and user communities for mobility services.

5.1.3.1 User profile

The user profile is a main functionality that allows the user to customize his/her profile with a set of functionalities specified in the following requirements.

Table 9. Requirements for the user profile

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|---------------------------------------------------------------------------------------------------------|-------------|----------------------------|-----------------|-----------|--------|---------|------------|
| FR-UP-001 | User can enter their General Preferences (price, time, # of changes) in their User Profile | requirement | Barcelona, Berlin, Trikala | S5, S7, S11 | Medium | Medium | Medium | Should |
| FR-UP-002 | User can enter their User characteristics (private constraints, reduced mobility) in their User Profile | requirement | Barcelona, Berlin, Trikala | S8, S9, S15 | Medium | High | High | Should |
| FR-UP-003 | User can enter their HMI preferences (visible POIs, ...) in their User Profile | requirement | Barcelona, Berlin, Trikala | S12, S14 | Medium | High | High | Could |
| FR-UP-004 | User can enter their preferences for Journey planning in their User Profile | requirement | Barcelona, Berlin, Trikala | S3, S5, S7, S14 | Medium | High | High | Should |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|---------------------------------------------------------------------------------------------------------------|-------------|----------------------------|-----------|-----------|--------|---------|------------|
| FR-UP-005 | User can define their own waypoints, which could be used for journey planning | requirement | Barcelona, Berlin, Trikala | - | Medium | Low | Medium | Could |
| FR-UP-006 | MyWay provides user's statistics about Environmental emissions profile | requirement | Barcelona, Berlin, Trikala | S3, S14 | Medium | High | Medium | Should |
| FR-UP-007 | MyWay provides user's statistics about Fuel effectiveness | requirement | Barcelona, Berlin, Trikala | - | Medium | Low | Low | Won't |
| FR-UP-008 | User sets details about his private vehicle | requirement | Barcelona, Berlin, Trikala | - | Low | Low | Low | Won't |
| FR-UP-009 | MyWay has a predefined Database of vehicles models (or vehicles categories) with vehicle details informations | requirement | Barcelona, Berlin, Trikala | - | Low | Low | Low | Won't |
| FR-UP-010 | User sets his/her private vehicle as shared for car pooling | requirement | Berlin, Trikala | S1 | Low | Medium | Medium | Could |

5.1.3.2 Group users

This chapter contains the set of requirements regarding the functionalities for the user communities for a specific mobility service like carpooling or private vehicle sharing.

Table 10. Requirements for the group users

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|-----------------------------------------------------------------------------|-------------|-----------------|------------------|-----------|--------|---------|------------|
| FR-GU-001 | User credibility is tracked for the pooling / sharing community | requirement | Berlin, Trikala | S1, S9, S10, S11 | Low | Low | Medium | Could |
| FR-GU-002 | User can create a car pooling community | requirement | Berlin, Trikala | S1 | Low | Low | Medium | Could |
| FR-GU-003 | User can join a car pooling community | requirement | Berlin, Trikala | S1, S9, S10 | Low | Low | Medium | Could |
| FR-GU-004 | User can leave a car pooling community | requirement | Berlin, Trikala | S1, S9, S10 | Low | Low | Medium | Could |
| FR-GU-005 | User shares his/her planned trips with people in their carpooling community | requirement | Berlin, Trikala | S1 | Low | Low | Medium | Could |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|-----------------------------------------------------|-------------|-----------------|-----------|-----------|--------|---------|------------|
| FR-GU-006 | User can create a private vehicle sharing community | requirement | Berlin, Trikala | S11 | Low | Low | Medium | Won't |
| FR-GU-007 | User can join a private vehicle sharing community | requirement | Berlin, Trikala | S11 | Low | Low | Medium | Won't |
| FR-GU-008 | User can leave a private vehicle sharing community | requirement | Berlin, Trikala | S11 | Low | Low | Medium | Won't |

5.1.4 System management

This chapter contains the requirements that group functionalities of system management like data analytics, user authentication, data administration and interfaces for services operators.

5.1.4.1 Analytics

This chapter contains the requirements for logging system, statistics and data analytics.

Table 11. Requirements related with the analytics

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|------------------------------------------------------|-------------|----------------------------|-----------|-----------|--------|---------|------------|
| FR-AN-001 | MyWay provides logging system to store system events | requirement | Barcelona, Berlin, Trikala | - | Medium | High | High | Must |
| FR-AN-002 | MyWay provides statistics of use | requirement | Barcelona, Berlin, Trikala | - | Medium | High | High | Should |
| FR-AN-003 | MyWay provides data analytics | requirement | Barcelona, Berlin, Trikala | - | Medium | High | Medium | Could |

5.1.4.2 User authentication

Requirements for user authentication and user authorization are a precondition to allow others related with security or user profiling.

Table 12. Requirements for the user authentication

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|-----------------------------------------------------------------|------------------|----------------------------|-----------|-----------|--------|---------|------------|
| FR-UA-001 | MyWay provides an authentication system | main requirement | Barcelona, Berlin, Trikala | - | Medium | High | High | Must |
| FR-UA-002 | MyWay provides different access roles with different privileges | main requirement | Barcelona, Berlin, Trikala | - | High | High | High | Must |
| FR-UA-003 | An Authenticated user could have mapped different roles | main requirement | Barcelona, Berlin, Trikala | - | Medium | High | Medium | Should |

5.1.4.3 Data administration

MyWay manages a large amount of data especially for the scheduled mobility services. The management, updating and consolidation of this information are important tasks to maintain the system reliability. This chapter contains requirements for this data administration. It is important to note that even though all this activities could be necessary for MyWay, some of them will not be implemented since they could be performed with external systems and are outside the scope of the project.

Table 13. Requirements for the Data administration

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|----------------------------------------------------------------------------------------------------------------------|-------------|--------------------|-----------|-----------|--------|---------|------------|
| FR-DA-001 | MyWay implements a dashboard to import transport data | requirement | Barcelona, Trikala | - | High | Medium | High | Must |
| FR-DA-002 | Data administrator uses the dashboard to import new lines of public transport | requirement | Barcelona, Trikala | S16 | High | Low | High | Should |
| FR-DA-003 | Data administrator uses the dashboard to previsualize imported transport data in order to check it before being used | requirement | Barcelona, Trikala | - | High | Low | Medium | Should |
| FR-DA-004 | Data administrator uses the dashboard to modify itineraries of imported lines | requirement | Barcelona, Trikala | S16 | High | Low | High | Could |
| FR-DA-005 | Data administrator uses the dashboard to modify schedules of imported lines | requirement | Barcelona, Trikala | S16 | High | Low | High | Could |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|-----------------------------------------------------------------------------------------------|-------------|----------------------------|------------------|-----------|--------|---------|------------|
| FR-DA-006 | Data administrator uses the dashboard to adapt transport data to optimize routing | requirement | Barcelona, Trikala | - | High | Low | Medium | Could |
| FR-DA-007 | Data administrator programs changes with the dashboard to be effective from a particular date | requirement | Barcelona, Trikala | S16 | High | Low | High | Could |
| FR-DA-008 | Data administrator manages POIs information | requirement | Barcelona, Berlin, Trikala | S16 | High | High | High | Should |
| FR-DA-009 | MyWay detects proximity between two stops | requirement | Barcelona, Trikala | S16 | Medium | Low | Medium | Won't |
| FR-DA-010 | Data administrator can aggregate two stops into a unique stop | requirement | Barcelona, Trikala | S16 | High | Low | High | Won't |
| FR-DA-011 | Data administrator adds information about a new lift to an existing metro stop | requirement | Barcelona, Trikala | S16 | Medium | Low | Low | Won't |
| FR-DA-012 | MyWay is capable to request services providing real-Time transport data formats | requirement | Barcelona, Trikala | - | High | Medium | High | Must |
| FR-DA-013 | MyWay is capable of using address autocomplete services | requirement | Barcelona, Berlin, Trikala | S4, S5, S12, S13 | High | Medium | Medium | Should |

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|--------------------------------------------|-------------|----------------------------|--------------|-----------|--------|---------|------------|
| FR-DA-014 | MyWay is capable of using geocode services | requirement | Barcelona, Berlin, Trikala | S2, S13, S15 | High | High | High | Must |

5.1.4.4 Interface for service operators

For some mobility services like bus on demand, requirements about specific interfaces with the operators have been analysed.

Table 14. Requirements related with the interfaces for the service operators

| ID | Requirement | Level | Region | Scenarios | Catalonia | Berlin | Trikala | Importance |
|-----------|---------------------------------------------------------------------------------------------------------|-------------|-----------|-----------|-----------|--------|---------|------------|
| FR-IS-001 | MyWay forwards the requests for bus on demand (by time and location) to service operator | requirement | Barcelona | S6, S15 | Medium | Low | Low | Could |
| FR-IS-002 | MyWay gets the consolidated trip plan for bus on demand from the provider and uses it for trip planning | requirement | Barcelona | S6, S15 | Medium | Low | Low | Won't |

5.2 Non-Functional Requirements

This chapter gives overview of the non-functional requirements to the system in terms of performance, responsiveness, interoperability, privacy, data quality and other related aspects.

5.2.1 Performance

This section summarizes the non-functional requirements related to the operating time of the services and system response times.

Table 15. Requirements for Performance

| ID | Requirement | Level | Catalonia | Berlin | Trikala | Importance |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|--------|---------|------------|
| NF-PE-001 | MyWay is accessible 24x7, service outages are preferred in the night and are announced 1 day in advance on the MyWay site | requirement | Medium | Medium | Medium | Should |
| NF-PE-002 | MyWay has high availability and reliability. A disaster recovery procedure is performed | requirement | Medium | High | Medium | Should |
| NF-PE-003 | For trip planning, MyWay APP responds within 5s, user is informed about the progress by a progress bar. Condition: average connection. | requirement | Medium | High | High | Should |
| NF-PE-004 | The MyWay app communicating with server responds within 2 s, excluding the trip planning. Condition: average connection. | requirement | Medium | High | High | Should |

5.2.2 Interoperability: System Interface/Integration

This section summarizes the non-functional requirements related to compatibility of MyWay front-end application with different platforms, browsers and data sources. Therefore, alternative journey planners and how to allowing users to implement an alternative front-end to the MyWay services have been analysed.

Table 16. Requirements for the Interoperability

| ID | Requirement | Level | Catalonia | Berlin | Trikala | Importance |
|-----------|------------------------------------------------------------------------------------------------------------------|------------------|-----------|--------|---------|------------|
| NF-IN-001 | Architecture allows using a third-party journey planner | main requirement | High | High | Low | Should |
| NF-IN-002 | Interface module is flexible enough to add a new data import for any of the data categories | main requirement | High | Medium | Medium | Should |
| NF-IN-003 | Back-end interface for front-end application is open to allow a third party to implement its own MyWay front-end | main requirement | Medium | Low | Medium | Must |
| NF-IN-004 | Data model is easily extensible to permit future improvements | requirement | High | Medium | High | Must |
| NF-IN-005 | Supports log of data interface for evaluation modules | requirement | Medium | High | High | Must |
| NF-IN-006 | Front-end can visualize different map services | requirement | Medium | Medium | Medium | Should |
| NF-IN-007 | MyWay has a mobile APP | requirement | High | High | High | Must |
| NF-IN-008 | MyWay APP runs on Android | requirement | High | High | High | Should |
| NF-IN-009 | MyWay APP runs on IOS | requirement | High | Low | Low | Could |

| ID | Requirement | Level | Catalonia | Berlin | Trikala | Importance |
|-----------|----------------------------------------------------------------------------------------------------------------------------|------------------|-----------|--------|---------|------------|
| NF-IN-010 | MyWay APP is adapted to tablets and smartphones screen size | requirement | High | Low | Low | Could |
| NF-IN-011 | For MyWay web interface, following browsers are supported in their more recent versions: Firefox, Chrome, IE, Safari | main requirement | Medium | Medium | Medium | Should |
| NF-IN-012 | Notification from the Bus on demand service comes as plain SMS to be accessible for users with "old fashion" mobile phones | requirement | High | Low | Low | Could |

5.2.3 Extensibility/Maintainability

This section summarizes the non-functional requirements related to the deployment model of the system and maintenance details.

Table 17. Requirements for Extensibility/Maintainability

| ID | Requirement | Level | Catalonia | Berlin | Trikala | Importance |
|-----------|------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|--------|---------|------------|
| NF-EM-001 | Architecture of MyWay is flexible enough to allow: Complete local instance for each living lab / shared data for all of them | requirement | High | Medium | High | Must |
| NF-EM-002 | Fast servers with 24/7 support | requirement | Medium | Medium | Medium | Should |

5.2.4 Privacy

This section summarizes the non-functional requirements related to data privacy, security and traceability of actions performed by the MyWay users.

Table 18. Requirements related with the Privacy

| ID | Requirement | Level | Catalonia | Berlin | Trikala | Importance |
|-----------|--------------------------------------------------------------------------------------------------------------------|-------------|-----------|--------|---------|------------|
| NF-PR-001 | Where practical, user data is anonymized | requirement | High | Medium | High | Should |
| NF-PR-002 | User profiles are stored in a server following the best-practice for privacy and personal data handling | requirement | High | High | High | Must |
| NF-PR-003 | MyWay data profiles storing is compliant with local legislation. Communications with sensitive data are encrypted | requirement | High | High | High | Must |
| NF-PR-004 | MyWay provides a traceability of the sensible actions performed by the users, especially for system administration | requirement | Medium | High | Medium | Should |
| NF-PR-005 | MyWay guarantees integrity and authorized access to the data | requirement | High | High | High | Must |
| NF-PR-006 | Only MyWay administrators have privileges to view or to modify internal data | requirement | High | High | High | Must |

5.2.5 Standards Compliance

This section summarizes the non-functional requirements related to the compliance of the MyWay to the source data standards in the transportation domain, compliance to EU standards and openness of the MyWay to cooperate with other systems.

Table 19. Requirements for the Standards Compliance

| ID | Requirement | Level | Catalonia | Berlin | Trikala | Importance |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|--------|---------|------------|
| NF-SC-001 | Where practical, data and Service Model should follow ITS & EU Guidelines | requirement | Medium | Low | Low | Must |
| NF-SC-002 | Standard “real” or “de-facto” has to be considered while creating the system | requirement | Medium | Medium | Medium | Should |
| NF-SC-003 | MyWay can integrate geographical data from Google maps, Openstreet maps and local maps or local geographical data compliant with OGC formats: WMS, WFS, KML, KMZ | requirement | High | High | High | Should |
| NF-SC-004 | Reuse experience from eMOTION, In-Time & Co-Cities in harmonization of different standards and create a “Common Agreed Interface” | requirement | High | Low | Low | Should |
| NF-SC-005 | MyWay web interface follows the most common accessibility standards | requirement | High | Medium | High | Must |

5.2.6 Data Quality: Availability and Reliability

This section summarizes the non-functional requirements related to the quality and consistency of data processed by the system.

Table 20. Requirements for the Data Quality

| ID | Requirement | Level | Catalonia | Berlin | Trikala | Importance |
|-----------|-----------------------------------------------------------------------------------------------------------|-------------|-----------|--------|---------|------------|
| NF-DQ-001 | Minimum level of data quality is ensured in order to make the system work properly in all the Living Labs | requirement | High | High | High | Must |
| NF-DQ-002 | Created data model with minimum mandatory fields which is present in all labs | requirement | Medium | Medium | Medium | Should |
| NF-DQ-003 | Data has to be fresh enough to guarantee correct solutions | requirement | High | High | High | Should |

6. SELECTED USE CASES FOR KEY FUNCTIONALITY

In this chapter, **selected detailed use-cases capturing MyWay key functionality** from the **public end user's point of view** are presented. During the detailed system design, relevant details of the functionality will be adjusted further.

This chapter keeps the same structure as the requirements overview (see chapter `Requirements`).

For the `System management` part, the detailed use-cases are not provided in this stage, as this functionality has to be elaborated further in detail during the work on MyWay detailed design.

6.1 Notation of the detailed use cases

For interaction overview between actors and particular detailed use cases, standard UML Use Case diagram is being used.

For the description of the particular use cases (depicted as ovals linked to the Actor picture in the Use Case diagrams), in accordance to the common software engineering praxis, we are using the following structure:

- **Use case ID** (internal, not used in this document)
- **Use case name**
- **Description** – a summary of the use case main flow
- **Actors** – list of actors participating on or interacting with the use case
- **Prerequisites** – preconditions, which have to be fulfilled to allow the run of the use case
- **Use case steps** – structured description of the functionality

To allow structuring of the use case steps and to allow alternative flows, based on our experience and best practise, we are using a set of following operators in the text:

- **(optional)** – The use case step marked as (optional) can be skipped in the flow of the steps
- **IF** – a condition
- **FOR EACH** – an iteration by a set of elements or situations
- **{ }** – all of the activities in the brackets have to be performed, there is no possibility to perform only part of the activities

- **GOTO STEP** – go to a particular step in the same use case
- **GOTO USE CASE** – go to a particular step in another use case. Each step is specified
- **CONSEQUENT USE CASE** – definition of the use case, which is logically following the particular use case. This operator is not used to capture all possible logical consequences of functions in the system, but only to capture the major consequences in the flow of functionalities
- **REFER TO** – a link to another use case

6.2 Actors of the system

There are several actors interacting with the MyWay :

- **Anonymous user** – non registered user having access to a limited set of MyWay functionalities (which can be performed without user profile data)
- **Registered user** – user having full access to MyWay public end user functionalities
- **Vehicle sharing community administrator** – registered user having the administrator rights to the vehicle sharing community. Initially the founder of the community, the rights can be delegated to other registered user.
- **Data administrator** – performs supervision and maintenance of data in the system, maintains the user list and access rights
- **System administrator** – responsible for general set-up of the system and system configuration in a technical sense
- **Transport service operator: scheduled service** – representative of transport service operator having the access to respective functions in the MyWay
- **Transport service operator: bus on demand** – representative of transport service operator having the access to respective functions in the MyWay
- **Transport service operator: vehicle sharing** – representative of transport service operator having the access to respective functions in the MyWay
- **Analytics operator** – member of the MyWay team, performing data analytics and getting usage statistics from the system
- **Public administration representative** – representative of public administration subject, having access to respective usage statistics from the system
- **MyWay** – the system itself. This actor is used in situations, when system interacts with any of the actors described above

The selected detailed use cases for the public end user's functionality in this document are related the following actors:

- Anonymous user
- Registered user
- Vehicle sharing community administrator
- MyWay

In the overview UML Use Case diagrams, MyWay actor is not displayed as a default.

6.3 Mobility Use Cases

This section describes the functionality of planning and following the trip and booking of the services.

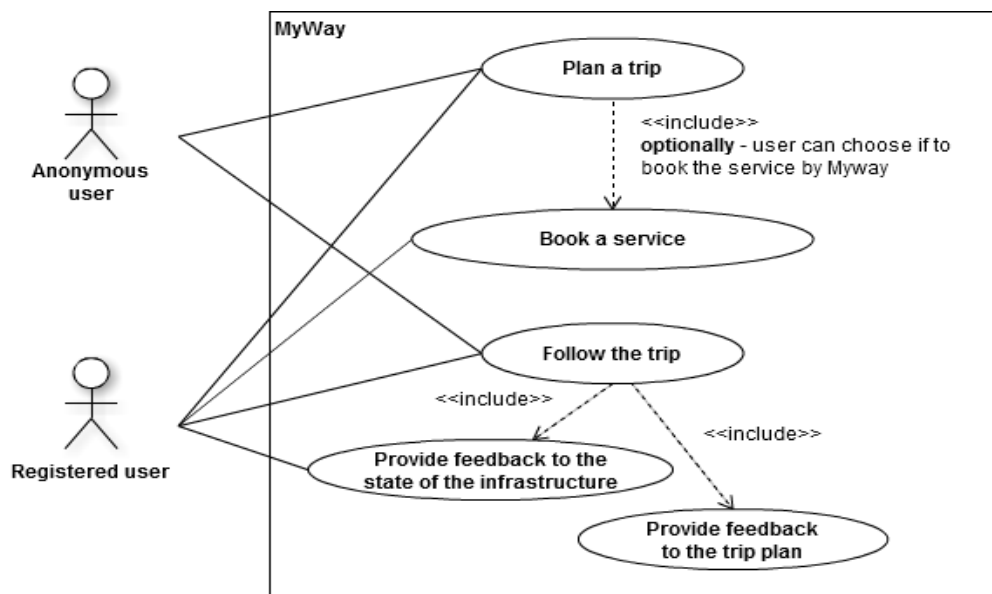


Figure 3. Selected mobility use cases

6.3.1 Plan a Journey

Use Case « Plan a trip »

Description:

User enters start and end point of the trip and can change his/her default preferences to plan the trip and to sort alternatives of the trip plan. MyWay provides alternatives of the trip, sorted by preferences. The particular trip plan is provided in the form of itinerary

(waypoint, type of transport, start time, end time). User selects one of the options to start following the trip, or can adjust the parameters and search again. Then, user can book / request / pay the transport services which are planned for the trip itinerary.

Actors:

- Anonymous user
- Registered user
- MyWay

Prerequisites:

User is registered and logged to the system

Preferences in user profile are set (minimally as initial default by the system after registering the user)

Use case steps – the main flow:

1. Registered user selects function “plan a trip”
2. Registered user enters the start point. The current user’s location is pre-filled as the start point
3. Registered user enters the end point
4. (optional) Registered user enters waypoints which have to be reached during the trip
5. Registered user can change trip planning preferences set in his profile for this particular search (if to use his own vehicle, price, emissions, personal constraints, ...)
6. (optional) Registered user changes default preferences to sort the alternatives of the trip plan (for this particular search only)
7. MyWay provides 3 alternatives of the trip, sorted by preferences, list beginning by the best fit. The particular trip plan is provided in the form of itinerary (waypoint, type of transport, start time, end time)
8. Registered user can switch between itineraries of the provided trip plans and display their routes in the map.
9. (optional) User can refine search criteria and preferences and start new trip search. GOTO STEP 2.
10. User selects one journey plan, which will be followed further on
11. (optional) FOR EACH of the trip itinerary items, where transport service has to be booked: User books the service (REFER TO: Use case "Book a service" (distinguish particular types)

12. CONSEQUENT USE CASE: REFER TO: Use case "Follow the trip"

6.3.2 Book/Reserve a service

Use Case « Book a service »

Description:

MyWay forwards user to PT service site with pre-filled booking request, opened in a separate frame/window.

Actors:

- Registered user
- MyWay

Prerequisites:

User is registered and logged to the system

Use case "Plan a trip" is executed up to the step "User books the service".

Use case steps - the main flow:

1. MyWay provides a separated window/frame to book a service for each of the trip itinerary items, where a PT service is used for the trip plan. In this window, the booking page of PT service provider is displayed, with pre-filled details of the booking request. MyWay doesn't participate in the booking process and financial transactions, just forwards the booking request to provider's site.

6.3.3 Track a Journey

Use Case « Follow the trip »

Description:

MyWay tracks registered user's position during a trip and recalculates the trip itinerary, if state of the infrastructure changes, user's position differs from trip itinerary by defined delta, on manual demand by the user. During the trip, user can provide feedback to the state of the infrastructure. At the end of the trip, user can express his feedback/her to the trip plan.

Actors:

- Anonymous user
- Registered user
- MyWay

Prerequisites:

User is registered and logged to the system

Use case “Plan a trip” is executed up to step “User selects one journey plan, which will be followed further on”

Use case steps - the main flow:

1. Registered user has his/her device with MyWay app turned on and is moving on his/her trip
2. MyWay is providing actual position on the map, remaining time, remaining distance
3. If state of the infrastructure changes, MyWay re-calculates the trip itinerary
4. MyWay compares the registered user's position with the trip itinerary and saves feedback automatically
5. If the registered user's position differs from trip itinerary by defined delta, MyWay re-calculates the trip itinerary
6. (optional) Registered user can manually re-plan the journey. GOTO USE CASE “Plan a trip”, step 2
7. (optional) Registered user can provide feedback to the state of the infrastructure. REFER TO: Use case "Provide feedback to the state of the infrastructure"
8. (optional) When trip finishes, registered user can express his feedback to the trip plan (his/her expectations and preferences met). REFER TO: Use case "Provide feedback to the trip plan"

6.3.4 Online feedback to “road conditions and limitations”

Use Case « Provide feedback to the state of the infrastructure »**Description:**

During the trip, user can report possible limitations on the road. MyWay recalculates the route for the user. After verification of the information, MyWay uses this information for recalculation of the trip plan for the other users.

Actors:

- Registered user
- MyWay

Prerequisites:

User is registered and logged to the system.

Use case “Follow a trip” is being executed.

Use case steps - the main flow:

1. Registered user activates function “report a limitation on the road”
2. MyWay pre-fills current GPS coordinates of the user
3. Registered user can modify location and selects type of the limitation: accident, heavy traffic (several levels), ice on the road, flood, obstacle on the road, crowd of the people, delay of the PT service and enter an additional description (optional) and estimation, how long the limitation will be active (optional)
4. IF not confirmed by another 2 users, { MyWay recalculates the route for the user providing the feedback. MyWay uses the feedback only for the further trip planning for the particular user providing the feedback. }
5. IF confirmed by another 2 users, { MyWay uses this information for recalculation of the trip plan for the other users, which are in the middle of the trip in that time. MyWay uses the feedback for the further trip planning for all the users. MyWay uses this information for recalculation of the trip plan for the other users, which are in the middle of the trip in that time }

6.3.5 Feedback to journey

Use Case « Provide feedback to the trip plan »

Description:

After the end of the trip, user is requested to provide feedback, if the journey plan has been accurate and if his/her preferences have been respected in the plan. Feedback is stored by MyWay and used for further evaluation of the services and planning algorithms.

Actors:

- Registered user
- MyWay

Prerequisites:

User is registered and logged to the system.

Use case “Follow the trip” has been executed (user has arrived at the final destination).

Use case steps - the main flow:

1. When “Follow the trip” use case ends, user is requested to provide feedback, whether the original trip plan has been accurate in comparison to the reality

(original time versus the real time, availability of the public resources used for a trip, etc.), whether his/her preferences have been respected in the journey plan and is asked for a general feedback. Feedback is not mandatory to fill.

2. MyWay stores the Feedback to be used for further evaluation of the services and planning algorithms by the MyWay implementation team.

6.4 Mobility services and resources awareness

This section describes the city transport information provided to the user by the MyWay and general feedback the user can give to the MyWay team.

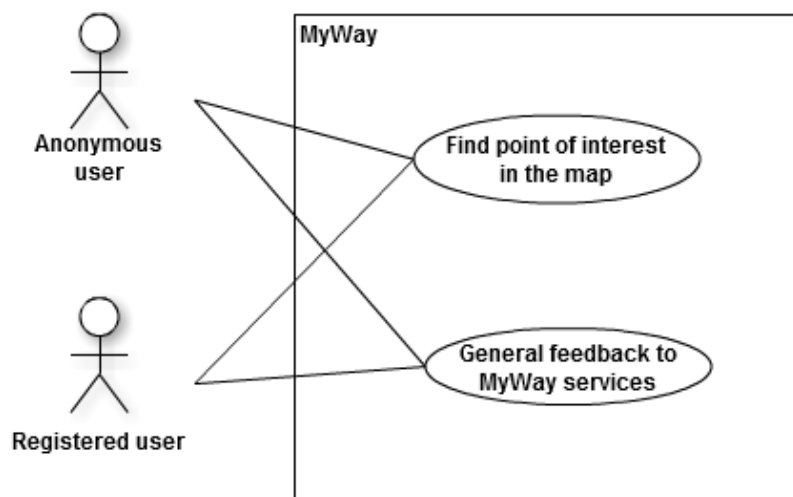


Figure 4. Selected use cases for mobility services and resources awareness

6.4.1 City information

Use Case « Find point of interest in the map »

Description:

User can filter and find points of interest (POI), which are displayed on the map. MyWay displays the POI details, when user selects the POI on the map.

Actors:

- Anonymous user
- Registered user
- MyWay

Prerequisites:

User is registered and logged to the system.

Use case steps - the main flow:

1. MyWay displays the points of interest in the map
2. (optional) User can filter points of interest by entered criteria
3. (optional) User can search a point of interest by type and approximate location
4. When user clicks on point of interest, detailed information is displayed in a box: name, description, coordinates, url for webpage, photo (optional). For restaurants, rating is displayed.

6.4.2 Paneuropean experience

The requirements for the Paneuropean experience are going to be reflected in the detailed use-cases in the other functional areas.

6.4.3 Feedback to the MyWay services

Use Case « General feedback to MyWay services »

Description:

User provides general feedback to MyWay services, consisting of user interface quality, responsiveness and possible platform problems, quality of trip planning and booking services and suggestions to further MyWay functionality.

Actors:

- Anonymous user
- Registered user
- MyWay

Prerequisites:

User is registered and logged to the system.

Use case steps - the main flow:

1. User selects a function “give feedback to MyWay services”
2. Structured feedback form is provided to the user. User can select only subset of questions to submit (he/she doesn't have to fill the whole form). The feedback form contains:

- User interface quality
 - Responsiveness of the system
 - Quality of trip planning in general (for particular trip plans REFER TO: Use Case “Provide feedback to the trip plan“)
 - Reliability of the booking services
 - Suggestions to further MyWay functionality
 - Compatibility problems (browsers, platforms, ...)
3. MyWay stores the feedback to be used for evaluation of the services and system improvements by MyWay implementation team

6.5 User profiling

This section describes registration of the user to MyWay, possibilities to set and update his/her profile and grouping of the users in the vehicle sharing communities.

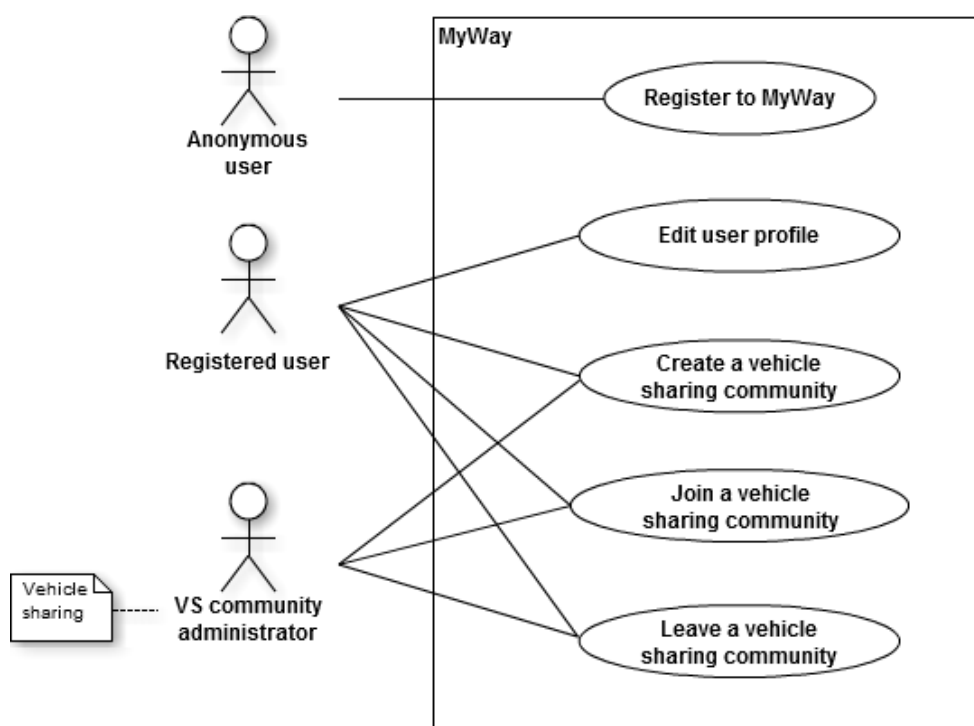


Figure 5. Selected use cases for user profiling

6.5.1 User profile

Use Case « Register to MyWay »

Description:

Initial user registration to MyWay. A minimal set of user profile information is required for the registration. During the registration, user is informed about the data protection policy rules and MyWay terms and conditions to accept.

Actors:

- Anonymous user
- MyWay

Prerequisites:

n/a

Use case steps - the main flow:

1. User selects “register” function
2. User is informed about data protection policy rules and MyWay terms and conditions to accept
3. User fills the registration form: Mandatory fields: name, surname, email, user name, password. Optional fields: Home GPS location or address, phone (for service booking).
4. MyWay sends verification email to the user.
5. IF user confirms the registration to the MyWay: { User profile is created for the user and registration data are filled to the profile. For the rest of the user profile, initial values are set. }

Use Case « Edit user profile »

Description:

User edits his/her profile, updates his/her personal information, manages his/her private vehicles, can express personal trip search preferences and other personal preferences.

Actors:

- Registered user
- MyWay

Prerequisites:

User is registered and logged to the system.

Use case steps - the main flow:

1. User selects function “edit user profile”

2. MyWay displays the profile structured to several tabs by the topic: Personal information, private vehicles, trip search preferences, personal preferences.

PERSONAL INFORMATION:

- Name, Surname
- Male/Female
- Email
- Mobile phone (for booking the services)
- Home Address
- Home GPS location

PRIVATE VEHICLES - for each vehicle:

- Type (list of values): Car, Van, Motorbike (incl. scooter), Electric scooter, Bicycle
- Fuel consumption (types – city / road 90km/h / highway 120 km/h)
- Maximum speed the user would like to drive

TRIP SEARCH PREFERENCES:

- Optimize the trip search by:
 - Minimum # of changes
 - Price
 - Emissions
 - Nice path
 - In or outside the touristic areas

PERSONAL PREFERENCES:

- Wheelchair user
- Maximum time to walk
- Estimated walking speed / reduced walking speed
- Exclude some kinds of transport possibilities from the search

3. For each category, user can adjust the values
4. After update of the profile, MyWay reflects it in the trip planning. REFER TO Use case “Plan a trip”

6.5.2 Group users

Use Case « Create a vehicle sharing community »

Description:

Registered user creates a vehicle sharing community, which will be available for other registered users to join. A private vehicle of the community founder will be set as the first vehicle for pooling within the community.

Actors:

- Registered user
- Vehicle sharing community administrator
- MyWay

Prerequisites:

User is registered and logged to the system.

Registered user has filled his/her profile details and entered a private vehicle for trip planning

Use case steps - the main flow:

1. Registered user selects function "create a vehicle sharing community"
2. Registered user enters details: name, description, url (optional)
3. Registered user sets his/her private vehicle to be a resource for the community
4. Registered user enables the community to be displayed to other users. The user will be set as community founder gets the role "vehicle sharing community administrator".

Use Case « Join a vehicle sharing community »

Description:

User sends a request to join a vehicle sharing community to its administrator. If administrator approves the user's request, the user is added as a member of the community and MyWay reflects the community vehicles in user's trip planning.

Actors:

- Registered user
- Vehicle sharing community administrator
- MyWay

Prerequisites:

User is registered and logged to the system.

A non-empty list of vehicle sharing communities with defined vehicle sharing community administrators is available in MyWay.

Use case steps - the main flow:

1. User selects a function “join a vehicle sharing community” and selects the community.
2. MyWay sends a request to respective vehicle sharing community administrator. The request contains information about the user, who wants to join the community, taken from his/her user profile. The requests are put in queue for approval.
3. Vehicle sharing community administrator approves or rejects the user.
4. IF administrator has approved the user: { MyWay sends a notification to the user, adds him/her as a member of the community and reflects the community shared vehicles in the user’s trip planning. In case of reject, MyWay sends the notification to the user. }

Use Case « Leave a vehicle sharing community »

Description:

User selects to leave a sharing community he/she is a member. If there are bookings on his/her private vehicles shared within the community, MyWay sends a notification to all other users who have booked the leaving user’s shared vehicle. Then MyWay notifies the respective vehicle sharing community administrator about the leaving user.

Actors:

- Registered user
- Vehicle sharing community administrator
- MyWay

Prerequisites:

User is registered and logged to the system.

User is member of a vehicle sharing community.

Use case steps - the main flow:

1. User selects a vehicle sharing community he/she is a member and selects function “leave the community”.

2. IF there are bookings on his private vehicles shared within the community, MyWay asks the user, if he/she really wants to leave the community. IF user confirms: { MyWay sends a notification to all other users who have booked the leaving user's shared vehicle. MyWay stops reflecting the leaving user's shared vehicles for further trip planning of the community members }
3. MyWay notifies the respective vehicle sharing community administrator about the leaving user.
4. MyWay removes the user from the list of community members.

7. CONCLUSIONS

During the requirement elicitation process more than 130 requirements, functional and non-functional ones, have been gathered. From them, the functional requirements have been classified into the following 4 macro categories depending on their scope:

- Journey planning and tracking
- Mobility services and resources awareness
- User profiling
- System management

Therefore, through the requirement classification and prioritization process, the functionalities have been divided in different groups with different priority in terms of implementation. Among a list of 14 main functionalities proposed at the beginning of the gathering process, "Plan a journey", "Book a service", "City information" and "User" profiling are identified as the key functionalities of MyWay.

The set of requirements for the "Journey planning and tracking" specifies a fully-intermodal journey planner that combines public and private transport modes with booking support. This feature allows the user to book the services before the journey planning (pre-trip) as well as during the trip (on-trip).

Because of the characteristics of MyWay, for the non-functional requirements the most relevant categories identified have been "privacy" and "interoperability" with external systems.

Regarding the prioritization of the requirements, it is important to note that the main inputs come from the vision of WP2 (Reference Design & Architecture) and WP4 (Living Labs Setup) but without considering the technical feasibility of all of them. Further activities in this way will be performed in the task T2.3 after the analysis and final definition of the MyWay architecture. Furthermore, final conclusions from the user research done by the WP1 (Mobility Behaviour) across the Focus Groups in the T1.1 as well as further results from the task T1.3, have to be considered for possible adjustments of the requirements.

Finally, detailed use-cases for a selected group of requirements have been presented to show these functionalities from the end user's point of view.

8. REFERENCES

[AgileModelling]

Agile Modelling – <http://www.agilemodeling.com>

[COCITIES]

Co-Cities – Cooperative Cities extend and validate mobility services

[EMOTION, 2007]

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TREN/06/FP6TR/S07.57248/019939 EMOTION, 2007 (<http://www.emotion-project.eu/>)

[INTIME]

Intelligent and efficient travel management for European Cities.
<http://www.in-time-project.eu/en/project/>

[MyWay-D1.1]

MyWay deliverable D1.1 Scenarios

[MyWay-D2.3]

MyWay deliverable D2.3 Initial system architecture and specification

[MyWay-D4.2.1]

MyWay deliverable D4.2.1 Barcelona Living Lab Specification

[MyWay-D4.3.1]

MyWay deliverable D4.3.1 Berlin Living Lab Specification

[MyWay-D4.4.1]

MyWay deliverable D4.4.1 Trikala Living Lab Specification

[MAPS]

Google Maps - <http://maps.google.com/>

[OGC]

Open geospatial consortium - <http://www.opengeospatial.org/>

[OSM]

Open Street Map - <http://www.openstreetmap.org/>