



MyWay

EUROPEAN SMART  
MOBILITY RESOURCE  
MANAGER

*MyWay: European Smart Mobility Resource Manager*

## D6.5 Report on recommendations for Policy Makers

**EU Seventh Framework Programme  
Grant Agreement No. 609023**

Work Package	6
Deliverable Number	D6.5
Version	2.0
Status (F: final, D: draft)	F
Dissemination level	Public
Authors	Daniela Stoycheva (POLIS)
Co-authors	Marco Garré (SOFTECO), ....
Project start date and duration	1 September 2013 - 29 February 2016
Submission date	31 March 2016
Resubmission date	22 June 2016



## Disclaimer

This document contains material, which is copyright of certain My-Way consortium parties and may not be reproduced or copied without permission. The information contained in this document is the proprietary confidential information of certain My-Way consortium parties and may not be disclosed except in accordance with the consortium agreement.

The commercial use of any information in this document may require a license from the proprietor of that information.

Neither the My-Way consortium as a whole, nor any certain party of the My-Way consortium warrant that the information contained in this document is capable of use, or that use of the information is free from risk, and accept no liability for loss or damage suffered by any person using the information.

The sole responsibility for the content of this publication lies with the authors. It does not necessarily represent the opinion of the European Union. The European Commission is not responsible for any use that may be made from the information contained therein.

## Version History

Version	Date	Main author(s)	Summary of changes
0.1	14/12/2015	Marco Garré (SOFTECO)	Table of Content, first draft
0.2	21/01/2016	Daniela Stoycheva (Polis)	Document first draft
0.5	14/02/2016	Softeco, ENIDE, NEXUS, CVUT, UNI-ADBN	Contributions for policy collection
0.6	29/02/2016	Daniela Stoycheva (Polis)	Integration of inputs
0.7	21/03/2016	Daniela Stoycheva (Polis)	Internal review version
0.8	29/03/2016	Daniela Stoycheva (Polis)	Integrating comments from internal review
0.9	30/03/2016	Marco Garré (SOFTECO)	Styles & Quality Check
1.0	31/03/2016	Daniela Stoycheva (Polis)	Final Version
2.0	20/06/2016	Daniela Stoycheva (Polis)	Integrated reviewers comments and new input from partners

## Authors

Author	Affiliation
Marco Garré	SOFTECO
Daniela Stoycheva	POLIS

José Fernandez	ENIDE
Cristina Pou Fonolla	ATM
Rocio Sanchez	NEXUS
Michal Jakob	CVUT
Daniel Becker	FRAUNHOFER
Kate Pangbourne	UNIABDN
Olga Serra	GENCAT

# CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>6</b>
<b>1. INTRODUCTION .....</b>	<b>8</b>
1.1 ABOUT MYWAY.....	8
1.2. WHY MYWAY IS NEEDED.....	9
1.3. OBJECTIVES OF MYWAY AND MEANS TO ACHIEVE THEM.....	10
1.4. SCOPE OF THE DOCUMENT .....	11
<b>2. MYWAY APPROACH .....</b>	<b>12</b>
2.1. SUPPORTING TECHNOLOGY .....	12
2.2. METHODOLOGY.....	14
2.2.1. Requirements .....	15
2.2.2. Stakeholder Interviews methodology .....	15
2.2.3. Scenarios .....	16
2.3. MYWAY LIVING LABS.....	18
2.3.1. Catalonia Living Lab.....	19
2.3.2. Berlin Living Lab .....	20
2.3.3. Trikala Living Lab.....	21
<b>3. POLICY RECOMMENDATIONS.....</b>	<b>23</b>
3.1. RECOMMENDATIONS ON DATA .....	28
3.1.1. Recommendations for all target groups and areas.....	28
3.1.2. Additional recommendations on Data to Local authorities and Service providers .....	32
3.1.3. Additional recommendations on Data to Service providers .....	32
3.1.4. Additional recommendations on Data based on area size.....	33
3.2. RECOMMENDATIONS ON REAL-TIME TRAVEL INFORMATION .....	34
3.2.1. Recommendations for all target groups and areas.....	34
3.2.2. Additional recommendations on Real-time travel information to Service providers .....	34
3.2.3. Additional recommendations on Real-Time Travel Information based on geographical size .....	35
3.3. RECOMMENDATIONS ON INTERMODAL SOLUTIONS .....	35
3.3.1. Recommendations for all target groups and areas.....	35
3.4. RECOMMENDATIONS ON INTER-INSTITUTIONAL COOPERATION .....	36
3.4.1. Recommendations for all target groups and areas.....	36
3.4.2. Additional recommendations on Intermodal solutions to Local authorities and Service providers.....	37
3.4.3. Additional recommendations on Intermodal solutions to Service providers and Transport operators .....	38
3.4.4. Additional recommendations on Intermodal solutions to Service providers .....	38
3.4.5. Additional recommendations on Inter-institutional Cooperation based on geographical size .....	39
3.5. RECOMMENDATIONS RELATED TO THE END-USER.....	39
3.5.1. Recommendations for all target groups and areas.....	39
3.5.2. Additional recommendations on Involving the end-user to Service providers.....	42
3.5.3. Additional recommendations related to the End-User based on geographical size .....	43
3.6. RECOMMENDATIONS ON PROVIDING QUALITY FUNCTIONALITIES.....	44

3.6.1. Recommendations on Providing quality functionalities to Service providers .....	44
3.6.2. Additional recommendations on Providing Quality Functionalities based on geographical size .....	45
3.7. RECOMMENDATIONS ON STIMULATING BEHAVIOUR CHANGE.....	46
3.7.1. Recommendations on Stimulating Behaviour Change to Local Authorities and Service providers .....	46
3.7.2. Additional recommendations on Stimulating Behaviour Change to Service providers	47
3.7.3. Additional recommendations on Stimulating Behaviour Change based on geographical size .....	48
3.8. RECOMMENDATIONS RELATED TO THE GEOGRAPHICAL SCALE .....	48
3.8.1. Recommendations for all target groups and areas .....	48
<b>4. CONCLUSIONS.....</b>	<b>50</b>
<b>5. REFERENCES.....</b>	<b>53</b>

## FIGURES

FIGURE 1. MAP OF MYWAY LIVING LABS .....	9
FIGURE 2. MYWAY ARCHITECTURE.....	13
FIGURE 3. OVERVIEW OF THE METAPLANNING PROCESS .....	14
FIGURE 4. PHOTO STORY MYWAY JOURNEY PLANNER IN A REAL-LIFE SITUATION .....	17

## TABLES

TABLE 1. RECOMMENDATIONS ON DATA PER STAKEHOLDER GROUP.....	23
TABLE 2. RECOMMENDATIONS ON REAL-TIME TRAVEL INFORMATION PER STAKEHOLDER GROUP .....	24
TABLE 3. RECOMMENDATIONS ON INTERMODAL SOLUTIONS PER STAKEHOLDER GROUP.....	24
TABLE 4. RECOMMENDATIONS ON INTERINSTITUTIONAL COOPERATION PER STAKEHOLDER GROUP.....	25
TABLE 5. RECOMMENDATIONS ON INVOLVING THE END-USER PER STAKEHOLDER GROUP .....	25
TABLE 6. RECOMMENDATIONS ON PROVIDING QUALITY FUNCTIONALITIES.....	26
TABLE 7. RECOMMENDATIONS ON STIMULATING BEHAVIOUR CHANGE .....	27
TABLE 8. RECOMMENDATIONS ON GEOGRAPHICAL SCOPE PER STAKEHOLDER GROUP .....	27
TABLE 9. MYWAY USER GROUPS .....	41

## EXECUTIVE SUMMARY

The purpose of this document is to provide policy recommendations by the MyWay project. The recommendations come from research and experience made with the developed MyWay intermodal journey planner app.

The document starts by explaining the need for an intermodal journey planner such as MyWay in view of current mobility problems and taking account of solutions that are already on the market. It then continues with presenting MyWay methodology and technology and outlining main points about mobility and MyWay application in the three Living Labs – Catalonia, Berlin and Trikala. The main chapter of this document gives policy recommendations to three different groups of stakeholders: Local authorities, Transport operators, and Service providers. The recommendations have been tailored for each of these groups to take account of their specific needs and functions.

This deliverable is built on lessons learnt in the course of the project and has considered feedback received by users in stakeholder interviews and in all test phases of MyWay app.

## LIST OF ABBREVIATIONS

Abbreviation	Description
API	Application Programming Interface
APP	Smartphone mobile application
D	Deliverable
ITS	Intelligent Transport Systems
GTFS	General Transit Feed Specification
KPI	Key Performance Indicators
LL	Living Lab
O-D Matrix	Origin-Destination Matrix
PT	Public Transport
VBC	Voluntary Behaviour Change
WP	Work Package

## 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-motorized 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.

To address these remaining challenges and gaps, the consortium of MyWay project has worked over the past two and a half years. The team composed of research institutes and universities, local authorities, ICT companies, a public transport operator and a European dissemination network, has produced the MyWay smartphone multi-modal travel app tested in three living labs –Catalonia (Spain), Berlin (Germany) and Trikala (Greece).

### 1.1 About MyWay

Placing the traveller at the heart of mobility, MyWay has developed an integrated platform, the European Smart Mobility Resource Manager, which facilitates a holistic view of sustainable mobility, combining all sorts of transport services and automatically handling transactions related to their usage into a seamless point-to-point mobility service. MyWay's main objective has been to enhance the personalisation and user adaptation of mobility services. Thus, MyWay smartphone app provides travel suggestions that are better optimized to the user's egocentric perspective, as well as that of society as a whole. Along with integrated ticket information and real-time updates, all possible transport modes available are displayed to the user in an integrated fashion, thus encouraging the use of cleaner modes of transport.

MyWay was tested in three 'Living Labs' that have deployed innovative measures to improve sustainable mobility: Catalonia/Barcelona, Berlin and Trikala. The combination of large and dense cities along with smaller MyWay test sites reflects the ambition for the European Smart Mobility Resource Manager to be tested in varying urban conditions and produce more in-depth data analysis. The Catalonia and Berlin Living Labs exemplify large and densely populated urban areas with an extensive mix of transport modes, whereas Trikala has been used as an example of a smaller city with fewer transport options. The map below shows the geographical location of the Living Labs and the size of the population in each of them.

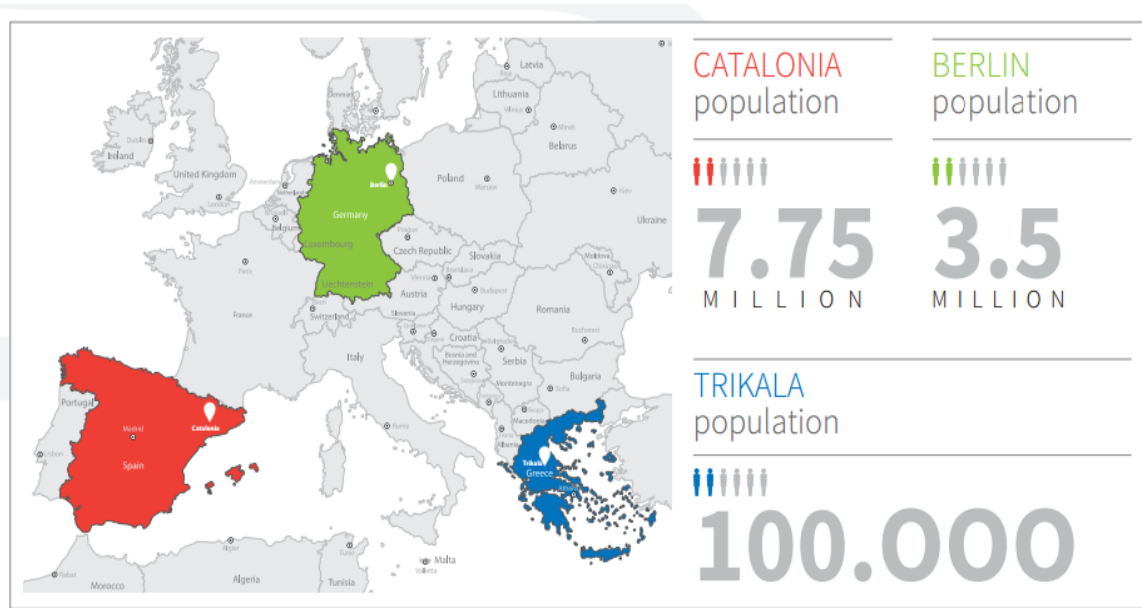


Figure 1. Map of MyWay Living Labs

MyWay is expected to boost travellers' use of cleaner mobility services by enabling the consideration of all available resources and their appropriate allocation to journey plans. This will therefore enhance the attractiveness, comfort and efficiency of transport networks and minimize GHG emissions since users will be encouraged to switch to more sustainable mobility choices and behaviour.

## 1.2. Why MyWay is needed

- **Congestion** – European roads suffer from large amounts of traffic and congestion due to the extensive amount of people who travel predominantly by car, and thus prolong journey times. The modal split of transport in Europe is dominated by passenger cars accounting for 73.4% of passenger traffic compared to just 1.4% for tram and metro combined (2011)<sup>1</sup> [European Commission, 2013].
- **Green House Gas emissions (GHG) and Air quality** – Road transport accounts for 72% of total GHG emissions from the transport sector and transport overall is responsible for 1/4 of overall GHG emissions in Europe<sup>2</sup> [European Commission, 2016]. Motor vehicles are a major source of pollution that contaminates the air we breathe and can cause harmful health effects. According to the World Health Organisation (WHO), some 40 million people in the 115 largest cities in the European

<sup>1</sup> <http://ec.europa.eu/transport/facts-fundings/statistics/doc/2013/pocketbook2013.pdf> (p.19)

<sup>2</sup> [http://ec.europa.eu/transport/strategies/facts-and-figures/all-themes/index\\_en.htm](http://ec.europa.eu/transport/strategies/facts-and-figures/all-themes/index_en.htm)

Union are exposed to air exceeding WHO air quality guideline values for at least one pollutant<sup>3</sup> [World Health Organization, 2016].

- **Provision of greener transport** - Current travel planning and information services provide multi-modal trip-planning services in urban or regional environments. Still for a greener transport, such a system should consider all possible mobility services, not only public and individual private transport, but also non-motorised modes and flexible services such as bus-on-demand, carpooling and EVs sharing. Also non-mobile resources such as parking facilities or services facilitating interchanges for specific categories of users have to be considered.
- **Lack of full coverage of all transport services** - This incompleteness is particularly acute when combining private and public transport services, which, at the same time, is exactly the combination that can significantly enhance user's mobility options.
- **Lack of harmonisation and system interoperability** - Existing services are normally fragmented and based on proprietary technical and operational solutions, only poorly or not at all interoperable with the rest of the urban mobility system.
- **Lack of a completely intermodal<sup>4</sup> journey planner** – local as well as international, which to address the mobility offering available in the three Living Labs in a completely intermodal way. Please, refer to Business Models based on MyWay [MyWay D6.3], Chapter 3.4. Market Analysis for an overview of existing personal mobility offering on the local as well as international market.
- As a result of the above, the **traveller does not always get the best possible offer** in order to address his/her personal mobility needs.

### 1.3. Objectives of MyWay and means to achieve them

- **Enable a better balance between mobility offers**  
by facilitating the seamless integration of public transport and other sustainable public and private transport modes in users' personal mobility choices.
- **Stimulate service cooperation and market development**  
by providing tools and technical solutions for transport service providers and operators to help improve service offer, interoperability and accessibility in the overall multimodal service chain.
- **Enhance the personalisation and user adaptation of mobility services**

---

<sup>3</sup> <http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/data-and-statistics>

<sup>4</sup> MyWay project differentiates between multi-modal and intermodal journey planner, the former being a journey planner that offers the multi-modal solutions, but does not provide links between the different modes of transport, whereas the latter providing both information on the different modes available AND offering a mix of different transport modes for one trip.

by increasing the cooperation between users and the transport system through incorporating user experiences, social networking and crowd sourcing in service planning and use.

- **Foster ICT transformative technologies in smart mobility**  
by providing and validating in real life conditions innovative technological solutions for the next generation of smart mobility services.

## 1.4. Scope of the document

This document provides policy recommendations by the MyWay project addressed at local authorities, transport operators and service providers. Each of the three groups has been provided with tailor-made recommendations. In addition, recommendations are given taking into account the size of the area – for small, big cities and metropolitan areas. Before reaching the policy recommendations, the document describes briefly in chapter 2 the approach used by MyWay – the methodology and technology applied. The chapter defines the supporting technology in MyWay, mainly based on the metaplanning approach. In addition, it also presents the functional requirements of MyWay journey planner, the stakeholder interviews methodology and the scenarios developed with user focus groups.

Chapter 3 is the core of this deliverable giving recommendations on the following topics:

- Data
- Real-time travel information
- Intermodal solutions
- Inter-institutional cooperation
- Involving the End-user
- Providing quality functionalities
- Stimulating behaviour change
- Geographical scope

Finally, Chapter 4 draws the main conclusions out of the policy recommendations.

## 2. MYWAY APPROACH

### 2.1. Supporting Technology

As part of the first stage of the MyWay project, an analysis of the current state-of-the-art for technologies, services and approaches was completed. This analysis can be found in Deliverable D2.2 “Review of enabling Technologies and Solutions” [MyWay D2.2]. Many different ITS standards, products and applications were considered relevant to MyWay. From end-user oriented solutions such as OpenTripPlanner or Waze, one of the most popular apps in the big application stores, to back-end data systems such as GTFS and standards such as Siri or Datex II, MyWay project has analysed them all.

On the basis of this analysis, the consortium developed recommendations which, together with the requirements, laid the foundations for the implementation activities later in the project. The review produced some significant results. For instance, public and private transport services – such as car-sharing or demand-responsive transport systems – often still lack strong integration. This has reconfirmed that the integration that MyWay platform wants to achieve, as one of the main project aims together with a highly personalised experience, are a niche in the market of mobility planning apps.

Several deliverables in MyWay have been working on developing the MyWay Architecture: Deliverable D2.1 “Requirements Specification and Analysis” [MyWay D2.1], D2.2 “Review of enabling Technologies and Solutions” [MyWay D2.2], D2.3 “Initial System Specification and Analysis” [MyWay D2.3] and D2.4 “Final System Specification and Analysis” [MyWay D2.4]. The MyWay system (depicted in Figure 2) has been designed and implemented having scalability in mind, following some basic architectural principles which can also be considered as policies in building future-proof systems:

- **Modularization of the system** to macro-components, components and sub-components, which communicate and share data by defined APIs. Interactions between components are managed by Service E2E Orchestrator component.
- **Common data model**, which defines the data interchanged between components. The common data model is mandatory for all components of the system and is implemented by code module, which is shared between all components.
- **System of internal APIs provided by MyWay components.** System internal APIs enable interchanging data objects based on the common data model.
- **Service E2E Orchestrator** supports the concepts above by managing internal communication between components. In Service E2E Orchestrator, key system processes are configured, so potential change in the processes is enabled by using this component. Besides that, its parts Notification Broker and Orchestrator will allow to have multiple instances of same components and also multiple deployments in different nodes without affecting the internal behaviour.

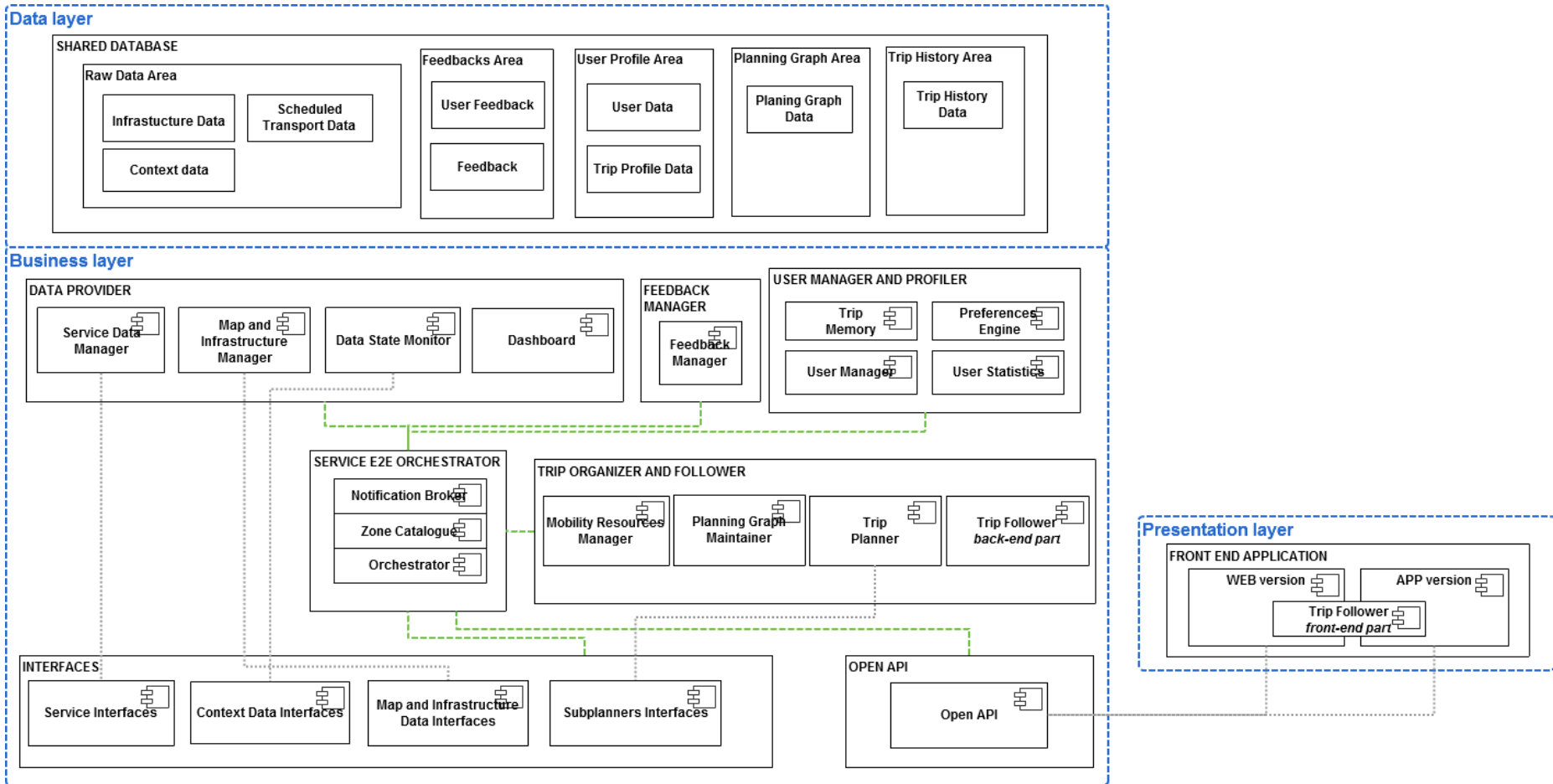


Figure 2. MyWay Architecture

One of the key features of the MyWay platform is the Metaplanning approach, which allows to take advantage of existing specialized journey planners, also called “sub-planners”, to create the trip plan, which utilises local transport resources and which is personalised to user’s needs and preferences.

The metaplanning process is performed in two phases, as outlined in Figure 3. In the first phase, we create so called Metaplan, a high-level trip plan which is prepared using a specialized data structure called Metaplanning Graph. In the second phase, the Metaplan is refined to produce a set of particular trip plans, which are presented to the MyWay user. In this refinement process, local sub-planners are employed.

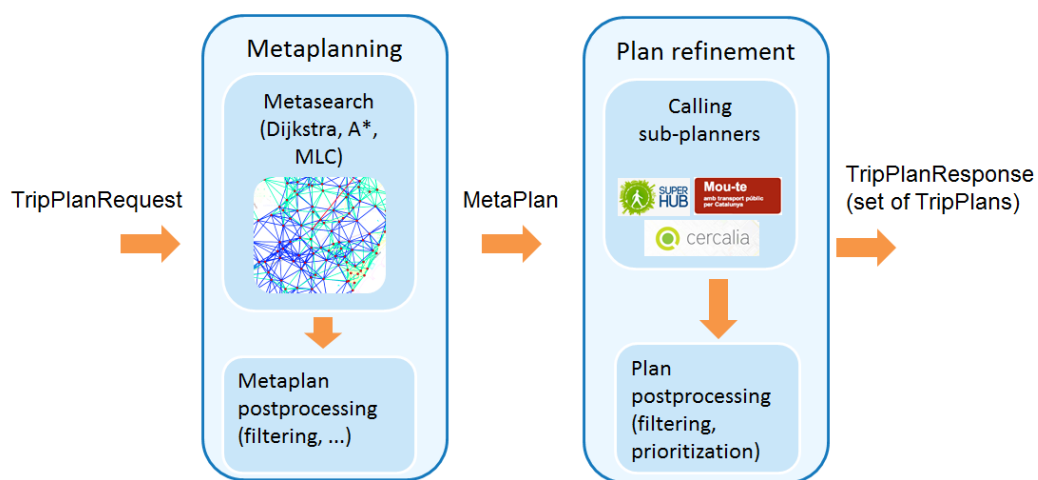


Figure 3. Overview of the Metaplanning process

The trip plans provided to the user are accompanied by a set of warning messages based on context information, as weather or real-time traffic information. These messages help the user to select the best trip to take.

This approach is at the base of some of the important lessons learnt and policies recommendations described in the following sections.

## 2.2. Methodology

The following chapter describes the functional requirements of MyWay journey planner, which serve as a basis for the definition and design of the MyWay components in the reference architecture. As next it presents the stakeholder interviews methodology and the scenarios developed with user focus groups [MyWay D1.1] to investigate the likely user reaction to the introduction of MyWay. A full overview of the requirements and the methodology is available in Deliverable D2.1 “Requirements Specification and analysis” [MyWay D2.1].

### 2.2.1. Requirements

The set of functional and non-functional requirements have been prioritised by individual Living Labs and their feasibility assessed in D2.1 [MyWay D2.1]. This process started by the analysis of available external planning data needed to implement the requirement, performed in each of the Living Labs. Then the overall technical feasibility and complexity of each of the requirements was analysed. With these inputs available, the project consortium agreed on the final prioritisation of the requirements, which were the basis for the MyWay system design firstly introduced in Deliverable D2.3 “Initial system architecture and specification” [MyWay D2.3]. For the prioritisation, the established MoSCoW notation was used. This notation uses four levels: Must be implemented (priority A), Should be implemented (priority B), Could be implemented (priority C) and Won’t be implemented.

As the project progressed, new functionality was proposed, the system functionality and architecture were optimised. In parallel, feedback was collected from project reviewers and the first prototype users in the Living Labs. After the update of requirements in March 2015, the split of functional requirements by the priority is the following:

- 118 functional requirements in total;
- 37 of them rated as Must implement;
- 36 of them rated as Should be implemented;
- 28 of them rated as Could be implemented;
- 17 of them rated as Won’t be implemented.

Regarding the specification of non-functional requirements, we register:

- 22 non-functional requirements in total;
- 8 of them rated as Must implement;
- 11 of them rated as Should be implemented;
- 3 of them rated as Could be implemented.

Besides that, 7 recommendations were registered complementing the set of non-functional requirements.

### 2.2.2. Stakeholder Interviews methodology

Consulting stakeholders formed an important element of work to support both evaluation and the development of an exploitation plan.

The University of Aberdeen developed guidelines on how to conduct ethical structured interviews, to enable Living Lab partners to undertake stakeholder interviews in the same way in each Living Lab.

During Phase 1 and 2 a total of nineteen stakeholder interviews were carried out, consulting representatives from city authorities, public and private transport operators, research organisations and transport information providers.

The interviewers demonstrated MyWay to the stakeholders, or allowed them to use it, and then asked for their opinion about the technical quality, its likely appeal to users, its strategic benefits and to give a quick SWOT analysis. In Phase 2 an additional question was asked about the voluntary behaviour change function that was introduced, if the stakeholder had been interviewed as part of Phase 1. A complete analysis of the Phase 1 stakeholder interviews is to be found in D1.4 “Scenarios, KPIs and guidelines for validation – Final version” [MyWay D1.4] on Chapter 4. The Phase 2 stakeholder interview data and analysis is added to the findings of the Phase 1 interviews for the evaluation exercise reported in [MyWay D6.2].

### 2.2.3. Scenarios

In the early months of the project, user focus groups were carried out to investigate the likely user reaction to the introduction of MyWay and to understand user requirements for a product like MyWay. A set of fourteen scenarios were created by the partners to enable the researchers to introduce use cases demonstrating the main innovations and concepts. Each scenario had particular characters associated with it, and the narrative included functions and services that would be provided to help the characters achieve their desired journey. A total of 16 focus groups were carried out across all the Living Labs, reaching 164 participants. The illustration below shows how these initial scenarios replicated a real world situation. The report and analysis of the initial scenario development and round of focus groups is reported in [MyWay D1.1].



Figure 4. Photo story MyWay journey planner in a real-life situation

Once MyWay was implemented, a subset of eight shorter scenarios were created to enable detailed user evaluation that focuses on how users interact with MyWay to create journey plans in particular contexts, something could not have been done with the Living Lab context where real users were 'in the wild'. Living Lab partners then carried out Scripted Journey Plan tests. Each scenario had a script so that test managers could check that the scenario could be performed to get the expected results. During Phase 2 a small number of testers were given the scenario, and asked to replicate the expected result. There were 8 testers in Berlin, 9 in Catalonia and 9 in Trikala. They then answered a questionnaire, so that MyWay team could understand more about the usability and user satisfaction, as well as show whether or not the promised scenarios could be demonstrated. The final iteration of the scenarios for developing evaluation exercises (the Scripted Journey Plans) is described in Chapter 2 of D1.4 [MyWay D1.4]. The methodology for the Scripted Journey Plan tests is also described in [MyWay D1.4] and the analysis is in Chapter 4 of D6.2 [MyWay D6.2].

## 2.3. MyWay Living Labs

MyWay Living Labs have gone through a long process from initial research to delivering a city users-tailored app, ready to serve their citizens.

**When developing a smartphone app like MyWay, there is one golden rule: know what the users want first.**

Following this rule, in the first phase, the project consortium prepared user scenarios, describing different kinds of users and their motivation and interaction with the prospective MyWay app. This was necessary in order to develop an app that people want to use, that takes account of their needs, and that is as self-explanatory as possible. The demonstration periods in all Living Labs were divided in three phases: Pre-Phase, Phase 1 and Phase 2. Two different groups were recruited - the group of Piloted users, people directly involved in MyWay project, and the group of Real Users, composed by people external to the project.

As next, the project developed a set of requirements for what the app should be able to do, based on use cases (see section 2.2.1). Use cases include users wanting to book mobility services, join a car-sharing community, book other vehicle sharing services, or plan an entire trip. This means, for example, that the app must have real-time data about public transport, be integrated with different vehicle sharing schemes, and be able to find routes and points of interest.

Finally, the Living Labs had to define which of the requirements are the most important to them. This was necessary in order to provide a tailored solution that works best for each city, as the mobility characteristics of each Living Lab are individual, i.e. users from the city of Berlin have access to different services from the users in the region of Catalonia or the small city of Trikala, and therefore MyWay functionality had to reflect these differences.

### 2.3.1. Catalonia Living Lab

- **Mobility in Catalonia region**

The MyWay Living Lab in Catalonia extends from the Barcelona metropolitan area to the whole of Catalonia region in Spain. As far as we are aware it is the only multimodal journey planning app covering this breadth in Catalonia.

Public transport demand in Catalonia has grown significantly, by 18% during in the last 10 years. One of the main goals of the Government of Catalonia (Generalitat de Catalunya (GENCAT) – a project partner) is to provide real-time and integrated traveller information, including all possible modes of transport. Catalonia was the first region of Spain with a public transport journey planner ([mou-te.gencat.cat](http://mou-te.gencat.cat)). The platform now includes more than 145 public transport operators, representing 1.250 lines and 15.000 stops.

The deployment of MyWay in the Catalonia Living Lab is the most comprehensive one of the three living labs. MyWay for Catalonia not only includes the possibility to book through the app and provides real-time information with regard to estimated arrival times for some bus lines and real status of bike sharing stations, but also offers integration of a wide variety of mobility services and modes. Through MyWay, users in Barcelona are also able to book a taxi. The latter is an important feature in the more rural regions outside Barcelona.

Barcelona Living Lab has selected seven focus groups for MyWay app to be tested: two (students and staff) from the Universitat Autònoma de Barcelona (UAB, University); three (commuters, students and elderly people) from Vall del Tenes (medium-size city), and two GENCAT employees.

- **User recruitment**

In MyWay Catalonia Living Lab, for Pre-phase and Phase 1, participants were recruited from the partners involved in the project, while the Phase 2 was open to any potential participants also external to the consortium. To have more information about the recruitment strategy in Catalonia see Deliverables D4.2.2 “Barcelona Living Lab Setup 1” [MyWay D4.2.2] (for the Pre-phase and Phase 1) and D4.2.3 “Barcelona Living Lab Setup 2” [MyWay D4.2.3] (for Phase 2).

- **Use cases**

The Catalonia Living Lab is the largest MyWay demonstrator in terms of number of users, area covered and services provided. Therefore, most of the use cases specified in the system requirements (see MyWay deliverable D2.1 [MyWay D2.1]) have been addressed. Below, the most relevant ones are listed:

- User centric vision
  - Role (preferences)
  - Singularity (walking speed, reduced mobility, etc.)
  - Easy recalculation route functionality

- Fully multimodal journey planner
  - Public / Private operators' integration
  - Flexible sharing mobility services
  - Real-time Bus-on-demand
  - Private car
- Booking
  - Booking services or at least ticket information
- Real-time awareness
  - Resources occupancy
  - Weather forecast information
  - Traffic information
- Taxi integration
  - Taxi booking

### 2.3.2. Berlin Living Lab

- **Mobility in the city of Berlin**

Berlin is an ambitious city, when it comes to promoting sustainable urban mobility. One of its ambitions, through the Berlin Living Lab in MyWay, has been to show how MyWay travel planner could help Berliners to make the switch to even more sustainable transport.

As the capital of Germany, Berlin is also Germany's largest city with 3.2 Million inhabitants living in an area covering 891.85 km<sup>2</sup>. Being a very international city, Berlin has inhabitants from more than 180 different nations.

The pilot in Berlin included different vehicle sharing concepts - fixed-station bike-sharing modes in combination with carpooling options, as well as Berlin's well known area-wide traditional public transport network. The public transport network of Berlin is well-equipped for MyWay as more than 100km of the network has cell phone coverage.

In addition to the diversity, the sharing schemes and the public transport networks cover different geographical areas, as well as various population and settlement structures. Users participating in the Berlin Living Lab have therefore included young students, as well as middle-aged employees.

The Berlin Living Lab's aim has been to establish a solid and balanced base of transport options, including public and private transport, as well as carpooling, bike sharing and walking. Berlin also wanted to address the political goals of fostering eco-mobility and improving the links between different modes of transport.

- **User recruitment**

During the pre-phase users were provided with a first version of the app. At Phase 1, the released version of the app included a larger number of features, and was more stable in operation. The goal was to test the app with an extended number of participants. Internal and external participants were recruited for the Pre-phase and Phase 1. Both partners involved in the Berlin Living Lab (Fraunhofer FOKUS and VMZ Berlin) recruited for the first user group staff internal to their organisations. Regarding the second user group, in addition to internal staff, real users from outside were recruited too, for example students at Fraunhofer FOKUS institute.

For phase 2, MyWay systems within the Berlin Living Lab were completed. In particular, the complete new realized connection to the carpooling operator Fliinc and the integration of this data into the routing service afterwards has extended the functionalities. Regarding the user recruitment both partners FOKUS and VMZ organized a local launch event at the Technical university of Berlin on 22 October 2015 to launch the demo phase. The purpose of this event was to present personally MyWay to the aimed target group. In addition, intensive promotion was done via the involved partners' websites and social media accounts to recruit a big number of people to take part in the test phase. Finally, personal talks to externals and partners complemented the activities.

For more detail on user recruitment see MyWay Deliverable D4.3.2 "Berlin Living Lab Setup 1" [MyWay D4.3.2] and D4.3.3 "Berlin Living Lab Setup 2" [MyWay D4.3.3].

- **Use cases**

VMZ and the other Berlin partners focused on the realization of three use cases, including:

- Joint trips to university: a private ride-sharing use case
- Incident in public transport: a use case with a disruption in the public transport network and a continue of ride with bike-sharing
- Sustainable alternatives: searching for an alternative transport option, producing less emissions

### 2.3.3. Trikala Living Lab

- **Mobility in the city of Trikala**

Trikala is a city of approximately 76.000 inhabitants, located north-west of Athens in a great plain area, below the mountains which lie north of the city. Inhabitants of the greater Trikala area have been demanding more affordable, reliable and multi-modal transportation as the existing infrastructure lacks the sophistication of an integrated transport approach.

The Trikala Living Lab assessed a number of indicators for a medium-sized city. The indicators include, among others, the reduction of municipal resources required for transport, the decongestion of the city centre, the reduction of CO2 emissions through the use of environmental means, and the promotion of innovative mobility sharing schemes.

In addition, the current transport system of Trikala supports both public and private commuting. The Trikala public transportation fleet consists of vehicles and buses equipped with GPS positioning systems accompanied by real-time information systems installed across the municipality. Moreover, a large amount of e-parking spots are spread across Trikala along with interactive parking information signs making it easier for citizens using private transportation modes.

Finally, a traffic monitoring system based on inductive loops enables traffic management and provides the basis for the development of traffic congestion avoidance systems. The MyWay Living Lab has made use of the existing transport and ICT systems, thus creating a fully functional model for developing, testing and evaluating essential aspects of the MyWay platform.

- **User recruitment**

The Trikala pre-phase was conducted with participants from within the company E-Trikala. The same pool of participants that used the applications during the Pre-phase, migrated into Phase 1, along with a few more. In Phase 2 the application was public in the market and dedicated recruitment event were organized. These participants were also asked to recruit other users that might be interested in using the service. For more detail on user recruitment see MyWay Deliverable D4.4.2 “Trikala Living Lab Setup 1” [MyWay D4.4.2] and D4.4.3 “Trikala Living Lab Setup 2” [MyWay D4.4.3].

As the MyWay platform evolved and its functionality increased, user motivation to participate in the tests increased. This was possibly due to the fact that at Phase 1, the system was converging to a stable platform that offered additional services, thus triggering the interest of users. In Trikala Living Lab, where alternative journey planners do not exist, methodologies and tools that enable a simpler involvement of the end user in the testing processes, such as reminder emails, clear guidelines and templates, in-application feedback, were proven to be useful.

- **Use cases**

Three main categories of users have been identified by e-Trikala for the Trikala Living Lab:

- Elderly travelling to/from hospitals or recreational centres
- Students travelling to/from the University which is located three kilometres away from the city centre
- Office workers moving to/from their work

### 3. POLICY RECOMMENDATIONS

The following recommendations are a result of the work in MyWay project. The partners involved in the project represent local authorities, private companies acting in the IT and mobility sectors, universities and research institutes, a transport operator and a European network of cities and regions. As such, our concluding recommendations have been agreed by a representative mix of stakeholders working in the mobility sector. Some of the recommendations are drawn from our project experience in the course of the work and refer to challenges that were overcome or to learnings for the future, i.e. we have not necessarily been able to apply them to the MyWay app. Others are distilled from the various forms of feedback from users and other stakeholders, through several mechanisms (the scenario focus groups, the stakeholder interviews, the scripted journey plan tests, and feedback opportunities embedded in the app), as well as from our analysis of the formal evaluation data.

**The recommendations are aimed at three different groups of stakeholders: local authorities, transport operators and service providers.** While the majority of the recommendations would be applicable to any city/region, no matter their size, there are some that would be more valid in a bigger city/region than in a smaller one. Therefore, we have also **made a differentiation depending on the size of the area for some more specific recommendations.**

This chapter is structured in the following way: first, recommendations that are valid to any group of stakeholders and any city/region independent of their size are listed; this is followed by specific recommendations offered to each group individually. The tables below give an overview of what recommendations are applicable to whom, whereas the detailed explanations are to be found in the text underneath.

Table 1. Recommendations on Data per stakeholder group

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
Open data and open APIs	X	X	X	X	X	X
Data collection and consolidation	X	X	X	X	X	X
Provision of quality data	X	X	X	X	X	
Data privacy and data use	X	X		X	X	X
Integrating new			X			

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>service providers</b>						
<b>Value of data generated</b>	X	X	X	X	X	
<b>Data on accessibility</b>	X	X	X	X	X	X
<b>Transport network anomaly detection</b>	X	X	X	X	X	X
<b>Reliable Mapping and Geocoding Services</b>			X	X	X	X
<b>Quantity and quality of data</b>						X

Table 2. Recommendations on Real-Time Travel Information per stakeholder group

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>Real-time data</b>	X	X	X	X	X	X
<b>Real-time monitoring of sub-planners</b>			X			
<b>Data maintenance and coherence</b>			X			

Table 3. Recommendations on Intermodal Solutions per stakeholder group

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>Multi-modal integration of</b>	X	X	X	X	X	X

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>public and private services</b>						
<b>More apps in Europe need to offer multi-modal/intermodal solutions</b>	X		X	X	X	
<b>Integration with booking services</b>		X	X	X	X	X
<b>Reasonable number of interchanges</b>			X	X	X	X

Table 4. Recommendations on Interinstitutional cooperation per stakeholder group

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>Involve as many stakeholders/actors as possible</b>	X	X	X	X	X	X
<b>Involve local transport operators</b>	X	X	X	X	X	X
<b>Involve all mobility service providers</b>	X	X	X	X	X	X

Table 5. Recommendations on Involving the End-User per stakeholder group

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>Involve the end-user in the whole 'life cycle' of the</b>	X	X	X	X	X	X

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>project</b>						
<b>Strong and tailored marketing and promotion strategy</b>	X	X	X	X	X	X
<b>Added-value from tracking for the user</b>			X	X	X	X
<b>User's preference</b>			X	X	X	X
<b>Innovation of the app</b>			X	X	X	X

Table 6. Recommendations on providing quality functionalities

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>Usable interface</b>			X	X	X	X
<b>Provision of high-value product</b>			X	X	X	X
<b>Eye-catching apps</b>			X	X	X	X
<b>Mobile devices' limitation</b>			X	X	X	X
<b>Same app for different cities</b>			X	X	X	X
<b>Adapting functionalities to the size of the place</b>						X

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>A Help option</b>			X	X	X	X

Table 7. Recommendations on Stimulating Behaviour Change

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>Informed decision</b>	X	X	X	X	X	X
<b>User's 'comfort zone'</b>	X		X	X	X	X
<b>Gamification and incentives</b>	X		X	X	X	X
<b>User feedback</b>			X	X	X	X
<b>User statistics</b>			X	X	X	X
<b>User-friendly interface and quality functionalities</b>			X	X	X	X

Table 8. Recommendations on Geographical Scope per stakeholder group

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
<b>Scale matters</b>	X	X	X	X	X	X
<b>Promoting a European "platform" with local specific apps</b>	X	X	X	X	X	X
<b>Combining journey planner with long-</b>	X	X	X	X	X	X

Recommendation	Local authorities	Transport operators	Service providers	Metropolitan areas	Big cities	Small cities
distance trip planning and booking						

## 3.1. Recommendations on Data

### 3.1.1. Recommendations for all target groups and areas

- **Open data and open APIs.** As seen from the results of the MyWay Living Lab trials, users are eager to have as much information as possible. In order to satisfy this request, data should be available from the sources. Open data and open APIs are essential for a functional intermodal or multimodal journey planner. In MyWay this need is also emerging from the technical perspective because to build an intermodal journey planner that is following the metaplaning concept, such as MyWay journey planner, it is necessary to have access to: (1) open data about the transport network and (2) open APIs of local journey planners that will be used as Subplanners by the intermodal journey planner. Local authorities and transport operators are usually the data owners for this information. On the open data side, it is useful to have as much data as possible from the following list:
  - positions of public transport stops,
  - positions of shared bike stations,
  - positions of Park & Ride parking places.

The open data sources significantly speed up the preparation of the intermodal journey planner and improve its quality. On the open APIs side, it is crucial to have access to at least a public transport journey planner API. Some other Subplanners (e.g. for bike and car) can be built using existing open map data sources (such as OpenStreetMap). By opening their data, local authorities and mobility transport operators can help increasing the use of sustainable transport modes if well integrated in feasible options to the user. This emerged also from the Stakeholder Interviews in which the stakeholders highlighted the benefits of offering as much as possible information to end users in an integrated way [MyWay D6.2]. MyWay will benefit from having more open data available, and so will end-users as more functionalities can be unlocked for them.

- **Data collection and consolidation:** In large software projects where multiple parties are involved, objective data is often provided via various different interfaces. Also, this data is often unstructured, fragmented and inconsistent as formats are varying over time and across components. To make matters worse, these shortcomings are not usually recognized until the data is required, e.g. for evaluation purposes. In these cases, the manual formatting and association is tedious, time-consuming and leading to potential errors. In order to improve on this situation, Fraunhofer FOKUS provided a Data Collection Framework for conducting an automated extraction of data in large projects with multiple partners and technologies (see [MyWay-D5.1] and [MyWay-D5.2]). This framework enabled component developers to make internal software data structures accessible in a uniform and straightforward manner for further processing and analysis. This drastically lowered the bar for performing further analysis on the data, e.g. for progress monitoring or evaluation. In addition, in order to convince data providers to share their data, they should see a benefit in doing so. In Trikala LL, for example, both local bus and parking facility operators perceived MyWay as a beneficial feature that would further enable the development of the local transport system. Therefore data that was already available was provided to MyWay.
- **Data management and monitoring tasks.** Even if the system uses information provided by others (such as in MyWay), data management and monitoring tasks are weekly needed to load, to combine and to validate the new versions of the data received. Integrating a lot of data is a huge and complex task. It requires data specialist technicians and data management and monitoring tools for those specialists, otherwise the system will become obsolete after a while. In Trikala LL, for example, MyWay consortium needed to deal with technical issues such as proper formatting and adaptation to standardized formats. The responsibility for DataHow to manage and analyse this data is one of the most important activities in future exploitation/evolution of the platform.
- **Provision of quality data.** Quality and structure of the data available is another key topic. From MyWay experience, the importance of having high quality data and high reliable services, is essential. Even if having the data “open” is of crucial importance, it is equally important that data is coming from trusted sources, is of sufficient quality and is up-to-date. Therefore, local authorities and transport operators, if providing the data, should try to observe as much as possible these rules.  
At the same time, the platform should offer travel information only if the requirements about trustworthiness, quality and being up-to-date are fulfilled. MyWay includes some improvements in handling different sources and data providers with the possibility to switch from one provider to another or to automatically exclude a sub-planner if the service is no more reliable (timeouts), while still providing the information to the users. As a lesson learnt, if different

sources provide the same information, the one with higher quality should be used and automatically capable to switch between sources if the quality is dynamic. Data should not be degraded by the platform and transition between systems and components must be lossless.

- **Data privacy and data use.** Data privacy is essential. Data about systems and users needs to be anonymised and aggregated before transmitting to third parties. MyWay needed to deal with these aspects, as any other platform which is interacting with users would need to do. MyWay has followed the “privacy by design” concept, introducing the privacy aspects at the beginning of the design phase. This concept is based on 7 foundational principles<sup>5</sup> [Cavoukian, 2011]:

1. Proactive not reactive; Preventative not remedial
2. Privacy as the default setting
3. Privacy embedded into design
4. Full functionality – positive-sum, not zero-sum
5. End-to-end security – full lifecycle protection
6. Visibility and transparency – keep it open
7. Respect for user privacy – keep it user-centric

In parallel, security experts and privacy advisors should create a task force, as done in MyWay, to ensure data privacy by applying relevant regulations at European, national and regional level. From the investigations made by the Security and Privacy Task Force in the MyWay project (whose results are available in [MyWay-D4.1].), use of data needs to follow specific terms which must be part of a formal agreement between the source of information and the consumer. The user should always be aware of how his/her data is being used. As a common rule, users must be aware of who is managing their personal data and with what purpose and should authorise it. Transmission of personal data to third parties should not be allowed if not explicitly authorised by the user, through the use of Consent Forms which were also introduced in MyWay Trials.

The importance of data privacy for the user has been underlined in MyWay by the users themselves. For example, a stakeholder stated in an interview “*Data is useful for administrators and companies, but not so much for citizens, who are not very keen to give personal data*”. Also the preference of users to use MyWay without authenticating themselves, shows that many users are still wary of giving away data.

---

<sup>5</sup> Cavoukian, Ann. "7 Foundational Principles"

- **Value of data generated.** As underlined by external experts participating in MyWay Workshops or in MyWay Advisory Board, as well as by MyWay partners, local authorities and transport operators are interested in how people move within their territory in order to improve the OD (origin—destination) pattern in the transportation planning model, which is usually the least developed component in transportation models. Having information about people's mobility would also allow local administration, transport operators and service providers to better match supply and demand of transport services. In addition, they are interested in knowing how people perceive the mobility offer (i.e. getting feedback from the citizens) and which is the most requested information from the users (e.g. analytics over requests) as also discussed in the MyWay Collaboration Workshop. A platform that is able to collect all this information and offer the outcomes of analysis would be of great use for local stakeholders. This has also been underlined by MyWay Advisory Board. Such information is very valuable for planning purposes and can be used to create, for instance, a heat map of the city, or a certain area of the city. For instance, the Fraunhofer Integrated Testing and Evaluation Framework (ITEF) used within MyWay can be used also to provide those extensive visualization capabilities which helps to quickly identify important patterns in huge amounts of data.
- **Transport network anomaly detection.** Although many people are still concerned about personal privacy, it is now become more common to understand that many apps provide additional functional value to users who enable tracking. Transport apps collecting information in real-time are more and more common. These apps can be considered as crowd-sourced data collection system or distributed sensor network where each mode measures a specific aspect of the transportation system. For instance, tracking information about users travelling in bus routes can provide valuable insights into current bottlenecks of the system. This way, anomalies, such as traffic disruptions, can be detected swiftly and with limited cost. In contrast to real-time data provided by transport operators, crowd-sourced data is a cost-efficient and independent alternative, assuming privacy requirements are met. Additional information is provided in [MyWay-D5.3].

MyWay has used a Trip Follower functionality. The benefits of the Trip Follower functionality from the local authorities' perspective are big. On the one hand, administrations can provide more accurate information to the citizens while they are travelling and, on the other, local authorities can get information about the mobility flows and citizens' feedback. The main problem to overcome related to the Trip Follower functionality is to have access to the real time incidents within the mobility network, which is not always an easy task. Depending on the Living Lab, there are too many different stakeholders (public and private) who are the owners of the data and can be reluctant to share it.

### 3.1.2. Additional recommendations on Data to Local authorities and Service providers

- **Data on accessibility.** MyWay introduces some elements to be able, at level of platform, to offer tailored solutions for mobility impaired people. This element was highlighted as a comparative advantage of MyWay by the MyWay Advisory Board members, considering also the lack of solutions available on the market. Unfortunately, this function is strictly related to the availability of information on accessibility from the sources itself, which in the case of MyWay was very difficult to find or consume.

For local authorities, it is important to facilitate the moving of mobility impaired people on their territory and this has been underlined several times by the Catalonia LL authorities. To achieve this successfully, local authorities should provide any data that they have in relation to mobility impaired people, e.g. infrastructure available, etc. to feed in the system. Many solutions are available on the market offering support to citizens in terms of mobility, but there is still some room and less competition in the market related to solutions integrating and offering complete information for mobility impaired people.

### 3.1.3. Additional recommendations on Data to Service providers

- **Integrating new service providers.** New mobility services may appear from time to time in locations. Efforts should be made to integrate new service providers at the earliest possibility, to maintain the completeness of the offer to users. A more complete offer of travel options would make it more appealing to the user and offer more concrete solutions for his/her mobility. The MyWay Business Models, described in [MyWay-D6.3], highlight how integrating different mobility service providers can be positive for users, local authorities and service providers alike. MyWay can help a virtuous circle be activated if the service provider understands the advantages he will have by being integrated in solutions and platforms providing a potentially larger user base.
- **Reliable Mapping and Geocoding Services.** Mapping and geocoding services normally are external services provided by others as a SaaS (Software as a Service), but they are key factors, taking into account that they are used as the entry points of any request to the platform. The importance of having a complete and reliable (in terms of quality of service and quality of data) geocode service determines the first impression of the user and the accuracy results in the trip planning application. MyWay has received feedback from the users stressing the importance of good maps in the app. Even if geocoding services are perceived as a secondary or standard functionality, it is important

to ensure the quality of the providers selected because their impact in the global solution is high. In the case of MyWay, this quality has been guaranteed by using certified data from a third party with a license in the Geocode Service.

### 3.1.4. Additional recommendations on Data based on area size

- **Obtaining data.** The bigger the area is, the more difficult it is to get all the mobility services information because there are many more stakeholders/administrations involved. At the same time, for the citizens it is much more important to be informed about alternatives they did not have in mind as the availability of options is greater and this may substantially change their travel time, number of changes, etc. On the other hand, in a relatively small area, with not many transport options, the challenge is to find data and the meta-planning approach has fewer advantages for users. Therefore, obtaining as much data as possible is the first step to take in a smaller area, even if the data is not open, or not real-time.

In the case of Barcelona/Catalonia living lab, the area covered is very large with 7,5M of inhabitants, 31.985 km<sup>2</sup> and 947 municipalities (Barcelona is only one of them). Moreover, the public transport framework is very complex with several levels of administrations with competence in public transport, more than 85 public transport operators (public and private) and with an annual demand of 971.3M of trips. Therefore, obtaining data was a big challenge. Thanks to the Government of Catalonia and ATM of Barcelona, all the static public transport data related to those 85 operators was concentrated in one unique source and was provided to the MyWay project. Moreover, some of the real-time information for bus was also provided.

- **Consolidation of data** will be a bigger challenge in metropolitan areas and big cities than in smaller areas, where the data will not be of such big amounts. As mentioned before, the Government of Catalonia had all the public transport static data which was also consolidated.
- **Value of data generated.** This recommendation is particularly relevant for metropolitan areas and big cities where the number of trips is much greater than in smaller cities and therefore management of citizens' travels is more difficult. In the case of the Barcelona/Catalonia Living Lab, for example, the data generated would be very useful to have a better knowledge of the preferences, itineraries, as well as mobility services used by the citizens. Moreover, the local authorities could, based on it, improve the mobility flows information and could provide a more adapted mobility supply.

## 3.2. Recommendations on Real-time travel information

### 3.2.1. Recommendations for all target groups and areas

- **Real-time data.** MyWay has tried to include as much as available real-time data in each Living Lab, following suggestions from experts of MyWay Advisory Board. Also users have expressed in their feedback the need to have access to information on mobility (e.g. delays, availability of parking, availability of bikes at the bike stations, etc.). Unfortunately in MyWay it was not possible to include the same amount of data in the three Living Labs, due to the lack of services available from the source. At the same time, it was emphasised in the user focus groups [MyWay D1.1] and in the stakeholder interviews that the journey planner should provide citizens with real-time travel information. To avoid this kind of problem in the future, local authorities should, wherever possible, provide the real-time data. When no official source of data is available on the field, crowd sourcing (e.g. structured feedback from users) is a feasible solution to be used. MyWay Advisory Board has also recognised this conclusion.

### 3.2.2. Additional recommendations on Real-time travel information to Service providers

- **Real-time monitoring of sub-planners.** The core metaplanning concept of MyWay builds on top of existing transport planning services for a given city or region. As a consequence, the MyWay metaplanner performance, in terms of quality and consistency of results, reliability and speed, depends on external service providers (the sub-planners). Moreover, these external service providers are outside of the control of the operator of the metaplanner which means that performance of these external services can vary significantly. Hence, in order to ensure a high quality of the metaplanner, a continuous monitoring of the quality of the external services needs to be implemented, which is described in detail in [MyWay-D5.3]. A mechanism to not only monitor, but also automatically switch between different sub-planners is extremely important, wherever applicable. As described in [MyWay-D 3.1.2], MyWay includes a basic mechanism to handle sub-planners which is linked to the reliability of the single sub-planner. Thus, if a sub-planner fails, the same information can be retrieved from another sub-planner handling the same mobility information or in the worst case scenario, the solution is presented to the user with a warning related to missing transport modes information. Also, when such events occur, notification of the service provider along with an automated error report to facilitate the recovery of these services can be done. It is very helpful to have real-time monitoring of all journey planning components – that means of the metaplanner component, as well as all the sub-planner components. Using

real-time monitoring, it is possible to detect failures of individual planners very quickly and minimise their downtime.

### 3.2.3. Additional recommendations on Real-Time Travel Information based on geographical size

- **Real-time data.** Real time data is a must, especially in bigger areas, where changes, such as disruptions or delays can cause a lot of confusion in the traffic. In the case of Barcelona/Catalonia Living Lab, the ATM of Barcelona provided some real-time information data, mostly related to the bus arrival times. However, the main problem was related to the incidents or disruptions data where currently it is still directly owned only by the public transport operators. This type of data is very important for an area like Catalonia, as with 971,3M trips per year and 85 operators, it is essential to inform about the current problems of the network and provide the possible alternatives. In smaller regions like Trikala, the transport system is relatively small and in many cases bus arrivals and departures are limited, already known or could be easily known to locals. Real-time data in this case can have an added value to visitors and tourists.

## 3.3. Recommendations on Intermodal solutions

### 3.3.1. Recommendations for all target groups and areas

- **Multi-modal integration of public and private services.** Lack of integration of public and private mobility services is often the case and is a barrier that needs to be overcome. MyWay has innovated in the field by developing algorithms that integrate different types of mobility services. Having these two worlds merge brings a clear advantage to a number of groups, as is strongly recognised in the stakeholder interviews (see Annex of D6.2). For the users, the key benefit is providing a more complete overview of possible transport alternatives for any requested journey, particularly those where combinations of different modes are optimal. For the Local Authorities, as it would allow them to enlarge the use of sustainable transport modes as the provision of filtered and targeted information is facilitative in encouraging greater willingness to consider a wider variety of modes in general (multimodality) and more trust in intermodal journeys through the provision of integrated journey plans that draw on multiple modes, with reasonable interchanges to link the desired origins and destinations. For the private operators, a key benefit of an app like MyWay is more direct access to a larger user base. For smaller, new mobility service providers, particularly those introducing an innovative product, this could support faster business growth beyond the initial niche of early adopters (e.g. electric vehicle sharing).

## 3.4. Recommendations on Inter-institutional cooperation

### 3.4.1. Recommendations for all target groups and areas

- **Involve as many stakeholders/actors as possible.** MyWay has been a project with many different partners, from different regions and sectors (ITC SMEs, Research organization, local authorities, service providers). This mixed group, after an initial period of tuning the needs and expectations of the different actors, represents the ideal composition to build a European system. MyWay benefitted from the cooperation of complementary transport system operators and service providers, extending the scope of trip planning recommendations. What is more, MyWay gathered experience in three different countries with three cities of different size and different mobility solutions available.

To achieve a truly intermodal/multi-modal journey planner, the participation of as many actors as possible is crucial at both functional and operational levels. Identifying which actors to include will depend on the size of the territory involved (see also the scale-related recommendations below in this document), the number of different public and private mobility services that are available in that geographic area, and who the holders are of the required data. In Catalonia LL, the Government of Catalonia and ATM had all the public transport static information, as well as some real-time information for buses, which made it easier. However, the 'golden information' related to incidents is still owned directly by the public transport operators and it was very difficult to obtain it. Open data sharing among stakeholders would enhance the effectiveness of the solution, as it would lead to optimised multimodal transport system scheduling and integration.

Though experience has shown that development, integration and operation of new features and services from various partners is a demanding process, tight management and effective scheduling of development and operation can help overcome any issues. In Trikala LL, for example, there was a coordinating organisation, E-Trikala, the main one responsible for stakeholder involvement, which had an extensive network of stakeholders developed and extended during previous activities.

- **Involve local authorities.** Local authorities are key when designing a journey planner as they know their citizens, know how they move, dispose of O-D matrices and have the data, which they can open to developers in order to produce the app. Local authorities are also key beneficiaries of the new mobility-related data that can be produced by an app such as MyWay. For MyWay, it was a clear advantage being able to test the app in three different areas and in the Catalonia LL to have the local authorities on board

- **Involve local transport operators.** Local transport operators are the main providers of public transport services in a given area. They usually have important data. Involving them from an early stage, with proper attention to any commercial issues where the operators are not public sector, will help to ensure a high quality end product.
- **Involve all (or as many as possible) mobility service providers,** both public and private. In order to provide a reliable and useful app to improve sustainable mobility, it is essential to provide a complete and realistic picture of the intermodal solutions available. Therefore, all mobility service providers (public and private) should be included within the app in an integrated way. However, this will involve several challenges, as some of these mobility service providers are likely to be very small and seeking to balance marketing and business finance and expansion activities with commitment to projects such as MyWay with only limited staff capacity and potentially limited capability in meeting some of the demands of a large and complex project. Other mobility service providers may not be willing to cooperate with operators who are perceived as competitors. Achieving sufficient breadth of project participation needs good negotiation skills as submitting data to an integrator app may not be part of a SMEs current business model/strategy.

### 3.4.2. Additional recommendations on Intermodal solutions to Local authorities and Service providers

- **More apps in Europe need to offer multi-modal/intermodal solutions<sup>6</sup>.** Currently only few apps in Europe offer multi-modal/intermodal solutions, as MyWay market research shows (see [MyWay-D6.4.3] and [MyWay-D2.2]). The majority of the journey planners offer information on public transport, or in general about one mode – e.g. taxi (Hailo), car-pooling (Fliinc), etc. There are a number of reasons for this – commonly data issues (e.g. collected data is not open, or data is not collected) though the complexity of building such integrative apps should not be underestimated. Nevertheless, an effort should be made to overcome these challenges in order to deliver to the citizen an app that represents as close as possible the reality of mobility choices available and which reflects real lives more closely. Feedback received in MyWay from the Scripted Journey Plans and the stakeholder interviews, shows that a particular strength of MyWay is *“the inclusion of different transport modes together, not just public transport or just private transport”*. A user also stated that *“The city [Berlin] promotes public transport and cycling and therefore the*

---

<sup>6</sup> MyWay project differentiates between multi-modal and intermodal journey planner, the former being a journey planner that offers the multi-modal solutions, but does not provide links between the different modes of transport for a single trip, whereas the latter provides both information on the different modes available AND offers a mix of different transport modes for one trip.

*integration of these transport modes is welcome by the city for forming a positive image”.*

MyWay is in that respect a pioneering app. Local authorities should try to support the app creator in overcoming the present challenges by providing information on mobility offer on their territory. At the same time, again following recommendations received by the users, an app *“should not be “multimodal” for the sake of it”.*

### 3.4.3. Additional recommendations on Intermodal solutions to Service providers and Transport operators

- **Integration with booking services.** MyWay experienced in Catalonia two different ways of integration of booking services, one is related to the electrical scooter-sharing provider which was deeply integrated in the platform, and another with the Hailo taxi provider which was lighter and provided an app-2-app link for the users. The key word anyway is “integration”. Offering a single solution able to merge public and private services, but also access to booking services, even if “light” as in the case of the Hailo taxis, directly from the app which has suggested the use of the mode of transport, can help to raise the profile of the app and make it better than other apps available on the market. MyWay has studied also a possible Business Model based on this kind of integration. More generally, basic functionalities to be offered for full integration are: service availability, price information, and service booking. Such an integration would bring the app closer to the new mobility paradigm “mobility as a service (MaaS)”<sup>7</sup> [Eurotransport, 2014]. The vision of MaaS is to see the whole transport sector as a co-operative, interconnected eco - system, providing services reflecting the needs of customers. The ecosystem consists of transport infrastructure, transportation services, transport information and payment services. Transport operators should cooperate with other service providers in order to ensure this integration.

### 3.4.4. Additional recommendations on Intermodal solutions to Service providers

- **Reasonable number of interchanges.** Despite that intermodality has a great value, the suggestions provided by the journey planner should be realistic, i.e. provide a reasonable number of interchanges. Intermodality should be in place to facilitate the traveller and provide him with a wider number of options, but not confuse him with too much information and a big mix of modes that are not realistic to take. MyWay has received this as a feedback by users.

---

<sup>7</sup> [http://www.itsineurope.com/its10/media/press\\_clippings/ITS%20Supp\\_et214.pdf](http://www.itsineurope.com/its10/media/press_clippings/ITS%20Supp_et214.pdf)

### 3.4.5. Additional recommendations on Inter-institutional Cooperation based on geographical size

- **Involving various stakeholders.** Involving various actors is not an easy task, because of a number of challenges, but it offers many advantages to the quality of the final product. Identifying which actors to include will depend on the size of the territory involved, the number of different public and private mobility services that are available in that geographic area, and who the holders are of the required data. A smaller area would have the advantage of a smaller number of stakeholders. This increases the chances that these actors know each other already and have a more direct contact to each other, which should facilitate the cooperation between them.
- From the local authorities involved in the Barcelona/Catalonia LL perspective, it must be guaranteed that those players/stakeholders who have the property of the mobility services and all the related data (static, dynamic, incidents, etc.) are involved in order to achieve a successful inter-institutional cooperation. Therefore, the number of stakeholders is not so important, but to ensure that all the stakeholders who have competence in this subject are involved. It would naturally be much easier if the power would be concentrated in public authorities, but it is not always the case.
- MyWay recommends having on board as key groups, at least, local authorities, local transport operators and as many mobility service providers as possible, both public and private.

## 3.5. Recommendations related to the End-user

### 3.5.1. Recommendations for all target groups and areas

- **User recruitment.** As described in [MyWay-D5.3], one of the most important tasks is user recruitment which is composed of user acquisition and user motivation. The first one can be described as “how to get people to join the project?” while the latter as “how to keep existing users in the project?”. Throughout the project, we have observed that user motivation is much more challenging than user acquisition. While there might be many users interested in the beginning who download and test the app, many of those drop-out, i.e. they stop using the app. We suggest there are several ways to improve user motivation and thereby reducing drop-out rate. In addition to providing a good-quality product (see Recommendations on Providing quality functionalities further in this document), frequent involvement in design, continuous marketing and promotion and gamification have been identified as important to keep the user.

- **Involve the end-user in the whole ‘life cycle’ of the project**, from the definition of needs and requirements, until the test and validation of the app, providing constant feedback. MyWay has involved a wide variety of users in order to test the app and receive feedback. These were initially involved using a focus group methodology which received some very valuable comments about, for example, the design of the app and functions that would be important for different types of users. This user involvement meant that project partners were able to consider this input alongside technical feasibility in the requirements prioritisation, which was very useful. Further on in the project, three types of users have participated in evaluating MyWay:
  1. “Piloted” users – a limited in number asked to perform specific scenarios in accordance with the user stories defined in WP2 of the project, so as to identify any technical or usability issues that need to be corrected or any functionalities’ improvement that need to be implemented. They have been recruited among people actively involved in the MyWay project.
  2. “Real” users - using MyWay in naturalistic conditions in their everyday life. They have been the majority of involved users. To account for behavioural responses because of users’ prior experience with planners, users have been equally selected from people who are currently using other planners on a regular basis and from people who do not use planners regularly.
  3. Stakeholders. Stakeholders can be regarded as experts in the field, and are likely to have an organisational interest in the service provided by MyWay. Therefore their opinions are important. Stakeholder feedback has also been an element in T1.1 Scenarios, use cases and user research. Full analysis of the stakeholder interviews can be found in [MyWay-D1.4] and [MyWay-D6.2].

Including mechanisms for feedback within the app itself also enables ‘real’ users to feel involved and have a sense of ownership of ‘their’ app, and alerts the app developers to significant problems being experienced by the user. Having built-in feedback is different to the formal project evaluation process – it is continuous and available to any user at all. It can help users to trust the app, as they are able to send complaints, etc.

Based on the results obtained, MyWay sees as important to include all kinds of users throughout the design of the intermodal journey planner app, taking into account gender, age and occupational status (working/student/retired). The main goal is to guarantee a representation of a wide diversity of citizens in terms of needs, resources and capabilities. Table 9 below shows that MyWay has targeted different types of user groups for testing the scenarios produced in [MyWay-D1.4].

Table 9. MyWay user groups

Scenario Combination	Demonstration of vision			LL Best Fit	Trial feasibility		
	Modes	Benefit	Target User Group(s)		Pre-phase	Phase 1	Phase 2
S1	Car-pool	Sharing, cost saving	Office worker Student	Berlin	No	No	Yes
S3, S7	Cycling/PT	Weather	All	Berlin	No	Yes	Yes
S2, S13	Multimodal	Transport Disruption	All	Berlin Barcelona	No	No	Yes
S4, S5	Multimodal	Intercity operability; personal preferences	Business traveller Student	Berlin Barcelona	No	No	No
S6	Demand responsive transport	Intraregional travel; flexible mode; innovative mode	Elderly	Barcelona	No	No	Partly
S8, S13, S15	Multimodal	Reduced mobility		Barcelona	No	No	No
S12, S14	Intermodal car/walk	VBC	Office worker	Trikala	No	No	Yes
S11	Car-pooling	Sharing, cost saving, social need	Office worker Elderly Student	Trikala	No	No	No

Source: Table 1. Preliminary works to refine scenarios: outcome of Athens workshop, p.15 [MyWay-D1.4]

Finally, a lesson learnt within the MyWay project is not to make too lengthy and complex questionnaires, as this has led to some drop-out in participants in pre-phase (Phase 0) and Phase 1 trials in MyWay.

The overall project evaluation methodology was also amended in response to user feedback from the Pre-phase and Phase 1 trials. [MyWay-D1.4] reports on the results of the Scripted Journey Plans (SJP) and the stakeholder interviews.

- **Strong and tailored marketing and promotion strategy.** Providing a good technological product is not enough. When someone is used to an app which is consolidated within the market, it is difficult to make them change. This is highlighted in the stakeholder interviews [MyWay D6.2]. A strong

marketing strategy that distinguishes between the different types of end-users and defining the different ways to get them involved is necessary.

- In MyWay, after the App was ready, it was demonstrated at launch events in each of the three LL in order to recruit users for its test phase with 'real' users. App-specific products have been created to promote the MyWay app separately from the MyWay project, such as a website and a leaflet. In addition to that, other recruitment strategies included spreading the information through articles in newspapers and magazines, social media, websites, banners, etc. To provide for additional incentives for users to test the app, contests with prizes, such as a mobile phone in Catalonia, camera in Berlin and bicycle in Trikala, were organised. The recruitment strategy was tailored for each focus group population. Detailed information about the recruitment strategies for each LL is available in [MyWay-D 4.2.3], [MyWay-D 4.3.3] and [MyWay-D 4.4.3].

### 3.5.2. Additional recommendations on Involving the end-user to Service providers

- **Added-value from tracking for the user.** For users, having their requests and mobility tracked involves a privacy trade-off. Therefore, user authentication and tracking are optional, and users need to get added value from the app and to understand that added value in order to authenticate/activate a trip follower function. The MyWay project studied the Voluntary Behaviour Change, applied to Mobility, selected and partially implemented an algorithm to promote the Modal Shift towards users of the app. The user can track their journey and obtain statistics (daily, weekly or over a period) about their mobility in terms of CO2 emissions, calories burned, distance performed for each single transport mode. The same information on past trips of users can be of interest for local authorities which, as already mentioned before, can benefit from having more knowledge on how the citizens move and how they can be motivated to change their usual habits towards more sustainable transport modes. In MyWay, the Trip Follower by definition ensures the soundness of the journey and collection of transport-related user statistics. Trikala Living Lab users, for example, have reported successful trip following that has been effective in proposing alternatives during deviations from proposed routes.
- **User's preferences.** To increase mobility services' use, the solution provided must be adapted to user's preferences - user's preferences function must be simple, easy to set up and understand by the user. Citizens are becoming more and more demanding with the mobility apps appearing in the market. The competitiveness is growing every day. Therefore, the possibility to define your mobility preferences in an easy way is a key issue to implement to make a difference on the market. While testing the scenarios in Barcelona, several users have valued the possibility to be able to adapt your profile and preferences in the app. A stakeholder from the Berlin LL

said in his interview: *“The UI, especially with the map being presented first, is easy to use. The preferences are positive too. They cover a lot of complicated settings as easy categories. It is much better than giving the user the opportunity to change transfer times between different modes of transport on their own”*. Nevertheless, users also found important to be able to return to the main interface (that contains no preferences), in case needed.

- **Innovation of the app.** Apart from the marketing campaign, it is essential to provide a new app which includes innovation and new services in comparison to the existing ones. In this sense, the users’ preferences, the multimodality results and the Trip Follower in MyWay are functionalities that can be considered innovative. The user statistics (especially calories) was mentioned in the stakeholder interviews [MyWay D1.4] as a distinctive innovation that MyWay has introduced. In addition, it was noted that the innovation of combining public and private transport is a Unique Selling Point and useful, and that the product also has something valuable for car users, especially the inclusion of parking locations. The unique selling point for each app should be very clear in order to compete successfully with other existing services.

### 3.5.3. Additional recommendations related to the End-User based on geographical size

- **Involve the end-user throughout the design of the intermodal journey planner app and in the whole ‘life cycle’ of the project.** It is important to include all kinds of users throughout the design of the intermodal journey planner app, as pointed out in the recommendations above. In smaller areas involving the citizens may be easier as usually local authorities would have a more direct contact to them. In Trikala LL, E-Trikala, the main responsible for recruitment, had extensive previous experience in dissemination and promotion of research activities in the city. Moreover, no similar approaches to trip scheduling were ongoing in Trikala, thus MyWay was an attractive approach that users found interesting. Therefore, recruited users were willing to support and contribute to the development of the platform during testing activities. This highlights the advantage of small cities with small ICT penetration compared to larger areas that have existing ICT solutions for transport.

On the other hand, it might be more difficult to find as broad representation of different groups of citizens as in a big area as they may not have organisations that represent them (e.g. a retired people’s organisation). In such a case experienced organisations, such as E-Trikala could be sought.

## 3.6. Recommendations on Providing quality functionalities

### 3.6.1. Recommendations on Providing quality functionalities to Service providers

- **Usable interface.** For an app to manage to enter the market and remain there, it should have a usable interface. MyWay Focus group results, as well as Scripted Journey Plans (SJP) show that as a minimum, the following criteria should be satisfied:
  - Easy to perform basic functionalities
  - Obtain results quickly
  - Have reliable results/data
  - Include innovative functionalities, but the basic ones to be there as well
  - Be user-friendly and self-explanatory

Some more elderly users have appreciated MyWay App's clear and large typography. Full analysis on users' perception of interface and design is available in [MyWay-D1.1].

- **Provision of high-value product:** Products which provide a high practical value to the user's everyday life will be used more often and spread through word-of-mouth. User interviews revealed that users recognize the potential advantages of the meta-planning concept [MyWay-D5.2]. Hence, a further improvement of the system and extension to additional transport providers could further raise the value to the end-user and boost user recruitment.
- **Eye-catching apps.** The design of the app needs to be eye-catching to attract users to it. Even if an app is very useful, if it does not draw attention to itself, it will not be discovered. The users who tested MyWay app praised its attractive appearance. In Catalonia LL a user commented: *"There is a huge competition in this field. Depending on the way other competitors would present the information and combined with other sources, they could be more attractive and sweep MyWay from the market"*, which once again stresses the importance of having an app with attractive design.
- **Same app for different cities.** MyWay provides a single application which is able to run in the three different Living Labs and includes support for the main languages used in the areas of the tests. This choice enables "roaming" scenarios. This is a key issue for the Europe-wide spread of the app. More and more, users are demanding global apps well integrated locally in terms of local services provided/included. Based on MyWay experience, the app should

have a global vision locally detailed. When testing a MyWay scenario, users found that due to the fact that MyWay stores profiles and preferences, they can imagine that MyWay could help them travel in the same way whilst away as when at home.

The fact that an app may be used in different cities/regions would also be a good selling point. There were comments in Berlin and Catalonia LL that an app which can be used in several locations was 'very convenient', but needs more coverage for the benefits to be felt.

- **Mobile devices' limitations.** In the first phase of the trials, the lack of information about the minimum characteristic needed to run the MyWay trials has caused some misunderstanding with users. In the other phases the information was made clearly available to the users. The fact that the new apps are developed only for the latest versions of Android and iOS systems prevents some citizens with older versions to use the app. To ensure universality of use, it should be considered that the app gets some technical modifications that would allow its use on older devices as well, or to present the app's limitation in a crystal clear way to the users. In addition, public authorities should define the minimum hardware/software features supporting the app.
- **A Help option.** MyWay included a functionality which allowed users to express their opinion on different aspects of the system, including the user interface and usability of the app. Some users have expressed interest in including a help functionality or guide to increase the usability and understanding about all the different functionalities offered by the app. A Help button might be foreseen to assist the user in using all the different options of the application.

### 3.6.2. Additional recommendations on Providing Quality Functionalities based on geographical size

- **Adapting functionalities to the size of the place.** Providing quality functionalities is important for any market and any app. In a smaller market, however, the app has to be adapted to the local conditions with less offer and disable functionalities that are not available. A smaller market might be easier to enter as big places, such as for instance Barcelona, are already quite saturated with journey planners. A new app is also going to face more competition in a bigger market from already established apps and providers, such as Google. In MyWay each area has a different version of the Metaplanner and User Profile, which are fed with different default parameters to fine-tune journey composition to the needs and habits of the citizens.

## 3.7. Recommendations on Stimulating Behaviour Change

### 3.7.1. Recommendations on Stimulating Behaviour Change to Local Authorities and Service providers

- **Informed decision.** Multimodality and availability of information about all modes allows citizens to make an informed decision and choice. This may ultimately lead to switching modes and to switching to a more sustainable travel behaviour. Unfortunately, MyWay app was only tested for a couple of months, that is why we do not dispose of evidence from the project of behaviour change having take place because of use of MyWay. However, the feedback received by Trikala LL users shows that the majority of the users believed that by using MyWay journey planner there would be a certain mode switch in the city from car to public transport.
- **User's 'comfort zone'.** Changing behaviour is difficult. Users in different attitude segments will not switch to any other mode, just those that fit with their personal identity and attitudes. As MyWay is based on satisfying users' preferences, more sustainable modes need to be promoted to users with caution. Our findings from Work Package 1 *Mobility Behaviours* shows that users have a comfort zone for different transport modes, that will reduce their trust in the app if it is challenged too greatly. Essentially, users will prefer messages that promote benefits for modes that are in-line with their attitude. We have identified potential to test whether user preference settings and/or revealed travel behaviour can be used to infer the segment and thus seek to offer journey plans that are the best match possible: it is counter-productive to suggest a mode that is too far from a user's 'comfort zone'. In discussions with the users, they stated that they are used to a standard itinerary and it is difficult for them to get used to an alternative route suggested by MyWay, even though it may seem more convenient. Therefore, apps like MyWay may need to include more information about routes which deviate from the user's comfort zone, e.g. give a reason why it is better, and match that reason to the user's segment. For example, some users are more open to health-related messages, others to time-related messages.
- **Gamification and incentives.** An interesting approach is the addition of gamification elements into the application in order to positively reinforce certain user behaviour. In the main project phase of MyWay (i.e. phase 2), users were rewarded with virtual points for issued trip requests and completed questionnaires. In the end of the project phase, users with the most points received prizes that were sponsored by individual MyWay partners. As described in [MyWay-D5.3], the gamification and incentives have contributed to an increased user activity, in comparison to the previous project phase (i.e. phase 1) where this was not implemented. In any case, caution needs to be exercised

to not distort the user behaviour (e.g. by rewarding bicycle trips with more points than car trips). The gamification and incentive mechanism can be further improved by seamlessly integrating it into the app and calculating incentive points in real-time. Also, introducing an element of competition by a high-score (e.g. “you are the most active user in Catalonia”) could further boost user motivation.

### 3.7.2. Additional recommendations on Stimulating Behaviour Change to Service providers

- **User feedback.** MyWay included a feedback functionality to let users express their opinion on the usability and reliability of different aspects (UI, journey planning, mobility service, etc.). On the other hand, MyWay also gives feedback to the people about their mobility. Giving people feedback about their behaviour is one of the basic mechanisms that is thought to be effective in helping people change - the idea is that if they know what they are doing, they can reflect on whether/what to change. In MyWay if users opt-in to VBC (voluntary behaviour change), this activates trip follower so MyWay can record the user's trips and in return the user can look at some of the data about their trips. VBC is an interesting functionality and should be further improved. Several stakeholders were very interested in this feature and regarded it as innovative in the field [MayWay D6.2]. It is considered that this way might be quicker and more efficient in motivating people to use sustainable modes than waiting for policy objectives to stimulate this change. It may be helpful, in addition, to be able to push occasional messages to users, or to include a message alongside journey plans or alongside the VBC statistics, rather than rely solely on icons.
- **User statistics.** Similarly to the VBC, statistics about the transport mode a user chose may help him switch to a greener transport mode. The user statistics in MyWay show CO2 emissions, calories and the transport modes that the citizen has used. Several Stakeholder interviewees were impressed by the user statistics feature, as highly innovative in a mobility planning context. They recommended that this be developed and be given a higher profile.
- **User-friendly interface and quality functionalities.** MyWay system was evaluated within three different runs of trials within the 30-month duration of the project. From the early stages, the app was created in order to look professional and to be comparable in terms of usability with existing applications in the application stores (Android and iOS). The users expressed in the questionnaire of the trials that the MyWay application and journey plans provided are as good as the applications already present on the market (Google Maps, Here, CityMapper,..). This was a success because the competition was very high and it is a good starting point to gain the trust of the users. If the app successfully promotes innovative alternatives to the use of the individual car

and presents the user with new to him/her options, this may ultimately lead to behaviour change.

### 3.7.3. Additional recommendations on Stimulating Behaviour Change based on geographical size

- **Behaviour change/addressing transport policies.** Our recommendation for practitioners is that they should be specifying a requirement for user segmentation in tools such as MyWay, in order to support guiding particular segments towards particular alternatives, such as shared vehicles (car clubs and city bikes as well as lift-sharing), or electric mobility, in addition to supporting an increase in multi-modal travel (for example, supporting Park and Ride by enabling the provision of bookable parking slots at public transport access points on parts of the network that have capacity). Access to high-quality real-time data and sophisticated routing and planning algorithms are at least as important to achieving this as the effectiveness of behaviour change messaging, which needs to be more targeted to individuals.

## 3.8. Recommendations related to the Geographical scale

### 3.8.1. Recommendations for all target groups and areas

- **Scale matters.** The size of the place where the app is going to be used is of prime importance. MyWay has been tested in a metropolitan area – the region of Catalonia, in a big capital city – Berlin, and in a small town – Trikala. Many differences have resulted out of the size of the three places, for instance in Catalonia, there have been more private providers involved, such as electric scooters, whereas in Trikala MyWay app included only the car, bicycle and public transport as modes. The activities in each of the places have been tailored taking account of their specificities. Detailed information about each LL is available in [MyWay-D 4.2.3], [MyWay-D 4.3.3] and [MyWay-D 4.4.3], as well as in [MyWay-D 5.3].
- **Promoting a European “platform” with local specific apps.** This should be the wider objective of every app in order to facilitate to the maximum the mobility of the citizens around Europe. The overall design of the app should be kept, but local functionalities, using specific sets of local/regional information, added and those that are not available disabled. In MyWay Berlin Focus group, participants liked being able to have journey-planning in their own language and with the same interface [MyWay-D1.1]. MyWay users also commented that it would be great that the MyWay app be present in Europe as it would facilitate people’s mobility. A user from one place who travels to another

where an app is available should be able to use their existing profile and preference settings, and functionalities and services that are available in the new place should become available to that user.

- **Combining journey planner with long-distance trip planning and booking.** This should be the long-term ambition, so that we get closer to ‘mobility as a service’ and to a single European door-to-door journey planner. Despite that MyWay has not done any work in that respect, this is a recommendation coming from MyWay consortium when looking at current tendencies on the market.

## 4. CONCLUSIONS

This document has provided policy recommendations drawn in the course of the two-and-a-half year work of MyWay consortium over the MyWay project. The recommendations come from research and experience made with the developed MyWay intermodal journey planner app. The MyWay app has been empirically tested in three very different Living Labs – the metropolitan area of Catalonia (Spain), the big capital city of Berlin (Germany), and the small town of Trikala (Greece). The partners involved in the project represent local authorities, private companies acting in the IT and mobility sectors, universities and research institutes, a transport operator and a European network of cities and regions, specialised in mobility issues. As such, these recommendations come from a representative mix of stakeholders working in the mobility sector and from three very different areas in Europe.

MyWay policy recommendations are meant for three different groups of stakeholders, namely Local authorities, Transport operators, and Service providers. This document has provided tailored recommendations for each of these groups. The recommendations have addressed the following topics:

- Data
- Real-time travel information
- Intermodal solutions
- Inter-institutional cooperation
- Involving the End-user
- Providing quality functionalities
- Stimulating behaviour change
- Geographical scope

On the data set of recommendations, it is crucial to mention that openness of data, as well as open APIs are key for an efficient intermodal journey planner, which aims to give the user as realistic picture of transport options available as possible. The more data is open, the more complete services can be offered to users by platforms such as MyWay designed on the basis of the metaplanning concept. Even if having the data “open” is of crucial importance, it is equally important that data is coming from trusted sources, is of sufficient quality and is up-to-date. Real-time data is a must as well. Static information is no longer sufficient to meet the expectations of the dynamic user that we are facing nowadays.

Obtaining existing data in good quality and format is decisive for the creation of the intermodal journey planner app, but the data obtained back from the use of the app is equally valuable. The more information an administration has from collected mobility patterns, the better it can adapt mobility supply to citizens’ real needs. A platform that is able to collect the information coming from the users and offer the outcomes of analysis would be of great use for all three groups – local authorities, transport operators and service providers.

Currently only few apps in Europe offer intermodal solutions. By being one of them, MyWay is a pioneering app, but our recommendation is that more apps in Europe need to offer multi-modal/intermodal solutions. The multi-modal integration of public with private services is key for providing quality information to the user. Integration with booking services goes even a step further towards building one ecosystem and bringing the services closer to the “mobility as a service” concept.

Moving on from more data-related recommendations to more governance-related ones, MyWay consortium suggests to involve as many stakeholders as possible in the building of the intermodal journey planner. Involving various actors is not an easy task, because of a number of challenges, but it offers many advantages to the quality of the final product. We recommend to have on board as key groups, at least, local authorities, local transport operators, as many mobility service providers as possible, both public and private.

Speaking out of experience with its target groups, focus groups and stakeholder interviews, MyWay would recommend involving the end-user throughout the design of the intermodal journey planner app and in the whole ‘life cycle’ of the project. It is important to include all kinds of users taking into account gender, age and occupational status. At the same time, to increase mobility services’ use, the solution provided must be adapted to the user’s preferences, so a user’s preferences function in the app would create a more individualistic approach to the user. Citizens are becoming more and more demanding with the mobility apps appearing on the market and competitiveness is growing every day. Therefore, the possibility for the user to define his own mobility preferences in an easy way would give a comparative advantage. Finally, when someone is used to an app which is consolidated on the market, it is difficult to make them change, therefore a strong and tailored marketing and promotion strategy is crucial.

Directly related to the satisfaction of the user is that the app provides quality functionalities. This means that the app should have a usable interface, which is eye-catching, user-friendly and straightforward to understand, and provides results quickly. The app should have all basic functions which are widely accepted, but also include a certain innovation, which would make it stand out. In the case of MyWay, this has been the User Statistics functionality, which shows CO2 emissions, calories and the transport modes that the citizen has used, but also in some cases, providing links between different modes of transport that did not exist before, e.g. in Berlin bike-sharing with car-sharing services.

If all of the above recommendations are followed, the chances of stimulating behaviour change are high. Multimodality and availability of information about all modes allows citizens to make an informed decision and choice. This may ultimately lead to switching modes and to switching to a more sustainable travel behaviour. Giving people feedback about their behaviour is one of the basic mechanisms that is thought to be effective in helping people change. The VBC (voluntary behaviour change) in MyWay app is an interesting and useful functionality in that respect.

Finally, the size of the place where the app is going to be used is of prime importance as small cities have different needs and resources from big cities from metropolitan areas. With that in mind, a European app adapted to local circumstances should be the wider long-term objective. This, together with the possibility of booking the services suggested and providing additional information to also address the needs of mobility-impaired people, should be the more ambitious objectives in moving towards one coherent, co-operative and

interconnected ecosystem of mobility, providing services reflecting the needs of the individual citizen.

## 5. REFERENCES

[Cavoukian, 2011]

Cavoukian, A. "Privacy by Design: The 7 Foundational Principles". 2011  
<https://www.ipc.on.ca/images/Resources/7foundationalprinciples.pdf>

[European Commission, 2013]

European Commission. EU Transport in Figures. Statistical Pocketbook 2013.  
<http://ec.europa.eu/transport/facts-fundings/statistics/doc/2013/pocketbook2013.pdf>

[European Commission, 2016]

European Commission. Mobility and Transport. All Facts and Figures. 23.02.2016  
[http://ec.europa.eu/transport/strategies/facts-and-figures/all-themes/index\\_en.htm](http://ec.europa.eu/transport/strategies/facts-and-figures/all-themes/index_en.htm)

[Eurotransport, 2014]

Eurotransport magazine. "Mobility as a Service – the New Transport Model?" Volume 12, Issue 2. ITS and Transport Management Supplement. 2014.  
[http://www.itsineurope.com/its10/media/press\\_clippings/ITS%20Supp\\_et214.pdf](http://www.itsineurope.com/its10/media/press_clippings/ITS%20Supp_et214.pdf)

[MyWay-DoW]

Annex I – "Description of Work" to the EC Contract

[MyWay D1.1]

MyWay Deliverable D1.1 "Scenarios"

[MyWay D1.4]

MyWay Deliverable D1.4 "Scenarios, KPIs and guidelines for validation. Final version"

[MyWay D2.1]

MyWay Deliverable D2.1 "Requirement Specification and Analysis"

[MyWay D2.2]

MyWay Deliverable D2.2 "Review of enabling technologies and solutions"

[MyWay D2.3]

MyWay Deliverable D2.3 "Initial system architecture and specification"

[MyWay D2.4]

MyWay Deliverable D2.4 "Final system architecture and specification"

[MyWay D3.1.2]

MyWay Deliverable D3.1.2 "MyWay Platform Detailed Technical Design 2"

[MyWay D3.2]

MyWay Deliverable D3.2 "MyWay Technology Baseline Description and Usage"

[MyWay D4.2.2]

MyWay Deliverable D4.2.2 "Barcelona Living Lab Setup 1"

[MyWay D4.2.3]

MyWay Deliverable D4.2.3 “Barcelona Living Lab Setup 2”

[MyWay D4.3.2]

MyWay Deliverable D4.3.2 “Berlin Living Lab Setup 1”

[MyWay D4.3.3]

MyWay Deliverable D4.3.3 “Berlin Living Lab Setup 2”

[MyWay D4.4.2]

MyWay Deliverable D4.4.2 “Trikala Living Lab Setup 1”

[MyWay D4.4.3]

MyWay Deliverable D4.4.3 “Trikala Living Lab Setup 2”

[MyWay D5.2]

MyWay Deliverable D5.2 “Living Lab Execution report First version”

[MyWay D5.3]

MyWay Deliverable D5.3 “Living Lab Execution report Final version”

[MyWay D6.2]

MyWay Deliverable D6.2 “Evaluation of MyWay integrated systems”

[MyWay D6.3]

MyWay Deliverable D6.3 “Business Models based on MyWay”

[MyWay D7.3.1]

MyWay Deliverable D7.3.1 “MyWay Newsletter N1”

[MyWay D7.3.2]

MyWay Deliverable D7.3.2 “MyWay Newsletter N2”

[MyWay D7.3.3]

MyWay Deliverable D7.3.3 “MyWay Newsletter N3”

[MyWay D7.3.4]

MyWay Deliverable D7.3.4 “MyWay Newsletter N4”

[MyWay D7.3.5]

MyWay Deliverable D7.3.5 “MyWay Newsletter N5”

[MyWay D7.4]

MyWay Deliverable D7.4 “MyWay Project Leaflet”

[World Health Organization, 2016]

World Health Organisation Regional Office for Europe. Health Topics. 23.02.2016

<http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/data-and-statistics>