Mobility as a Service in a multimodal European cross-border **Corridor** (**MyCorridor**)

Deliverable 9.3

Project Final Report

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The MyCorridor project Consortium consists of:

No.	Name	Short name	Country
1	NEWCASTLE UNIVERSITY	UNEW	UK
2	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	CERTH	EL
3	OSBORNE CLARKE LLP	OC LLP	UK
4	WINGS ICT SOLUTIONS INFORMATION & COMMUNICATION TECHNOLOGIES EPE	Wings ICT	EL
5	SWARCO MIZAR SRL	SWARCO MIZAR	IT
6	SWARCO HELLAS SYSTIMATA KYKLOFORIAS A.E.	SWARCO Hellas	EL
7	CHAPS SPOL SRO	CHAPS	CZ
8	HACON INGENIEURGESELLSCHAFT MBH	HACON	DE
9	MAP TRAFFIC MANAGEMENT BV	MAPtm	NL
10	VIVA WALLET HOLDINGS - SOFTWARE DEVELOPMENT SA	VivaWallet	EL
11	AMCO OLOKLIROMENA SYSTIMATA YPSILIS TECHNOLOGIAS ANONYMI VIOMICHANIKI KAI EMPORIKI ETAIRIA	AMCO	EL
12	TOMTOM DEVELOPMENT GERMANY GMBH	TOMTOM	DE
13	ROMA SERVIZI PER LA MOBILITA SRL	RSM	IT
14	TTS Italia	TTS	IT
15	PANEPISTIMIO PATRON	UPAT	EL
16	IRU PROJECTS ASBL	IRU	BE
17	SALZBURG RESEARCH FORSCHUNGSGESELLSCHAFT M.B.H.	SFRG	AT

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Abbreviation List

Abbreviation	Definition
AB	Advisory Board
API	Application Programming Interface
B2B	Business to Business
B2B2C	Business to Business to Customer
B2C	Business to Customer
BMR	Business Model Radar
CIA	Core Impact Assessment
D	Deliverable
DMP	Data Management Plan
DPO	Data Protection Officer
EB	Ethics Board
GDPR	General Data Protection Regulation
IPR	Intellectual Property Rights
JSON	JavaScript Object Notation
KPI	Key Performance Indicator
MaaS	Mobility as a Service
MoR	Merchant-of-Record
OEM	Original Equipment Manufacturer
OTP	Open Trip Planner
PB	Partnership Board
POI	Point of Interest
PT	Public Transportation
QCB	Quality Control Board
QoS	Quality of Service
SC	Steering Committee
SME	Small – Medium Enterprise
SRT	Service Registration Tool
SUMP	Sustainable Urban Mobility Planning
SWOT	Strengths Weaknesses Opportunities Threats
TM	Traffic Management
TMSA	Traffic Management Services Aggregator
UC	Use Case
UI	User Interface
URL	Uniform Resource Locator
VAS	Value Added Service

WP	Work Package

Executive Summary

This Deliverable stands for the final report of MyCorridor. The objective of the current report differs from that one of the final progress report that is of administrative nature. Herein, the objective is to summarise in short the aims and the outcomes of the project, presenting also the research approach followed in each case.

As such, a summary of the main activities and results is included providing only publishable information (as the nature of the current Deliverable is Public). Starting from the project factsheet (Chapter 2) and the presentation of the Consortium (Chapter 3), whilst the challenge that the project came to address, followed by the its vision, aim, objectives and core approach followed are all presented in Chapter 4. Chapter 5 presents in short the governance of the project and Chapter 6 summarises the user-driven approach of the project. The core innovation of the project, the one-stop-shop solution is presented in Chapter 7, both its back-end mechanisms and its front-end mobile applications, whereas an overview of the MaaS services, provided through it is provided in Chapter 8. Chapter 9 gives a more in-depth insight on the Traffic Management layer of the MyCorridor MaaS solution.

Chapter 10 describes the pilot activities taking place in MyCorridor and summarises the key findings and lessons learned from the pilots, whereas Chapter 11 looks into the key impacts of the project as being assessed upon the pilot results.

MyCorridor has also explored a series of legal issues revealed during MyCorridor several phases, that are also associated in the broader sense with MyCorridor. Chapter 12 summarises them. Chapter 13 summarises, on the other hand, the incentivisation and promotion strategies explored in the project that are also associated in the broader sense to MaaS. Chapter 14 summarise the deployment and business modeling aspects related to both the project and MaaS in general, as well as the exploitation strategy and products of the project. The dissemination activities of the project are outlined in Chapter 15, where risk assessment, data management and ethics issues tackled in MyCorridor are presented in Chapters 16, 17 and 18 respectively. Chapter 19 presents the SWOT of the integrated MaaS solution, being the core product of the project, Chapter 20 highlights the selling points of its core product, whilst the Deliverable is concluded in Chapter 21.

MyCorridor achieved to develop an one-stop-shop standards abiding MaaS platform that allows, through mobile applications, travellers to experience a series of mobility, infomobility and value added services under the MaaS paradigm and service providers and other MaaS aggregators interface their services or the platforms through it in a cross-border fashion. The technical solution is supported by novel business roles and relations, promotion and inventivisation policies.

Overall, 26 transportation services (including trip-planners) have been integrated into the platform and provided to the travellers, namely 6 mobility services, 12 infomobility services, 4 traffic management (TM) services and 1 added value services as well as 3 external trip-planners in view of the hybrid trip planner.

378 people participated in the user experience activities of MyCorridor, using the services provided, under different product configurations and in different contexts in two phases and 5 pilot sites across Europe. The findings have led to the assessment of the solution as well as the conduct of an impact assessment that reveals aspects beyond project consideration.

The identified exploitable results of MyCorridor are in total 12. The majority of the identified results are of TRL 7 and above, which shows a significant maturity, and a short time to the market, mostly 1-2 years.. Out of the 12 identified results in total, those that are concerning the exploitation of overall MyCorridor system can be exploited either as a digital service case or as a software product sales case. Those that are concerning the individual exploitation of research results are mainly of software nature and shall be exploited as software product sales case. Undoubtedly, the key exploitable product of the project is considered to be the one-stop-shop B2B2C MaaS platform and its front-end mobile applications that can be exploited in several ways as they have been identified by the Consortium.

The project has had 15 publications in journals, conference proceedings and magazine articles and has participated in 39 events around Europe and overseas. In addition, it has been widely disseminated through its web site, social media and printed a series of dissemination material that has been regularly updated during the project (leaflet, poster, roll-up, videos, etc.). Finally, it has organized 3 Pan-European workshops in its context, achieving – apart from increasing awareness on MyCorridor specific activities and outcomes – to bring together other initiatives placed in the same field and to raise key discussion items around MaaS .

The project has participated and contributed in standardization activities in the field of MaaS whereas it has come up with lessons learned and application guidelines for further consideration by the MaaS community. As a conclusion, the project Consortium considers all the objectives of the project met.

1 Introduction

1.1 Purpose of the document

This document is MyCorridor's final report, submitted as deliverable D9.3 at the end of the project's 42-month duration. It describes the overall technological and research strategy of the MyCorridor project and the emerging results out of it. The report also gives an account of the governance, risk management and dissemination and exploitation activities of MyCorridor as well as of the lessons learned across all aspects (technical, legal, operational). Only the parts that can be publicly available have been reported; for further confidential details, one should refer to the corresponding project Deliverables that can be available upon request and authorisation by the project Coordinator. All the publicly available Deliverables of the project can be downloaded from http://www.mycorridor.eu/project-library/.

In addition, it should be stressed that the objective of this report is different to the one of the final progress report. While the latest focus on the description and justification of the effort put by the Consortium in the M19-M42 period of the project, the current report focuses on the description of the work approach itself as well as the project outcomes as achieved during the full course of the project.

1.2 Intended audience

This is a public document. It is of potential interest to all MaaS stakeholders (researchers, end-users, service providers, aggregators, policy makers, authorities and deployerts) looking to exploit or deploy MaaS and MyCorridor like schemes and solutions or to conduct further research in this domain.

1.3 Interrelations

The final report of the project covers to the maximum degree possible (given also the public nature of the report), all activities and key findings of the project, starting from stakeholders' needs to final results assessment. As such, this document has considered as its primary input the work done and reported in all the other deliverables and milestones of the project.

2 MyCorridor factsheet

Table 1: MyCorridor factsheet.

Contract Number	723384
Project acronym	MyCorridor
Project Name	Mobility as a Service in a multimodal European cross-border corridor
Call topic	H2020 MG-6.1-2016 Innovative concepts, systems and services towards 'mobility as a service'
Type of Project	Research Action
Date of start	01/06/2017

Duration	42 months
Total Cost	€ 3,491,331.25
EC Contribution	€ 3,491,331.25
Project Coordinator	Dr Roberto Palacin, UNEW
Technical & Innovation Manager	Dr Maria Gkemou, CERTH/HIT
Project web site	http://www.mycorridor.eu/
	https://twitter.com/MyCorridor
	https://www.linkedin.com/in/mycorridor/

3 The Consortium

MyCorridor tasks have been undertaken by a balanced consortium encompassing all key actors, namely 2 key industrial Partners (SWARCO MIZAR, TOMTOM), 7 dynamic SMEs in the mobility market (SWARCO Hellas, CHAPS, WINGS, MAPtm, AMCO, VivaWallet, HaCon), 1 mobility agency (RSM), 1 ITS association (TTS), 4 Research performers (UNEW, CERTH, UPAT, SRFG), 1 multinational Legal Firm with specialisation in novel mobility scheme structuring (OC) and IRU Projects, which is the "innovation arm" of the IRU (International Road Transport Union) with 170 members in more than 100 countries globally, constituting also the liaison to MaaS Alliance. This truly multidisciplinary and fully complementary team covers the whole of Europe through local, long distance and cross border Pilots in a corridor of 6 European countries; from the South (Greece, Italy) through to Central (Austria, Germany, the Netherlands) and Eastern Europe (Czech Republic).

Table 2: MyCorridor project consortium members.

No.	Name	Short name	Country
1	NEWCASTLE UNIVERSITY	UNEW	UK
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4 The Challenge, the Aim and Objectives & the Approach

4.1 The Challenge

In the context of the Eurobarometer Survey (2014), Commissioner Violeta Bulc said: *"Today's survey shows that good infrastructure, better connections, and cheaper tickets are the main concerns of EU citizens. That is why we need to remove technical and administrative barriers to ensure that transport services can really operate across the whole EU, without national boundaries. Also we cannot assume that transport services will always be there, or be safe, unless we maintain them. Transport is about people. That is why in all of my initiatives, the main objective will be to contribute to travellers needs and to set the conditions for the European transport economy to flourish."* That survey had also revealed that convenience is by far the main reason for choosing a specific means of transportation for everyday and long journeys (both 61%), followed by speed (respectively 31% and 41%) and price (12% and18%).

In light of these aspects, MyCorridor aimed to advance the current status by delivering a solution that would introduce a new concept at that time (turning to be quite popular, however, nowaydays), the so-called 'Mobility as a Service' (MaaS), which aims to realise the vision of seamless mobility services.

In this context, the MyCorridor solution was considered from the beginning to support the MaaS concept by providing distinct features such as the Mobility Services Aggregator across the whole EU and addressing citizens' concerns. And this, MyCorridor aimed to achieve through the development of an innovative platform and novel business schemes. In this way, MyCorridor would enable a paradigm shift for car users, by driving the "vehicle world" towards MaaS.

In specific, one of the basis of the MyCorridor project, from its very beginning, has been the TM2.0 platform (i.e. as an enabler of MaaS), and, therefore, the starting point in this respect, were those mobility services related to the interactive traffic management vision of the "vehicle world". It, therefore, aimed to extend the current capability of TM2.0 by integrating in a single platform pan-European data sets, able to offer urban and interurban services that are multimodal, seamless, flexible, reliable, user-friendly, all-inclusive, cost-effective and environmentally sustainable.

4.2 The Mission, the Aim & the Objectives

To address the gaps and challenges mentioned above, MyCorridor aimed:

To develop the **technological and business platform**, which will **enable technologies, applications, business models, legal and operational schemes and travel behaviour adaptation and promotion strategies** to make **MaaS a sustainable reality**, seamlessly integrating **public and private transportation means** as needed, into a **cross-border travel chain**, without owing any of them!

Still, this aim was placed in the context of a broader **mission** of the project, that has been:

To facilitate sustainable travel in urban and interurban areas and across borders by replacing private vehicle ownership by private vehicle use, as just one element in an ***integrated/multi-modal MaaS chain***, through the provision of an innovative platform, based on mature ITS technology, that will combine connected traffic management and multi modal services and thus facilitate modal shift. It will propose a technological and business MaaS solution, which will cater for interoperability, open data sharing, as well as tackling the legislative, business related and travel-behavior adaptation barriers enabling the emergence of a ***new business actor*** across Europe; the one of a ***Mobility Services Aggregator***.

The concrete objectives of the project that were defined in order to meet the above aim and vision are as follows:

- **Objective 1: Integration of MaaS vehicles into a multimodal service chains platform**, to be fulfilled through the **following steps:**
  - To develop a technological solution that will be comprised of in-vehicle components, business processes and payment platforms, by utilising and enhancing existing mature and robust ITS.
  - To extend the scope and capability of TM2.0 to cover multi-modality aspects, as part of an updated sustainability strategy within the platform (e.g. facilitating a modal shift from car to other modes).
  - To develop an open Cloud Architecture that is able to support, in a flexible and modular way, all the above technical components, in compliance to Open Data principles.
  - To design inclusive, personalised, context-aware and user friendly interfaces for all mobility user required actions, as well as for pushed services and information to the traveller.

  Expected Outcome: A single MaaS chain, composed of one-stop-shop web services, with tools to easily integrate single services to content and an optimized and adaptable UI for all travellers.

- **Objective 2: Provision of a new business paradigm, actor and model for pan-European cross-border adoption**, to be fulfilled through the **following steps:**

- To develop a one-stop-shop business platform for the purchase of Mobility Tokens for accessing Mobility Services and enabling the sustainable provision of such services across borders, Europe-wide.
- To create a novel business model across Europe: the one of a Mobility Services Aggregator.
- To propose novel financing, pricing and taxation strategies as well as schemes to enhance travelers' socially responsible behavior adaptation and to facilitate the market uptake of these new business models.
- To propose appropriate operational (i.e. on data sharing, service sharing business rules, data protection, etc.) and legal (cross-border) schemes, to enable the realisation of such trips under real life conditions.

Expected Outcome: A new business paradigm and business actor (MaaS aggregator), able to provide holistic MaaS services locally and, through roaming, globally in competitive prices and with flexible business schemes.

- **Objective 3: Proof of concept of the new business model and integrated platform by selected UC's and performance of full operational analysis and impact assessment through interconnected Pilots across a European corridor**, to be fulfilled through the **following steps:**
  - To assess all relevant technological, technical, behavioural, legal, operational and socio-economic barriers through the application of a real-life multimodal journey across a European corridor and realize demonstration Use Cases to allow proof of concept.
  - To perform a full impact assessment and viability analysis of the proposed solutions and develop appropriate dissemination and exploitation plans for their sustainable market take-up.

  Expected Outcome: To develop a legally abiding, operationally functional and fully viable MaaS platform as proved through extensive testing across 6 countries and sites, from South to North of Europe and by their overall impact assessment.

The project Consortium considers all the objectives of the project met.

4.3 The Approach

MyCorridor targeted to prove its aim through a number of European sites, which are connected and form a cross-border corridor (from the far South to the far North, crossing Central and Eastern Europe) with road transport and multimodal chains. Those sites would use Mobility Package tokens, purchased through a single access point and incorporating the following services: **a) Traffic management services** (advanced navigation, adaptive traffic control, traffic status & event detection, dynamic traffic management), **b) Services related to MaaS PT interface** (Multi-modal real time information/planning/booking/ticketing), **c) MaaS vehicle related services** (car sharing, car-pooling, parking, taxi, …), and **d) Horizontal services** (loyalty schemes, Mobility Tokens, clearing).

Moreover, MyCorridor aimed to build business models and roles, some of the new to mobility, that would support in a pragmatic way the concept introduced.

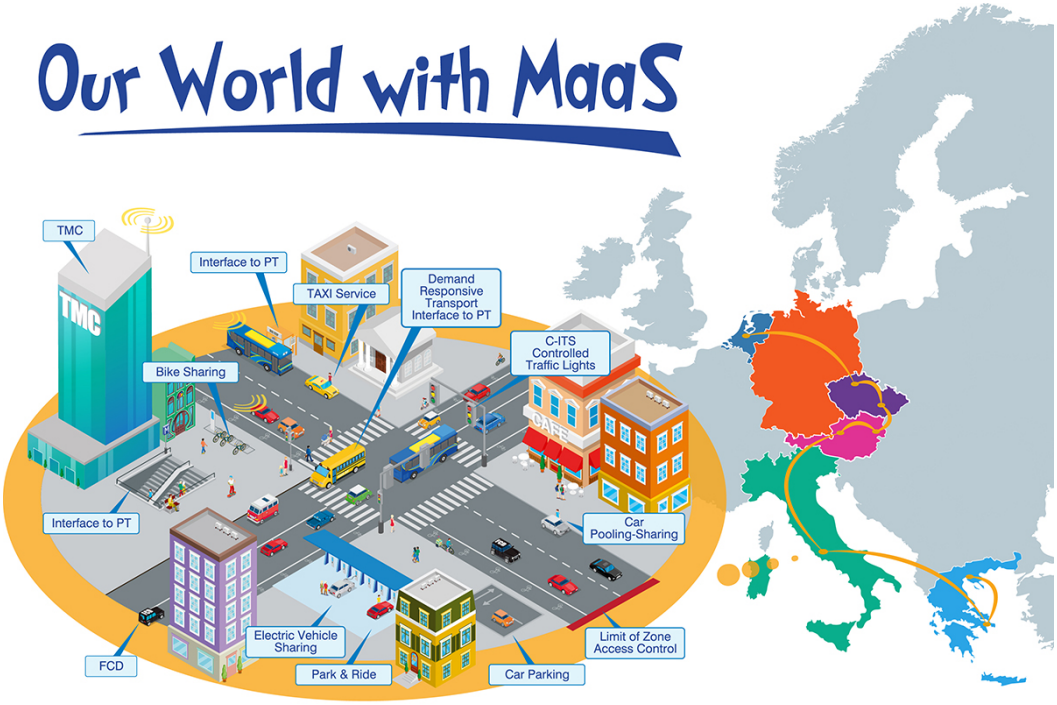

Figure 1: The MaaS paradigm as approached by the MyCorridor interconnected public and private transportation services.

5 MyCorridor Governance

5.1 Governance

MyCorridor project encompasses 18 partners and 10 interdependent work packages. Hence, it was deemed important to establish a governance and management structure (Figure 2) that would be able to meet the challenges of the successful project implementation. As such, the project governance was designed to achieve the following goals:

- Lean structures and procedures for agile and cost-effective project management.
- Equitable distribution of activities and responsibilities among all 18 partners.
- Efficient vertical and horizontal information flow, especially between work packages.
- Proactive conflict resolution mechanisms.
- Thorough assessment of potential risks involved.
- Optimal assignment of experienced personnel to the scientific, technical and managerial tasks.

The project structure was defined to allow reliable overall coordination, efficient communication, clear decision procedures, work flow giving rise to Deliverables meeting time and quality requirements, all done in accordance to the European Commission Grant Agreement and the project Consortium Agreement.

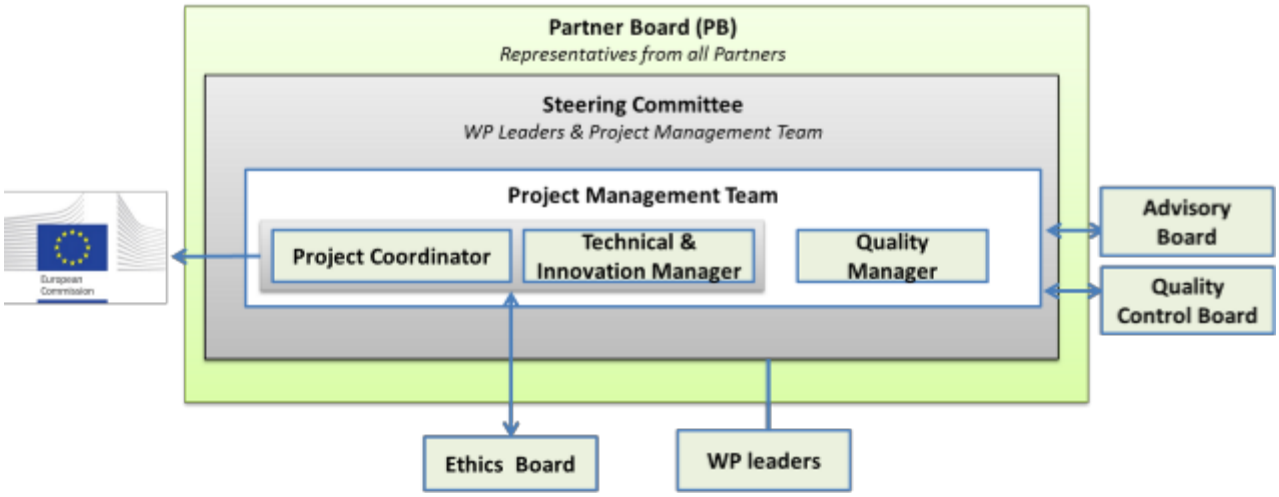

Figure 2: MyCorridor project governance and management structure.

The project management structure and procedures, as well as the detailed roles of each body of the project governance, have been elaborated in the Project inception Report as well as in *D9.1: MyCorridor Quality Assurance Plan.*

As shown above, the **Project management Team (PMT)** consists of the Coordinator, the Technical and Innovation Manager as well as the Quality Manager. It acts as the main consensus-building body on overall project coordination and as such provides a link between the WP leaders and the Partner Board.

The **Steering Committee (SC)** consists of the Project Management Team, chaired by the Coordinator, and all WP leaders. Its role has been to make executive decisions on strategic issues and will have a major impact on the overall outcomes and success of the partnership.

The **Partner Board (PB)** is the superior governing body of MyCorridor. It represents every partner in the Consortium and it is empowered to review compliance of members with the Consortium Agreement and with the stated goals of the project. It is comprised of one delegate per partner organisation. The Partner Board takes final decisions on policy and contractual issues and conflicts as requested by the Coordinator. Each delegate has one vote; decisions are made by consensus whenever possible. Only in cases where consensus is not possible, decisions are made by majority voting.

The **Quality Control Board (QCB)** is responsible for compiling, co-ordinating and supervising the implementation of the MyCorridor workplan. The QCB consists of the Quality Manager (Ing. Laura Coconea. PhD, Senior Researcher SWARCO MIZAR), the Coordinator (UNEW), the Technical & Innovation Manager (CERTH), one internal expert assigned by each Partner and one expert external to the project. The tasks and synthesis of the Quality Control Board (QCB) as well as all the quality control processes and mechanisms applied in the project are described in *D9.1: MyCorridor Quality Assurance Plan*.

The QCB also coordinates an **Ethics Board (EB)** in order to ensure the compliance of the project to ethical issues, requirements and mechanisms as they have been defined in the project Ethics manual presented in *D10.1: POPD – Requirement No.1*, and its later update *D9.2: MyCorridor Ethics Manual*.

The MyCorridor Ethics Board (EB) is led by the Quality Manager and was in charge of preparing the Ethics Manual and monitor throught the whole project that all its activities were conducted in compliance with it. One of the goals of Ethicss Board has been to ensure that the planned evaluations and tests ere following respective national regulations. For all evaluations taking place in a country, a responsible person, local to the site and the beneficiary running it, has been nominated for following the project's Ethics Board

recommendation, keeping the names of participants hidden and ensuring that identities of test subjects as well as data collected are kept properly confidential and anonymised before use.

Finally, MyCorridor's **Advisory Board (AB)** consisted of 3 high levels independent experts, identified before the project launch, as of the phase of the proposal preparation:

- Christopher Irwin, Chairman of European Passengers Federation (EPF), Belgium
- Jean Grebert, R&I Renault, France
- Gabriel Plassat, ADEME (French Agency for Environment and Energy)

This AB helped to ensure that MyCorridor is aligned and up-to-date with the other related activities and projects internationally. It also assisted in the selection and definition of the use cases, the review and provision of feedback on the project mid-term results and risk assessments and the validation of the final project results against the original targets at the final project Workshop event. Its members were invited to all project own events, being also key note speakers or panel participants in some of them.

5.2 WP & Activity leaders

The table below presents the Work Package leaders of the Consortium on entity and physical person level.

Table 3: Work Package leaders.

WP No.	Lead Beneficiary	Responsible Person
1	2 – CERTH	Maria Gkemou
2	5 – SWARCO MIZAR	Laura Coconea
3	2 – CERTH	Maria Gkemou
4	2 – CERTH (originally 7 – CHAPS)	Maria Gkemou
5	2 – CERTH	Maria Gkemou
6	14 – TTS Italia	Laura Franchi
7	5 – SWARCO MIZAR	Laura Coconea
8	16 - IRU	Carlo Giro
9	1 – UNEW	Roberto Palacin
10	1 - UNEW	Roberto Palacin

Task (Activity) leaders have been responsible for the work delivered at Task level. They have been in charge of the coordination and execution of the work activity within their Task(s) and of reporting the progress of that activity to the WP leaders. They have been also in charge of the coordination, preparation, quality control and completion of their Task deliverable(s).

5.3 Dissemination Team

The Dissemination Team consists of the Coordinator, Technical & Innovation Manager, and the leader of the Dissemination WP (WP8), IRU, which has been represented over the project duration by 4 personnel; initially this was Monica Giannini and Gorazd Marinic, then Nikolas Schmalholz and latterly Carlo Giro. The role of the Dissemination Team was to define the objectives of the dissemination and the dissemination and communication strategy of the project, to monitor and promote dissemination activities in the project as well as the development of the various dissemination material and means, to record the Consortium dissemination activities held, to identify new dissemination opportunities, and to

evaluate the outcomes, quality and impact of the dissemination activities held. An overview of the dissemination objectives and activities of MyCorridor can be seen in section 15 of the current report.

5.4 Meetings

7 physical plenary and technical consortium meetings have been organised over the course of the project. All of the meetings have been organised by UNEW (Coordinator) and CERTH/HIT (Technical and Innovation Manager). All detailed minutes are internal to the Consortium and the EC. In addition, a large number of online call conferences have taken place on both administrative and technical aspects. Physical and virtual meetings included the Strategic Advisor Board members where appropriate and possible, including the project's three stakeholder workshops held in February 2018, November 2018 and October 2020 (this specific one was virtually conducted due to COVID-19 mobility restrictions). Dissemination specific events and meetings are further described in section 15 of the current report.

6 A User-Driven Approach

6.1 The MyCorridor User-driven Approach

The overall process that led to the development of the Use Cases entailed a number of steps to collect current market information, assess factors and players and determine the traits needed for MyCorridor Use Cases. The following figure reflects the user-driven approach denoting also the WP1 activities of the project where the respective work items were conducted.

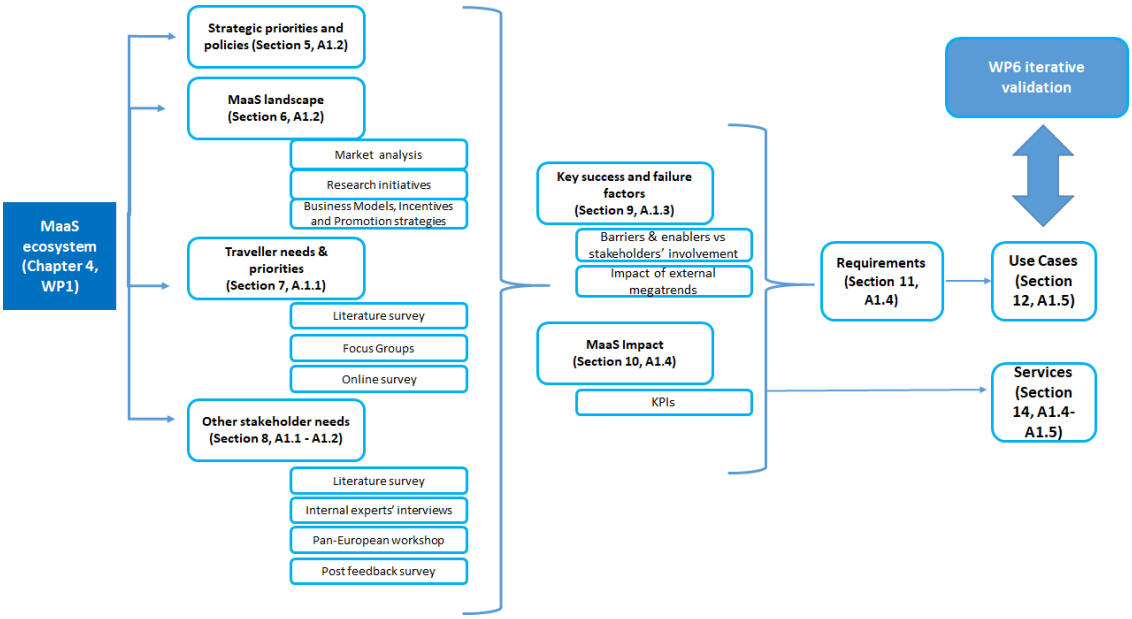

Figure 3: MyCorridor methodology towards determining the Use Cases.

More specifically, the approach started by defining Mobility as a Service and clarifying the position of MyCorridor within MaaS. Then, a first registration of the MaaS ecosystem was performed so as to determine the stakeholders and the different disciplines and clusters that participate in it. To properly comprehend and depict the MaaS ecosystem and how MyCorridor is related to it, all (if any) strategic initiatives, priorities and policies were studied so as to determine how authorities, organisations, the EU and private partnerships view MaaS. In specific, the *ITS Directive and ITS Action Plan*, the *Public Sector*

Information (PSI) Directive, the *INSPIRE Directive*, the *Roaming* and the *GDPR directives*, the *Action Plan Urban Mobility 2009*, the *EasyWay Deployment Guidelines*, the *Smart Ticketing Alliance*, the *Commission Staff Working Document towards the multimodality roadmap*, the *EU's Payment Service Directive 2*, the *European Data Economy*, *policies from POLIS and MaaS Alliance*, the *TM2.0 initiative* but also *industrial MaaS initiatives* and the *MaaS visions across the Atlantic* have been explored and discussed, whereas it was sought how MyCorridor aimed to address/comply with them and to which degree.

Moreover, an analysis of the MaaS landscape followed in which the market was analysed, research projects were summarised and existing/emerging business models, incentives and promotion strategies in the field were studied to understand how MaaS has entered the market and what steps have been taken. As part of the market analysis, the most and less advanced MaaS offerings were described. 9 advanced offerings, 10 single dimension schemes and 5 research initiatives were analysed at the first phase of the project, while this process was reiterated continuously during the design and development phase to keep the project evolution up to date. Also, an overview and comparison of the MaaS offerings across 6 recognised cooperation stages was conducted, summarising the modes present in each and the key areas of MyCorridor that they are addressed. In addition, the key MaaS activities per European city as well as the key emerging pilot/demonstration outcomes have been expored.

Research initiatives that deal with MaaS were also explored in the first phase of the project. Using the information collected from the market analysis and the research projects, an overview of the MaaS offerings was presented, followed by an analysis of the first outcomes from MaaS piloting in cities. Then, the existing and potential business models were analysed based on already applied MaaS schemes and on existing literature, followed by incentives and promotion strategies that have been used so far to communicate MaaS to their target audience. The presentation of the MaaS landscape closed with the anticipated placement of MyCorridor in the market.

Having determined the stakeholders, the project then focused on travellers to explore their needs, preferences, habits and profiles. To achieve this, a literature survey has been conducted to determine the profile of the travellers and understand their needs and priorities. To further reinforce the literature survey results, focus groups are conducted in EU partner cities and an online questionnaire is circulated to travellers across the EU. In specific, six (6) focus groups took place in Greece (Thessaloniki & Athens), Austria (Salzburg), Czech Republic (Prague), Italy (Rome) and Belgium (Brussels). As such, 44 persons in total took part in the focus groups conducted. Findings have been consolidated and discussed across key aspects, namely *Human experience*, *Conceptual acceptability*, *Technology challenges* and *Legal concerns*. The online survey was conducted in order to complement the qualitative outcomes emerging from the focus groups. It aimed at further investigating and capturing more tangible findings regarding MaaS acceptance, traveller behaviour, needs and priorities in a more systematic way that would be easier to reflect in the anticipated implementations. The on-line survey was completed by 142 participants from different countries and of different age, gender and background. It was promoted through the project web site, social media and the Consortium beneficiaries' individual networks. The results out of all the above sources were aggregated and were used to guide MyCorridor towards addressing those needs.

At the same time, in order to have insights on other stakeholders' needs in MaaS overall and MyCorridor in specific, a literature survey, internal interviews with experts, a Pan-European workshop and a post-feedback survey were conducted. The 1st Pan-European workshop of MyCorridor took place on the 9th of February 2018 in London, UK and was attended by more than 50 stakeholders. The interactive session, managed through Mentimeter tool (https://www.mentimeter.com/) addressed four key topics, namely *MaaS & public sector*, *MyCorridor Use Cases*, *Business Models* and *Towards a Euro-Mobility ticket*. As a follow-up activity, 20 participants completed a more targeted post-workshop on-line survey.

The results of all three sources were consolidated and used to guide MyCorridor towards addressing the other (than travellers) stakeholder's needs. The next step focused on the determining the key success and

failure factors for MaaS deployment. The barriers and enablers were examined while the impact of external trends was explored. After having analysed the above, the impact of MaaS was evaluated. For this purpose, impact assessments of previous projects were used, assisting at the same time towards determining Key Performance Indicators (KPI's) for MaaS success that were later considered for the final project KPIs in the context of the project impact assessment framework.

The above information was then used to determine the user and market driver requirements that guided the final issue of the Use Cases and scenarios, being the result of all the above mentioned steps. It is important to stress here the iterative nature of the methodology as the Use Cases of the project was planned from the beginning to be iteratively validated through the two evaluation rounds in WP6 that – as it was anticipated - redefined them up to a certain degree.

6.2 The MaaS ecosystem

A MaaS ecosystem is by default complex and multidisciplinary as it brings together partners, players, participants and providers from different business segments in order to reach a value proposition and deliver the MaaS service to customers. To further explore enablers and barriers of MaaS growth, it has been essential to the project, to understand the participants' profile, their pains and gains as well as the relationships between the stakeholders, technologies and capabilities involved in the MaaS growth. Starting from the classification proposed by the MAASiFie project (http://www.vtt.fi/sites/maasifie) and consolidating further, the MaaS ecosystem as perceived by MyCorridor is reflected in the following table.

Table 4: Main stakeholders' roles.

MaaS Ecosystem stakeholder cluster	Indicative stakeholders	Stakeholders profile/ responsibilities
Government/Authorities	• Ministry of transportation • Transport agency • Road administration • Transport safety agency/authority	• Legislator; • Enable testing and pilots through legislation; • Finance infrastructure investments; • Implement transport policies, strategy and investments; • Create (long-term) plans and guidelines for national development of transport services; • Management of national transport infrastructure; • Issue permits; regulations; prepares legal rules regarding the transport sector.
Cities/ Regions	• Regional/local transport agency • The city and city planning (technical, traffic, ITS) department • Tourist agency or department	• Plan, organise and manage public transport; • Provide locations of stations and stops; • Strategic urban and city planning; • Transportation and traffic planning; • Representing the local infrastructure; • Traffic management; • Operation of systems.
Mobility/MaaS operator *or* MaaS aggregator *or* Maas Issuer *(the term*	• MaaS company • Traffic Management or City agency	• Combines the transport services (*mobility products*), infomobility

MaaS Ecosystem stakeholder cluster	Indicative stakeholders	Stakeholders profile/ responsibilities
MaaS Aggregator will be used from now on in the current document)	• Public transport operator • PPP • E – marketplace business entity • An alliance of mobility operators, etc.	services and other ICT services into a single application. • Provides personalised travel solutions. • Responsible for customer service and user experience • Basically a business role; could be coupled with a technical role. • *Could be one entity, an alliance of entities or roaming businesses following the telecom world paradigm. As seen in previous column, this role could be played – depending the business model – by various entities.*
Transportation Service Provider/Operator (supplier of mobility products)	• Public transport operators (all modes) • Vehicle (car/bike/...) sharing/pooling/rental service provider (public or private) • Parking operators • Road operators (tolls) • Taxi operators • Coach buses operators • Traffic Management operator	• Transport operator providing schedules, fares as covered by Ticketing, offer fares and real-time information, vehicle information, booking information, availability, locations (e.g. bikes and docking stations). • Multi modal or road management. • Running ITS applications for management, control and passenger information purposes. • Could provide also transport content (i.e. drivers and rides database).
Infomobility, added value and Mobile Service / Technology providers *(for convenience, the shortened term to be used will be Mobile Service Providers from now on)*	• Infomobility services providers • Dynamic navigation service providers • Mobile application providers • Telecom providers • Financial services providers • Trusted 3rd parties • Technology (ICT, ITS) providers • *Other/Local MaaS aggregators*	• Provide infomobility related services (i.e. information services, value-added services, etc.). • Provides key enabling technology and services (e.g. mobile ticketing, payment) and ICT infrastructure. • Providing ITS infrastructure.
Travellers	• All transport users/ travellers consuming MaaS, including pedestrians, cyclists, public transport customers, car drivers but also vulnerable to exclusion citizens (people with	• Tailored MaaS consumers.

MaaS Ecosystem stakeholder cluster	Indicative stakeholders	Stakeholders profile/ responsibilities
	disabilities, elderly, with language barriers, etc.).	

6.3 Travellers needs & priorities

The key findings regarding current traveller behaviour and their needs, preferences and priorities, as recognised by MyCorridor in its first year, from all the different sources (literature survey, focus groups, on-line survey,) are summarised/aggregated below.

- Most travellers are willing and/or very willing to change their mobility habits and their mode of transport provided travel services are made better overall, and provided that data privacy and security of information are ensured. Travellers need to be assured that the application will use their personal information only to suggest tailor made solutions and for no other reasons.
- When travelling locally and especially cross border, travellers stated that reliability of information and interoperability are the most crucial criteria as participants expressed that they did not want to miss out on options and offers in case all transport information is not aggregated into the MaaS app.
- Vehicle-sharing in general is a notion that raises several concerns by specific traveller clusters.
- Security of transactions and user friendliness/ intuitiveness are the two most crucial aspects that should be addressed in traveller's interaction with the one-stop-shop through mobile.
- Travellers would like to enjoy traffic management services as this would help them in their decision making regarding which mode of transport to use and which route to follow.
- Social inclusion was an important aspect for travellers when discussing about MaaS.
- Travellers are less likely to share information such as age, gender and hobbies than travel behaviour and travel criteria such as time, cost and comfort.

Apart from the travellers, exploration of the needs and priorities of all MaaS ecosystem actors have been thoroughly explored and can be found in public D1.1 (not repeated herein, to avoid oversizing of the Deliverable).

6.4 Overview of barriers and enablers for MaaS

During the project, the relevant barriers and enablers were recognised for the deployment of MaaS services, as provided in the following table. 21 general barriers and 18 general enablers have been identified.

Table 5: Overview of barriers and enablers for the deployment of the MaaS services.

Category	Barriers	Enablers
User and market-related	• Limited understanding of user needs • Lack of user acceptance	• Higher level of end user's involvement • Increased attention for sustainable transport • MaaS potential to offer flexible and personalized services • Trends supporting MaaS Growth
Conceptual	• Ambiguous reliability of exchange data	• TM2.0 concept

Category	Barriers	Enablers
	• Limited political acceptance and intervention • New roles for public administrations • New business model acceptance	
Technological	• Unaddressed interoperability and compatibility • Unaddressed security and data management • Need for a (currently missing) mechanism for open location data • Need for (currently missing) correct mobile network dimensioning	• High penetration of Navigation Devices • Increase in penetration of reliable traffic information
Organizational	• Lack of cooperation between stakeholders • Ambiguous availability of skilled staff • Lack of security infrastructure for cooperative vehicle data • Need for (currently missing) common data formats for intermodal traffic information	• Establishment of MaaS alliance • Universal mobility offers • Progress of cooperative ITS data policy in Europe • Stronger cooperation between stakeholders • Smart Ticketing Alliance (STA)
Business- related	• No clear business model • Users' privacy concerns	• Political pressure for change • Public-Private Partnerships
Legal	• Allocation of liability • Unspecified ownership of data • Data protection • Financial services laws and regulations • Competition regulations • Unsupportive regulation and legal framework	• Crypto-currency assets • Geo-blocking Regulation

In addition, **4 key megatrends** have been recognised to have impact on MaaS deployment in the medium term, namely: *urbanisation, sustainability (environmental challenges), demography* and *travel trends towards multimodality*.

6.5 MyCorridor Use Cases

The MyCorridor Use Cases and scenarios aimed to reflect the key functions of the one-stop-shop that would be developed in the project. They aimed to provide, in a summative way, the conceptualisation of the system and serve as the basis for the specification and development activities that would follow in the project design and development phases. Moreover, the Use Cases constituted the baseline upon which the pilot scenarios of WP6 were constructed.

The Use Cases have been derived as an aggregated outcome of the user-centric approach followed at the first phase of the project and presented in section 6.1.

In addition to the textual descriptions of the Use Cases, and in order to allow their easy digestion by the development teams in the future phases of the project, UML (Unified Modeling Language™) diagrams have been prepared for each of them, showing the relationships among actors, sub-modules and activities/actions identified within each Use Cases. The tool selected for the development of UML diagrams of MyCorridor Use Cases have been is the Visio 2010 tool. The overview of the finally formulated MyCorridor Use Cases follows below:

Traveller Use Cases

T1 - User Login/Register/ Authentication

- T1.1 - New/unregistered traveller
- T1.2 - Registered traveller
- T1.3 - Failed registration
- T1.4 - Failed Login/Authentication
- T1.5 - Login of unregistered user

T2 - Static & semi-dynamic profiling

- T2.1 - New/unregistered user creating profile
- T2.2 - Registered user

T3 - Personalised MaaS package configuration, purchase & redemption

- T3.1 – Configuration, purchase & redemption of personalised MaaS package (consisting of one or more mobility products) coupled with trip planning
- T3.2 - Configuration, purchase & redemption of personalised MaaS package with multicriteria search (without encompassing trip planning)
- T3.3 – Configuration, purchase and redemption of ready to use MaaS packages

T4 - Personalised Info support (added value services – athletic, touristic, cultural, health push personalised notifications)

- T4.1 – Configuration, purchase & redemption of personalised MaaS package (consisting of one or more mobility products) coupled with trip planning and *personalised push notifications*.
- T4.2 – Configuration, purchase & redemption of personalised MaaS package with multicriteria search (without encompassing trip planning) *coupled with personalised push notifications*.

T5 - Modification/Cancelation

- T5.1 - Modify selected mobility products
- T5.2 - Cancel the selection of all mobility products

T6 - Traveller feedback

- T6.1 - View information of other travellers
- T6.2 - Provide feedback for other travellers
- T6.3 - Provide feedback for MaaS

T7 - Loyalty scheme (encompassing incentivisation & rewarding)

Service Providers Use Cases

S1 - Service provider log-in

- S1.1 - Registered service provider
- S1.2 - New/unregistered service provider

S2 - Service registration

S3 - Service provider business rules editing

Back-end Use Cases

B1 - Overall Business Rules editing

B2 - Added value synthetic

B3 – Clearance with the traveller and the service providers (e-vouchers)

B3.1 - E-vouchers creation and issue

B3.2 - E-money voucher cancellation

B4 – Mobility Token Issue and redemption (use/validation)

The detailed description of all use cases of the project can be found in the public D1.1 as well as through the handier format that are presented under: http://www.mycorridor.eu/use-cases-guides/. Overall, all the findings emerging as of the exploration activities of the first year of the project, along with the detailed project Use Cases can be found at *D1.1: MyCorridor Use Cases*.

7 The MyCorridor One-Stop-Shop Solution

7.1 System Arhitecture and Modules

From the very beginning of the conceptualization phase of MyCorridor platform, it was realized that the combination of an early understanding of both functional and non-functional requirements, along with an appropriate choice of the architectural style that will most effectively satisfy these requirements, would be a key factor for the successful deployment of the platform. Mapping requirements to a system architecture refers to the formal procedure that takes as input both the functional (expressed by the defined use cases) and the non-functional requirements, and provides as output the system architecture components organized into a particular structure based on a specific architectural style. The choice of architectural style can often constrain certain requirements fulfilment, while practical and comprehensive mappings do not always exist. In addition, many proposed solutions for implementing this process focus mainly on the non–functional (e.g. quality), rather than the functional requirements of the system. In order to fulfil the defined requirements of the MyCorridor system, the following system architecture components were defined:

- **Mobile Applications**: The front-end module of the MyCorridor system architecture used by the travellers. Through the applications developed, the travellers get access to the MyCorridor platform. There were two front-end mobile applications developed in the project, in Anroid and iOS operating systems, sharing the same look and feel as well as connecting to the same back-end mechanisms in the same manner, and, finally providing the same mobility products to the travellers. Those are further described in 7.2 and 7.3.
- **Web Application**: Front-end applications through which both the service providers and the MaaS aggregators get access to the MyCorridor platform. In particular, the web application used by the service providers is the Service Registration Tool (SRT), and the one used by the MaaS aggregators is the MaaS Aggregator Dashboard.
- **Trip-Planner**: Hybrid multimodal trip-planner.
- **Matchmaking Module**: The system architecture component responsible for matching the traveller's requests with the MaaS offerings that exist in the MyCorridor platform, namely the several types of services.
- **Multi-criteria Search Module**: The system architecture component responsible for retrieving services according to different user search criteria (e.g. transportation module, type of mobility product, etc.).
- **MaaS Product Synthesis Module**: The system architecture component responsible for supporting the generation of new services from the MaaS aggregator as the result of synthesis/combination of two or more different services.

- **Traveller Feedback Module**: The system architecture component responsible for integrating the travellers' feedback, regarding either the individual services or the overall MaaS packages, into the MyCorridor platform.
- **Big Data Management Module**: The system architecture component responsible for the provision of data analytics services that produce useful insights regarding the usage of the MaaS services.
- **Business Rules Implementer Module**: The system architecture component responsible for providing the necessary functions to the service providers and the MaaS aggregator for viewing, modifying and validating the business rules of the individual services and the overall MyCorridor platform, respectively.
- **Payment Module**: The system architecture component responsible for the payment of the different service providers through VivaWallet's payment services, as well as, the integration with the back-office systems of the underlying service providers, in order for the traveller to be able to select, pay and receive the desired mobility service.
- **MaaS API**: The stable, robust, efficient and secure RESTful API that is responsible for the communication and interaction between all the system architecture components, as well as for the communication between the overall MyCorridor platform and external modules (e.g. Traffic Management Services Aggregator).
- **Travellers Data Repository**: The database that holds all data entities related to the traveller.
- **Services Data Repository**: The database that holds all data entities related to the services and the service providers.

The aforementioned system architecture components were organized into a particular structure based on a specific architectural style. Considering the uses cases of the MyCorridor platform reported in the deliverable D1.1 and the system's non-functional requirements, it was decided that the architectural style that best matches the needs of the MyCorridor platform is **the layered architecture**. The main advantages of the layered architecture pattern are:

- **Components within each layer deal only with the logic of their layer**. For example, components in the presentation layer deal only with the logic of the front-end interfaces, whereas components in the application layer consider only the back-end infrastructure of the system. This *separation of concerns* feature increases flexibility, maintainability and makes the system easily scalable.
- **Components can be reused by multiple applications**. For example, a mobile interface could be used instead of a web browser by simply replacing the user interface (UI) component in the presentation layer. Considering that layers are independent, there are no further changes required in the other layers.
- Layered architecture allows different kind of development teams to focus on a specific layer with minimum dependency between them. Hence, ease of development is enhanced, making it easy to add new layers with additional functionality or replace existing ones without affecting other parts of the system.
- **Each layer relies only on the features and services offered by the layer that lies beneath it**. Therefore, each layer is isolated and can be tested regardless of the rest. In addition, different levels of security can be configured on different layers.

The architecture of the MyCorridor platform was designed taking into account all the aforementioned advantages of the layered architecture pattern and the result is presented in Figure 4:

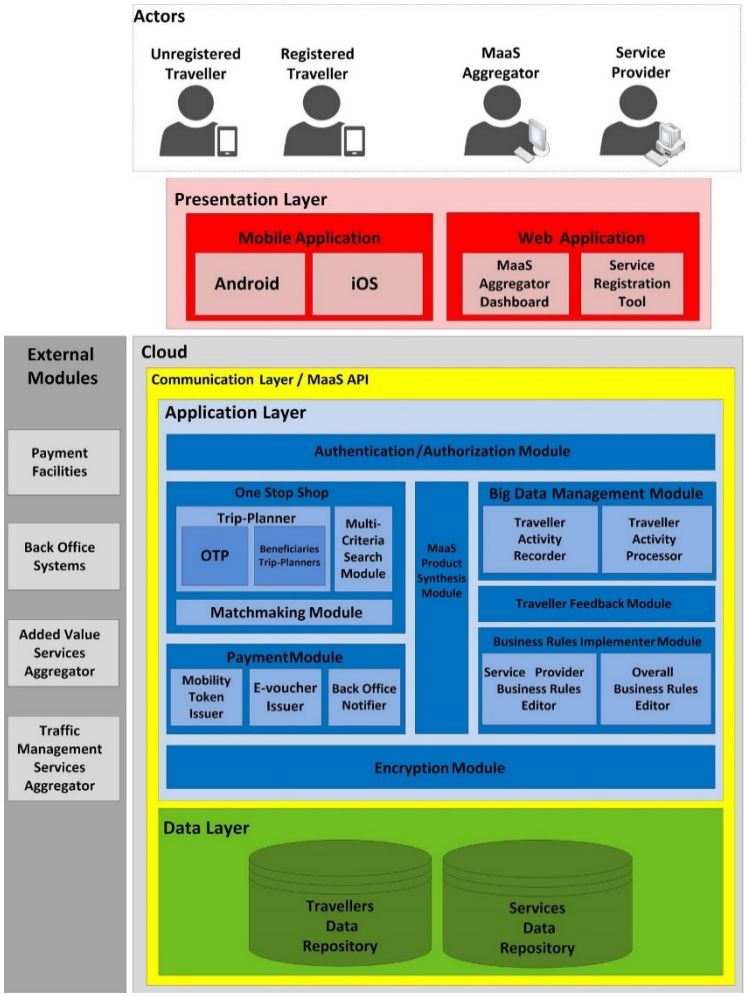

Figure 4: MyCorridor Conceptual Architecture.

The core service delivery platform (i.e. backend) of the MyCorridor ecosystem consists of a set of modules that are essential for providing MaaS offerings to the end user, i.e. the traveller. The core modules are the following:

- Service Registration Tool (SRT)
- Data Models and Repositories
- MaaS API
- Matchmaking Module
- Hybrid Trip-Planner
- Big Data Management Module
- Business Rules Implementer Module
- Traveller Feedback Module
- Payment Module

The *Service Registration Tool (SRT)* is the module that facilitates the registration of the basic information that describe a service into the MyCorridor platform. This information includes features like the name of the service, the base URL of its API, the documentation of the API, etc. The provision of this information to the MyCorridor platform through SRT is the first, automatic step for registering a service. After this step, a manual collaboration process between the service provider and the MaaS aggregator takes place

in order to complete the service registration process. Hence, the overall service registration process within MyCorridor platform is semi-automatic.

The *Service Registration Tool* provides a simple and straightforward procedure and is offered through the MyCorridor platform as a web service. It is an online tool (Figure 5) which aims to automate the process of registering a service on the MaaS platform.

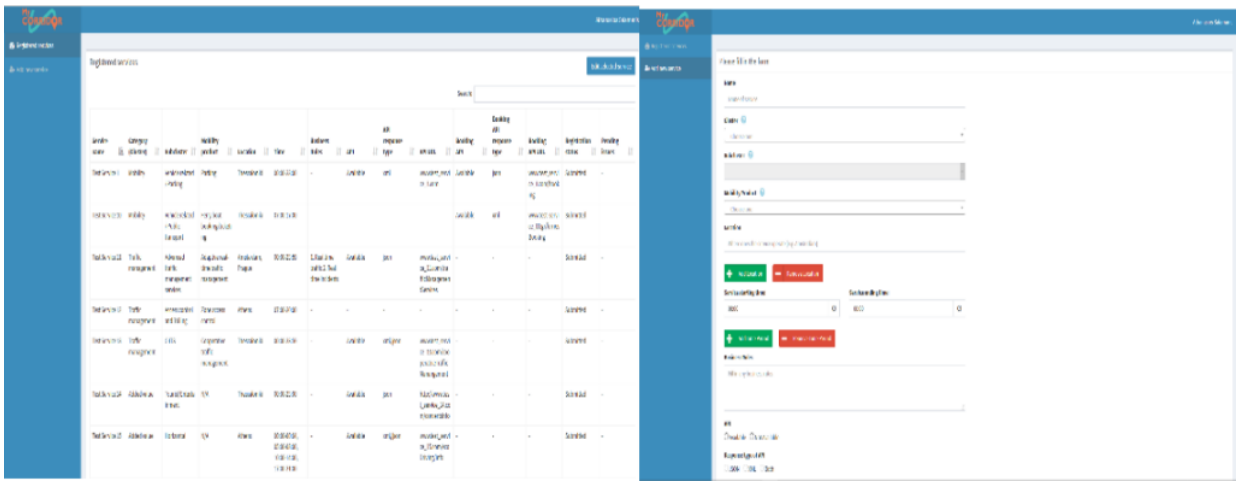

Figure 5: The Service Registration Repository (left) and the Service Registration Tool form (right).

The main functionalities supported are namely a) Service provider registration and login, b) Registration of a new service, c) Edit of an existing service, and d) View existing services.

Several *data models* were defined in order to support the provision of MaaS offerings to the travellers through the service delivery platform. These data models represent several entities involved in the operation of the MyCorridor platform, like the traveller, the service provider and the service, and are realized using a well-known data format, i.e. the JSON data format. The instances of these data models (i.e. data objects) are stored in NoSQL data repositories, namely the Travellers Data Repository and the Services Data Repository. Additionally, there is another line of implementation of these data models, namely as OWL ontologies.

The orchestrator of all operations that take place within the MyCorridor platform is the *MyCorridor MaaS API*. This is a RESTful API responsible for exposing the data models and their instances to the several modules of the platform, as well as to implement the communication between the modules and between the overall platform and external modules (e.g. Traffic Management Services Aggregator (TMSA) and VivaWallet's payment services).

The mechanism for matching the traveller's requests with the services registered in the MyCorridor platform is implemented by the *Matchmaking Module*. This module implements the two main MaaS offerings provision scenarios. The first scenario is the MaaS&Go, in which the traveller submits a trip request (which includes information like trip origin and destination) to the system, and receives a set of trips that have appropriate services matched to their legs. In this scenario, the Matchmaking Module interacts with another module of the service delivery platform, namely the Hybrid Trip-Planner, which is responsible for proving multimodal trips based on the travellers' requests. The second scenario is the MaaSPacks, in which the traveller again submits a trip request to the system, but this time s/he receives as result just a set of services that best meet the trip request requirements, without employing the Hybrid Trip-Planner. Both scenarios are reported in the deliverable *D5.2: Mobile applications and interfaces*.

The *Hybrid Trip-Planner* is responsible for providing multimodal itineraries for getting from point A to point B, upon traveller's trip request. In MyCorridor, a hybrid trip-planning solution was designed and implemented. This solution combines the OpenTripPlanner (OTP), an open source multimodal trip-planner, with commercial trip-planners provided to the MyCorridor platform by some of the internal service providers of the project (namely CHAPS and HACON). This hybrid trip-planning solution was chosen so that the Hybrid Trip-Planner can provide multimodal cross-border trips. However, this proved to be a difficult task due to the limitations on freely available GTFS data across Europe.

The *Big Data Management Module* is responsible for recording the data related to user activity within the MyCorridor platform, as well as for the processing of such data in order to extract information useful for both the MaaS aggregator and the service providers. The extracted MaaS use patterns can help the service providers to identify weaknesses and problems in their services, in order to correct them and attract more travellers.

The *Business Rules Implementer Module* provides the appropriate means for the definition of the business rules schema under which the MyCorridor services are provided. In particular, it was decided that the MyCorridor platform could be utilized as a testbed for the implementation and evaluation of different business policies that are more appealing to different types of stakeholders. For example, in a specific period of time MyCorridor can be used for promoting public transportation services (which is in favour of public authorities' interests), while in another period of time it can be used for promoting car-related services (which is in favour of a private company's interests). The decision of the appropriate business policy is made by the MaaS aggregator. The Business Rules Implementer Module facilitates this process by effectively assigning appropriate weights to the services registered on MyCorridor platform.

The *Traveller Feedback Module* is responsible for the integration of travellers' feedback to the MyCorridor platform. Effective feedback, either positive or negative, holds a significant role in the MyCorridor platform. Ratings provided by the travellers are involved in the seamless service delivery by assisting the improvement of the offered MaaS products and further enhancing the overall travellers' experience and decision-making process. Travellers' feedback was acquired in multiple ways, including a star rating system, open-ended fields for suggestions as well as customer satisfaction and overall user experience related questions.

The *Payment Module* is responsible for the seamless and complete provision of all inclusive, multimodal mobility services by linking the back-offices of the service providers with the payment facility of the MyCorridor platform, namely VivaWallet's infrastructure. This connection is implemented by MyCorridor front-end apps, which integrate VivaWallet's API. It should be noted that VivaWallet is a certified provider of payment services and as such, it utilizes PCI-PTS and FIPS 140-2 level 3 certified payment Hardware Security Modules (HSMs) to perform all the required processes (e.g. card number and PIN related cryptographic operations for the processing & storage of the cardholder data) that ensure the security and integrity of all the data involved in payment processes.

All details regarding the System Architecture and the back-end modules of the system are provided in Deliverables *D2.2 : MyCorridor interoperable, open and seamless architecture and MyCorridor subsystems and modules specifications, D3.1: MyCorridor cloud service delivery platform, service gateway, big data management module and business rules implementer module*, *D3.2: MyCorridor traveler feedback integration module* and *D3.3: Mobility tokens and e-payment services – the "EURO Mobility Ticket"*.

7.2 The front-end in Android

7.2.1 Introduction

MyCorridor application is available at Google Play since March of 2020 via the https://play.google.com/store/apps/details?id=certh.gr.mycorridor. It is maintained and occasionally updated. Its current version is 1.34.

7.2.2 Main menu

The main menu is developed as a navigation drawer component. It contains all the functionalities that are supported by the Android application.

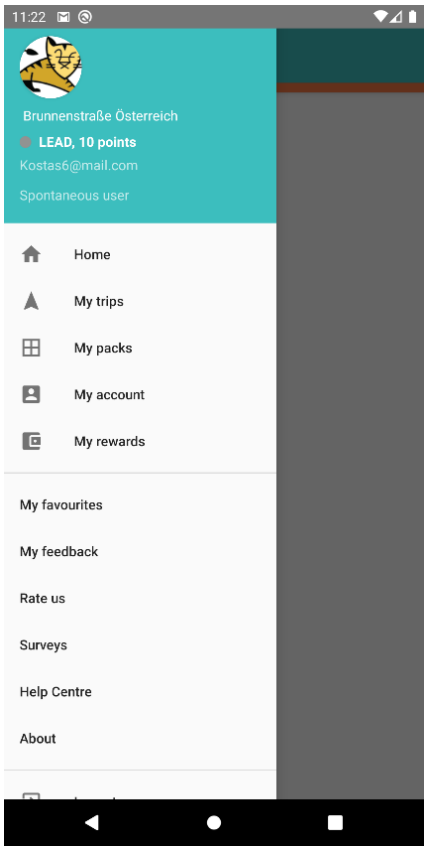

Figure 6: Main Menu (1).

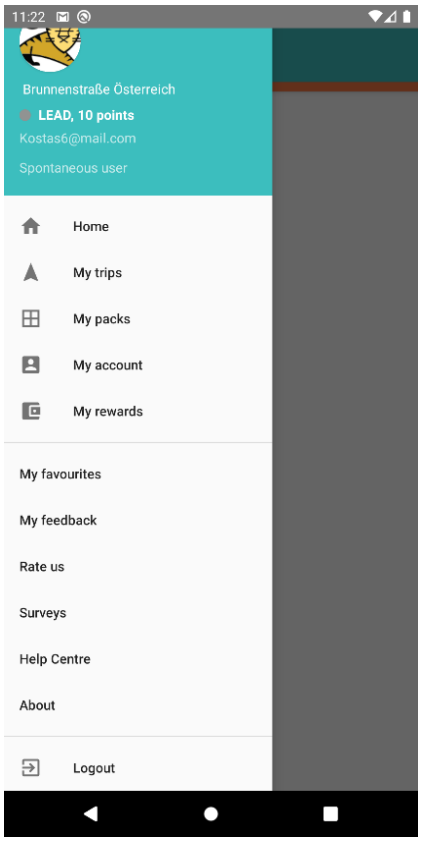

Figure 7: Main Menu (2).

7.2.3 Home page

The "Home" page is launched after the user has successfully logged-in. The "Home" page contains the core MaaS products provided which are:

- **Green Packs**: provides green packages to the travellers; meaning products that promote a positive environmental footprint.
- **MaaS Packs**: provides individual mobility products upon request.
- **MaaS on the Go**: the traveller is provided with MaaS services coupled with a specific travel route.

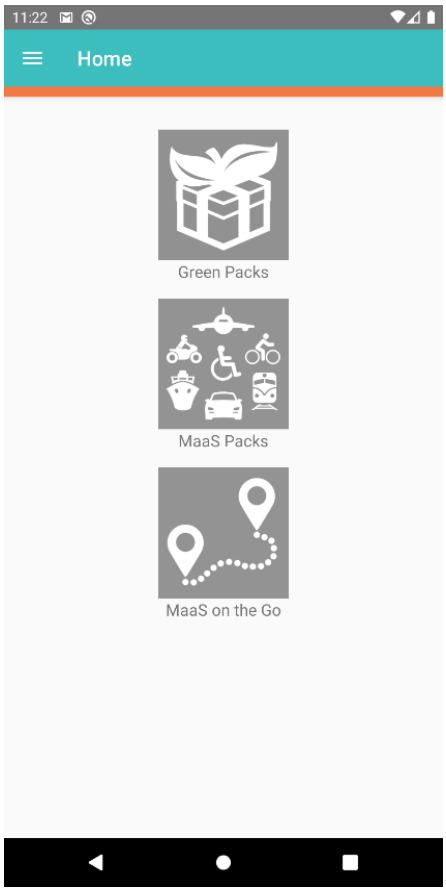

Figure 8: Home page.

The next figures illustrate the interaction flow that the user has to follow to proceed with the purchase of any of the above three products:

7.2.4 Green packs

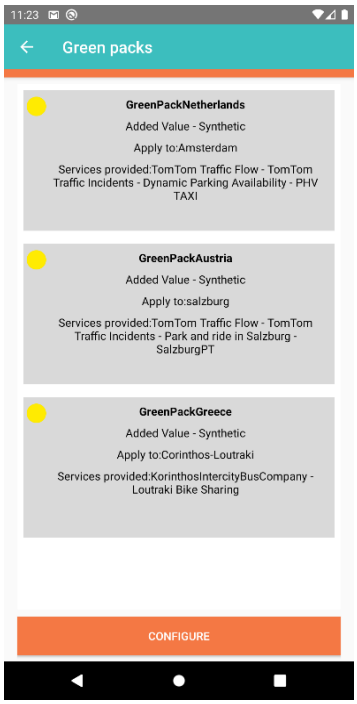

Figure 9: Select a Green Pack.

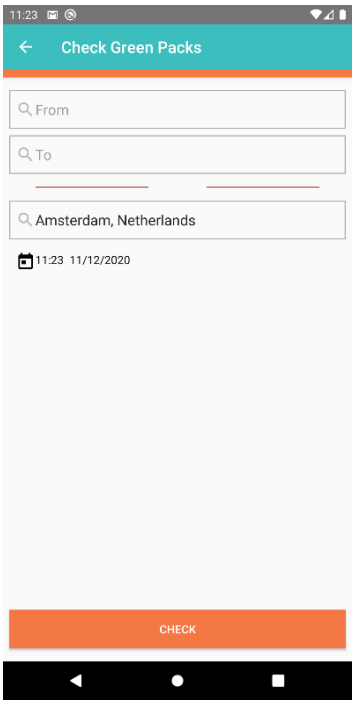

Figure 10: Select a city of fill in origin and destination addresses.

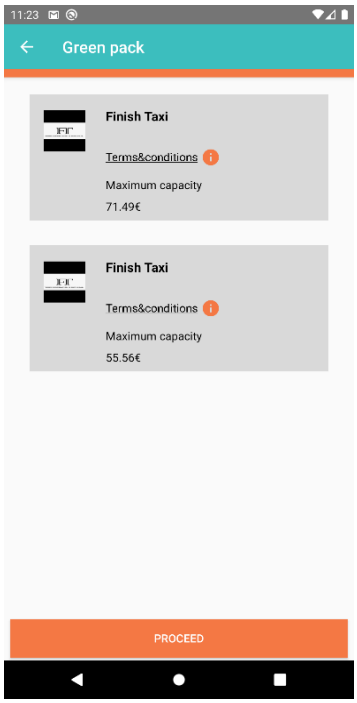

Figure 11: Select a service.

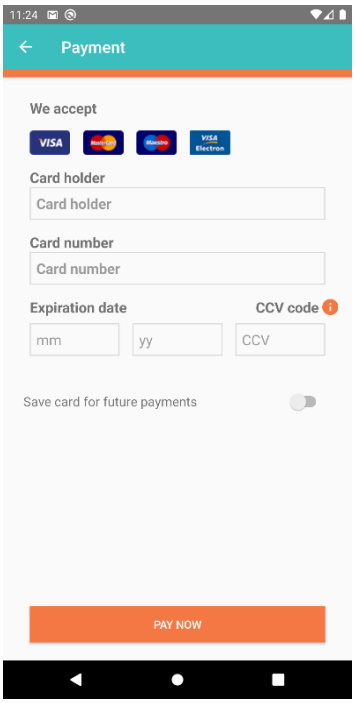

Figure 12: Proceed with the payment.

7.2.5 Maas Packs

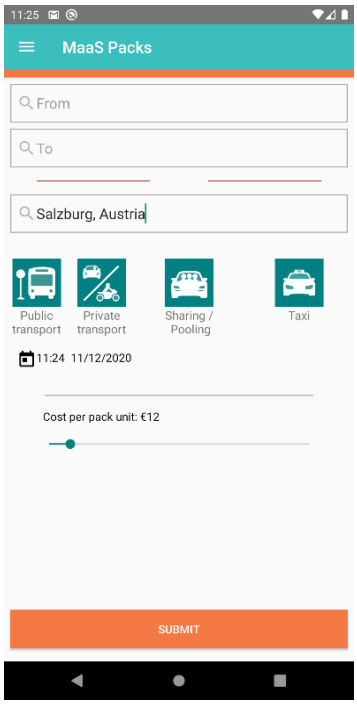

Figure 13: Select city or origin and destination , transport types, date and time and cost.

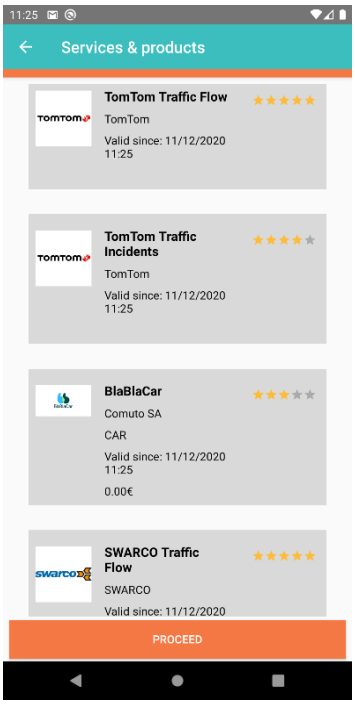

Figure 14: View available services.

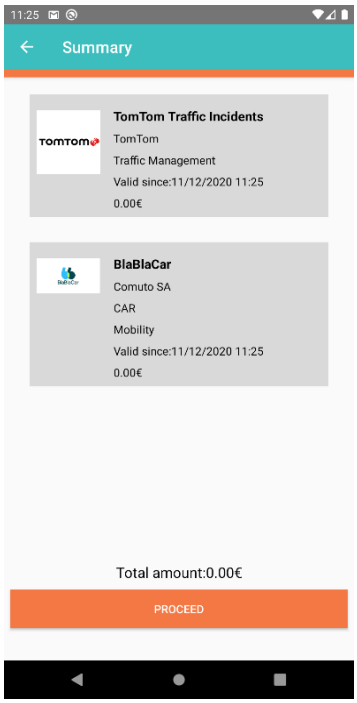

Figure 15: Summary of the selected servicess

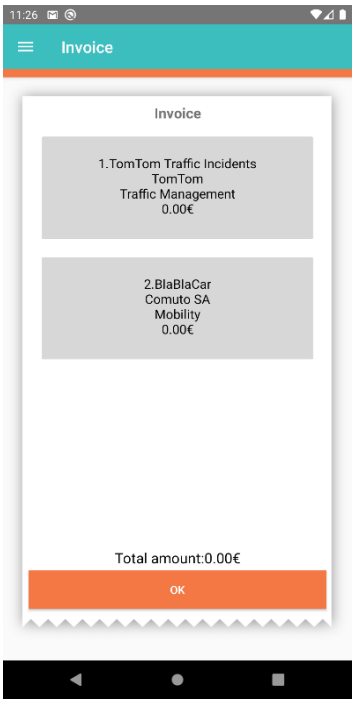

Figure 16: Invoice.

7.2.6 Maas On the Go

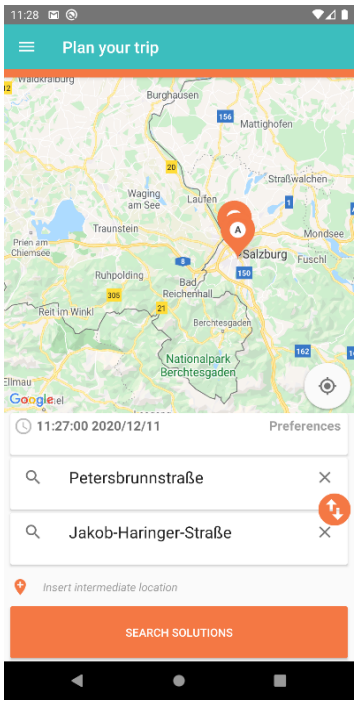

Figure 17: Search for solutions.

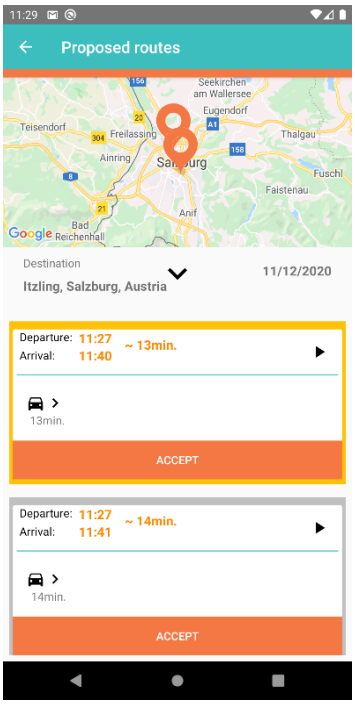

Figure 18: Matched solutions.

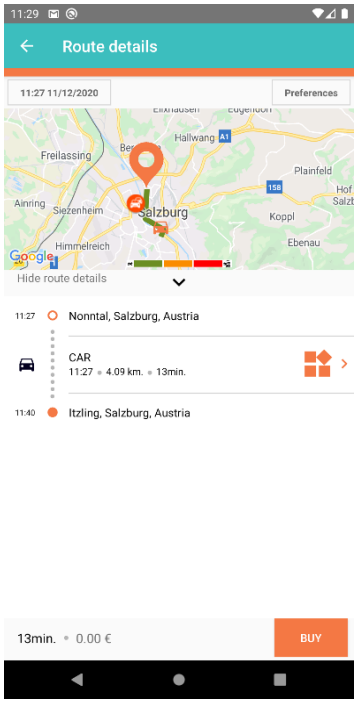

Figure 19: Route's details.

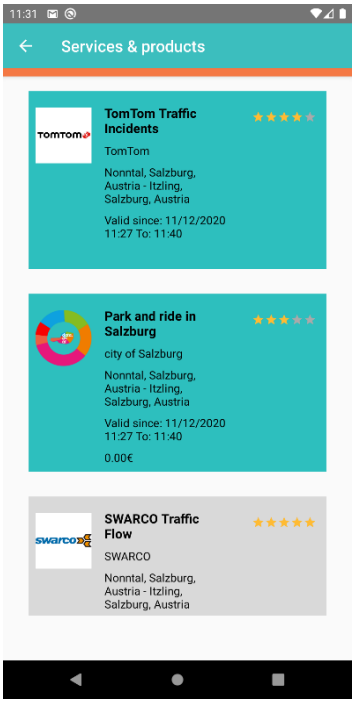

Figure 20: Purchase services for the requested trip.

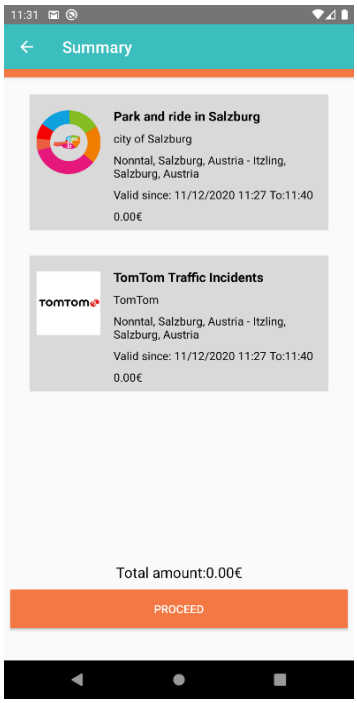

Figure 21: Summary of selected services.

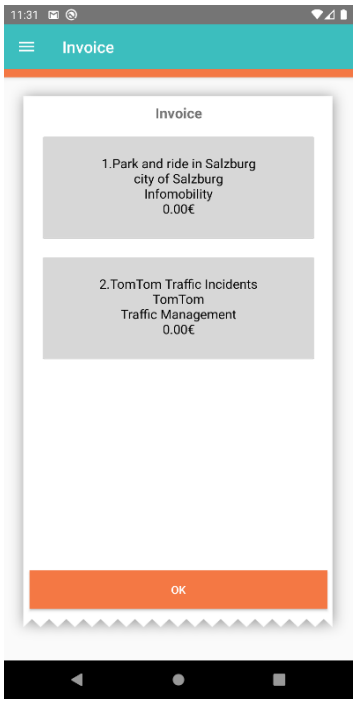

Figure 22: Invoice of trip; trip is also stored.

7.2.7 Stored solutions

The user is able to see his/her stored "Green Packs", "MaaS Packs" from the "My packs" main menus' option. Moreover, s/he can view the stored "MaaS on the Go" solutions from "My trips" option respectively. The following figures depict these two options:

Figure 23: "My packs"; view stored "MaaS Packs" and "Green Packs".

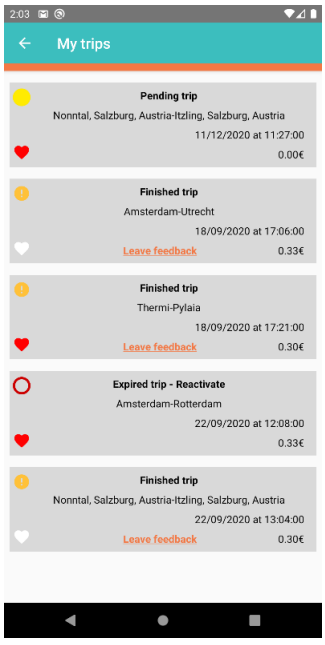

Figure 24: "My trips"; view stored "Maas on the Go" solutions.

The user can also view his/her favourite trips from the “My favourites” main menu option. These trips are illustrated with a coloured red heart as it is shown in Figure 24.

7.2.8 My account

The user can view and edit his/her personal details and preferences such as the travel preferences. The travel preferences consist of the transport types and routing preferences and various services. The figures below illustrate the “My account” option.

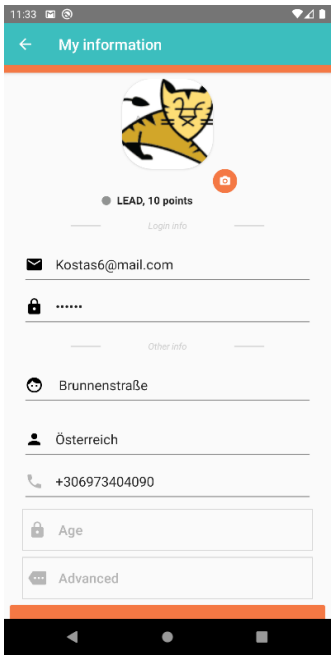

Figure 25: Personal information.

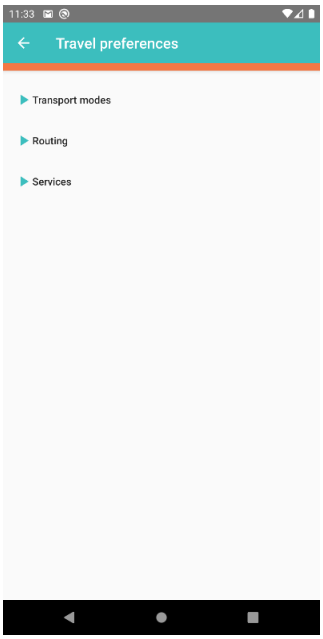

Figure 26: Travel preferences.

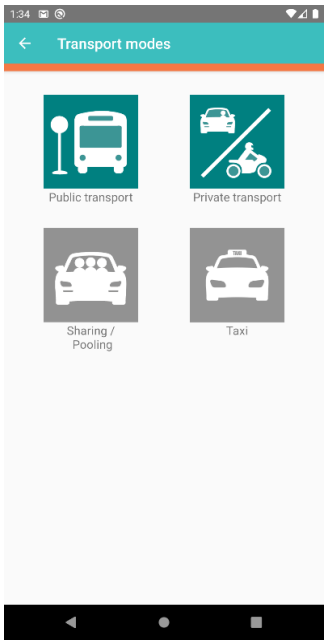

Figure 27: Transport types.

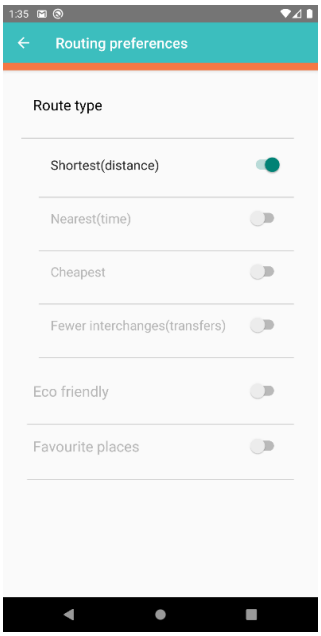

Figure 28: Routing preferences.

7.2.9 My rewards

The overall functionality of "My rewards" is based on the on loyalty scheme which is described in *D7.3: B2B master contract, B2C terms of use, privacy and cookie policy*. The following screen shots demonstrate the functionalities of the loyalty scheme that are supported by the application.

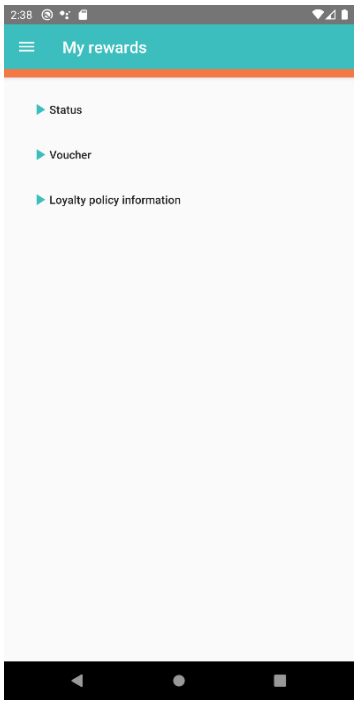

Figure 29: My rewards options.

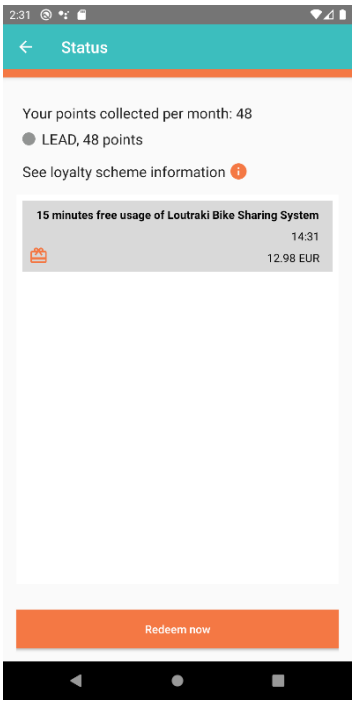

Figure 30: Status based on points.

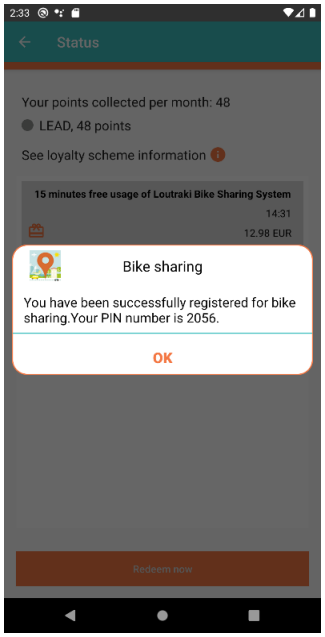

Figure 31: Redeem an offer.

Figure 32: View vouchers.

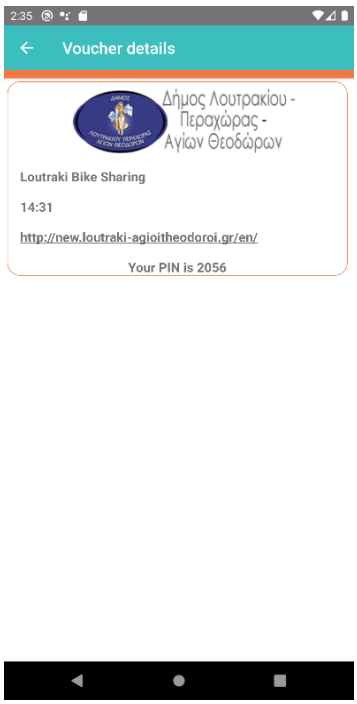

Figure 33: View voucher details.

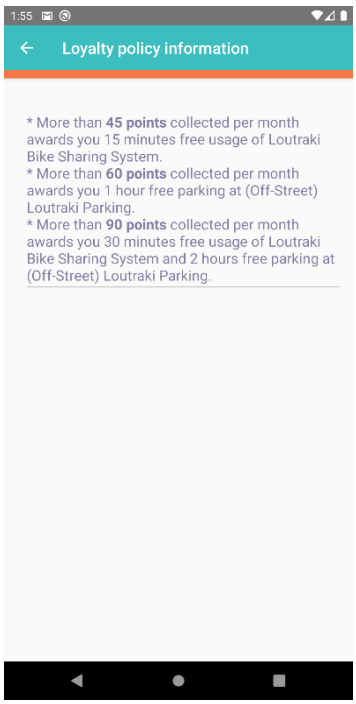

Figure 34: Loyalty policy information.

7.2.10 My feedback and rate us

Both "My feedback" and "Rate us" operations are connected to the MyCorridor traveller feedback module back-end. The traveller feedback module is described analytically in *D3.2: MyCorridor traveller feedback integration module*. The next figures show the "My feedback" and "Rate us" functions.

Moreover, the user is able to provide feedback about his/her user experience after a trip is finished. The questions about user experience are:

- How satisfied are you with the app?
- How happy using the app makes you?
- How much your traveller experience has improved by using the app?
- How easy was it to use the app?

All the above procedure is described in D3.2 at chapter 5.

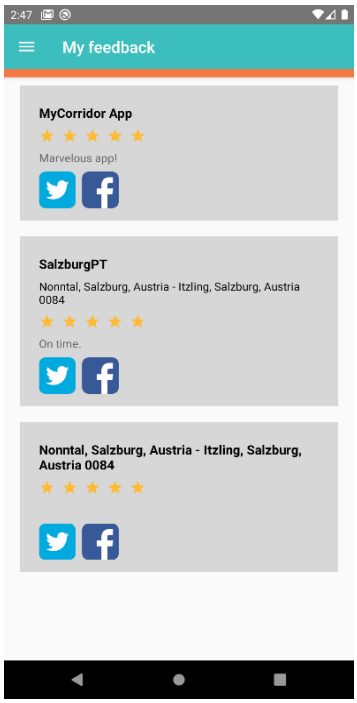

Figure 35: My feedback.

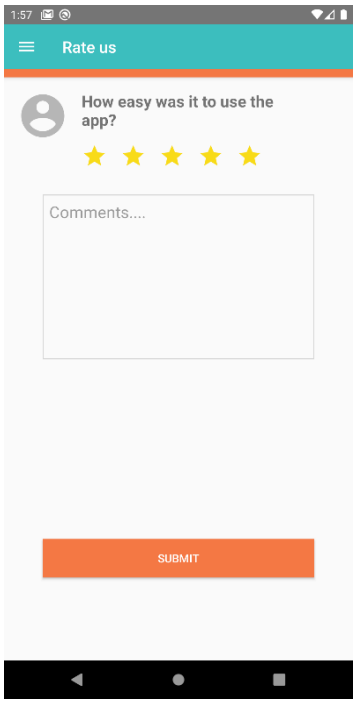

Figure 36: Rate us.

7.2.11 Surveys

The implementation of the "Surveys" is analytically reported in the latest version of *D6.1: Pilot plans framework and tools* deliverable. The user has to fill in the consent form, background and before questions and the after questions according to the pilot test procedure. The "Surveys" screen is shown below.

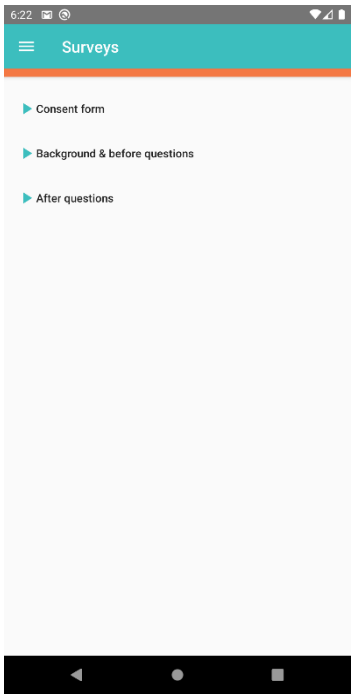

Figure 37: Surveys.

7.2.12 Payment and mobility tokens

As it is mentioned above, the user is able to pay for a service electronically and buy a mobility token. The mobility token can be a pdf file (as it is the case, for example, in the "Salzburg PT" and "AMSBus" providers in MyCorridor) or an image (as it is the case, for example, in the "KTEL Korinthou" provider). The mobility token can be also provided as a PIN number (e.g. in the case of "Loutraki Bike Sharing System"). **This fact reflect the big heterogeneity and lack of standardization on European level on ticketing, which is a key barrier to be resolved, to allow wide deployment of MaaS across the globe.**

The payment process in MyCorridor is accomplished using the VivaWallet API. The full transaction is taking place using the Native Checkout v2 3DS process (https://developer.vivawallet.com/online-checkouts/native-checkout-v2/) .

Moreover, the Android application integrates the "PHV taxi" external car service. The "PHV taxi" requires a pre-authorisation payment process. This means that the amount has to be checked whether it exists in the user's account before the service is taken place. When the trip is finished, the payment process is calculated and the final amount of the service is charged. The pre-authorization process is totally transparent to the user and he/she is only informed at the beginning. The user can find his/her stored mobility token from "My trips". The following figures show the mobility tokens for each of the providers:

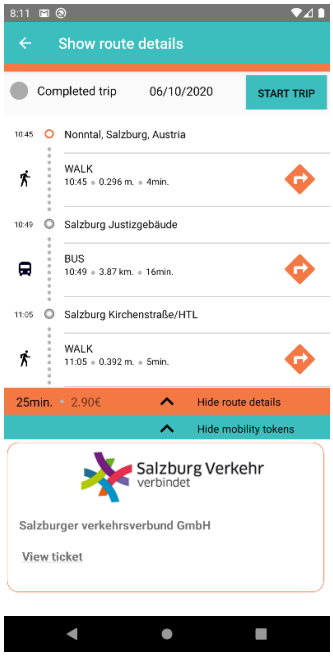

Figure 38: Trip with Salzburg PT provider.

Figure 39: Salzburg PT mobility token.

Figure 40: Trip with AMSBus provider.

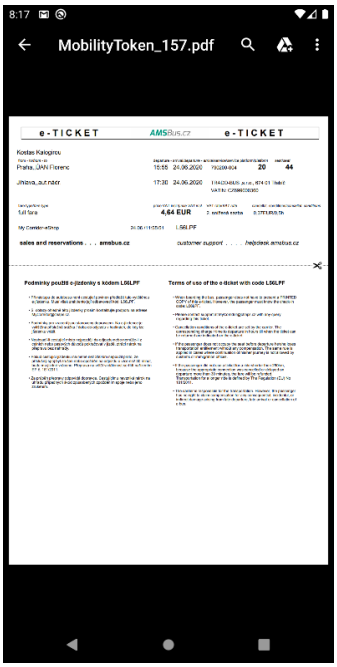

Figure 41: AMSBus mobility token.

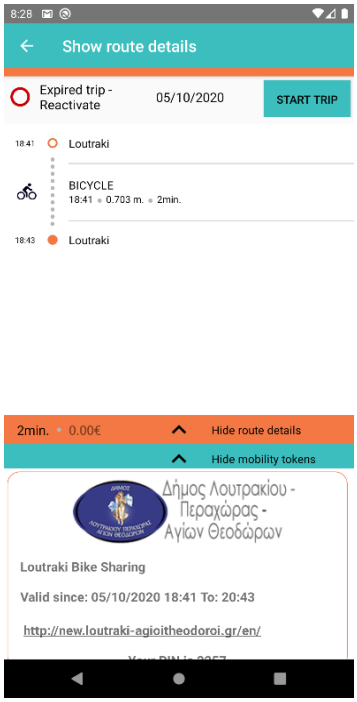

Figure 42: Loutraki bike sharing service.

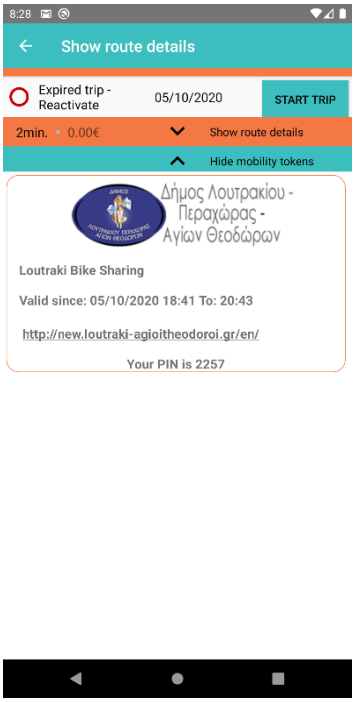

Figure 43: Mobility token as a PIN number of the Loutraki bike sharing service.

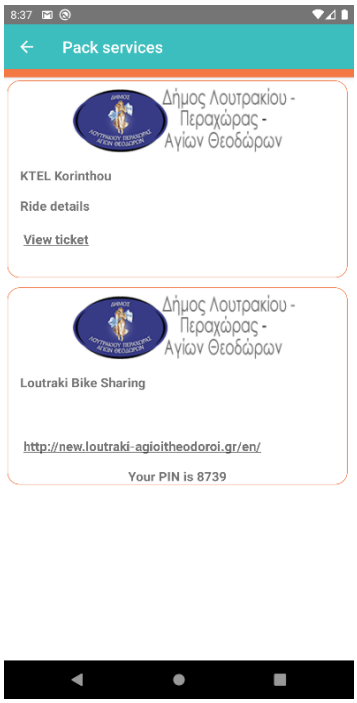

Figure 44: KTEL Korinthou (bus) service.

Figure 45: Mobility token of the KTEL Korinthou (bus) service.

7.2.12.1 PHV taxi

Finally, the full interaction with the "PHV taxi" external car service is described in the following figures. It was decided to demonstrate the whole flow in a separate paragraph due to the fact that this service provider was external among the others in MyCorridor project.

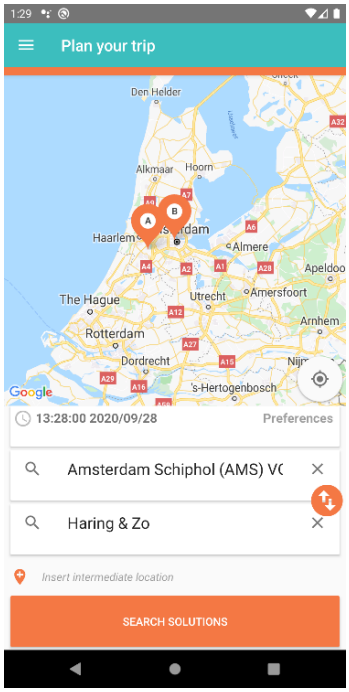

Figure 46: Search for solutions in Amsterdam area.

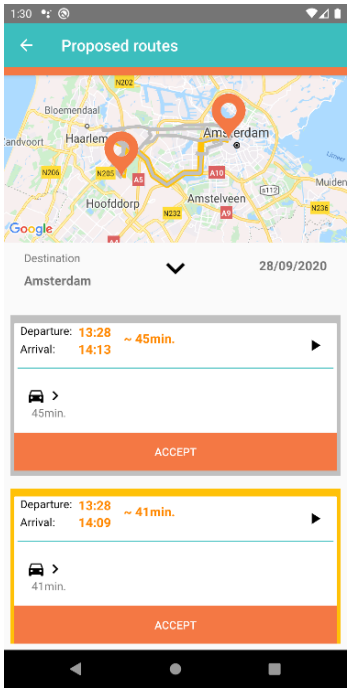

Figure 47: Select solutions.

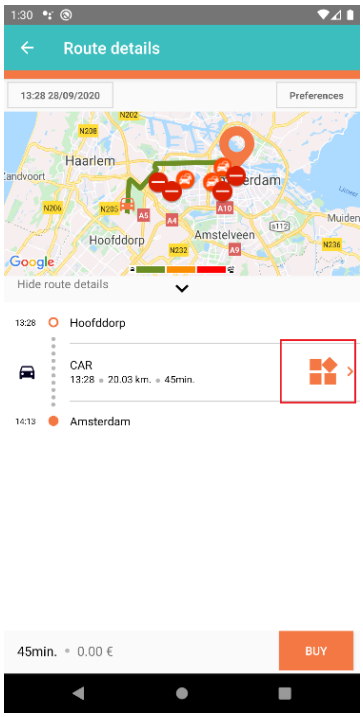

Figure 48: View services.

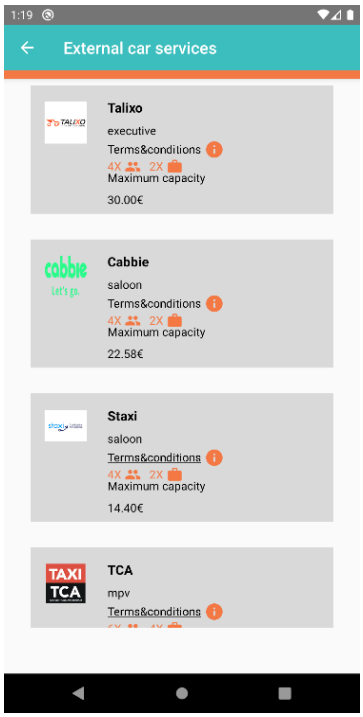

Figure 49: Select one of the available service.

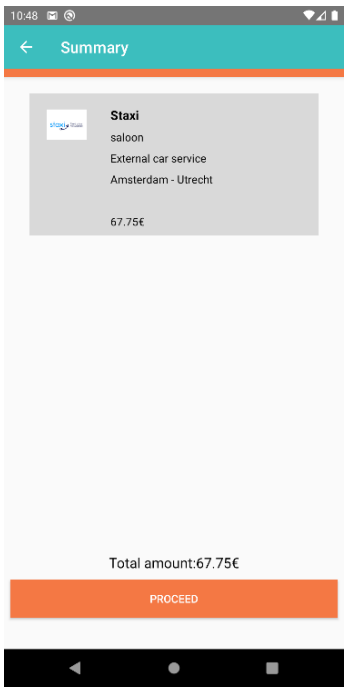

Figure 50: Summary.

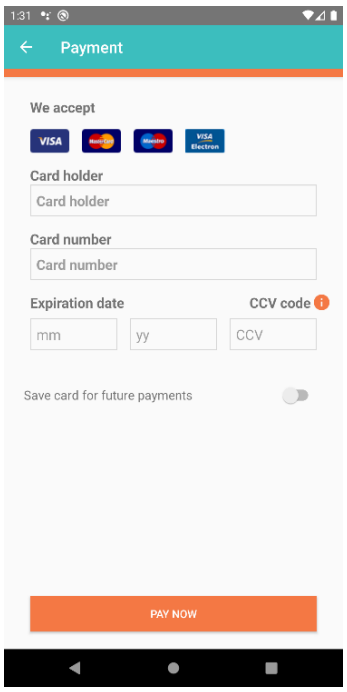

Figure 51: Proceed with the payment.

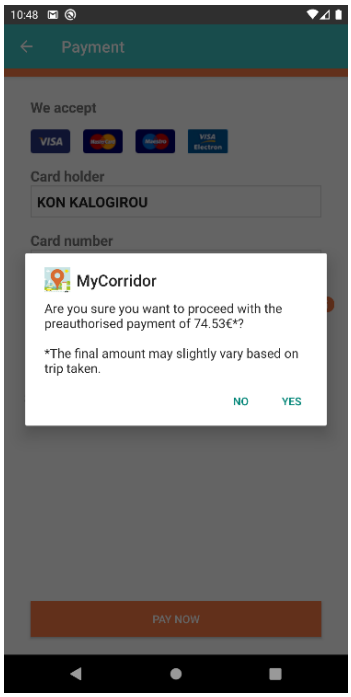

Figure 52: Preauthorized payment.

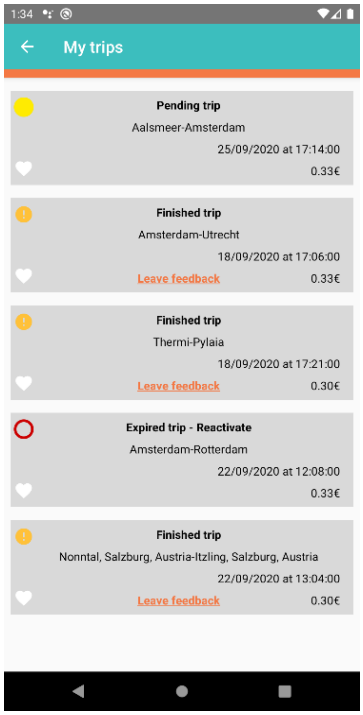

Figure 53: View the trip (from "My trips").

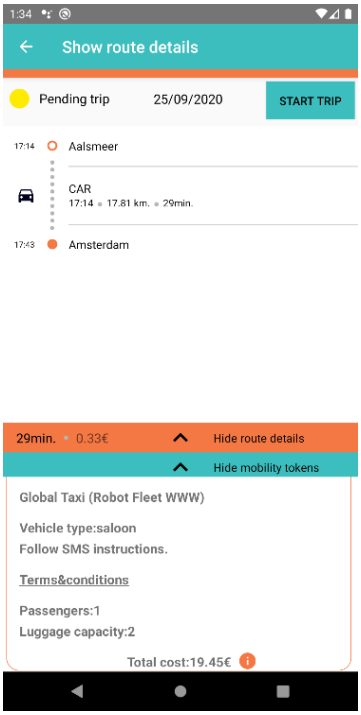

Figure 54: View details of the trip.

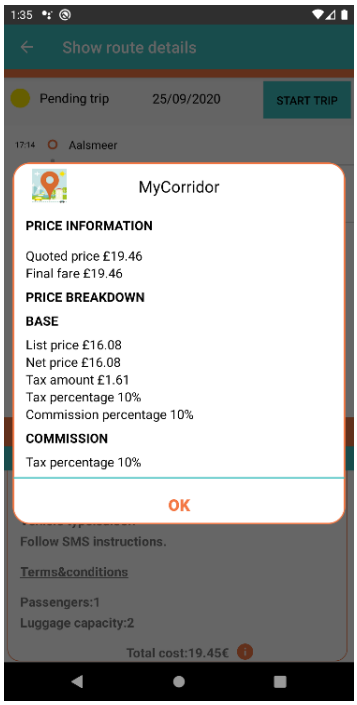

Figure 55: View the price information.

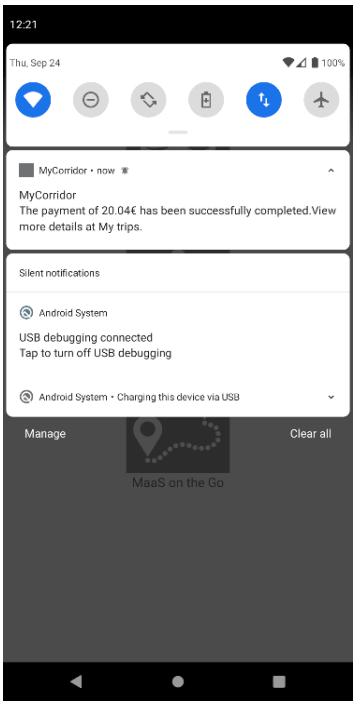

Figure 56: Receive push notification informing that the transaction has been successfully completed.

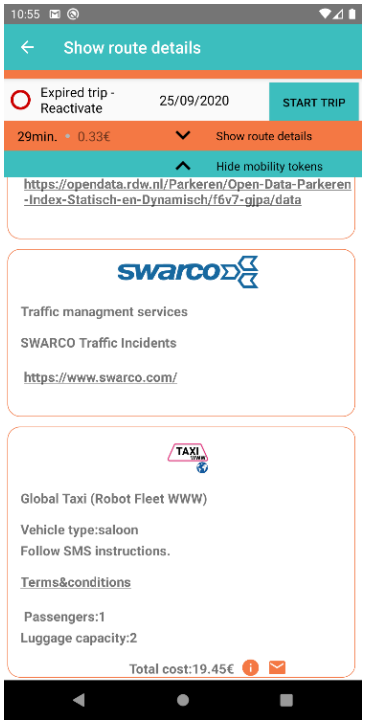

Figure 57: Refund is enabled after the trip and its payment took place successfully. The user can click on the "envelope" icon to send an email requesting the refund.

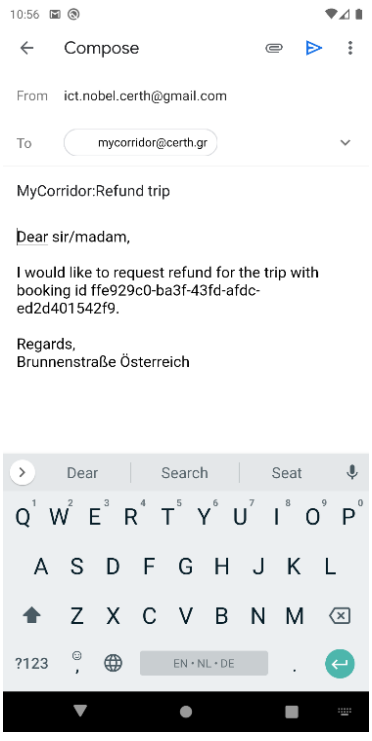

Figure 58: The auto-generated email to request a refund.

7.2.13 Push notifications

The Android application provides various push notifications. Most of them are provided when the navigation is taking place and deal with traffic management events, information provided for associated mobility services (i.e. itineraries of Public Transport, etc.) as well as value added services (associated with recreational activities, health activities, etc.). They are shown on the map as point of interest (POI) and they are also announced to the driver via text to speech messages. The various types of push notifications are demonstrated in the following figures:

Figure 59: Available parking stations in Amsterdam (1).

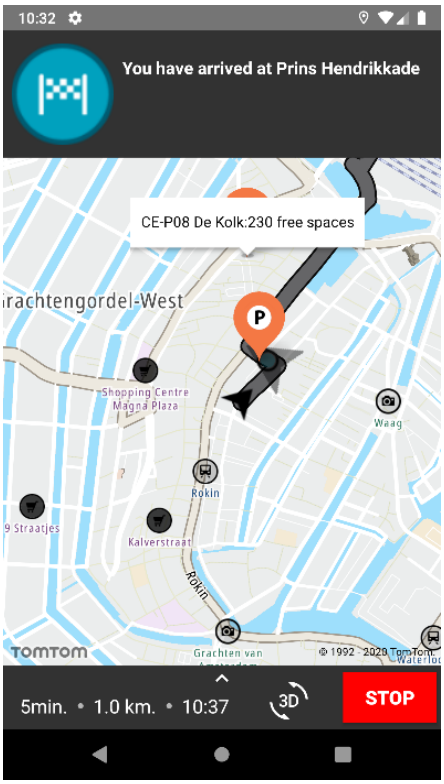

Figure 60: Available parking stations in Amsterdam area (2).

The next figures show the push notification related to the train's arrival time and the departure time with the corresponding platform:

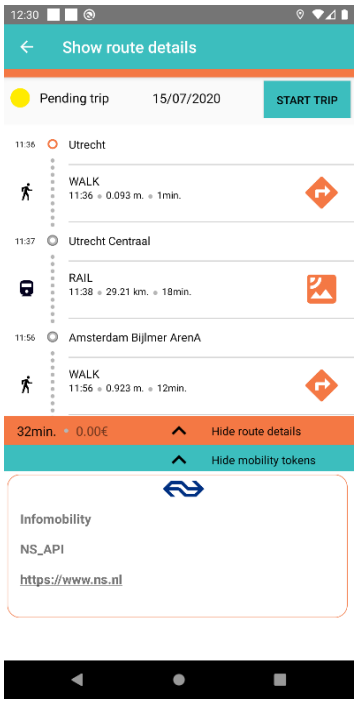

Figure 61: Enable train service push notification by clicking the orange icon on the right.

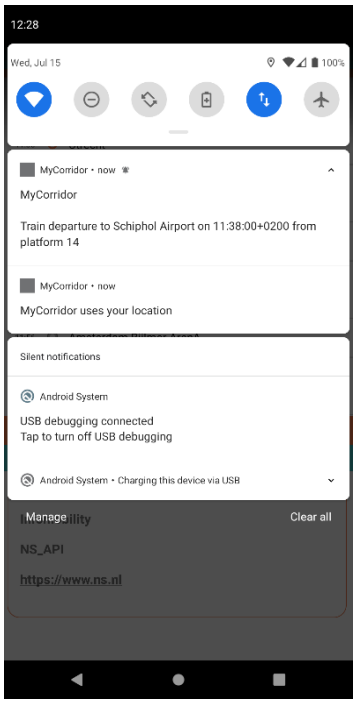

Figure 62: Push notification for the departure time and platform of the train.

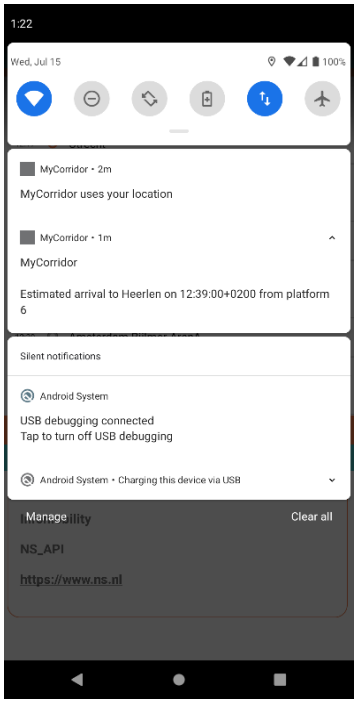

Figure 63: Push notification for the estimated time of train arrival.

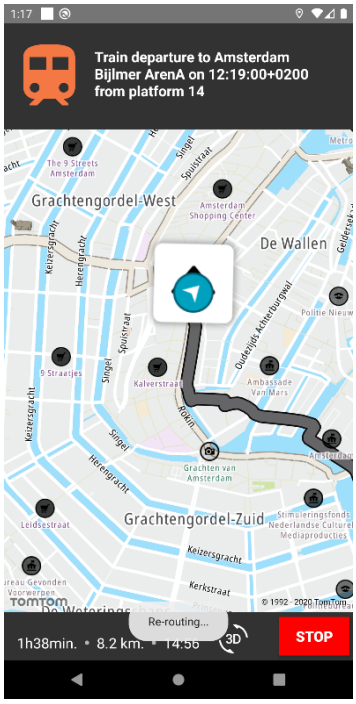

Figure 64: Receive push notification while you are on the road to the train station.

Figure 65: Available parking stations in Salzburg area.

Figure 66: Traffic incident ("Cluster" category) in Salzburg.

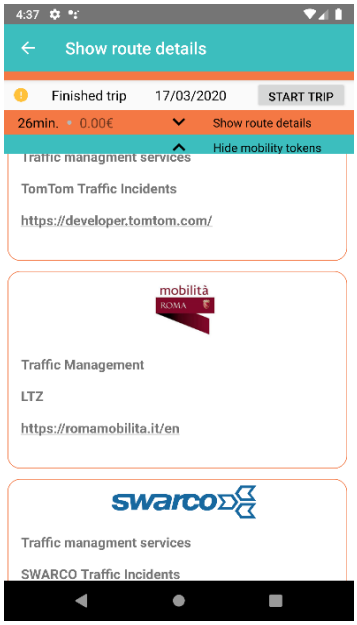

Figure 67: Limited Traffic Zone (LTZ) service in Rome.

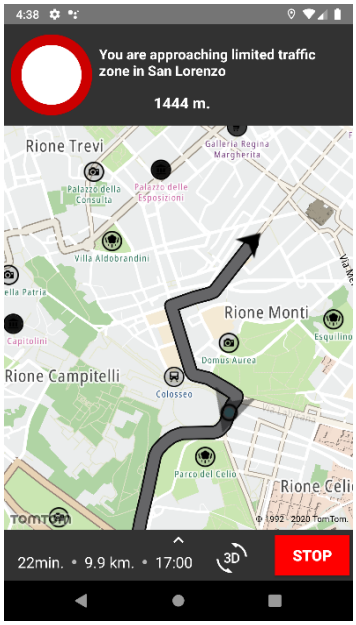

Figure 68: LTZ push notification.

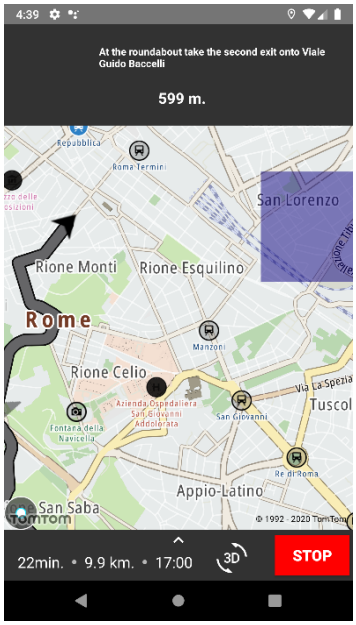

Figure 69: The restricted area as a coloured box on the map.

Finally, the TLA service also provides push notifications with the appropriate information. The figures below illustrate some examples:

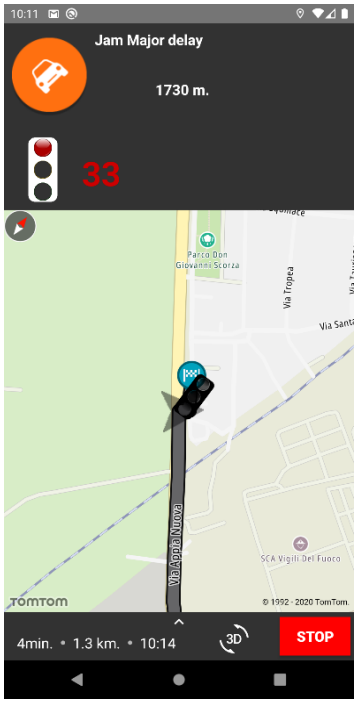

Figure 70: TLA service with traffic incident information in Rome.

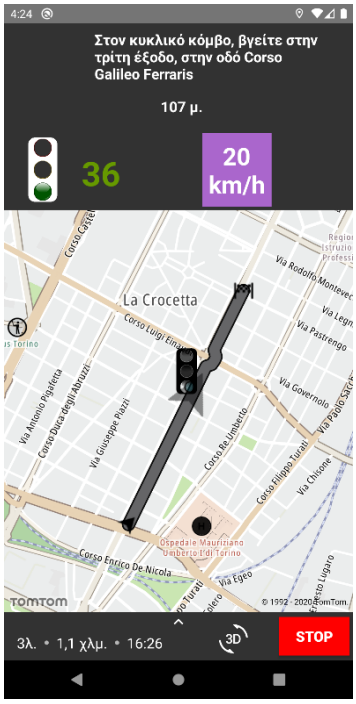

Figure 71: TLA service in Rome.

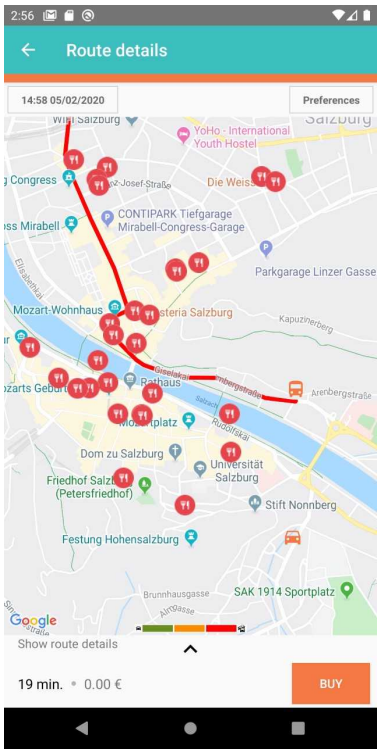

Figure 72: Restaurants in the proximity area of the user trip route (added value services).

7.2.14 Navigation

The Android application integrates the TomTom Map SDK API (https://developer.tomtom.com/maps-sdk-android). The user is able to use the navigation for any of his/her stored trip. The navigation can take place for any of the following transport types:

- Car
- Pedestrian
- Bicycle
- Bus

The user can select to navigate the whole trip by clicking the "START" button or any of its steps by clicking the orange icon on the right.

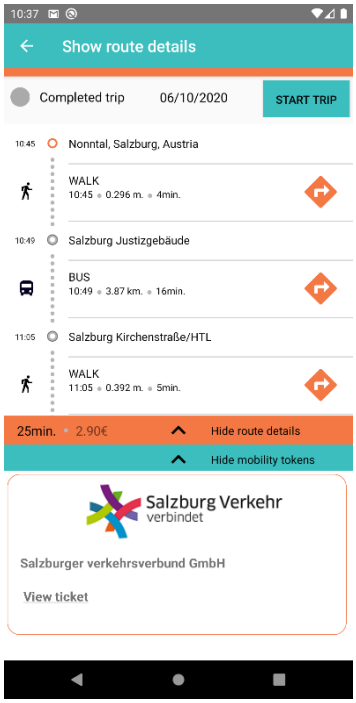

Figure 73: Route and steps navigation.

The following figures depict how the navigation takes place:

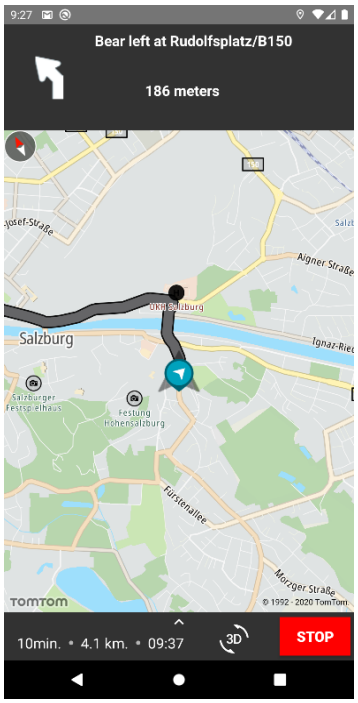

Figure 74: Start navigation.

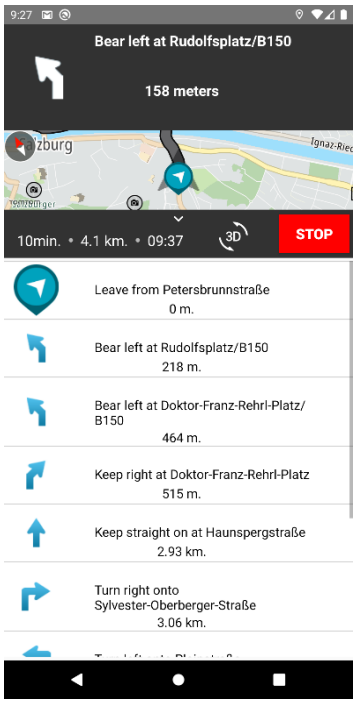

Figure 75: View list of instructions.

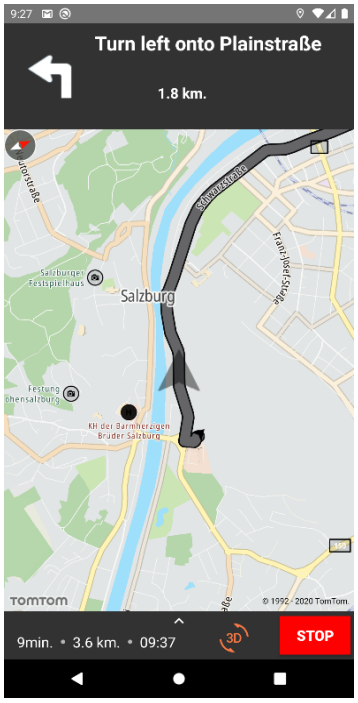

Figure 76: Enable 3D view.

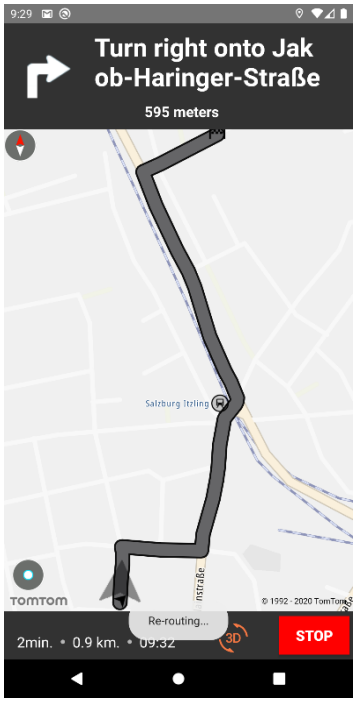

Figure 77: Re-routing process.

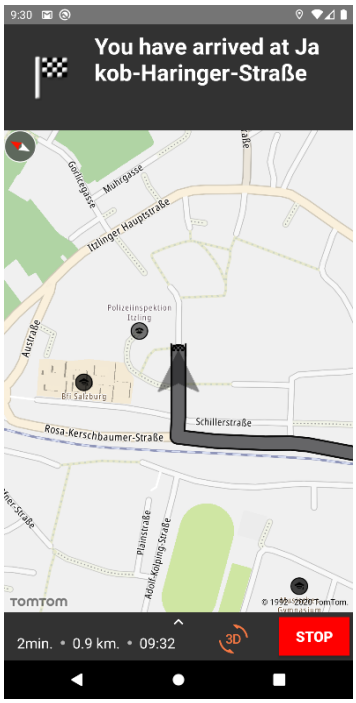

Figure 78: Arrive at the destination point.

7.2.15 Other options

Finally, there are some other options are supported by the Android application. These are the following:

- Help Centre
- About
- Logout

The next figures depict these operations:

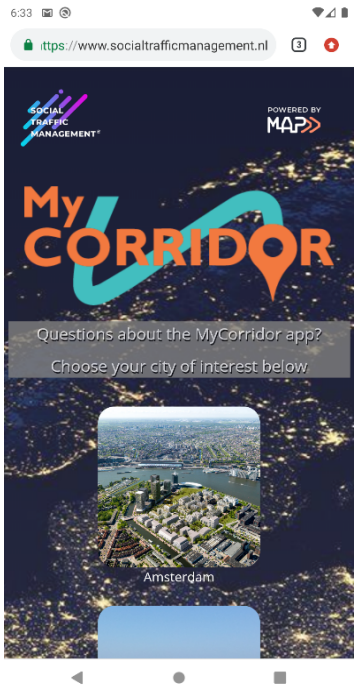

Figure 79: Help Centre.

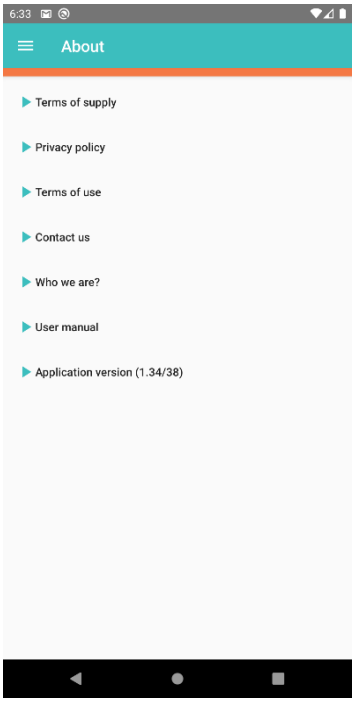

Figure 80: About.

By the "Logout" option, the user is able to leave the application. S/he has to be authenticated again when the MyCorridor Android application is launched later.

7.3 The front-end in iOS

As previously mentioned, the iOS application shares exactly the same look and feel with the Android application providing exactly the same products in the same manner. Still, although the development of the iOS application was following the Android original, however, mainly due to respective platform specifications and OS requirements, several differences may be observed. The bottom main menu used in iOS apps was the motivation for variant app navigation consisting of three main MaaS flows, Profile and More menus. MaaS on the Go homepage is used as the landing page for already-signed users.

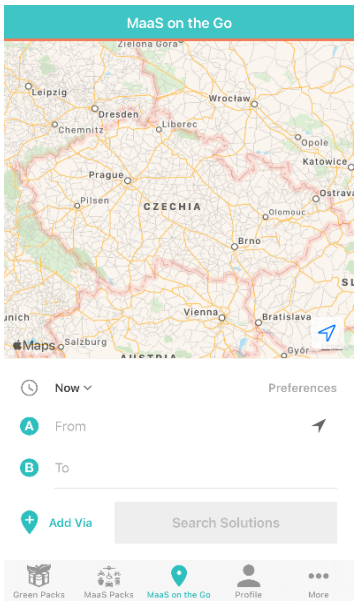

Figure 81: Landing page and main bottom menu.

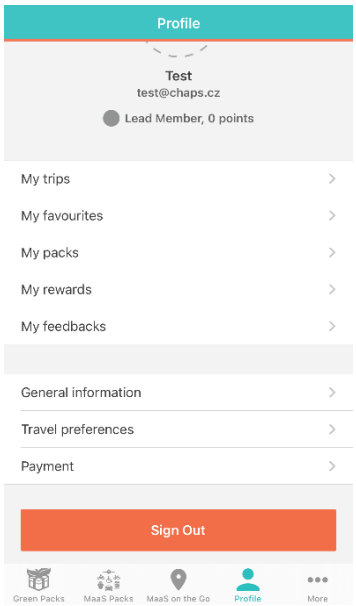

Figure 82: Profile menu.

Profile and More submenus then follow the structure and logic of the Android app.

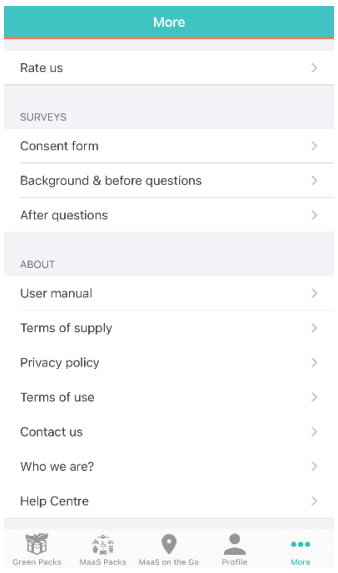

Figure 83: "More" menu.

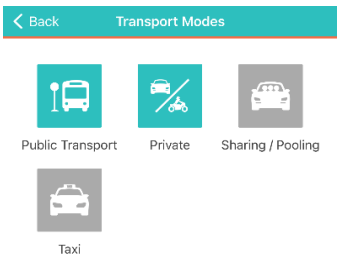

Figure 84: Transport Modes selection.

The iOS app also uses native maps for route display:

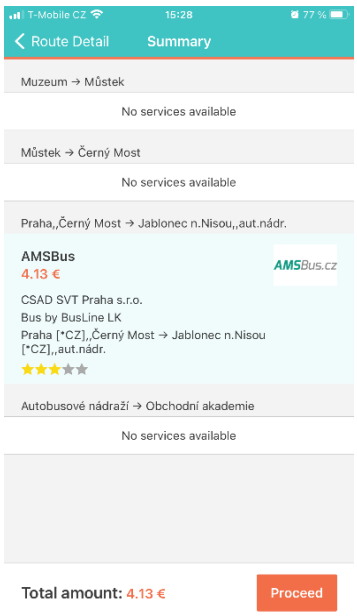

Figure 85: Route detail default display.

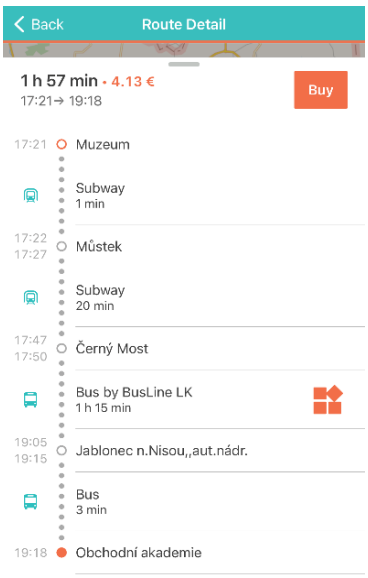

Figure 86: Route detail extended display.

A Summary step was also introduced to allow users to manage the services selection in one place. For navigation mode, TomTom SDK and maps were used:

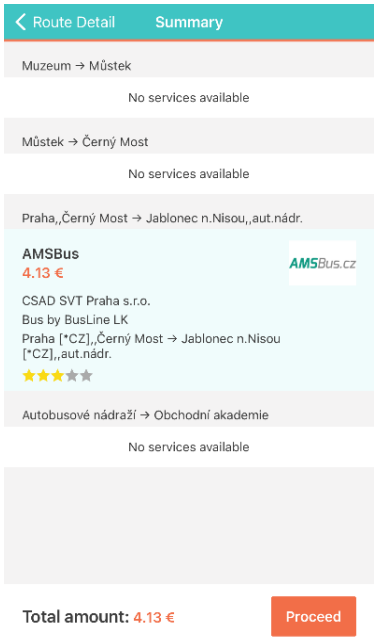

Figure 87: Summary step.

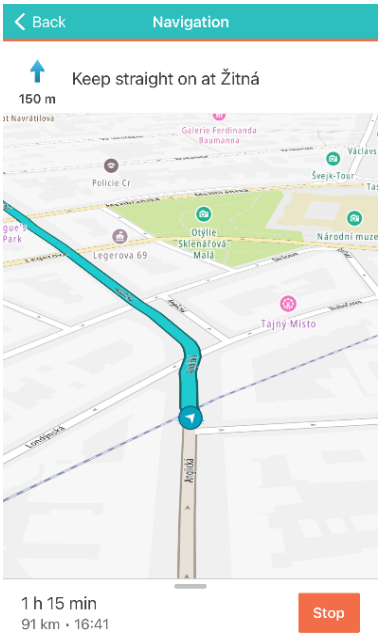

Figure 88: Navigation mode.

MyCorridor iOS application is available on App Store (https://apps.apple.com/us/app/mycorridor/id1525696822), the current version is 1.2.0.

Further details with regard to mobile applications developed in the project are provided in *D5.2: Mobile applications and interfaces.*

8 The MaaS Services

8.1 Overview of services

Overall, 26 transportation services have been integrated into the one-stop-shop platform, namely 6 mobility services, 11 infomobility services, 4 traffic management (TM) services and 1 aggreggated added value service as well as 3 external trip-planners, provided also as an aggregated hybrid trip planner.

3 out of 6 mobility services (i.e. AMSBus, SVV and Karhoo) and 1 external trip-planner (i.e. VAO trip-planner) have both sandbox and production environments. Work has been conducted for switching from sandbox to production. The final documentation is available at https://mycorridor.iti.gr/doc/. The data repositories switched from sandbox to production environment before the beginning of the pilots.

Services in MyCorridor have been either:

- internal to the Consortium – meaning that they originate from the project entities, or,
- external to the Consortium, meaning they are attracted from the MyCorridor Consortium for the scope of the demonstration and pilots. In some cases, whenever this was required a Non Disclosure Agreement has been signed with external service providers.

Still, either internal or external, some of those services are in reality aggregators of services. This is the case, for example, for the hybrid trip planner and the aggregated added value and TM services that have been developed in the project, but also for some external services (i.e. Karhoo). This, in reality, equals to many more than 26 individual services.

Table 6: MyCorridor one-stop-shop services.

No	Service of MyCorridor platform	Service Provider	Cluster of service	Type of service	Mode	Presence in MyCorridor Pilots	Type of Payment Model	Booking API	Response	Internal/ External to MyCorridor
1.	AMSBus (https://amsbus.cz/)	Chaps	Mobility	Public Transport (urban & interurban, Bus)	PT	CZ	Pre-payment	YES	JSON	Internal; aggregating external services for the project
2.	Salzburg Public Transport (https://salzburg-verkehr.at/)	Salzburger Verkehrsverbund GmbH (Salzburg Transpor Association)	Mobility	Public Transport (urban, Bus/Train)	PT	AT	Pre-payment *(though in MyC it will be free of charge for MyC participants)*	YES	JSON	External

No	Service of MyCorridor platform	Service Provider	Cluster of service	Type of service	Mode	Presence in MyCorridor Pilots	Type of Payment Model	Booking API	Response	Internal/ External to MyCorridor
3.	Korinthos Intercity Bus Company (https://www.ktelkorinthias.gr/)	Korinthos Intercity Bus Company S.A.	Mobility	Public Transport (interurban, Bus)	PT	GR	Pre-payment	YES	JSON	External
4.	Bike sharing Loutraki (http://new.loutraki-agioitheodoroi.gr/)	Municipality of Loutraki	Mobility	Bike Sharing	Private Transport (Bike)	GR	Pay as you go	GR	JSON	External
5.	Karhoo (https://www.karhoo.com/)	Karhoo	Mobility	Taxi and private hire e-hailing	Taxi	NL, DE, GR	-	YES	JSON	External aggregating more than three service providers in MyC sites
6.	Aggregated TM services of MyCorridor (developed in MyCorridor)	SWARCO Mizar	Traffic Management	Travel Times, Traffic Events, Traffic Management Strategies	Private Transport	IT, AT, GR, NL	-	NO	XML/JSON	Internal; developed in the project aggregating a series of TM internal services of other beneficiaries
7.	Real Time Traffic Flow (https://developer.tomtom.com/traffic-api)	TomTom	Traffic Management	Traffic flow	Private Transport	NL, AT, GR, IT, DE, CZ	Pay as you go (but provided for free in the project)	NO	JSON, XML	Internal
8.	Zone Access Control Information in Rome	RSM	Traffic Management	Zone access control information	-	IT	N/A	NO	JSON	Internal
9.	TLA service	SWARCO Mizar	Traffic Management	Forecast of traffic light switches	Private Transport	IT, GR	N/A	NO	XML	Internal

No	Service of MyCorridor platform	Service Provider	Cluster of service	Type of service	Mode	Presence in MyCorridor Pilots	Type of Payment Model	Booking API	Response	Internal/ External to MyCorridor
10.	Route planning/On-line routing (https://developer.tomtom.com/online-routing)	TomTom	Info mobility	Multimodal route planning	Private Transport	NL, AT, GR, IT, DE, CZ	Pay as you go (but provided for free in the project)	NO	JSON, XML	Internal
11.	Park and ride in Salzburg (https://www.data.gv.at/katalog/dataset/9087fe9a-1dd4-49a1-98b4-8a8c659eb64f)	City of Salzburg	Info mobility	Park & Ride	Private Transport	Salzburg (AT)	AT	AT	JSON	External
12.	Prague parking (http://www.tsk-praha.cz/tskexport3/json/parkings)	Technická správa komunikací hlavního města Prahy, a.s.	Info mobility	Parking	Private Transport	CZ	-	NO	JSON	External
13.	NS - API (all train services in Netherlands) (https://www.ns.nl)	Nederlandse Spoorwegen – Dutch Railways	Info mobility	PT information	PT	Rome	-	NO	JSON	External
14.	KV78Turbo-OVAPI	Stichting openOV	Info mobility	Public Transport (train)	PT	NL	-	NO	XML	External
15.	Static Parking Availability (https://opendata.rdw.nl/Parkeren/Open-Data-Parkeren-Index-Statisch-en-Dynamisch/	RDW	Info mobility	Parking info	Private Transport	NL	-	NO	JSON	External

No	Service of MyCorridor platform	Service Provider	Cluster of service	Type of service	Mode	Presence in MyCorridor Pilots	Type of Payment Model	Booking API	Response	Internal/ External to MyCorridor
	f6v7-gjpa/data)									
16.	Dynamic Parking Availability (https://opendata.rdw.nl/Parkeren/Open-Data-Parkeren-Index-Statisch-en-Dynamisch/f6v7-gjpa/data)	RDW	Info mobility	Parking	Private Transport	Amsterdam	-	NO	JSON	External
17.	Park&ride Loutraki (http://new.loutraki-agioitheodoroi.gr/)	Municipality of Loutraki	Mobility	Parking	Private Transport	GR	Pay as you go	GR	JSON	External
18.	Prague Municipality API for vehicle sharing (https://api.mojepraha.eu/v3/shared-cars/)	Prague Municipality	Info mobility	Vehicle sharing	Sharing/pooling	CZ	-	NO	JSON	External
19.	Aggregated Added value services (informatory on POIs, etc.)	WINGS	Info mobility – added value	Touristic /Entertainment	Push information	NL, AT, GR, IT, DE, CZ	-	NO	JSON	Internally developed aggregating external services
20.	BlaBlaCar carpooling service (https://www.blablacar.com/)	Comuto SA	Info mobility	Car pooling info	Sharing/ pooling	NL, AT, IT, DE, CZ	-	NO	JSON	External
21.	CheckMyBus (https://www.checkmybus.com/)	CheckMyBus GmbH	Info mobility	Coach services info	PT	NL, AT, IT, DE, CZ	-	NO	JSON, XML	External
22.	Hybrid Trip Planner; integrating	CERTH/ITI	Info mobility	Cross-border multimo	All	NL, AT,	-	NO	JSON	Internally developed as

No	Service of MyCorridor platform	Service Provider	Cluster of service	Type of service	Mode	Presence in MyCorridor Pilots	Type of Payment Model	Booking API	Response	Internal/ External to MyCorridor
	ODP, IDOS journey planner (www.idos.cz) & HAFAS trip planners (https://www.hacon.de/en/solutions/trip-planner-and-travel-companion/)			dal trip planning		GR, IT, DE, CZ				aggregated service
23.	OV-Fiets	OV-Fiets	Info mobility	Bike rental	Private Transport (Bike)	NL	-	NO	JSON	External

It is worth referring to Karhoo external service aggregator (https://www.karhoo.com/), the final agreement with whom required a long negotiation and technical integration process. Karhoo is a comprehensive open platform enabling taxi and private hire e-hailing from any website and mobile app. It connects thousands of ride providers to global brands through only one technical integration, and enables an open and fair marketplace by standardising and digitalising ride purchase on a global level.

The coverage of Karhoo Fleets in Europe consists of 8 Countries, which are: Belgium, France, Germany, Ireland, Luxembourg, Netherlands, Spain, United Kingdom; some of them 24/7. It encompasses 163 fleets consisting of 76000 vehicles. Karhoo can cater to any kind of traveller, including higher-end passengers and business travellers, as well as the occasional consumer who would like to enjoy luxury transportation as a special treat. Karhoo has supply contracts in place with each of its Fleet and DMS partners. Karhoo can operate as Merchant-of-Record (MoR) (collecting funds from travellers on behalf of the Fleets), or let the MaaS app be MoR (in which case it produces a statement and payment-request to the MaaS app). In MyCorridor case, Karhoo operated as MoR.

8.2 The Hybrid Trip Planner

Despite the fact that in MyCorridor some trip planners are coming from project beneficiaries operating in some countries of MyCorridor were available, there is none that would accommodate the need for cross-border multimodal trips that was one of the goals of the project.

The trip planning service was deemed since the beginning as one of the key assets that should be offered to the traveller given that it would support all modes and cross-border trips. As such, MyCorridor, having no access to such a trip planner, made the technical decision from the early beginning of the project to develop from scratch one that would exploit the individual trip planners whenever possible, would support seamless cross-border service and, in addition, would enable the personalised trip-based matchmaking of services available in the platform.

The MyCorridor Hybrid Trip-Planner is responsible for providing multimodal itineraries for getting from point A to point B, upon traveller's trip request. This solution combines the OpenTripPlanner (OTP) (http://www.opentripplanner.org/), an open source multimodal trip-planner, with commercial trip-planners provided to the MyCorridor platform by some of the internal service providers of the project (namely CHAPS and HACON). The selection of the OTP or one of the commercial trip-planners, depends on the traveller's trip request. When a trip request refers to an area that is under the coverage of a commercial trip-planner, that specific trip-planner is used. On the other hand, when the submitted trip request refers to an area that is out of any of the commercial's trip-planners range, the OTP is employed.

8.3 Added value services

Whereas the mobility and infomobility services are self-evident in content, it is worth highlighting the added value services as well as the Traffic Management (TM) services that have been provided through MyCorridor solution to the travellers. While the TM services and the concept behind them are presented in section 9, herein we summarise the approach followed for the Added Value services.

The Added Value Services, as conceptualised in MyCorridor, provide added value information regarding live music, weather, arts and entertainment, food, drinks, outdoor activities, transportation, shopping and medical centers. In MyCorridor, Added Value Services are offered aggregated through the Added Value Services (AVS) API, supported with information coming from three open APIs. Each of the three open APIs provide information for specific service categories. In particular:

- the SongKick (https://www.songkick.com/developer) API is utilized for live music: The SongKick API offers access to a live music database with over 6 million upcoming and past concerts. SongKick requires an API authorization key to be included as a parameter to every request and users of SongKick API must apply for the key. The SongKick API endpoint utilized is https://api.songkick.com/api/3.0/events.json and requires a location URL parameter.
- the DarkSky (https://darksky.net/) API for weather: The DarkSky API provides the weather anywhere on the globe, returning (where available) current weather conditions, minute-by-minute forecasts out to one hour, hour-by-hour and day-by-day forecasts out to seven days and hour-by-hour and day-by-day observations going back decades. The DarkSky endpoint utilized is https://api.darksky.net/forecast and an authorization API key is required to communicate successfully with the DarkSky API. Therefore, a user must apply for an API key while DarkSky has a restriction of 1000 free API calls per day.
- the FourSquare (https://developer.foursquare.com/docs/api) API for all the other categories: The FourSquare API returns a list of recommended venues and points of interest near the current location or inside a bounding box. The FourSquare database has more than 105 million places, including restaurants, hotels, hospitals, transportation, museums, bars, stadiums, colleges and shops. The FourSquare API requires two authorization keys, a client ID and a client secret. Both keys are obtained after registration.

All three services are available in Greece, Italy, Austria, Germany, Czech Republic and Netherlands.

In service synthesis the MaaS aggregator can combine multiple services and produce a new service to offer, i.e., the following operations are provided to the MaaS aggregator:

1. Given a number of selected services (2 or more) the MaaS aggregator can check if the services are compatible. Services are declared compatible if the operating hours and the operating locations of all the services are overlapping. In order to achieve this, the intersection of the operating hours and locations is calculated. If this intersection is non-empty, this means that the services are compatible.
2. Given a number of selected services (2 or more), if they are compatible, the MaaS aggregator can retrieve the common operating hours and the common operating locations for the new synthetic

service. In this function, the calculation of the intersection of the operating hours and locations of each service is generated and after some refinement, they are returned to the user.

9 MaaS & Traffic Management: From TM2.0 to TM2.1

Correlation between MaaS and Traffic Management (TM) operations has been a cornerstone of MyCorridor project concept. The research hypothesis has been that this would be a win-win relationship:

- MaaS operator would benefit from the use of various traffic management related services as part of the multimodal information service suite provided by the MaaS application, such as: real time traffic information services, navigation services as well as C-ITS.
- Traffic Management would benefit from the use of MaaS application as a) an additional channel to reach the traveller and influence his/her behaviour, b) a multimodal transport operators platform through which data and strategies could be exchanged.

The Traffic Management– MaaS convergence can enable Road Operators to implement interactive multimodal traffic management and implement traffic management measures to optimize the multimodal network capacity thanks to the use of all vehicles and transport modes available by the deployment of network wide multi-modal management strategies (system optimszation and equilibrium) obtaining through a strictly Road and MaaS actors cooperation.

More specifically, the Traffic Management work in MyCorridor is based on the **concept of Traffic Management 2.0 (TM2.0)**, which has already incorporated interaction between Traffic Management and Service Providers. TM2.0 stands for a new proven collaborative concept for Traffic Management and Control, in which the travellers and goods, through the use of new technologies and sensors, become entirely part of the data supply chain (www.tm2.0.org). It offers great new opportunities for Traffic Management and Control making it, on one side, cheaper and more efficient for the road operators, and, on the other side, more custom, friendly and acceptable for the users. This is done combining effectively data collected by the infrastructure and from the mobility services in the vehicles and smartphones. Current navigation systems in the vehicle use traffic information to provide individual route advice to drivers, missing however the information related to traffic circulation strategies, traffic regulations or prioritized routes put in place by the TMCs. TM2.0 aims to close this loop and facilitate interactive traffic management. The Road Operator sends its Traffic Management Plans as these are decided by the Public Authorities to the Service providers operating in the area, who then send tailor-made information to their customers with regards to routing provided via the in-car navigation device.

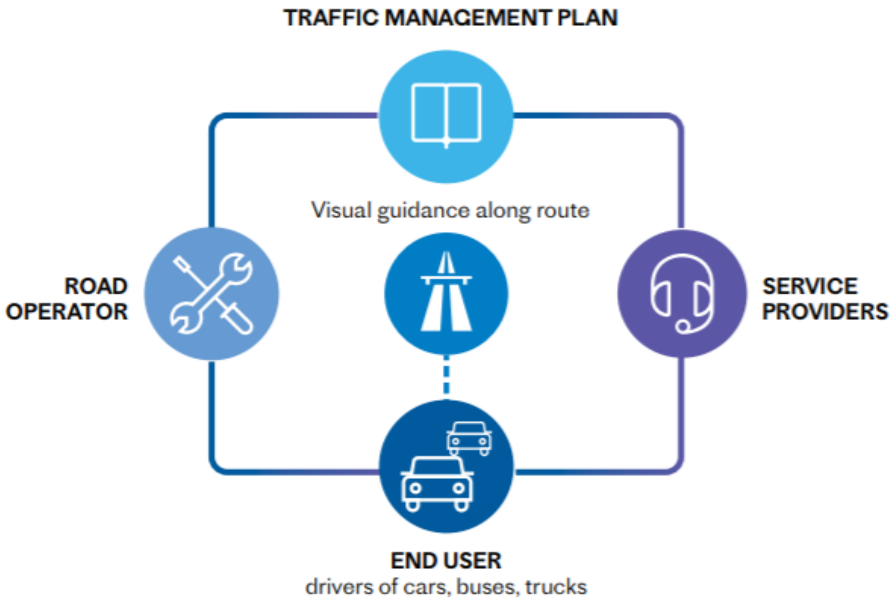

Figure 89: The TM2.0 concept [www.tm20.org].

In this context, MyCorridor considered the following actions:

1. Development and demonstration of Traffic Management services as part of MyCorridor suite of services (WP4);
2. Incorporation of Traffic Management and Multimodal management in MyCorridor business models (WP7);
3. Cooperation of MyCorridor with TM2.0 Organisation.

Concerning the first action, the project has developed a series of traffic management services that support relevant use cases (UC), which have been integrated in the one-stop-shop solution and then demonstrated and evaluated at MyCorridor pilot sites. These services include:

- Real-time traffic information
- Routing and navigation services
- Strategy manager: the Traffic Management Center decides a strategy to mitigate traffic problems and disseminates guidance to the drivers
- Off-street Parking availability

With respect to business models, the project has defined a business architecture in which the TM2.0 stakeholders and MaaS stakeholders are merged into a unique eco-system.

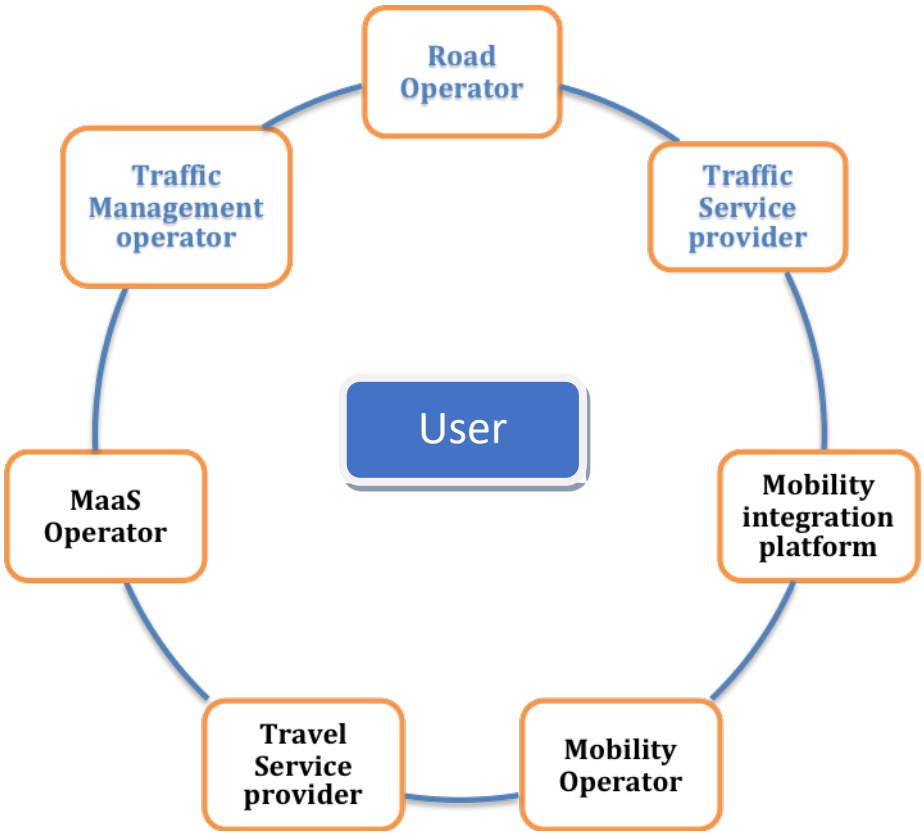

Figure 90: MaaS and TM2.0 eco-systems [Traffic Management 2.0 – Mobility as a Service Task Force – Final Report. TM2.0. 2019].

In deliverable *D7.1: Mobility Services Aggregator Business Model*, MyCorridor has analysed the involvement of Traffic Management Operators and traffic service providers as core stakeholders in the value chain and business modeling. MyCorridor can support Traffic Managers to operate a multimodal management scheme. In fact, one of the dominant business cases analysed is that of Traffic Management. In this case, the TM Operator is the main customer and the business model is based on Impact driven fees (i.e. fee which is justified based on measured traffic-related KPIs, which prove positive impact on traffic efficiency) from the Traffic Managers.

With respect to *the cooperation with TM2.0,* MyCorridor, during its lifespan, maintained continuous contact with TM2.0 platform. In the framework of this cooperation, TM2.0 platform has initiated two relevant taskforces:

- Mobility as a Service Task Force
- Multimodal Mobility Task Force; a joint initiative with MaaS Alliance.

A Workshop held on 19 February 2020 in Brussels: "MaaS and Multimodal Mobility & Traffic Management", which was organised by both the TM 2.0 and MaaS Platforms, concerned the integration of Traffic Management and Mobility as a Service into a single operational framework to deliver Multimodal Mobility Management and Services, mainly at Urban Environment. A few of the key results of the Workshop most relevant to the current report are presented below.

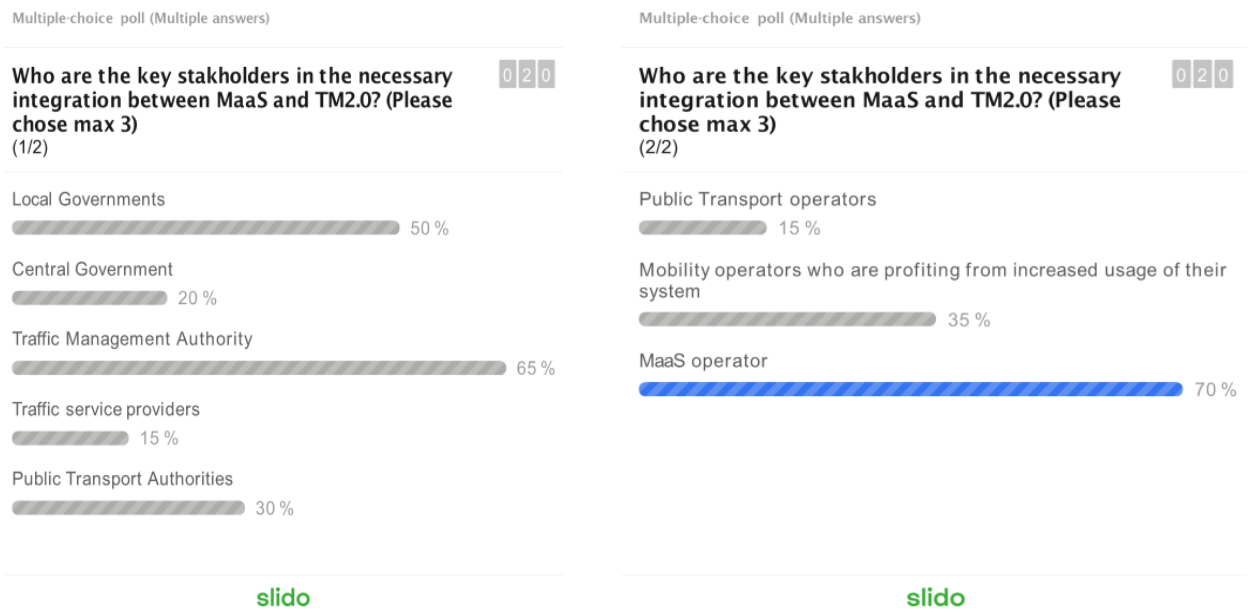

Figure 91: Opinion of audience opinion on key stakeholders in the context of MaaS and TM integration - – Brussels Joint TM2.0 & MaaS Alliance Workshop February 2020.

The main conclusion from the Workshop was that to achieve a multimodal management goal there should be two key objectives as a basis for any future business structure (i.e. business architecture) planning:

1. The collaboration between public entities (for example TM agency, PT Operators, city administration) as well as between public and private stakeholders should be based on clear business rules for data sharing, responsibilities, and end-user contacting, which should be facilitated by the governance model and knowledge management tools.
2. The end-user engagement is essential for the market's success.

10 Pilots

10.1 Overview & evaluation objectives

The evaluation activities of this project entailed the participation of service and transportation providers, developers, research institutes, transportation companies, and various SMEs in 5 pilot sites across Europe (Austria, Czech Republic, Greece, Italy, and The Netherlands) with the participation of travellers and service providers in two separate phases.

At the end of evaluation activities, stakeholder focus groups - with representatives from government/authorities, cities/regions, mobility and MaaS operators and aggregators, transportation providers/operators, infomobility, added value and mobile service/ technology providers and travellers - were held to support the supplementary impact assessment, as well as to collect feedback about the added value of the developed MaaS technologies to the MaaS and, generally, the transportation market and facilitate in identifying the necessary steps to be taken to create the conditions for a sustainable and growing MaaS one-stop-shop.

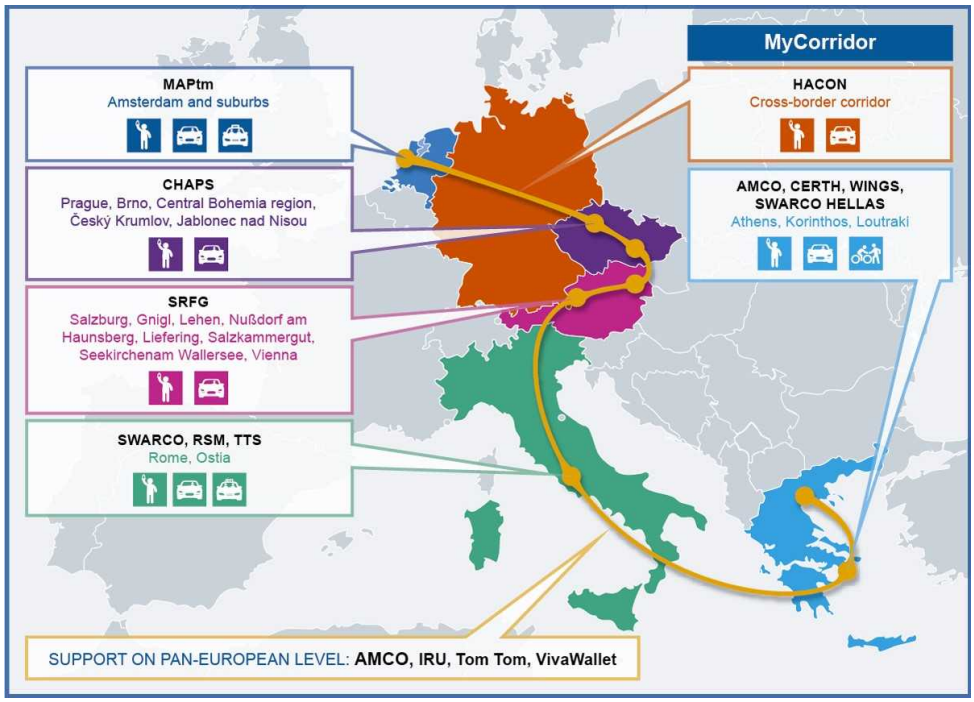

Figure 92: MyCorridor pilots.

The overarching aim was to evaluate the **use** and **user experience of travellers** and **service providers** in using the MyCorridor MaaS mobile application with different mobility products (services, or combination of services either mobility, infomobility and/or added value), available in different pilot sites through pre-determined (Green packs) and/ or customised MaaS packages (MaaS on the Go, MaaS packs) but also, and, mainly, to obtain knowledge about the MaaS paradigm potential in Europe and materialise it in lessons learned.

As such, a multi-faceted evaluation framework was targeted for the evaluation of the MyCorridor MaaS solution, consisted of the mobile app for travellers and the online service registration solution for service providers to be able to integrate their services to be offered through this mobile application, both supported by the B2B2C one-stop-shop platform developed. The evaluation project-specific objectives has been to:

- To evaluate the **usefulness, ease of use, usability and user experience of travellers and service providers** in using the MyCorridor mobile application (1st iteration) and the Service Registration Tool, respectively– *mostly formative/ partially summative*.

- To evaluate the **user experience of the MyCorridor mobile app in a semi-real-life** (i.e. travellers use the mobile application in real conditions but only for pre-defined journeys where the integrated services are available) use in a longitudinal condition with both main clusters of users for a longer period – *summative evaluation, collection of analytics and online feedback forms (incl. benchmarking evaluation)*.

This evaluation framework **was user-centred and multi-faceted**, i.e. it addressed 2 major clusters of users (service providers and travellers), in 4 types of evaluation activities (co-participatory, formative and usability testing, real-life and benchmarking experience, impact assessment). Apart from the co-design phase, the other three evaluation activities have been closely connected and followed an iterative approach. Apart from a multi-faceted evaluation, the approach adopted was mixed, as it included interviews, questionnaires (some of them standardised), travel diaries (for the second phase) as well as

co-participatory design focus groups that were conducted before the beginning of the first iteration to resolve any design problems, issues and indecisions.

Overall, **378 people participated in the user experience activities of MyCorridor**, divided as follows:

1st phase (141 users in total):
- 119 travellers of all types (commuters, tourists, businessmen, low ICT literacy users, mobility restricted users, spontaneous users and students);
- 5 service providers;
- 17 stakeholders

2nd phase (237 users in total)
- 166 travellers of all types
- 15 service providers
- 25 attendees in travellers focus groups
- 31 transport and MaaS stakeholders participating in the stakeholder groups across the five pilot sites, plus the UK , held to accommodate complementary impact assessment purposes (see more in section 11.1.1)

The project pilots, especially the real-life pilots of the second phase, were promoted through various channels from the project beneficiaries, both local to the sites as well as central to the project. In this context, a page dedicated to pilot activities was prepared at the project web site (http://www.mycorridor.eu/pilots/).

10.2 The pilot sites

10.2.1 Austria

The Austrian pilot site was led by Salzburg Research and focused on services in the Federal State of Salzburg as well as in the City of Salzburg. The regional capital of Austria, located at the border to Germany, is a tourist attraction throughout the year. The city, which is a home to 150.000 inhabitants, also accommodates several universities. Therefore, many employees and students, as well as tourists are commuting to and from the city on a regular basis.

10.2.2 Czech Republic

The Czech pilot site was led by CHAPS and was intended to be based on a combination of public transport and traffic management services, mainly on local journey planner IDOS (infomobility), interurban and international bus reservation and ticketing system for AMSBus and partner's traffic management and routing services. Additionally, the development team implemented added value services, Prague P+R occupation information and also a Prague Zoo events feed. The conduct of the multimodal trips within wider Prague and Brno areas and also intercity journeys, for which the use of the AMSBus intercity coach system was planned, turned out to be challenging due to the Covid-19 pandemic, therefore mainly car trips to work and other necessary trips within wider Prague and Brno areas have been tested by using the services presented in the following table.

10.2.3 Greece

The Greek pilot was led by AMCO and included the cities Korinthos and Loutraki. Services of the Korinthos Intercity Bus Company S.A. were included, which executes the route between the two cities, as well as the

Bike Sharing System that is operated by the municipality of Loutraki and parking space availability information. The main feature of the Greek pilot site is that the route between Korinthos and Loutraki is being served by many buses daily and since the distance is not very long (20 km) many passengers are using it.

10.2.4 Italy

The Italian pilot was led by RSM. Rome is a city with one of the highest car ownerships within Europe, so the private mode of transport remains one of the most used. For this reason and also due to a lack of included mobility services into the MyCorridor platform, the pilot testing in Italy focused on the traffic information and traffic management services for the private mode. In addition, because of the Covid-19 pandemic many people were not willing to use the public transport offers in Rome. Even persons, who use the public transport under normal circumstances on a regular basis, preferred using a car or any other private transport mode if they had access to it. In addition, because of home office working policies from the majority of the companies, traffic has seen a great reduction, so people were more inclined to use their car when they had to move around Rome.

10.2.5 Netherlands

The Amsterdam pilot was led by MapTM. Amsterdam is the capital and most populous city of the Netherlands, home to around 2.5 million inhabitants in its metropolitan area. Located in the heart of the economically strong Randstad region, Amsterdam is considered as a hub for businesses and tourism alike. Thanks to its large port and direct train connections to all major Dutch cities, as well as a dense network of local and regional trains, Amsterdam infrastructure is used by many commuters.

In the real-life trials of the second roud, participants were invited to use the MyCorridor for their daily commutes to work, to university and for leisure travels to the Johan Cruyff Arena, a main destination for concerts and sport events in Amsterdam.

COVID-19 was a major drawback for the Amsterdam pilot. The travels towards the Johan Cruyff Arena stopped with no concerts and sports events. Finally, there was less public transport and many people did work from home. The services that were tested where all related to traffic management.

10.31st evaluation phase

10.3.1 Service providers

The evaluation with service providers was **remote, unmoderated and contextual** (i.e. service providers completed the process and questionnaire at their own time and at their own place). Service providers completed the registration of their service on their own. Before any process takes place, they were interviewed on their professional background, current and existing relevant experience and their expectations about the *Service Registration Tool* and process (i.e. pre-acceptance).

The first functional prototype was evaluated by internal to the project service providers during the first iteration phase and externals to the project service providers in the second phase. Testing scenarios were prepared to only guide the service providers in completing the accompanying diaries and not for traditional usability testing purposes. The service providers themselves assessed the process and the perceived effort, success and easiness. The baseline interview lasted approximately an hour. Interviews were held via phone or Skype (or other online meeting applications). The main sections of the interview are a) Background information, b) Previous Experience/Current Behaviour, c) Constraints/Cost/Value, d) Risk/Impact.

The online service provider scenarios completion and logs were filled in after the completion of each scenario. The participant rated each scenario with regards to its ease of use with a 5-rating Likert scale, rated the success of completion of each scenario, added the steps taken to complete each scenario as well as gave an estimate of time taken to complete each scenario. The Service Registration Tool and integration process evaluation (post-questionnaire) included the following categories: a) Service Registration Tool use and performance, b) use of supportive documentation and examples, learnablity, sustainability and maintainability, changeability, effort, Usability (standardised questionnaire, SUS scale (Brooke, 2013)). The evaluation session was completed within two hours. Users completed a General Data Protection Regulation (GDPR) compliant consent form regardless if they are members of the Consortium or not.

10.3.2 Evaluation with travellers

In the first iteration phase, travellers (commuters, tourists, businessmen, low ICT literacy users, mobility restricted users, spontaneous users and students) participated at each pilot site. However, a user might fit to more than one of these categories (e.g. a user can be both a mobility-restricted businessman and a commuter). Background information of the identified users was collected before any testing taking place, also with the consideration of their mobility patterns and choices. Users varied in age, type of user cluster, ICT literacy and education, occupational background, nationality, income and vehicle use. The users were loosely matched to the testing scenarios with the sole aim to collect meaningful and appropriate data, aiming for users to fully realise the potential of the offered services through this single digital platform with diverse mobility choices (i.e. from daily travelling routines (commuter) to special occasions (tourists)).

A mixture of usability (i.e. testing scenarios, think aloud protocol) and user experience (i.e. the user is given a loose storyboard with very clear objectives) were selected for the first iteration phase including the application of the 'think aloud' protocol.

During this phase, **baseline experience was collected** [Formative data and content analysis of topics and themes under the four areas: A. Background information, B. Access Needs & Wants and MaaS awareness, C. Consumer experience, and D. MaaS pre-acceptance through a questionnaire consisting of 24 question items (13 close-ended and 11 open-ended)] as well as **data** during the **Face-to-Face evaluation sessions with respect to: a) Scenario completion,** b) **Subjective measures included closed and open-ended question items, and c) Facilitator notes** (emotion heuristics, observation notes from 'think aloud' protocol and completion rates, usability problems, scenario duration, scenario level satisfaction, errors, clicks, and click).

10.4Second evaluation phase: The semi-real experience

The final evaluation phase aimed to evaluate the one-stop-shop with of all integrated services and involving real travellers. The number of users and trips per pilot site is seen in the following table.

Table 7: Number of users and number of conducted trips per pilot site.

Pilot site	Number of trips	Number of users
AUT	475	50
IT	74	13
NL	28	8
GR	200	69
CZ	157	26

Pilot site	Number of trips	Number of users
Total	**934**	**166**

10.4.1 Evaluation with service providers

The second evaluation phase with service providers considered the integration of the remaining services and the integration of external/ invited service providers. External service providers tested the updated version of the Service Registration Tool(SRT)(https://mycorridor.iti.gr/srt/). The process looked alike the one followed in the first phase.

10.4.2 Evaluation with travellers

On the contrary to the second phase with service providers, the second evaluation phase with travellers was completely different when compared to the first one. The second evaluation phase was conducted in semi-real conditions. As the existing platform offered pre-defined services at certain areas, then the travellers were recruited to complete real journeys and carry out real transactions (with no additional monetary gain/procurement for the aggregator/payment or any of the partners but solely for service providers that are (or not)members of this Consortium). Users were divided in *Mainstream* and *In-depth travellers*. The first group only completed the pre and post questionnaires and random pop-up questions (questionnaires are available through the mobile app. The questionnaires includes items to collect data for the traveller's experience, the evaluation of the MyCorridorapp, impact assessment and potential usefulness and effectiveness of incentives (WP7 contributed items). The users signed an online consent form and first they completed the pre-questionnaires. The second group completed longer and more elaborate quesetionnaires along weekly diaries.

Additional focus groups with travellers as well as stakeholders (e.g. representatives from authorities, regional transport agencies, touristic agencies, mobility and MaaS aggregators, public transport -and other type of vehicles-operators, infomobility and added value providers, mobile and technology service providers, etc.) were held at the end of the second evaluation phase; firstly,to collect qualitative data to triangulate data collection and enrich the other types of collected data and, secondly, to conduct the supplementary impact assessment based on MCA. Focus groups with stakeholders aimed to collect information about the sustainability and growth of MyCorridor as a business and consumer experience after the end of the project with consideration on new directions/innovationsin transportation, such as IoT and automation apart from MaaS.

The evaluation plan and the experimental plans of the two evaluation phases taking place in MyCorridor are reported in D6.1: Pilot plans framework and tools.

10.5 Results

10.5.1 Results from evaluation with service providers

Results from evaluation activities with service providers have confirmed three main hypotheses established for this part of the evaluation, as follows:

- the service registration tool is useful;
- the service registration tool is usable;
- the service providers are successful in completing the registration process.

Still, in the first evaluation phase, the *Service Registration Tool* was not considered so easy to use. After the optimisation that followed in between the two evaluation phases, this result changed in the second phase. However, the usability of the tool was lower (which can be justified by the fact that more active interaction with the tool was held this time and, as such, more interaction issues were revealed).

10.5.2 Results from evaluation with travellers

The results from the baseline interviews in the first evaluation phase show that the most used means of transport among the respondents is the car, while bicycle and train show the highest satisfaction rate. In addition, the results show that finding a cheap and convenient travel mode is most important to respondents, and that about 42% of the sample have heard of MaaS before. In addition, train and plane tickets are the most commonly purchased tickets online. The most frequently given positive answer regarding MyCorridor is that respondents like the feature of buying an all-in-one ticket, while on the contrary about a third of respondents do not show a high level of trust in the app.

From the answers of the pre-questionnaires we can conclude that about a third of the participants has already heard of MaaS and that 83% of the respondents are used to buy mobility products online. Furthermore, train and plane tickets are the most frequently purchased tickets. About one third of the participants showed some concern with the intended payment process of the MyCorridor app. However, if the respondents are familiar with the organisation, 75% of them feel comfortable buying products online. Further, the participants find it important to buy on websites that are easy to navigate and have a proper design. We found a moderate approval rate when respondents were asked if it is pleasant to use the MyCorridor platform.

When it comes to the evaluation of three scenarios (registration, setting up an account and using either "MaaS on the Go" or "MyPacks") we got the following results: the average score over all pilot sites for the easiness of the registration process was 83[1] and the average score for the usefulness of the registration process was 72[2]. The results for setting up an account show an average score for the easiness and an average score of 73 for the usefulness. When it comes to creating an own MaaS pack or using MaaS on the Go the average score for the easiness of this process was 63 and for the usefulness 66. Overall the analysis of the scenarios showed that registration and setting-up an account are generally considered as useful options but the design of the app and some unclear options made it difficult for the respondents to complete the scenarios. This finding is also underlined by the results of the post-questionnaires, where the respondents declared that they were not able to find what they wanted in the MyCorridor app. This could be due to the observation that respondents feel that the app is not very easy to use on their first visit and that the information on the screen is not very well structured. Nevertheless, 75% of the respondents state that they would recommend the app to a friend.

This criticism on the App was taken seriously by the app's developer teams to make the app more user-friendly for the second test phase. Additional functions were fully implemented for the second pilot round. In the development process the feedback that was provided from the pilot tests and the issues that came up have been taken into consideration. The improved versions of the MyCorridor App applications have eventually been made available in Google Play (Android version) and App Store (iOS version).

The **second iteration phase**, that was a semi-real testing experience with **real travellers** and consequently completely different than the first evaluation phase, the improved and final version of the one-stop-shop app with all integrated services was tested by recruited travellers in the five pilot sites. The second iteration phase was supposed to be conducted in spring 2020. However, due to the Covid-19

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[1] *0 = not easy to use at all, 100 = very easy to use*
[2] *0 = not useful at all, 100 = very useful*

pandemic and the severe restrictions in the pilot sites, the start of the test phase had to be postponed to June. As such, the second test phase was then conducted from 15 June to 31 October 2020 in all pilot sites. However, the constraints due to Covid-19 were also strongly felt during this period, as the mobility behaviour of the participants was different then under normal circumstances. From September onwards, the governments in the pilot sites also gradually reintroduced more severe restrictions, which significantly reduced the number of trips made by the recruited persons or made them resort to different modes of transport than they would choose under normal circumstances.

To provide a deeper understanding of how the MyCorridor application works, we conducted several analyses of the logged data in an aggregated form. The results show that the average journey time ranges from 25 minutes to 80 minutes. Overall, the average journey time in all countries is 38 minutes. Further, the average trip length amounts to 29 km, with the average trips lengths ranging from 16 to 117 km between pilot sites. The logged data also show that the average number of transfers made is 1.1 among all countries over all participants. Figure 93 shows the relative share of service clusters that were used by the participants in the second iteration phase. The most frequently used service clusters were traffic management services (53%) followed by green packs (21%) and mobility services (20%). In Figure 94 it can be seen that the majority of the users used the Maas on the Go option (79%), while 21% used the offered green packs.[3]

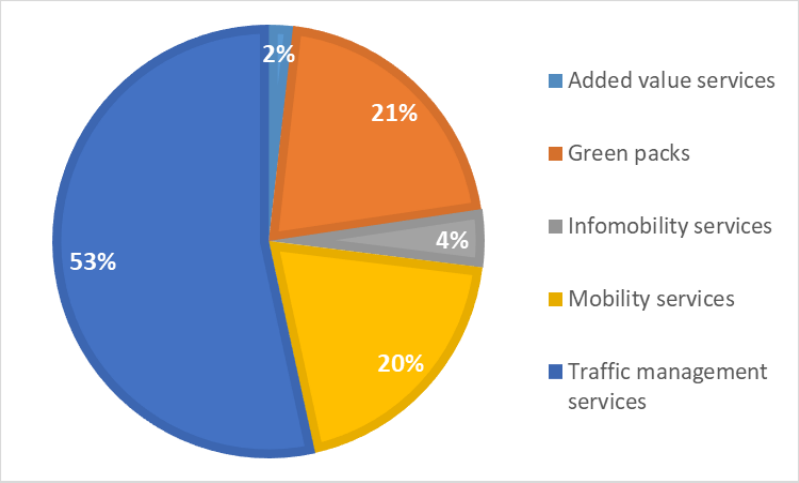


Figure 93: Relative share of service clusters that were used in the second iteration phase.

[3] *It has to be noted here that the Green Packs were only offered in Greece.*

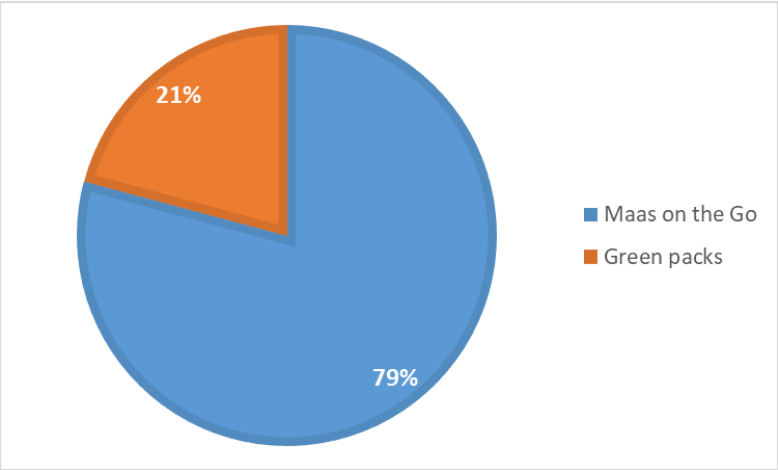


Figure 94: Relative share of the type package that was chosen by the participants in the second iteration phase.

In the second evaluation phase the users were divided into mainstream and in-depth users and the results of the questionnaires were analysed separately for those two user groups and overall for all pilot sites. The in-depth users were asked to give deeper insights into their impressions and experiences by answering more questions in the context of the pre- and post-questionnaires, by writing a diary with their experiences and at the end of the second pilot phase they were invited to participate in a focus group discussion where they could share their experiences as well.

The results from the pre-questionnaires show that most users across all pilot sites use the car as their only mode of transport for their most frequent trip or for a combination of two or more modes (including walking). The answers given by users about distance and time spent during their most frequent trip, which they make mainly for commuting, are consistent with the results of the analysis of the logged data.

A very high percentage of users mentioned they have never used a MaaS app before, so subsequently the testing of the MyCorridor app might be more difficult than using a normal app, as not all aspects of MaaS were very clear to the users. The approach to the MyCorridor app was neutral for the in-depth users and slightly more confident for the mainstream users.

At the end of the second test phase, an evaluation of the MyCorridor app and in general of the whole experience was requested from the users in the post-questionnaires. Mainstream users tended to have a more positive rating than in-depth users, and on average the rating of all aspects is neutral for mainstream users (about 50% of the average rating), while the rating is lower for in-depth users.

The rating is higher for general aspects of the app (ease of use and overall experience), but becomes lower when it comes to specific technical issues, such as features and functions that users would want in the app, the usefulness of the app for organising trips and the time spent on planning.

The reasons expressed in the pre-questionnaires as to why users were most attracted to MaaS were confirmed after the test phase for the MyCorridor app, with the ability to use all modes of transport with just one ticket being the most important, followed by the ability to switch from private to public transport modes without having to think about it. Most of the users tested the app with their conventional means of transport and only a small percentage used the new services.

In summary, user evaluation seemed to be biased by testing a product that is not fully developed in the way that users would want it to be, but at the same time it seems that users would be very positive about the MaaS product if the development standard was high (i.e. they experienced a commercial product).

This indicates that the expectations for a MaaS app are generally very high and that users do not distinguish between already long-established and new, innovative functions which are still in the development phase.

As mentioned above, the in-depth users were asked to keep diaries and report their experiences with the MyCorridor application on their journeys. The results from the questionnaires are also reflected in the answers of the diaries. All in all, one can say that the in-depth users across all pilot sites found the basic idea of a cross-border travel app very appealing and good. The main advantage is seen in the fact that planning, booking and purchasing mobility products are possible within one single app and that it can be used across borders. Room for further improvements is seen in the usability of the app, to make it clearer, simpler and more intuitive to use, in the functionally of the GPS and in individual functions such as the routing results or the resetting of the password.

User feedback was overall positive and higher compared to the aggregated post-questionnaires' results. It appears that the use of navigation support was mostly related to negative responses.

The latter is also supported by the focus group discussions that followed, where users mentioned that their worse experiences involved the navigation support. A major lesson learnt is that the integration of navigation support services requires a parallel and a separate evaluation phase/layer to validate its efficiency and effectiveness and this is only possible through real, consecutive, and repeated trips to be taken by an adequate number of users. COVID-19 negatively affected any such potential endeavour, and hence emulated s/w alternatives were utilised, which could partially and isolatedly address and partially solve the arising issues.

Nevertheless, travellers shared the strong belief that the MyCorridor application has two strong points: a) the provision for personalised MaaS ticketing through elaborate travelling preferences menu, and, b) the combination of owned, shared and public transportation means within and without a country and hence can become a competitive product. Finally, diverse travelling requirements have arisen during the focus group discussions, even among the same group, which shows that COVID-19 does not primarily affect the need for alternative travelling options for older travellers but mostly for the workforce and early technology adopters. Health and safety are important factors for the mobility of all travellers, but the purpose of travelling remains the defining factor.

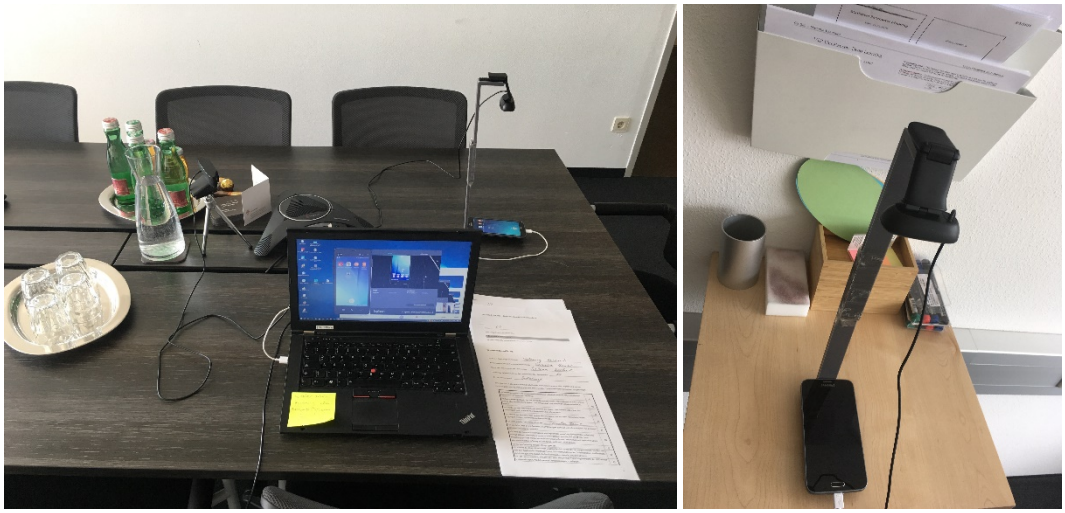


Figure 95: Set-up of the lab-based testing in the first iteration phase at the Austrian pilot site.

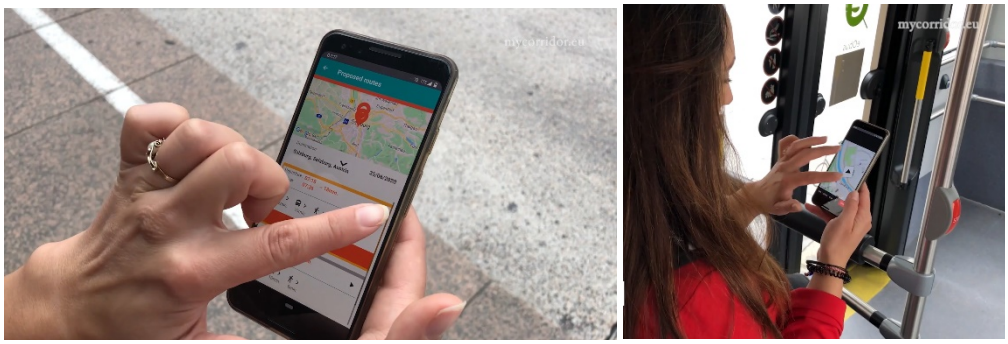


Figure 96: Images from the conduct of the second pilot round in Salzburg.

All the MyCorridor pilot results and findings, as well as the following lessons learned, are reported in detail in (public) *D6.2: Pilot results consolidation.*

10.6Lessons learned

Apart from the findings of the evaluation activities that were specific to the project outcomes, the overall experience gained through the pilot activities is substantiated in the following lessons learned and recommendations proposed.

10.6.1 Lessons learned from evaluation activities

The approach of multiple stages of iterative user input has proved essential in shaping the user interface for MaaS applications. The approach taken in MyCorridor is similar to that advocated in ISO92410-210 'User Centred Design', with user evaluation at both a formative and summative stage.

The results and lessons learned address technical, operational, and business aspects from the project.

One observation is that no aspect of a MaaS product can be taken in isolation. Even if the novelty and innovation is in a specific function (e.g., in terms of mobility packs and ticketing), other functions such as mapping and routing must be in place, robust and of a high quality, for user acceptance.

This is also reflected in the finding that the integration of a large number of mobility services is essential in order to provide an attractive and ideally all-encompassing offer so that users can take real advantage of the usage of the MaaS applications. A MaaS product will lose attractiveness if it doesn't offer the whole range of mobility services available in the city/region an especially if it does not include the innovative mobility services such as car-sharing, car-pooling, etc.

Also trust among all stakeholders was identified as being key to MaaS' success, especially when it comes to payment functions. The issue of trust could be addressed by providing more information on MaaS in general and also by providing more information on the MyCorridor app specifically.

The studies have also revealed that the concept of MaaS still needs some promotion as it was not very well known to the majority of the users. It must still become tangible for the users what advantages such an application can actually bring them. Meeting this need can also increase confidence in the MaaS applications.

For users it is also very important that the MaaS application is easy to use, clearly structured and intuitive, so that users feel confident when using the app and can rely on the quality of the services. From the conduct of the second pilot phase, we have seen that users are now used to a very high standard from various commercial providers on the market and expect a perfectly functioning app with impeccable

usability. The “normal” functionalities were partly in the foreground of the evaluation and not the advantages or the additional benefits offered by the MaaS app. A MaaS app has to be an innovative and up to date application that includes the latest developments. This indicates that the expectations for a MaaS app are generally very high and that users do not distinguish between already long-established and new, innovative functions which are still in the development phase.

For future MaaS applications, it is important that a MaaS app offers services that show a clear added value compared to pure navigation apps and that the provided information is correct and always available. A MaaS app should bring advantages to the users in terms of costs and time spent travelling. It is important for each involved actor in the MaaS ecosystem clearly to know the benefit that MaaS will bring to them – this certainly involves both the users as well as service providers.

The quality of the offers has a great influence on the daily mobility decisions. A MaaS app offered in the region of the user is certainly not the only decision criterion, but it is one factor that is taken into consideration in the daily decisions of selecting which means of transport and route to use. If a good quality MaaS offer is available, it can positively influence the decision towards environmentally friendly, shared mobility offers. This is especially true when it comes to travelling across borders, when one often lacks the detailed information for local mobility offers in the destination country. The studies have shown that users would be keen to use a MaaS app when they are travelling abroad or when they are planning their holidays and think that it would be beneficial if they could use an all-in-one ticket option. A good and comprehensive MaaS application could close this gap.

Local variation is substantial - not just in terms of local transport provision but in the specific needs and expectations of users for that locality, both in terms of journeys and in terms of how they want to consume their mobility. For example, countries and cities vary in terms of the relevance of supporting rural users.

From the service provider's point of view, data transferability between functions and transport services is critical and must be seamless - noted both in terms of user feedback and in the perceptions of transport stakeholders (see D6.3) - while this is a technical challenge, success in this arena can ensure the usability of the product as a whole. To achieve this, a technical solution has to be in place that operates across national borders. Therefore, an open, fair and transparent data governance system is needed. In addition, the use of a common MaaS API has to be used for the integration of services in order to achieve a high level of technological readiness. A further trend in technology that can be used in the near future will be the usage of NFC technology for the validation of mobility tokens in a MaaS platform.

In terms of operational features the MaaS products should have integrated a trip planning engine that is able to find all the available mobility services in the region of the user including all the possible alternatives that can be taken into consideration for a trip from A to B. In order to achieve this, as already mentioned, all mobility offers of the region must be available in the app. This also includes that regulations and policies are in place that encourage service providers to join the MaaS platform.

In times of the Covid-19 pandemic, mobility behaviour has changed in that the number of daily journeys has been fundamentally reduced, private cars are used more than public or shared mobility services again than under "normal" circumstances, and journeys across national borders are not possible or only possible to a very limited extent. This maximises the challenge for MaaS – not only are people using public transit less, they are even less disposed to experiment and try new offerings or alternatives to their usual journey plans. Nevertheless, it is important to continue working on the topic of MaaS, as it pursues a long-term vision and perspective that cannot be implemented in the short term. In the future, public, shared and easily accessible mobility services will (hopefully) take on a central role again. The topic is not only essential for individuals but for the topic of mobility as a whole.

In times of the Covid-19 pandemic a MaaS app could also offer the additional service of providing information on the occupancy rate of the mobility offers. Further, also the indication of available “single-

user" mobility services (such as scooter sharing or bike sharing) could be an important information and convince people to use this specific offer. That would bring an added-value for these special times and provide a direct benefit for the users.

Overall, MaaS will be one of the key innovations to shape the mobility of the future in years to come and has the potential to optimise the mobility system, positively impacting the traveller's journeys by offering multimodal transport solutions. To succeed, MaaS solutions will have to be user centric, open, complementary, and scalable.

Finally, the rollout of MaaS has moved in a short space of time from a vision to a reality. Users therefore have high expectations of what MaaS can do for them, and how any one MaaS service compares with a number of MaaS alternatives in the market. This means MaaS provision of the future needs to be of a high quality both in terms of transport provision, and in application user experience. Also, the importance of incentive needs to be considered when testing with users as this increases the attractiveness to participate.

10.6.2 Recommendations for analysing MaaS data

For future studies on MaaS platforms, a larger sample could be used so that more data is available, especially if one wants to make country-specific evaluations, derivations, and comparisons. This would require a significantly larger sample per country.

This sample should also be as heterogeneous as possible, so that, for example, women, young and older people, etc. are represented in sufficient numbers, as the mobility behaviour of these groups certainly differs from other users' groups. This could then be used to evaluate the user-friendliness, acceptance, satisfaction, etc. per user group and, based on the results, implement appropriate improvements so that the MaaS application has a high level of attractiveness for as many user groups as possible.

In future MaaS studies, it should also be ensured that similar spatial structures are compared with each other and that a distinction is made between applications in large cities and rural regions, for example. The characteristics of the mobility sector in these areas are very different and so are the requirements for a MaaS application.

Even though personalisation of MaaS offers is widely considered as a significant benefit, this cannot be based on the user profile setup (which would make such an application installation unbearable complex) but on user data analysis. Here it is important to note that a successfully personalised MaaS platform has to collect usage data from huge audience.

Apart from the above lessons learned and recommendations, in *D8.10: Towards a unique and sustainable Mobility Token driven MaaS*, that is publicly available and downloadable from the project web site, provides structured *Lessons Learned* derived from the knowledge gained throughout project in terms of app development, integration, and technical verification and evaluation phases that have been further materialised to business, legal, standardisation, technical and operational Guidelines and are for further consideration of all parties, internal and external to the Consortium, that wish to use/adopt, maintain a unique and sustainable Mobility Token driven MaaS.

11 MyCorridor impacts

11.1.1 MyCorridor impact assessment

An in-depth impact assessment of the project has been held and reported in *D6.3: MyCorridor impact assessment* (Public), the framework of which has been reported in *D6.1: Pilot plans framework and tools*. The two-stages impact assessment methodology consisted of a semi-quantitative impact assessment undertaken to quantify impacts over different areas, namely *environment*, *economy* and *society* - referred to as "Core Impact Assessment" methodology (CIA) – and a supplementary qualitative assessment - the Simplified Multi-Criteria Analysis (SMCA) – that was conducted to gather complementary data regarding governance and business related impacts generated by the MyCorridor ecosystem; this assessment integrated the CIA results and drew upon the results of site-based focus groups and one-to-one interviews that were held with stakeholder groups' representatives of the local pilot sites.

22 KPIs have been defined in total for the overall impact assessment framework (as depicted in the following table – see D6.1 and D6.3 for more); particularly, quantitative KPIs were employed to estimate impacts using data collected both for the baseline scenario and during field tests in order to conduct a before/after impact estimation of the MyCorridor system. The vast majority of them were estimated by means of CIA methodology, the remaining ones (i.e. KPI 10-14 & KPI 22) were addressed through the stakeholder consultations that were carried out during the project. These consisted of three focus groups carried out in Austria, Greece and Italy as well as direct one-to-one interviews with MaaS stakeholders in Czech Republic, the Netherlands and in the UK.

Table 8: MyCorridor project KPIs.

Level	KPI id	KPI	Level	KPI id	KPI	Level	KPI id	KPI
Individual/user level	1	Total number of trips made	Business/organisational level	8	Number of customers	Societal level	15	Emissions
	2	Modal shift		9	Customer segments		16	Resource efficiency
	3	Number of multimodal trips		10	Collaboration/partnership in value chain		17	Citizens accessibility to transport services and beyond
	4	Attitudes towards PT, and shared mobility		11	Revenues/turnover		18	Citizens overall comfort & well-being
	5	Perceived accessibility to transport		12	Data sharing		19	Trustworthiness in transport
	6	Total travel cost per individual		13	Organisational changes, changes in responsibilities		20	Security and safety of citizens
	7	Total travel time per individual		14	Contribution to standards and novel business models		21	Modification of vehicle fleet
							22	Legal and policy modifications

Among other (full analysis can be found in public D6.3), from the extensive impact analysis conducted, it can be concluded that MyCorridor has the potential:

- (KPI 1) **to reduce the overall number of trips equating to a -55%** in the overall amount of trips with respect to the baseline situation;
- (KPI 2) **to deliver a modal shift in favour of bus and cycling modes represented by 15% and 10% increases in the use of bus and cycling modes** respectively;

- (KPI 3) **to increase the number of multimodal trips, i.e., +6% increase in the number of multimodal trips** with respect to the baseline situation;
- (KPI 4) **to result in a minor positive change in attitude toward the use of shared mobility options** based on the results of Likert-type questions to travellers.

Particularly, the **modal shift achieved translates in an increase in customer numbers, i.e. KPI 8, for bus (+101 users over the whole duration of the trial period) and bike sharing (+62 users over the whole duration of the trial period) modes, reflecting in a positive economic impact for respective operators.**

A **worsening of the overall accessibility to transport services** (i.e., bus, rail) perceived by MyCorridor users was estimated (based on users' surveys based on Likert-type questions), which **may have been triggered by the current pandemic situation** and, particularly, by travellers being reluctant to use PT to perform their daily trips during the health emergency crisis, unless the trip was strictly necessary; and negative to negligible impacts for individual total travel time (KPI 6=+5% compared to the baseline) and travel cost (KPI 7=+18% compared to the baseline equating to +6 min delay experienced by travellers on average when compared to the baseline conditions) were estimated.

MyCorridor also demonstrated a **significant reduction in CO_2 emissions** from road-based transport activity (KPI 15=-23%).

In the interviews and focus groups conducted with 31 transport and MaaS stakeholders across the five pilot sites, plus the UK, the objective was to understand where stakeholders felt MaaS had the most potential impact, how that might be affected by business model and deployment context, and what other contextual factors may influence impact. Responses indicated that revenue and profit was a key impact in private urban settings, whereas in the urban-public scenario increasing passengers was perceived as a more relevant impact. Additionally, in rural environments, the impact was more in terms of externalities (accessibility, equity, safety and environment), whereas the impacts in urban environments related more to operational factors (revenue, passenger numbers, transport connectivity).

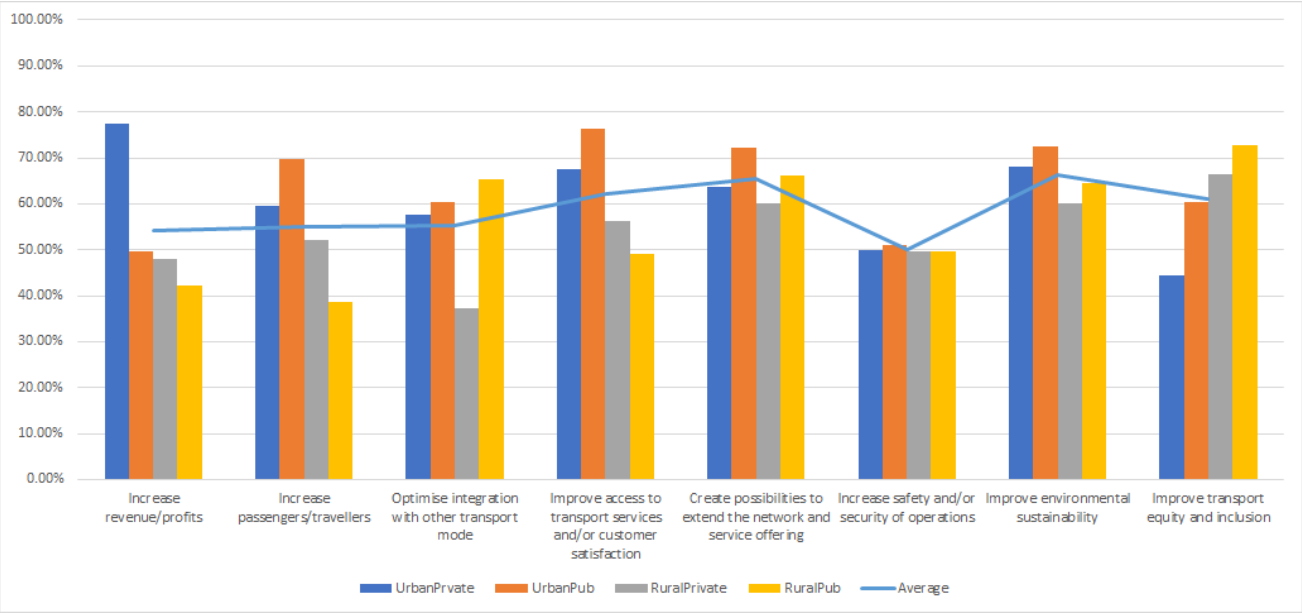


Figure 97: Impact comparison deployment scenarios by country and average among stakeholders.

A number of additional factors were raised as relevant to impact context. Concerns around data sharing and interoperability, and lack of national / local political support were seen as the most relevant barriers to impact. Policy was most necessary for equitable data sharing, common data sharing standard and in the role of a neutral body to act as guarantor of data sharing. Finally, while MaaS can support the COVID-19 recovery by providing travellers with new types of information (e.g. crowding / social distancing), stakeholders felt that the unprecedented change brought about by COVID-19 offered a significant opportunity for MaaS to enter and reshape travel. The above findings from stakeholder consultations were also validated through an interactive survey that was administered to participants of the 3rd MyCorridor Pan-European workshop. Other than validating the most popular entry-level barriers preventing cross-border MaaS, amongst the most favored recommendations that MyCorridor put forward were the inclusion of advanced traffic management features into MaaS planning (acting as an enabler for MaaS) and the establishment of data sharing protocols and fair business rules avoiding unfair market competition.

11.1.2 Lessons learned from MyCorridor impact assessment studies

An effective MaaS solution providing citizens with simplified access to multiple mobility options can be a powerful tool enabling a modal shift towards more sustainable modes of transport, reducing the use of private car-based mobility and improving transport externalities. Previous research has established direct positive effects for business organisations participating to MaaS, whilst, on the other hand, key implications for them would also lie in the need for changing their value proposition and existing data sharing practises, and a potential re-organisation of staff responsibilities.

Given the lack of robust, extensive evidence currently available for both types of users, it is of paramount importance to establish new knowledge in this area in order to ultimately gather an informative basis driving awareness, uptake and political commitment for MaaS.

MyCorridor demonstrated positive effects, also facilitated through the advanced traffic management features (TM2.0), in relation to the reduction of the overall number of trips, a modal shift towards bus and cycling trips, an increase in the number of multimodal trips and a positive attitude towards shared forms of mobility. These positive effects must be contextualised in a scenario with strong travel restrictions imposed across the EU throughout the operation of the pilots, which generated a lower than expected acceptability/use of shared forms of mobility (i.e., due to a high perception of contagion risk) and an altered existing mobility behaviour (i.e., on average less trips unless these were necessary); under normal circumstances, in a real-life operational environment, the materialisation of such positive impacts are considered to be only affected by the way in which the MaaS offering is packaged, the number and types of services available at different sites as well as by the specific incentivisation mechanisms enabling behavioural change in favour of more sustainable travel choices.

MyCorridor proved to be attractive for males, people aged 26-45, highly educated users as well as family members (i.e., living with partners and/or with children); however, the extent to which users' choices and the overall uptake are influenced by the high number of contributing situational factors (e.g., age, gender, education, living conditions as factors used to segment MyCorridor users) could not be directly established given the limited volume of contextual data and the high interdependencies among such factors.

Particularly, given the emergency context, the volume of data that could be collected for heterogenous user groups with different needs was lower than expected, thus resulting in a lower informative basis required to establish and validate cause-effect mechanisms for specific user categories. As a result, the collection of larger volumes of data regarding the socio-economic characteristics of users will be a critical element to consider as part as future research on MaaS in order to substantiate quantitative correlations

between socio-demographic profiles and the potential uptake of MaaS, and thus their resulting change in behavior.

Despite the circumstances, MyCorridor proved its potential to generate an economic impact for service providers who experience increases in their customer basis with all traveller clusters being addresses thanks to personalisation features. It should also be mentioned that the availability of a larger number of services will in future not only drive more informed and sustainable travel but will also provide further evidence to demonstrate increases in customers as well as economic gains that can be achieved for any kind of service providers (either mobility-related or added value).

MyCorridor demonstrated its potential to contribute to the reduction of CO_2 emissions from road-based transport activity thanks to the modal shift, the TM2.0 feature and a shift in mileage across different modes. Moreover, negligible to minimum negative before-after impacts citizens accessibility, general transport comfort, transport trustworthiness, personal safety and transport security are considered to be a reflection of the current travel restriction imposed at EU level and the change in individual behavior that was inherently generated.

A combination of stakeholder focus groups and interviews were also used in MyCorridor to access perceptions of the major areas of MaaS impact, and of potential barriers and contextual factors that influence success of specific deployment scenarios (i.e., private-urban, private-rural, public-urban, public-rural MaaS). Transport accessibility and transport integration were seen as the most dominant stakeholder impact criteria, that is criteria by which stakeholders judge alternatives. While other impact criteria were rated as less important, this was in part due to them being more relevant to specific contexts – revenue was more important to private MaaS deployment, while passenger numbers were more relevant to policy makers and to the public setting, particularly in the urban environment.

While the rural mobility context was seen as more challenging, particularly for private MaaS, there were benefits found with regard to transport inclusivity and equity, and a reduced environmental footprint. The results of the focus groups and interviews also highlighted the importance of data standards and regulations as well as of niche business models and roles. On the other hand, the technology was felt to be reasonably mature and less of a concern.

Despite the challenges that still exist, the above findings confirmed that MyCorridor has a very valuable use and even more promising future potential for both travellers and other stakeholders, and can ultimately generate a change in existing travel patterns enabling for a shift towards more sustainable and less polluting mobility, while offering considerable value to car drivers and subsequent traffic efficiency and environmental gains through the advance traffic management functionality (i.e., TM2.0).

Considering the objective difficulties and the very peculiar conditions MyCorridor was forced to operate, its overall impact magnitude must be further consolidated at the EU level; additional evidence from large scale deployment under “normal” mobility and life circumstances would definitely allow to validate the lessons learnt and ultimately quantify the actual value MyCorridor generate specifically for travellers, business organisations and society as a whole.

12 Legal Issues & MaaS

During the project, a series of legal aspects related to MaaS were explored. The table below sets out, at a high-level, the key legal issues considered during the MyCorridor project, as applicable to MaaS. Further below, we summarise some of the specific issues and key lessons learned from the MyCorridor project.

Table 9: Legal issues applicable to MaaS.

Legal issue	Comment
Data protection	Data protection must be a top priority for any MaaS ecosystem, which is heavily dependent on quality data, including personal data.
Cybersecurity	Cybersecurity must also be a top priority for a MaaS ecosystem, given the vast amount of data that a MaaS ecosystem processes.
Intellectual Property Rights / licensing agreements	In a commercial MaaS context, greater control of intellectual property rights may be required. This would not only be to protect any rights in software and other technical solutions, but also where (and to the extent) intellectual property rights may be used to protect, control and monetise valuable data. However, on the other hand, the use of intellectual property rights, (where possible), to protect data, can further restrict access to data and may stifle the development of MaaS.
Consumer law	Platforms and stakeholders within a MaaS ecosystem must consider the consumer laws applicable to each jurisdiction in which they provide services to consumers. This requires considerable time, and may prevent a uniform approach across borders.
Contractual framework	Owing to the numerous stakeholders involved in a MaaS ecosystem, there can be a complex network of contracts to consider and negotiate.
Legal and contractual liability between MaaS stakeholders	Contractual liability in MaaS may be an area worthy of further research and possibly EU-level legislative intervention, to ensure that liability can be apportioned fairly and appropriately within MaaS, particularly where a MaaS platform already enjoys significant market power.
Payments law	Payment services providers will play a key role in any MaaS platform, bringing challenges and considerations from a payments law perspective.
Platform regulation	The application of platform regulations and, in particular, the P2B Regulation to MaaS platforms and any resulting obligations imposed on MaaS platforms should come to light in the coming years.
Competition law	Competition law is a key framework relevant to MaaS, which could be a concern to those organisations who already hold significant market power in the mobility sector. However, competition law can also help to grow the deployment of MaaS, by preventing market leaders from blocking off access to MaaS to new entrants.
Data standardisation and interoperability	A lack of data standardisation and technical interoperability requirements, both at national levels and at an EU-level, can complicate, and even restrict, access to data in MaaS and the integration of various MaaS solutions.
Local regulations and industry agreements / legal interoperability	Local regulations and industry agreements, regulating fares and ticketing, can complicate or even create barriers to the integration of ticketing functions into a MaaS platform.

Various legal and commercial issues can create challenges to the deployment of MaaS. During the MyCorridor project, Osborne Clarke, as a MyCorridor Consortium partner, advised on some of the key issues noted above, and explored practical and legislative measures which may assist with the deployment of MaaS ecosystems and MaaS platforms. Osborne Clarke also drafted legal contracts and other documentation, required for the MyCorridor project, providing an indication of the contractual framework applicable to a MaaS ecosystem. Further information can be found in *D7.4: Analysis of the legal and regulatory barriers in MaaS*, but we set out below a summary of the primary lessons learned during the MyCorridor project.

- **Data protection**

One of the key lessons learned from the MyCorridor project is that access to data and stakeholder trust are integral to the success of a MaaS platform and ecosystem. Proactive and ongoing governance, security and regulatory compliance procedures will encourage users to sign up to a MaaS solution and share their personal data with the MaaS platform.

- **Access to data**

'Data institutions', designed to offer a form of data governance, to encourage the sharing of data (not just personal data), could offer a governance solution for data sharing within MaaS, building trust between various stakeholders. Data institutions and 'data trusts' are explored further in D7.4.

- **Standardisation**

A lack of data standardisation and technical interoperability requirements, both at national level and at an EU-level, can complicate, and even restrict, access to data in MaaS and the integration of various MaaS solutions. Ongoing EU-level intervention in this regard is required to facilitate the deployment of MaaS.

- **Payments in MaaS**

With respect to integrating payment services into a MaaS platform, consideration needs to be given to this early on. In particular, time needs to be dedicated to assessing the payments model required for the platform, and which regulated payment service the prospective payment services providers are licensed to perform, particularly in the context of cross-border MaaS.

- **Contractual framework**

The MyCorridor project evidenced the complex network of contracts required within a MaaS ecosystem, and the lengthy negotiations that can take place, particularly in relation to liability, with numerous stakeholders involved in a MaaS ecosystem. Contractual liability in MaaS may be an area worthy of further research and possibly EU-level legislative intervention, to ensure that liability can be apportioned fairly and appropriately within MaaS.

- **Consumer law**

From a consumer law perspective, MaaS platforms will have to consider the consumer laws applicable to each jurisdiction in which they operate, as well as the various transport-mode specific consumer laws. While there is a level of harmonisation across the EU, differences do exist which will require considerable time to ensure compliance.

- **Legal interoperability**

Local regulations and industry agreements, regulating fares and ticketing, can complicate or even create barriers to the integration of ticketing functions into a MaaS platform. An example of this during the MyCorridor project came in the context of rail ticketing. Following discussions with the provider of an existing EU-wide ticketing platform, with the goal of integrating that platform's services into the MyCorridor platform for the purposes of the Pilots, the provider decided it would be unable to participate in because in some countries the local regulation and industry agreements that regulate the creation of rail fares and the issuance of rail tickets made it too difficult to integrate their services in time to join the Pilots.

13 Incentivisation & Promotion Strategies in MaaS

Socially responsible travel incentives and promotion schemes and MaaS can go hand in hand with one another. It is up to MaaS mobility providers to intelligently include travel incentives and promotion schemes which aim at decreasing emissions coming from the transport sector. MaaS has the potential to

portray itself as enabling a greener and more sustainable way of thinking among mobility users. Incentives and promotion schemes are considered as essential tools for the transport industry with many examples such as the ones of airlines and the advanced loyalty programmes introduced by them. These demonstrate best practices and customer loyalty. MaaS needs to co-exist with traditional transport modes, like the private car and the public transport, and thus a model that improves the lives of commuters significantly giving them alternative options and saving time and money can take over a market share.

MyCorridor's has paid special attention to socially responsible travel incentives and promotion schemes. The Deliverable *D7.2: Socially responsible travel incentives and promotion schemes* serves as a descriptive and analytical documentation discussing how incentives and promotion schemes could encourage and increase the use of MaaS solutions based on an extensive literature review conducted on transport and other service oriented industries. The aim of this "living document" is to provide recommendations on how to introduce a socially responsible incentive policy for MaaS. This policy is based on an overview of existing incentives and promotion schemes and from the feedback compiled from existing practices but also from the pilot sites and other relevant project activities.

During the course of this task, an overview of the European transport market was given by providing insights on traditional transport operators and the ones that have recently emerged in the smart mobility framework due to technological disruption. Relevant regulation is also discussed and mapped according to new mobility service providers, while it also includes regulatory frameworks for MaaS at EU and Member-State level. The opportunities and challenges that could impact MaaS deployment and relevant regulations and policies that MaaS will have to be considered. The economic model influencing MaaS is identified where different types of economies such as platform economies and sharing economies are analysed. These are taken into consideration related to how MaaS and more specifically MyCorridor could enhance a socially responsible travel behaviour.

Moreover, the documentation summarises the existing travel incentives and promotion schemes in Europe and beyond. Target groups for advertisement (age groups, business travellers, corporate employees, frequent commuters, tourists etc.) and other loyalty schemes across all transport modes (aviation, hotel industry etc.) are also discussed. Furthermore, travel incentives and promotion schemes applicable to MaaS are listed as well as advancing proposals on how to best incorporate them in a MaaS scheme and how MyCorridor be successfully deployed. A few suggestions for promotions and incentives for stimulating MaaS business success include:

- Loyalty schemes
- Promotion campaigns
- Scaling discounts
- Added value services
- Tax reductions
- Calculating CO_2 reductions by eco-driving
- Comparing environmental benefits because of modal shifts

A few examples can be as follows:

- Financial benefit for commuters to switch to cycling by paying an amount of money based on the km travelled.
- Vouchers equal to a specific amount of money that can be spent only for the purchase of ecological products – services (Train tickets – purchase of electric scooters, bicycles).
- Instead of providing a company car, the employer can provide employees with a budget to be spent on other transport modes as car sharing, public transport, etc.

- Environmental incentives by the governments – cities (10% discount on MaaS costs) if you pollute less than the average commuter (>30% less CO_2) - CO_2 Compensation programmes.
- Promotions for students, socially excluded parts of the city population.
- Promotions on days or time-slots where there is no congestion.
- Discounts or free access to public transport by purchasing tickets at cultural events.
- Social responsibility or CSR plans targeting CO_2 reduction.

The above schemes can be subsidised by the employer, government, cities, transport providers, cultural or similar promotions etc.

The main challenges while applying incentives/ promotion schemes can be:

- The integration of existing promotions/ incentives (by a transport provider) to a MaaS platform and how the total discount will be calculated when similar schemes are overlapping.
- The inclusion of regional, national and European governmental schemes or employer schemes and the interoperability with governmental platforms.

MyCorridor has also provided recommendations on how to overcome challenges. A challenge for MaaS is to ensure that users are aware of new technologies and alternatives to private vehicle use. Loyalty schemes can play an important role in increasing awareness by rewarding loyal customers which could then lead to the creation of MaaS 'ambassadors'. It is significantly important for MaaS to grow and consolidate itself in parallel to the current regulatory uncertainty that there is at the moment. For this reason, cooperation between stakeholders typically involved in the MaaS supply chain is key. Cooperation is also needed to overcome any barriers that the transport stakeholders might be facing.

14 Business modelling & Exploitation results

The business modeling work of MyCorridor is performed in the framework of *WP7: Business models, incentives and legal issues* and specifically in A7.1. The results of this work are presented in *D7.1: Mobility Services Aggregator Business Model*, which examines the business model that a MaaS provider, could employ when running the system. The business modeling work done includes an analysis of the challenges that have emerged in the last years in the Mobility market as MaaS is becoming more and more popular as a concept, namely:

- The diversity of MaaS schemes' deployment options;
- The diversity in the nature and objectives of the stakeholders within the MaaS Eco-system;
- The migration of the end user's role from a simple consumer of services and infrastructure user towards an active stakeholder in the co-production value chain;
- The conflicts arising from the new Public Sector perspective in delivering MaaS vs the emergence of new private-sector providers;
- The quest for Mobility Management using MaaS as a user behavioral change tool.

MyCorridor responds to these challenges by developing multiple MaaS business model scenarios and deployment strategies. The following table presents each one of the alternative **basic deployment scenarios** and their characteristics.

Table 10: MyCorridor basic deployment scenarios.

Scenario	Characteristics
Scenario I – urban-private-led MaaS	MaaS marketplace with many multiple services and limited integration:

Scenario	Characteristics
	▪ Strong competition among market players over profitable customer demand segments; ▪ The proliferation of fragmented services; ▪ Services integration potentially low restricting large-scale adoption of MaaS.
Scenario II – suburban-private-led MaaS	MaaS marketplace with high access costs and dependence from car ownership: ▪ Low population density resulting in high access cost to MaaS; ▪ Lack of critical mass produces low QoS; ▪ Moderate to high dependency on private car results in negative environmental impacts.
Scenario III – suburban-public-led MaaS	Public-led MaaS with heavily subsidised service offer: ▪ Heavily subsidised services that are capable of offering service at no more than satisfying levels; ▪ Public-led nature of service delivery provide a good level of integration across service needs such as school trips, hospital visits, etc.
Scenario IV – urban-public-led MaaS	Public-led MaaS with heavily subsidised service offer: ▪ Service delivery is heavily driven by procurement systems and minimum requirements; ▪ Potentially high level of service integration; ▪ MaaS offer seamlessly meeting diverse needs of customers.

Furthermore, the general MaaS deployment model would distinguish **between the MaaS Platform and the MaaS Operator,** who is the entity providing the service to the end-user. The MaaS Operator can be also a "Global" player that has its own platform and customize it for each city/area. Or the MaaS platform could be an independent entity that hosts all the data and functionalities needed for a MaaS Operator to provide its products. MyCorridor as a system can include both options. It could be deployed as:

1. Either a MaaS operator who owns its platform – End to end system for B2B2C market.
2. And/Or as a MaaS Platform (from now on MaaS aggregator platform or MaaS aggregator according to MyCorridor terminology) – B2B platform serving MaaS operators.

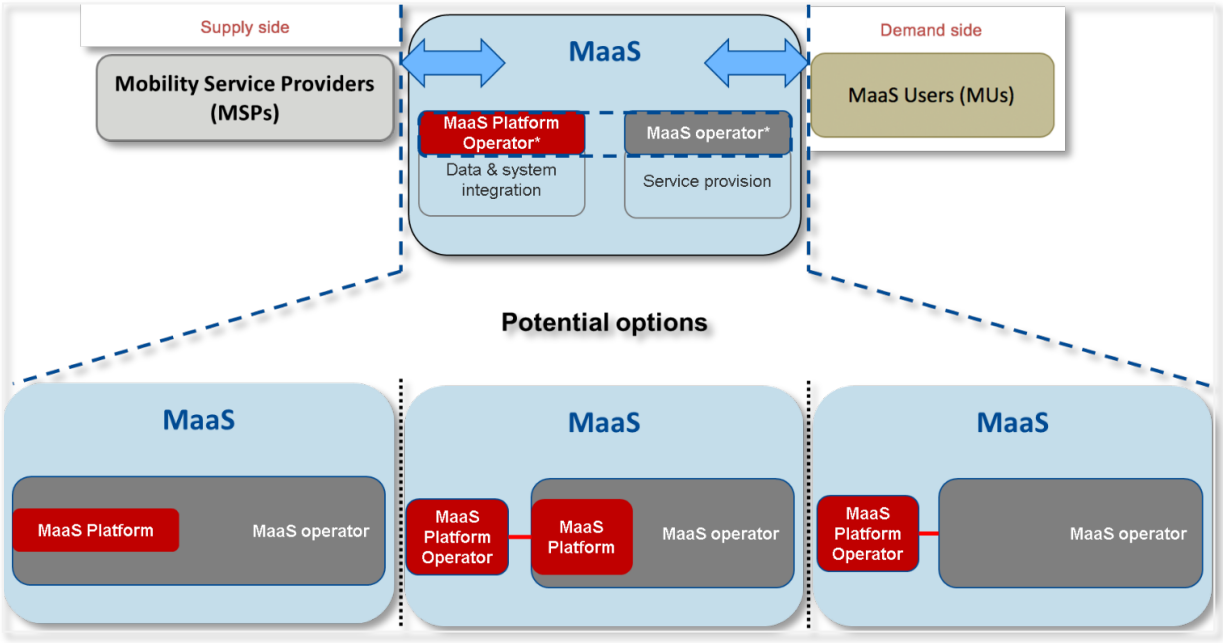


Figure 98: Distinguish between MaaS operations (services to users) and MaaS platform (data management) [Source: Mobility as a Service (MaaS) and Sustainable Urban Mobility Planning (SUMP), Practitioner Briefing, European Platform on Sustainable Urban Mobility Plans, 2019].

MyCorridor has on top, a cross-border aspect: the various MaaS stakeholders can work internationally via a distributed model supported by MyCorridor; this allows a "Global" effect on local independent operations. The effect is twofold:

- Interoperability between independent systems, which allow travellers to use MaaS service of other cities when they are visiting the latter.
- Add on service links on interurban and possibly cross border Corridors.

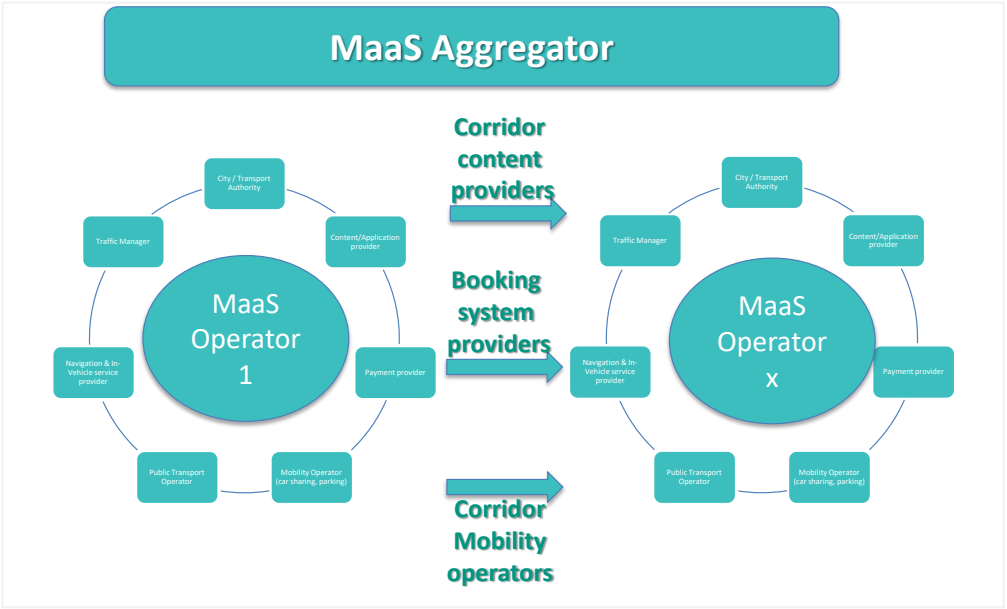


Figure 99: Interoperability between different MaaS locations and operations.

By bundling these alternative strategies, MyCorridor results in 3 dominant deployment options and respective business models:

Table 11: Dominant MyCorridor deployment options and respective business models.

MyCorridor system deployment option	Description	Deployment building blocks	Market	Interoperability & Cross border level	Customer - Audience	Business model
Global MaaS operator	MyCorridor is deployed at global level covering multiple areas and corridors in between as a B2C system servicing end users.	Urban scale and/or Rural scale (for different locations) Private led or Public led (National/Regional Public Entity)	B2C	High	End users Local End users Visitors Mobility service providers (local and corridor) VAS providers Advertising customers City Authorities Traffic management operators	Freemium Transaction fee Click on fee Impact based fees (measured against KPIs)
Local MaaS operator	MyCorridor is deployed at local level covering one and only area as a B2C system servicing end users	Urban scale and/or Rural scale (for adjusting areas) Private led or Public led	B2C	None	End users Local End users visitors – through the MaaS aggregator collaboration with MyCorridor like MaaS operators Mobility service providers (local) VAS providers (local) Advertising customers City Authorities Traffic management operators	Freemium Transaction fee Click on fee Impact based fees (measured against KPIs)

MyCorridor system deployment option	Description	Deployment building blocks	Market	Interoperability & Cross border level	Customer - Audience	Business model
Global MaaS aggregator	MyCorridor is deployed at global level covering multiple areas and corridors in between as a B2B system servicing local MaaS operators	Urban scale and/or Rural scale Private led Or Public led (National/Regional Public Entity)	B2B2C	High	Local MaaS Operators Corridor Mobility service providers & VAS providers City Authorities	Subscription and or transaction fees Impact based fees (measured by KPIs)

Through the two business model methodologies (Business Model Canvas; Business Model Radar (BMR)) that have been deployed in MyCorridor in order to analyze the modeling issue, it has been proved that MyCorridor can support a multi-stakeholder MaaS environment, comprised of multiple players, who run their businesses at either local or global level, urban or Rural environment, coming from the either public or private sector. On top, MyCorridor facilitates a one-stop-shop of services among and between various locations by providing interoperability between local and long haul, corridor mobility service providers through the MaaS Aggregator.

MyCorridor project proposes a **value-driven business model**, which focuses on the end-user (**User Centric**). In fact, MyCorridor develops value for the end-user traveler as a B2C one-stop-shop of personalized and interoperable services but also expects the user to be a co-productive partner, who delivers:

- Personal and preferences information for marketing purposes;
- Operational data such as FCD;
- Feedback on services' quality;
- Social and responsible mobility behavior according to MyCorridor system's suggestions.

As a result, the value generated by the end-users is distributed to the entire MaaS ecosystem, which is extended to include the TM2.0 stakeholders (i.e. MaaS operators, Mobility service providers, City Authorities, Traffic Management operators). To achieve this, MyCorridor employs an Open Tool approach to accommodate different and variant business and strategic objectives of the stakeholders. By "Open" we mean a flexible mechanism, which facilitates different objectives and respectively incentive strategies. This approach will lead to a win-win result and will facilitate synergies between the private sector, public sector and TM at local but also in European levels. MyCorridor maintained a continuous contact with TM2.0 platform to cooperate in this perspective. The cooperation resulted in two TM2.0 Task Forces (TF) for MaaS and Mobility Management respectively, which were based on MyCorridor work. The latter TF was jointly undertaken with MaaS Alliance.

Thus, the key targeted customer segment is the mobile **end-user** clearly distinguished between inhabitants (local users: commuter or leisure traveler) and visitors (for business or tourism). So long as

a satisfactory number of end-users is attracted the **Mobility Service Providers** will increase their sales through the B2C application. Besides Mobility service providers, MyCorridor could also support value-added services (VAS) in the area of recreation and tourism. In this context of long-haul trips along with corridors **VAS providers** are another important customer segment.

MyCorridor can support **City Authorities** to deploy a successful city-wide MaaS scheme (either through public procurement or through an open backend platform model), and **Traffic Managers** to operate a multimodal management scheme. The personalised function could accommodate focused advertising based on end-user preferences. The **advertising customers** could be *Mobility service providers or other retailers.* To develop a cross border network of MyCorridor like-minded systems, another important customer segment is **potential MaaS operators** (B2C one-stop-shops at the local level).

Respectively the business model analysis identifies the following main revenue streams as a B2C service (provided by a MyCorridor MaaS operator):

- Sales fees from the mobility service provider
- Sales fees from VAS provider
- Advertising fees
- One-time off fees from registered users for advanced services
- Impact driven fees from Authorities and Traffic Managers

And the following main revenue streams as a B2B(2C) service aggregation platform (provided by a MyCorridor MaaS aggregator):

- Fees from MaaS Operators in the network.
- Sales fees from mobility service providers along corridors.

In the context of business modelling work, MyCorridor organized a Workshop in Rome on 16 November 2018, which mainly focused on the business aspects of MaaS deployment. In the context of the framework, the project organized an interactive business model session by engaging the audience in the development of the business model radar for specific business cases. The BMR technique was applied in the interactive business modelling session, in which several stakeholders both from MyCorridor project and external to the project participated. In this session, the opinion of the participants regarding the proposed business framework and model by MyCorridor was sought. The vast majority of the audience accepted that the defined challenges were indeed the ones hindering MaaS wide deployment and that MyCorridor proposal was viable and realistic.

Figure 100: MyCorridor Workshop in Rome (16/11/2018).

Elaborating the results of the business modelling workshop, the project has devised a BMR analysis for 4 business cases. The following table presents the main actors and co-creation value per case:

Table 12: Alternative business case scenarios examined under the BMR exercise.

A/A	Business case	Customer*	Focal Actor	Core Actors	Enriching actor	Co-created value
1A	Base case: B2C MaaS (Private sector deployment)	Mobility service providers VAS providers (optional)	MyCorridor MaaS operator (Private enterprise)	End-user	City Authority Content providers Traffic management operator	Trip planning, On-trip support → Service sales
1B	Base case: B2C MaaS (Public sector deployment – Public procurement)	End-user	MyCorridor MaaS operator (Public sector)	Mobility service providers Traffic management operator	Content providers VAS providers	Trip planning, On-trip support → Socially responsible mobility
1C	Base case: B2C MaaS (Public Transport deployment – Public or Private entity)	End -user VAS providers (optional)	Public Transport operator	Mobility service providers	City Authority	Trip planning, On-trip support → Increase PT Service sales
1D	Base case: B2C MaaS (PPP method)	End-user Mobility service providers	MyCorridor MaaS operator (Private enterprise) City/Transport Authority	Traffic management operator	Content providers VAS providers	Trip planning, On-trip support → Socially responsible mobility & Service sales
2	Interoperability case: Touristic B2B(2C) MaaS	MaaS operator at visiting the site MaaS operator at home site	MyCorridor MaaS aggregator	Visitor end user Mobility service providers at visiting the site and along Corridor	City Authority Content providers Long Haul booking systems VAS providers at visiting the	Trip planning, On-trip support → Interoperability of services & Seamless trip

A/A	Business case	Customer*	Focal Actor	Core Actors	Enriching actor	Co-created value
					site and along corridors	
3	Traffic Management case	Traffic management operator	MyCorridor MaaS operator	End-user Mobility service providers Real-time traffic service providers	City Authority Content providers	Trip planning, On-trip support → Traffic efficiency (based on KPIs)

** Advertising customers are omitted for reasons of minimising complexity, although they are a possible option*

Overall, the following business model innovations are identified:

- The business model takes into account the needs of **Multimodal Mobility Management**; MaaS system can become a channel for recommendations to end-users, imposing as such soft measures through influencing user behavior.
- **Impact driven business model**. One of the main customer targets (and revenue stream) is the Transport Authority and/or Traffic Management Operator. The revenues may come to the MaaS operator only when the impact is proven through the calculation of the relevant KPIs.
- **End-users are moving to the center of the service, but not as passive consumers**; they are in fact, becoming part of the value proposition by delivering value to the entire Eco-system.
- The proposed business model caters to **Interoperability and corridor based MaaS.**

The most promising of the research items analyzed in the project in this respect is the potential of MaaS to become a key tool to **influence user behavior within a public-private driven Mobility Management scheme**. For this reason, the report identifies as a major area of importance for future research the further definition of **Governance and business models for multimodal mobility management**.

In addition, during the project, the exploitation strategies and plans for the future MyCorridor product and its various configurations have been explored and reported in *D8.9: Exploitation plans.* The project exploitation strategy includes 3 alternative approaches that could be implemented in parallel, namely:

1. Exploit overall MyCorridor MaaS system; this approach considers MyCorridor outcome as a complete, integrated system that could be commercially exploited on the basis of a "global" and cross border MaaS application.

2. Exploit individual MyCorridor research results; this approach is based on the identification of the individual project's results that could become commercially exploitable products. For each one of them, the exploitation plan identifies a key partner for exploitation (Champion) and other beneficiaries, and describes a short individual exploitation plan.

3. Consider basic MyCorridor documentation and standard interfaces as public knowledge, which should be widely disseminated and/or supported for standardisation activities. In this context, the documentation could support the deployment of MaaS systems related to MyCorridor core concept, but not necessarily within the boundaries of MyCorridor's consortium. The two main results falling under this approach are: a) business model, b) data models/interfaces.

In this context, MyCorridor consortium recognizes two (2) different exploitation cases:

- MaaS digital service deployment case: MyCorridor system - or individual modules - deployed by a project partner as a global or local one stop shop for B2C or a B2B(2C) backend platform. In this case, MyCorridor products are licensed to the potential MaaS operator by the product owners. Furthermore, the industrial project partners can integrate their existing systems, services and products to the envisaged MyCorridor MaaS system.

- System/Software sales case: MyCorridor exploitable results are promoted in the market as individual products by industrial partners or spin off companies of Research partners, who are identified as "champions" (Key partners for exploitation). The champions could be either the product owners themselves or paying Royalties to the actual product owners.

The identified exploitable results of MyCorridor are in total 12. The majority of the identified results are of TRL 7 and above, which shows a significant maturity, and a short time to the market, mostly 1-2 years.. Out of the 12 identified results in total, those that are concerning the exploitation of overall MyCorridor system can be exploited either as a digital service case or as a software product sales case. Those that are concerning the individual exploitation of research results are mainly of software nature and shall be exploited as software product sales case.

On top, the Consortium has identified a couple of results that have a value as public knowledge and the basic exploitation will be performed through promotion to the MaaS community and standardisation.

- *Business model*: this is a documentation description of the business model to be followed by the entity playing the role of the MaaS Aggregator platform operator. It is supportive material to either one of the above mentioned cases. Furthermore, it could be used in the context of wide promotion of MaaS and MyCorridor concept to the general MaaS Community.

- *Data models and interfaces*: this is the documentation of the data models and interfaces to MyCorridor system. It is supportive material to either one of the above mentioned cases. Furthermore, it could be used in the context of wide promotion of MaaS and MyCorridor concept to the general MaaS Community and Standardisation.

As reported in *D8.9: Exploitation plans*, it has been recognised by the Consortium that the exploitation of those results requires further actions with respect to business agreements and enhancement with other applications especially in the Tourism domain. This approach is considered as providing a sustainable market future taking into account the post-pandemic increase expected in the mobility and tourism markets.

The identified exploitation results of MyCorridor are depicted in the following table.

Table 13: MyCorridor exploitation plans.

No	Type of exploitation strategy	Exploitable Result	Project Dels	Current TRL	Exploitation case	Type of result	Key Partner for exploitation (*Champion*)	Other Partners/ Contributors – royalties [4]
1.	MaaS system exploitation strategy	MyCorridor integrated, one-stop- shop solution	D3.1	7	MaaS service deployment Software sales	Digital Service Software	VivaWallet CERTH spin off	License by CERTH
2.		MyCorridor B2B aggregator platform	D3.1	7	MaaS service deployment Software sales	Digital Service Software	VivaWallet AMCO CERTH spin off	License by CERTH/ ITI
3.		Personalised mobile apps and services in iOS and Android	D5.1, D5.2	7	Software sales	Digital Service Software	CERTH /HIT (spin-off) , Chaps	
4.	Individual product exploitation strategy	Service Registration tool	D3.1	7	Software sales	Software	CERTH /ITI (spin-off)	-
5.		MyCorridor ticketing, mobility tokens & payment services	D3.3	8	Software sales	Software	VivaWallet	Royalties to CERTH

[4] *Partners in this column are – additionally to the Partners in the previous column - those involved in the development of each product. The specific exploitation rights of each and for each outcome will be explored through the IPR Directory that has been developed.*

No	Type of exploitation strategy	Exploitable Result	Project Dels	Current TRL	Exploitation case	Type of result	Key Partner for exploitation (*Champion*)	Other Partners/ Contributors – royalties [4]
							AMCO	
6.		Traveller feedback integration module (as standalone module)	D3.2	6	Software sales	Software	CERTH /HIT (spin-off)	-
7.		Business Rules editor	D3.3	7	Software sales	Software	AMCO	Royalties to CERTH/ ITI
8.		Interconnected MaaS VAS'es	Part of D4.1	9	Software sales	Software	WINGS	Royalties to CERTH
9.		Integrated multimodal planning for MaaS (as standalone module)	Part of D4.1	7	Software sales	Software	CERTH /ITI (spin-off)	Royalties to CHAPS, TomTom, HACON
10.		Integrated Traffic Management in MaaS (TM2.1 concept)	Part of D4.1	NA	Software sales	New Knowledge Improved Software	SWARCO MIZAR	Royalties to TomTom, SRFG, MAPTm
11.	Promotion of MyCorridor concept exploitation strategy	MaaS Aggregator business model and implementation policies	D7.1, D7.2D 7.3	NA	Support result	Documentation	VivaWallet/AMCO/CERTH/ SWARCO MIZAR	
12.		MyCorridor API & data models		7	Support result	Documentation & Standard	VivaWallet/A	

No	Type of exploitation strategy	Exploitable Result	Project Dels	Current TRL	Exploitation case	Type of result	Key Partner for exploitation (*Champion*)	Other Partners/ Contributors – royalties [4]
						software interfaces	MCO/CERTH	

15 Dissemination activities

15.1 Overview

In its 42 months of activity, the MyCorridor project has successfully fulfilled its communication and dissemination objectives, as shown above. The dissemination strategy presented for the first time in *D8.2: Dissemination strategy and actions* and all its scheduled updates (D8.3; D8.4) aimed to map all communication activities for the MyCorridor project and describe how to reach specific target audiences. It has served as the comprehensive and central listing for all communication activities and events over the course of the project. The following aspects were identified since the beginning:

a. **Identification of Target Audience and Stakeholders**:
   i. Private sector: Transport industry (traffic management, transporters, transport operators), Research centres and communities, Service providers (mobility, infomobility, added value), E-ticketing and e-payment service providers, Technology providers, MaaS aggregators and local nodes, Interest Groups (e.g. MOBiNET Service Provider Community, MaaS Alliance, CEN working group)
   ii. Public sector: Public authorities (including public transport operators), Municipalities/cities
   iii. End users: Travellers of all categories, General public, citizens
   iv. Media: Online sector magazines, Scientific/technological reviews.
b. **Determination of Key Messages**: Explain the objectives of the project, keep audiences informed on project developments and promote preliminary and final outcomes and results.
c. **Decision on key Dissemination Measures and Means/Channels**: include a balanced mix of traditional (scientific publications, conferences and demonstrations, stakeholder workshops, industry fairs and exhibitions) and innovative ones (social media, specialised websites and forums, workshops with companies specific audiences, strategic talks) to secure the most effective outreach to each target audience group.
d. **Monitoring**: The WP8 leader (IRU) would be constantly monitoring dissemination and communication activities in order to keep the project on track and reach the dissemination objectives.

The **key communication messages** defined and used over the project duration are as follows:

- Explain and make aware of the objectives of the project (stage 1)

- Keep audiences informed on project developments (stage 2)
- Promote preliminary and final outcomes and results (stage 3).

Over the course of the project, the following **key dissemination and communication activities** have been carried out:

- Creation of a coherent and consistent identity for the MyCorridor project, supported with e.g. logo, leaflets/flyers, brochures, banners, posters, and roll-ups. In addition, preparation and update of a brief project presentation in English that was used for any dissemination purpose;
- The creation and maintenance of a constantly updated modern website (http://mycorridor.eu/), where knowledge as an enabler of social change has positive effect in everyday life and is relevant to the target audience, and creation of a social media presence on LinkedIn and Twitter, in connection with all public events where MyCorridor is organising or participating in. In addition, frequent newsfeeds through articles in the web site and the social media but also through formal newsletters, press releases and the project videos has taken place during the project;
- The creation of an Interest Forum including stakeholders from all key target groups of MyCorridor;
- Organisation of project specific events and demonstrations at national and European level;
- Participation in key international and European conferences and industry exhibition fairs;
- Collaboration with major public and private stakeholders at round tables, cluster events and working groups organised by the European Commission or the project consortium;
- Submission of scientific and industry relevant articles to relevant journals and publications;
- Development of a dissemination monitoring mechanism that allowed for in-advance planning of up-to-the-point dissemination activities but also for following-up on the impact created.

Table 14: Key dissemination activities.

Type	Details
Website	Website was delivered in September 2017 and was regularly updated with content since then. It can be found at: http://www.mycorridor.eu/. After the GDPR introduction in May 2018, a GDPR compliant subscribe link has been added to the homepage as well as a pop-up window for first time users.
Social media	The following social media accounts were developed: • https://twitter.com/MyCorridor • https://www.linkedin.com/in/mycorridor/ They are managed by IRU Projects. They count so far: Twitter: 346 followers LinkedIn: 174 members
Publications	MyCorridor has had 15 publications in journals, conference proceedings and magazine articles.
Own events	MyCorridor held its 1st Pan-European workshop on 9 February 2018 in London with more than 50 participants and hosted by Osborne Clarke. The 1st clustering meeting was organised on 6 February 2018. MyCorridor held its 2nd Pan-European workshop on 16 November 2018. The 2nd clustering meeting was held on 15 November 2018 in Rome. The 3rd clustering meeting was held on 7 November 2019 at MaaS Alliance premises. Finally, MyCorridor's 3rd Pan-European workshop and final event was organised online. The event successfully gathered 72 virtual attendees, who learned

Type	Details
	from the consortium's online presentations about MyCorridor and from external speakers who were invited to present. The event was also virtually attended by INEA.
Participation in other events	MyCorridor participated in 39 events around Europe and overseas. Below is a summary of the main events and conferences to which MyCorridor participated in. Starting with TRB 2017 in Washington D.C., USA, CERTH presented MyCorridor for the first time to an external audience. Due to IRU Project's responsibility as a liaision with the MaaS Alliance, it participated and presented the project at numerous meetings which include the MaaS Alliance General Assembly on 19 June 2017. IRU Projects also presented the project during the 'MaaS in cities and regions' event organisd by POLIS on 19 September 2017. On 27-29 September 2017, CERTH participated and presented the project during the ICTR 2017 – International Congress on Transportation Research. A month later, IRU Projects presented MyCorridor in Montreal, Canada during the ITS World Congress organised by ERTICO. A few days later, IRU Projects and TTS Italia presented the project during the Middle East and North Africa Regional Congress organised by IRF in Dubai, UAE on 29-31 October 2017. In 2018, MyCorridor was presented at the beginning of the year during an IRU members meeting in Brussels, Belgium. A few days later, MyCorridor was represented by IRU Projects during ERTICO's Multimodality event on 24 January 2018 in Brussels, Belgium. During the Transport Research Arena (TRA) Conference 2018, Swarco Mizar presented the project on 16-21 April 2018 in Vienna, Austria. In September 2018, MyCorridor participated with numerous partners – IRU Projects, MAPtm, Newcastle University and Swarco Mizar – to the ITS World Congress 2018 held in Copenhagen, Denmark. A few months later in November 2018, MAPtm presented the project's objectives and state of play during the IRU International Taxi Forum in Cologne, Germany. In 2019, MAPtm and Osborne Clark presented the project during the MaaS Congress in the Netherlands in February. A couple of months later, in June 2019, MAPtm presented the project during the ITS European Congress organised by ERTICO. In November 2019, CERTH and MAPtm represented and presented MyCorridor during a Horizon 2020 MaaS Workshop jointly organised by CEN, INEA and DG MOVE. A month later, on 4-5 December 2019, MyCorridor was presented by the University of Newcastle at the 3rd European conference on results from transport research in H2020 projects. In April 2020, MyCorridor was supposed to participate in the TRA conference with a special session, which was cancelled due to COVID-19. Despite events and conferences shifting to a virtual format, MyCorridor participated in numerous occasions. CERTH, due to the liaison activities conducted by IRU Projects with the MaaS Alliance, presented the MyCorridor API at the MaaS Alliance Technology and Standards Working Group meeting on 21 September 2020. In October 2020, MyCorridor was invited to speak at the General Assembly of the MaaS Alliance where the University of Newcastle presented the project. On 19 November 2020, the University of Newcastle was invited to speak at a webinar organised by POLIS on MaaS. Finally, on 1 December 2020, MyCorridor participated and presented the project at the at the 4th European conference on results from transport research in H2020 projects.

Type	Details
Flyers, logos and project identifiers	The project logo was developed by IRU Projects at the beginning of the project while the flyer was developed by TTS Italia and delivered in November 2017. The project brochure was also developed by TTS Italia with two different versions. The first version of the project brochure was delivered in May 2018 while the second version was delivered in May 2019. An extra brochure was created ad hoc for the MyCorridor final event early 2020. Two roll ups to be used at events were developed and printed in January 2018 and November 2018 respectively.

15.2 Target audience

The **target audience** encompassed all stakeholders involved in the value chain: Industry & SMEs, research, end users, the public sector and public authorities and multi-sector associations. The targeted audience was successfully reached thanks to a set of tools and actions, such as the project's website and social media accounts, the project newsletters and press releases. Such positive outcome was measured with KPIs, set each year and outlined in section 15.6 below.

15.3 Project identity

All dissemination material produced in the project can be found in the Library of the web site.

15.3.1 Logo and visual identity

The visual identity of the project, defined by IRU Projects, was inspired by a set of keywords: mobility as a service, corridor, connection, location, innovation, travel and road. The logo has positive and fresh colours that would reflect the innovative aspect (orange) and the sustainability aspect of the project (green). The logo is centered on the word "corridor" and incorporates the path element, which is reflecting both road and rail transport. The logo was added to any official document related to MyCorridor (PowerPoint, deliverable etc.), to any dissemination and promotional material, and where possible to the websites of the Project partners.

Figure 101: MyCorridor logo.

15.3.2 Website

The MyCorridor website was launched as the main communication tool for the project. It is the online "face" of the project and includes all relevant information, both for external stakeholders and internal (Consortium). The website runs on the WordPress content management platform to enable simpler uploading, publishing and management of content. The website integrated from the beginning social media tools (e.g. LinkedIn, Twitter) to provide active participation and support to the project's community. The web site has been live since September 2017 and can be accessed at: http://www.mycorridor.eu/.

The website has successfully met the target of having 100 users per month by average, as it can be seen below.

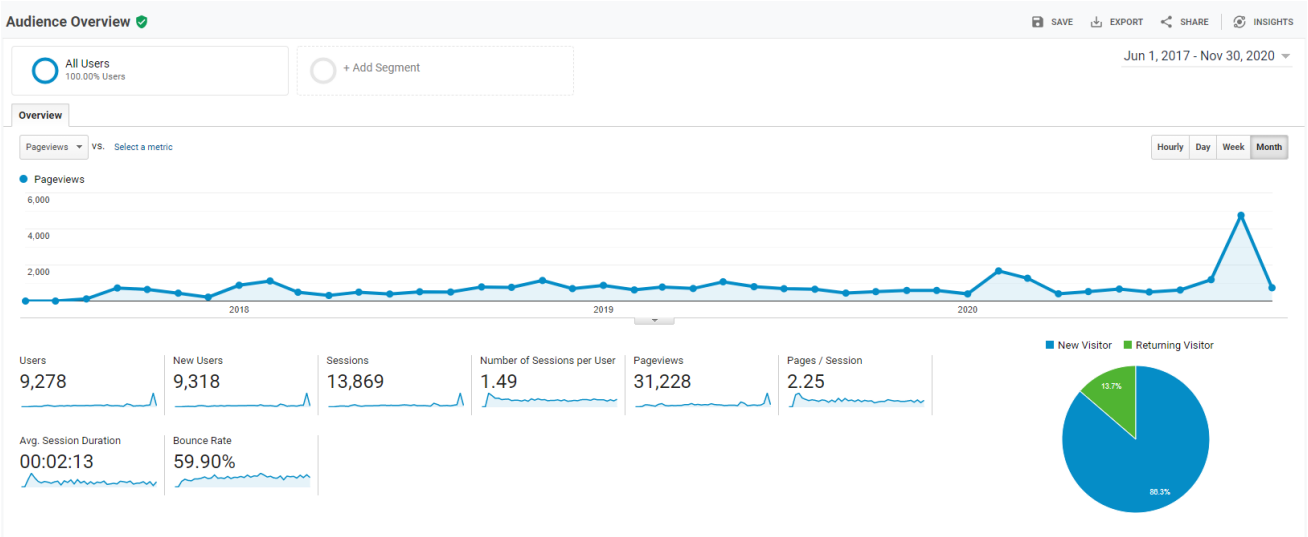


Figure 102: MyCorridor page views from June 2017 to November 2020.

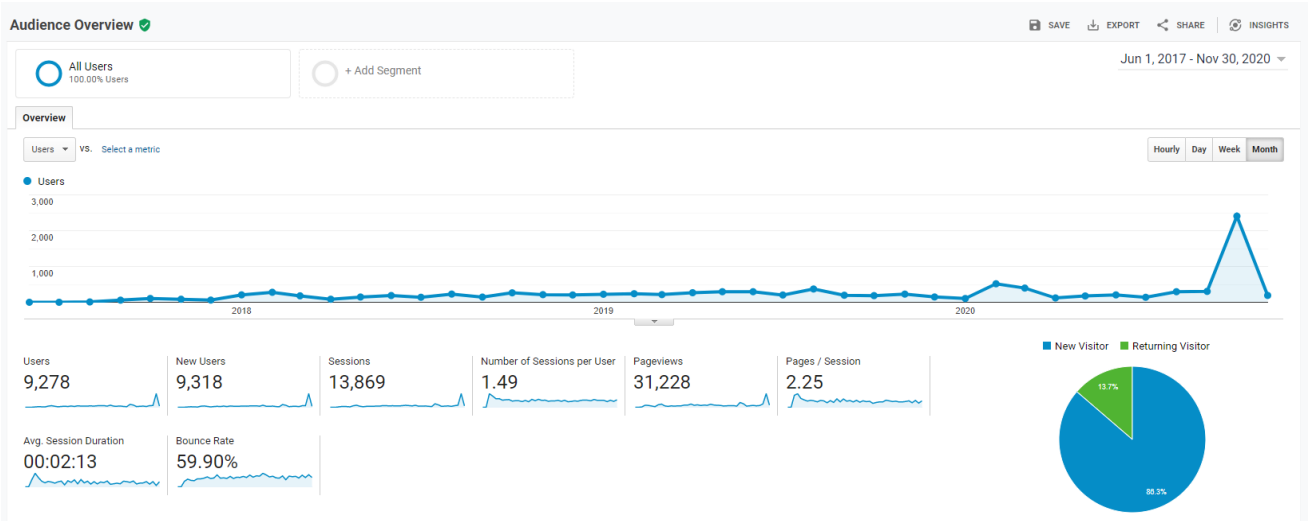


Figure 103: MyCorridor active users from June 2017 to November 2020.

15.3.3 Interest Group

One of the main strategies elaborated under the MyCorridor project for the engagement of stakeholders is the creation of the MyCorridor Interest Group. The MyCorridor Interest Group was set up in November 2018 and includes more than 180 stakeholders, ranging from transport and mobility service providers, authorities, research organisations and various associations. The Interest Group has served as major dissemination pool for project news, events and on-line surveys.

MyCorridor has established a mailing list on Mailchimp to be used for the dissemination of the electronic newsletter and press releases. This list comprises of all MyCorridor contact lists and relevant partners contacts. With the introduction of the General Data Protection Regulation (GDPR) coming into force on 25 May 2018, the MyCorridor mailing list had to be revised in the way that all contacts the list included had to opt-in during the sent GDPR campaign to continue receiving project news and information.

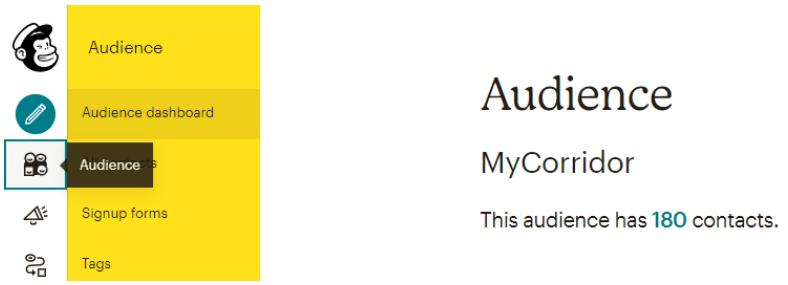


Figure 104: MyCorridor Interest Group contact list.

15.3.4 Promotional flyers, posters and brochures

A promotional flyer about the project has been produced and distributed (in print and electronic forms) to a broad range of stakeholders that participated in all project events but also to those that the project participated. In parallel with the flyer, two project brochures describing MyCorridor's activities and goals in greater detail were developed in May 2018 and May 2019 respectively. An extra brochure was also created ad hoc for the MyCorridor final event.

Figure 105: Front of the MyCorridor flyer.

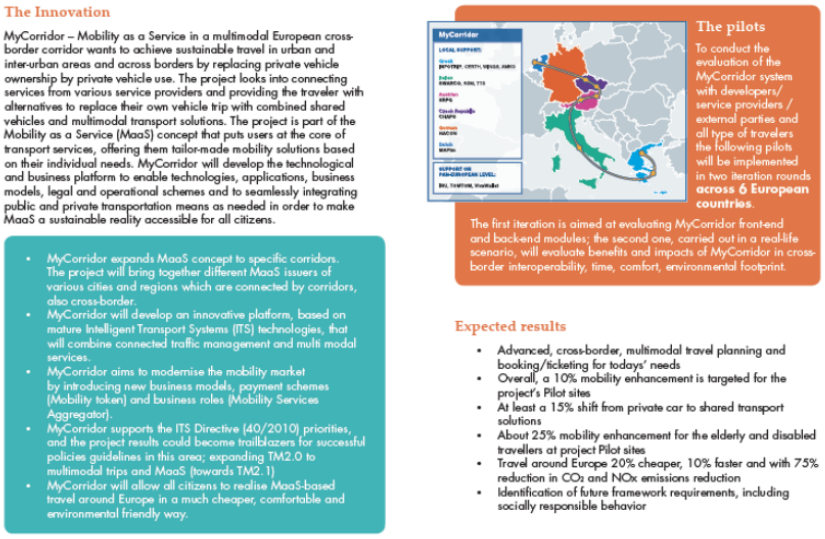


Figure 106: Back of the MyCorridor flyer.

The preparation of a project roll-up was not explicitly listed under the project dissemination actions. However, it has proved an important tool to further define the visual identity of the project and properly capture audience attention when participating at events. The project roll-up was especially used during the MyCorridor workshops, like those held in London and Rome.

There have been two versions of the roll-up, both reproducing the visual identity already developed and are structured as follows:

- Ad hoc image explaining the project concept along with the project logo and motto
- Fact and figures of the project
- Project consortium logos
- Project coordinator's contacts
- Social media logo and address.

Figure 107: First version of MyCorridor rollup.

Figure 108: Second version of MyCorridor rollup

A second, newer version of the project roll-up was prepared for the MyCorridor workshop in Rome; it contains an updated project image better explaining the MaaS concept applied to MyCorridor and it especially address service providers, the main target of this second workshop.

For the final event, virtual promotional material was created and shared with the MyCorridor Consortium. This material included a *Virtual flier – Save the Date* and the *Agenda* of the virtual event.

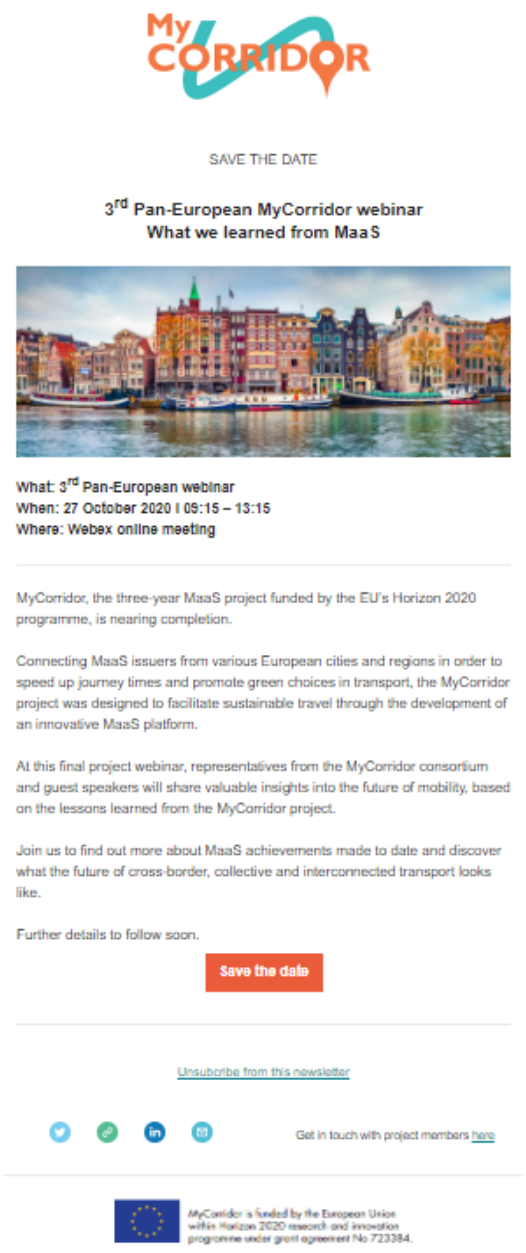
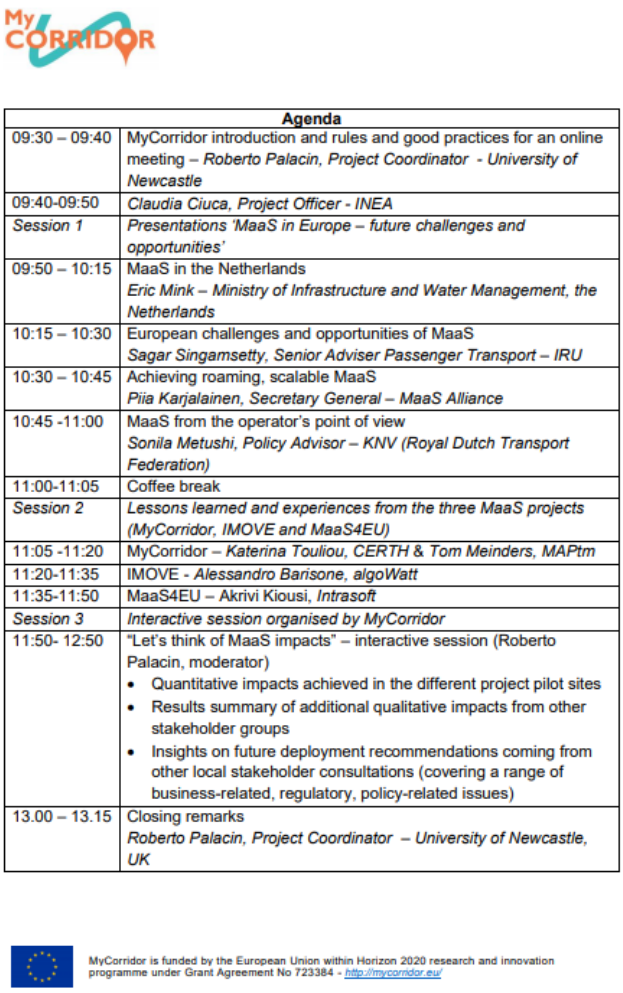


Figure 109: MyCorridor virtual flier – Save the Date.



Agenda	
09:30 – 09:40	MyCorridor introduction and rules and good practices for an online meeting – *Roberto Palacin, Project Coordinator - University of Newcastle*
09:40-09:50	*Claudia Ciuca, Project Officer - INEA*
Session 1	*Presentations 'MaaS in Europe – future challenges and opportunities'*
09:50 – 10:15	MaaS in the Netherlands *Eric Mink – Ministry of Infrastructure and Water Management, the Netherlands*
10:15 – 10:30	European challenges and opportunities of MaaS *Sagar Singamsetty, Senior Adviser Passenger Transport – IRU*
10:30 – 10:45	Achieving roaming, scalable MaaS *Piia Karjalainen, Secretary General – MaaS Alliance*
10:45 -11:00	MaaS from the operator's point of view *Sonila Metushi, Policy Advisor – KNV (Royal Dutch Transport Federation)*
11:00-11:05	Coffee break
Session 2	*Lessons learned and experiences from the three MaaS projects (MyCorridor, IMOVE and MaaS4EU)*
11:05 -11:20	MyCorridor – *Katerina Touliou, CERTH & Tom Meinders, MAPtm*
11:20-11:35	IMOVE - *Alessandro Barisone, algoWatt*
11:35-11:50	MaaS4EU – Akrivi Kiousi, *Intrasoft*
Session 3	*Interactive session organised by MyCorridor*
11:50- 12:50	"Let's think of MaaS impacts" – interactive session (Roberto Palacin, moderator) • Quantitative impacts achieved in the different project pilot sites • Results summary of additional qualitative impacts from other stakeholder groups • Insights on future deployment recommendations coming from other local stakeholder consultations (covering a range of business-related, regulatory, policy-related issues)
13.00 – 13.15	Closing remarks *Roberto Palacin, Project Coordinator – University of Newcastle, UK*

Figure 110: Agenda of the virtual event.

During the project, three brochures were created, two of them offivcially listed in the project deliverables and an extra one was created for the MyCorridor final event, initially foreseen in Amsterdam in March 2020 but postoponed as a virtual event in October 2020 due to the pandemic. The first project brochure, due at M12, has been a quite detailed description of the project: objectives, innovative aspects, introductions to pilots. This first version of the brochure was structured on six folding pages with A5 format as follows:

- page 1: an ad hoc image describing the main project concept, along with the project motto;
- page 2: what's behind MyCorridor;
- page 3: what's new and innovative in MyCorridor;
- page 4: an introduction to pilots;
- page 5: first results achieved;
- page 6: project facts and figures, partners' logos, coordinator's contacts, online and social media contacts.

Figure 111: MyCorridor first brochure.

The second project brochure, released at M24, was thought as of as a more detailed tool to be distributed among external stakeholders. It describes the project progresses with a focus on pilots first and second round; as well as payment back office handling and MyCorridor App functioning. This second version of the brochure was structured on six folding pages with A5 format as follows:

- page 1: an ad hoc image describing the main project concept, along with the project motto;
- page 2: two rounds pilots general overview and App functioning;
- page 3: what happened in the first round of pilots;
- page 4: what is expected in the second round of pilots;
- page 5: explanation of the payment back offices handling;
- page 6: project facts and figures, partners' logos, coordinator's contacts, online and social media contacts.

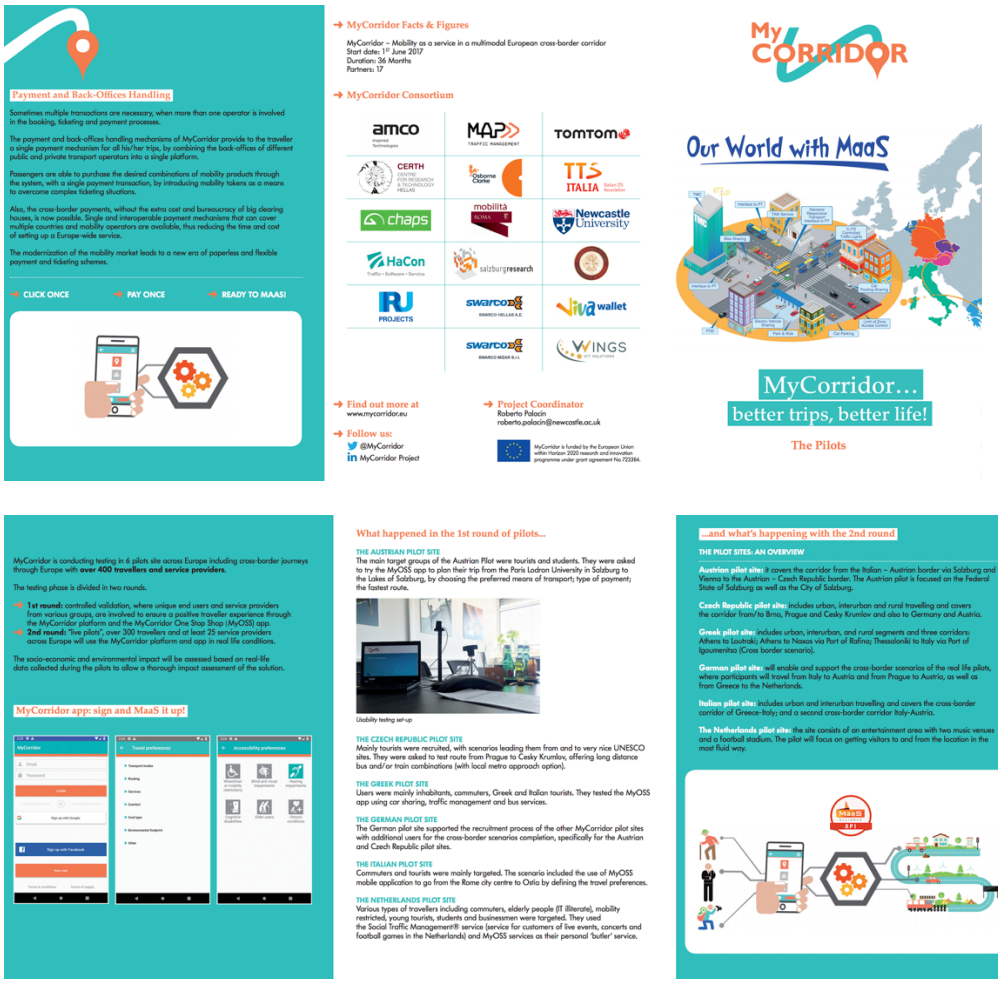


Figure 112: MyCorridor second brochure.

Finally, an extra brochure was created ad hoc for the MyCorridor final event. This version of the brochure was structured on six folding pages with A5 format as follows:

- page 1: an ad hoc image describing the main project concept, along with the project motto;
- page 2: what's MyCorridor and what to expect from the project;
- page 3: short description of the first and second round of pilots;
- page 4: pilots description and work done;
- page 5:challenges faced within the pilots; MyCorrdor App and Service Registration Tool;page 6:
- project facts and figures, partners' logos, coordinator's contacts, online and social media contacts.

Figure 113: The brochure created for the final event.

All of the dissemination material (flyers, posters and brochures) are made available on the MyCorridor website (under "Project Library").

15.3.5 Social media, posts and content

Project specific Twitter and LinkedIn accounts have been created to raise awareness and maximise exposure. Social media has played an important role in the development of the MyCorridor community. The social media accounts have been managed by IRU Projects. The MyCorridor website includes social media buttons for MyCorridor social media accounts and for sharing content via the various platforms. The content of the social media posts has been on the following subjects:

- News directly generated by the project
- News that mention the project
- News of interest to the project
- Events organised by the project
- Events related to the topics addressed by the project

In the 42 months of the project, MyCorridor's **Twitter** account reached 346 followers. Since the last data reported from October 2019 in D8.4, the top three tweets (from the period October 2019-November 2020) have all reached over 2.000 impressions, hence, the number of times a Tweet has been seen.

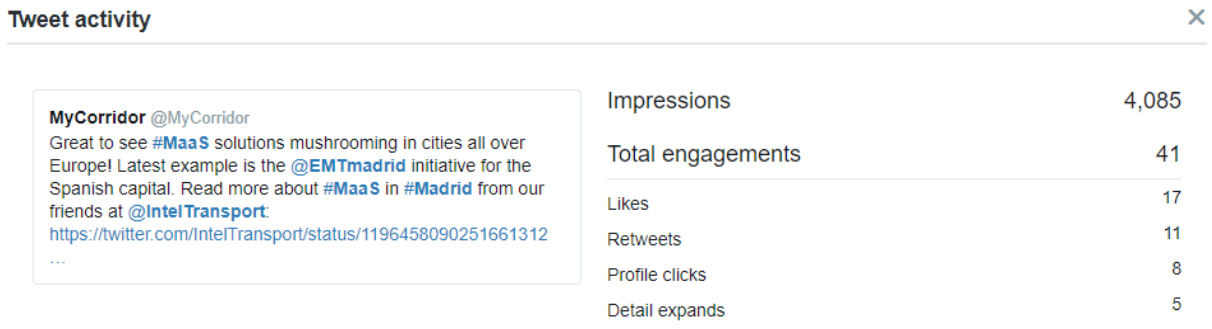


Figure 114: Top tweet, with 4,085 impressions and 41 total engagements.

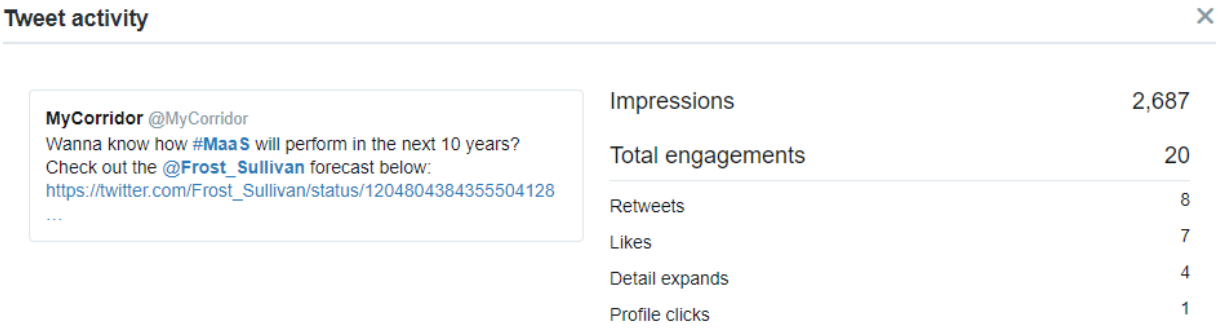


Figure 115: Second best performing Tweet, with 2,687 impressions and 20 engagements.

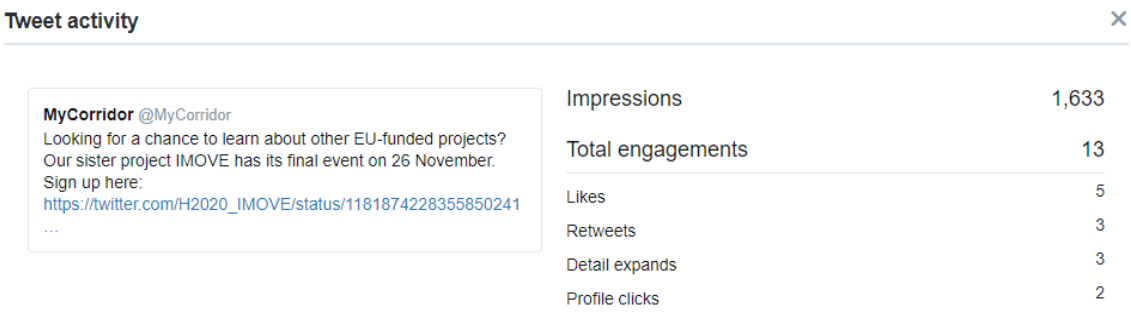


Figure 116: Third best performing Tweet, with 1,633 impressions and 13 engagements.

Finally, the MyCorridor Project **LinkedIn profile** gained **173 connections**. The profile served as tool to promote MyCorridor's activities and as place to foster discussions stakeholders. The connections include transport service providers, universities, transport associations, research centres, private companies, mobility start-ups.

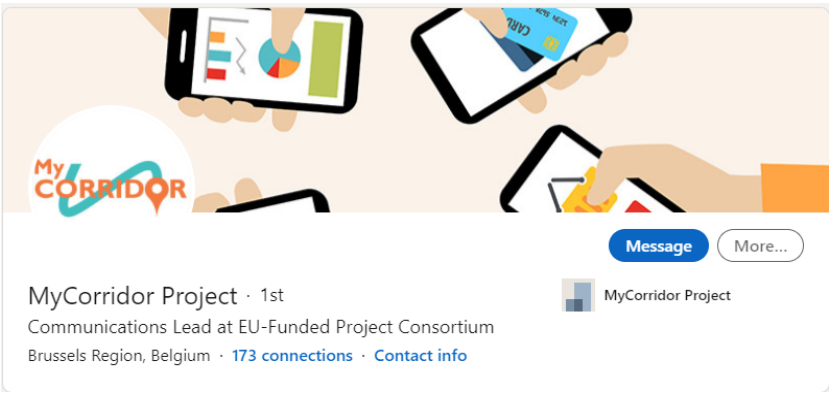


Figure 117: MyCorridor LinkedIn page.

Figure 118: MyCorridor LinkedIn post on the 3rd Pan-European Workshop 'What we learned from MaaS'.

15.3.6 Newsletters & press releases

MyCorridor has sent four newsletters to the mailing list subscribers when major project achievements occur during the project life. The first MyCorridor newsletter was sent out in February 2018. The second MyCorridor newsletter was sent out in early December 2018 with an open rate of 48.1%. The third MyCorridor newsletter was sent out in May 2019 with an open rate of 43.9%. Lastly, the fourth and final newsletter was sent in October 2020 and focused on the upcoming 3rd (virtual) Pan-European Workshop.

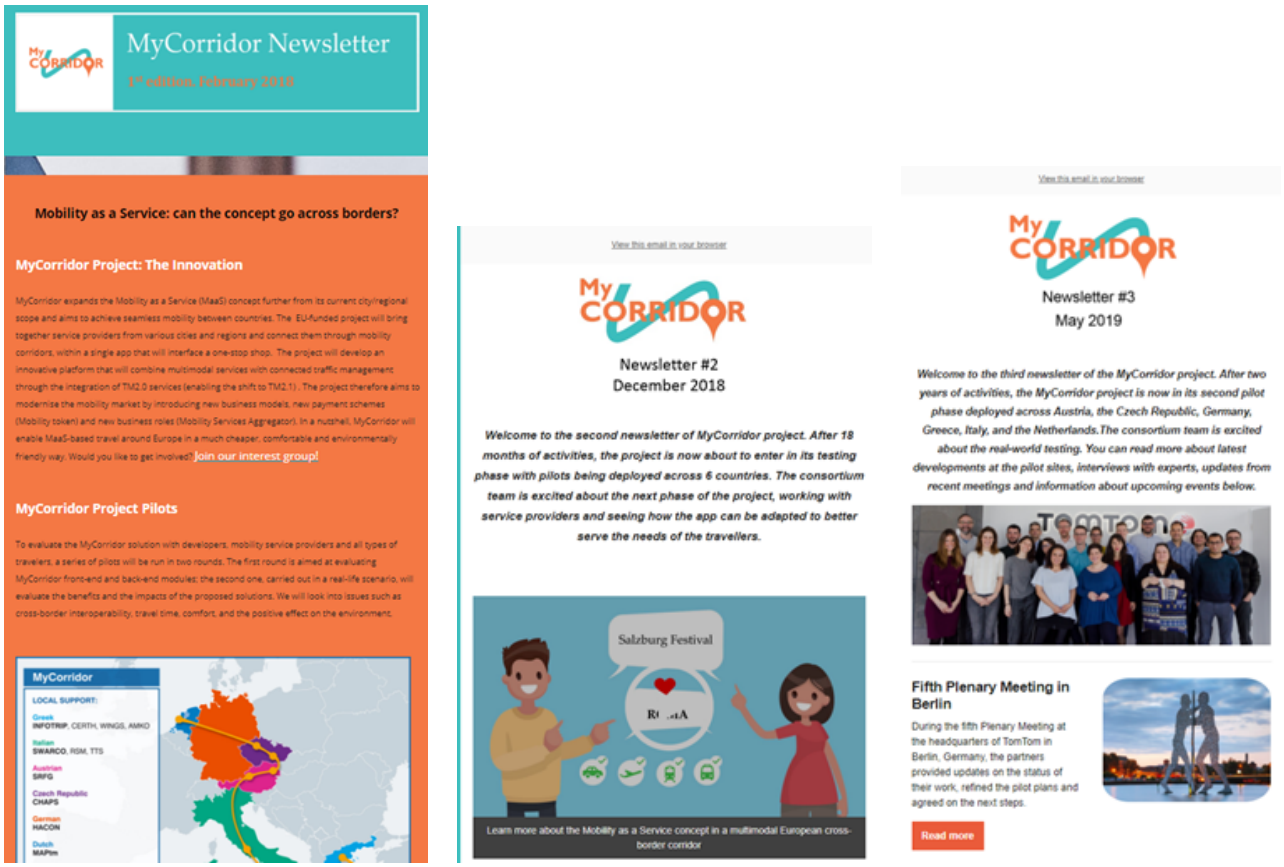


Figure 119: MyCorridor newsletter issue #1 (left), #2 (middle), #3 (right).

MyCorridor was tasked with issuing at least 3 press releases, prepared in English and translated to local languages by partners. Press releases were released in correspondence with relevant project milestone or in collaboration with other MaaS projects as well as the MaaS Alliance, in order to inform both external stakeholders and national media. The first press release was issued in early December 2018 while the second and third press releases were released in October and December 2020 respectively.

View this email in your browser

Newsletter #4 - October 2020

Welcome to the fourth newsletter of the MyCorridor project. After three years of activities, MyCorridor project is now seeing the outcomes of the pilots deployed across Austria, the Czech Republic, Greece, Italy, and the Netherlands. The consortium is excited about sharing real-world travellers' experiences. Read below about the latest developments, interviews with experts and information about our upcoming event.

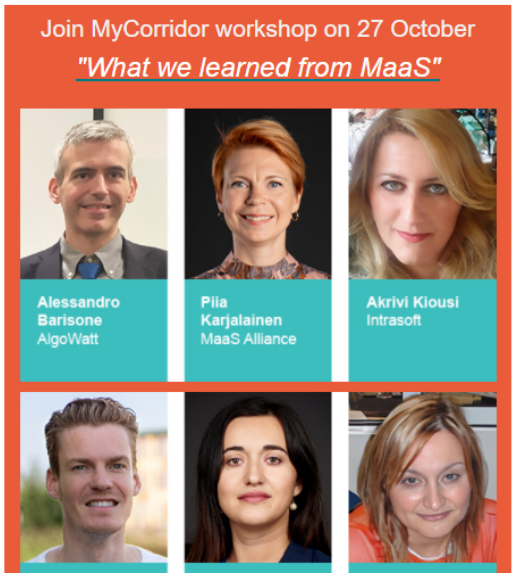


Figure 120: MyCorridor newsletter issue #4.

EU projects explore common standard for digital mobility services

A common standard for designing digital transport services is being considered by three EU-funded projects working on improving the mobility of EU citizens with the help of Mobility-as-a-Service (MaaS).

MyCorridor, **MaaS4EU** and **IMOVE** agreed to explore the options put forward by the MaaS API (Application Programming Interface) aiming to streamline the currently cumbersome and time-consuming API integration process of the various transport services. This would encourage MaaS aggregators to develop attractive transport services that would incentivise travellers to move away from car ownership and make more use of public transport and shared services.

Developed by MaaS Alliance, the API defines a common approach to designing a transport service API, from the use of communication protocol and data format to security standards, basic methods and service calls, responses and general behaviour of an API. The use of a 'common language' will help boost the expansion of the MaaS service offering which will, consequently, lead to a unified and seamless cross-border experience for the end user.

Figure 121: MyCorridor press release issue #1.

What we learned from MaaS

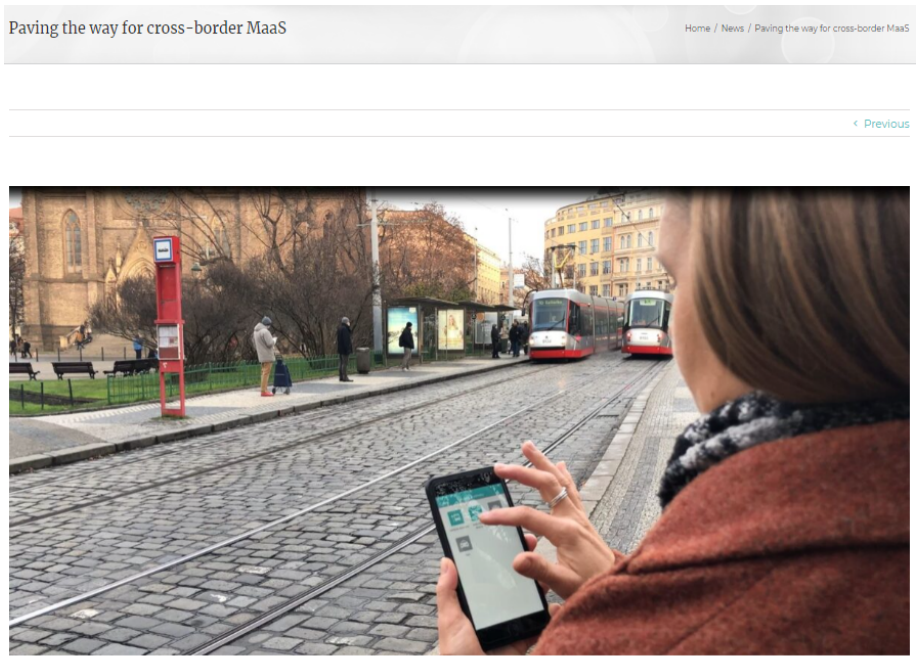
MyCorridor – http://www.mycorridor.eu/ – organised on 27 October its final event, a Pan-European workshop gathering experts from the transport and mobility sector to discuss the progress and future of Mobility as a Service (MaaS).

The event was held virtually gathering over 70 participants from several segments of the industry; transport and mobility service providers, research bodies, authorities and associations.

Nearing completion after more than three years of work, the MyCorridor was designed to facilitate sustainable travel through the development of an innovative MaaS platform, connecting MaaS issuers from various European cities and regions in order to reduce journey times and promote green choices in transport.

During the event, MyCorridor representatives and guest speakers shared valuable insights into the future of mobility and opportunities and challenges of MaaS based on the lessons learnt from MyCorridor.

Figure 122: MyCorridor press release issue #2.



Paving the way for cross-border MaaS

After three and a half years, the MyCorridor project comes to an end after an exciting journey to advance cross-border Mobility as a Service (MaaS). Funded by the EU's Horizon 2020 programme, MyCorridor adopted a unique approach in achieving sustainable travel in urban, interurban areas and across borders.

Figure 123: MyCorridor press release issue #3.

15.3.7 Project video

IRU Projects produced two different videos throughout the duration of the project. The first video was not explicitly listed among the project deliverables in WP8. In agreement with the project management team, it was decided to create a video at the early stage of the project. This was used as a visual tool for dissemination, able to summarise the project's scope and objectives. The following two videos were produced:

- First version of the video created for the first Pan-European Workshop in February 2018.
- Second and final version of the video including footage from the different pilot sites, MyCorridor Application development and testimonials from partners.

The video can be accessed on Youtube via the following links.

- First version https://www.youtube.com/watch?v=gEwbNks3RYs
- Second and final version http://www.mycorridor.eu/project-video/

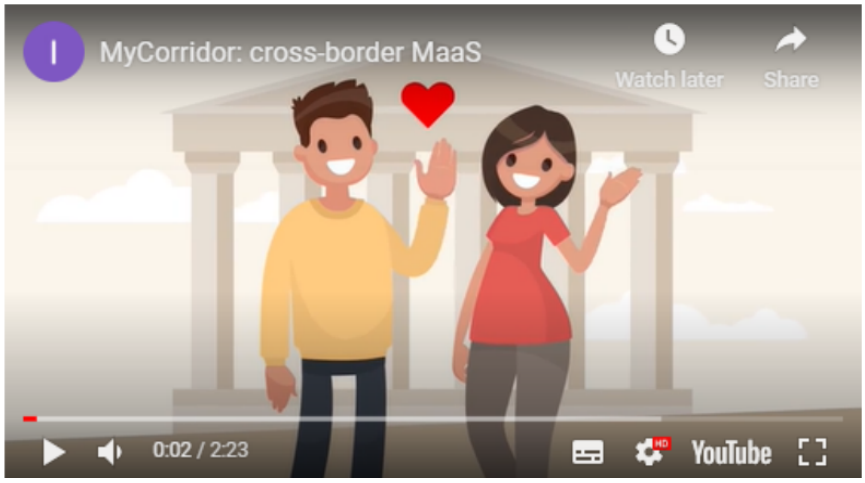


Figure 124: MyCorridor first video opening shot.

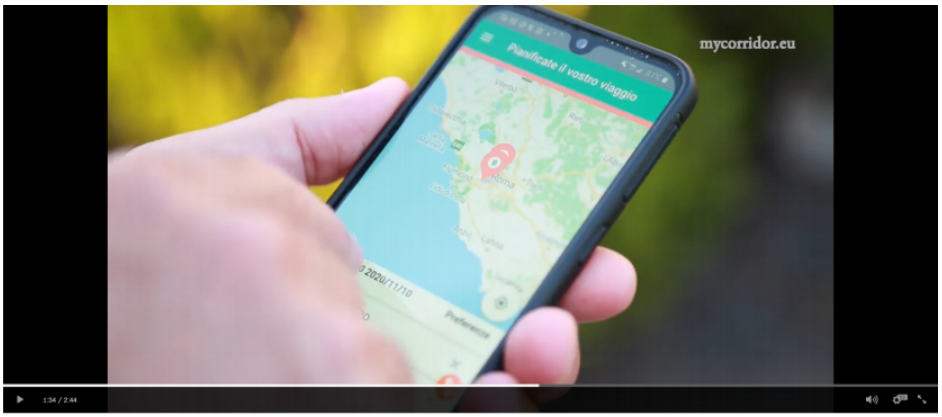


Figure 125: MyCorridor second video trip planning shot.

15.4 Planning and monitoring

MyCorridor issued three deliverables (D8.2; D8.3; D8.4) on project dissemination planning and activities reporting. Key website statistics such as page views and average time spent on a page were recorded using a Google Analytics dashboard displaying visitor demographic information (such as countries links, devices and gender, etc.). In addition, social media accounts/pages statistics have been monitored periodically using the relevant social media analytics tools. To record all activities past, present and future, an online monitoring and reporting tool has been established (MyCorridor Dissemination Log) and was accessible and editable for all partners. All consortium partners have been encouraged to use this tool as the primary means of monitoring and reporting. All activities were reported on this sheet, while the Coordinator and Dissemination and Communication Manager should both be notified of any and all activities. Finally, the project early identified Key Performance Indicators (KPIs) for dissemination. The performance of the project against them has been reported in the dissemination issues and the progress reporting. The final status is given in section 15.6.

15.5 Key dissemination activities

15.5.1 Overview of activities

During the 42 months of the project, MyCorridor was involved in a total of 40 events, including the final event, which was held virtually on 27 October 2020. Below is a table of all dissemination activities and events MyCorridor organised or participated in from M1-M42.

Table 15: Dissemination events involvement.

Title of event	Date	City and Country	Who
TRB 2017	8-12 January 2017	Washington, USA	CERTH
General Assembly of MaaS Alliance members	19 June 2017	Strasbourg, France	IRU Projects
"MaaS in cities and regions" at POLIS urban Mobility Breakfast BY POLIS Network	19 September 2017	Brussels, Belgium	IRU Projects
ICTR 2017 – International Congress on Transportation Research	27-29 September 2017	Thessaloniki, Greece	CERTH
ITS World Congress by ERTICO	29 October 2017	Montreal, Canada	IRU Projects
Middle East and North Africa Regional Congress by IRF	29-31 October 2017	Dubai, UAE	IRU Projects and TTS Italia
IRU members meeting	January 2018	Brussels, Belgium	IRU Projects
ERTICO Multimodality Reception event	24 January 2018	Brussels, Belgium	IRU Projects
MyCorridor 1st Pan European Workshop	9 February 2018	London, UK	All
Transport Research Arena (TRA) Conference 2018	16-21 April 2018	Vienna, Austria	Swarco Mizar
IRU members meeting	May 2018	Geneva, Switzerland	IRU Projects

Title of event	Date	City and Country	Who
Steering Committee TM2.0 platform	May 2018	Brussels, Belgium	Swarco Mizar
Conference on long-term planning for urban mobility	14-15 May 2018	Nicosia, Cyprus	Swarco Hellas
ECOMM 2018 – European Conference on Mobility Management	30 May – 1 June 2018	Uppsala, Sweden	MAPtm
MFTS 2018 - Management of Future Motorway and Urban Traffic Systems	11-12 June 2018	Rome, Italy	MAPtm
22nd International Forum on Advanced Microsystems for Automotive Applications	11-12 September 2018	Berlin, Germany	TomTom
ITS World Congress	17-21 September 2018	Copenhagen, Denmark	IRU Projects, MAPtm, UNEW, Swarco Mizar
Future Mobility Week	3-5 October 2018	Turin, Italy	Swarco Mizar
IRU International Taxi Forum	2 November 2018	Cologne, Germany	IRU Projects
TUCTE - Towards user-centric transport in Europe (Mobility4EU)	13 November 2018	Brussels, Belgium	IRU Projects
SmartCity Expo	13-15 November 2018	Barcelona, Spain	IRU Projects
ITS Forum 2018	14-15 November 2018	Utrecht, The Netherlands	Swarco Mizar
MyCorridor 2nd Pan European Workshop	16 November 2018	Rome, Italy	All
AIIT "Mobility as a Service: how does mobility change?"	30 November 2018	Turin, Italy	Swarco Mizar
4th ITS Hellas national conference 2018	18-19 December 2019	Athens, Greece	Swarco Hellas
MaaS Congress in the Netherlands	12 February 2019	Rotterdam, The Netherlands	MAPtm, Osborne Clark
AIIT National Congress on MaaS developments in Italy	7 May 2019	Rome, Italy	RSM
ITS European Congress	3-6 June 2019	Eindhoven, The Netherlands	MAPtm, OC, Swarco Mizar
Mobil.TUM	22 October 2019	Munich, Germany	Swarco Mizar
Horizon 2020 MaaS Workshop	6 November 2019	Brussels, Belgium	CERTH, MAPTm
MaaS Alliance cluster meeting	7 November 2019	Brussels, Belgium	CERTH, IRU
IMOVE final event	26 November 2019	Brussels, Belgium	UNEW
2nd International Conference on Mobility as a Service	3-4 December 2019	Tampere, Finland	CERTH, MAPtm, Swarco Mizar

Title of event	Date	City and Country	Who
3rd European conference onresults from transport research in H2020 projects	4-5 December 2019	Brussels, Belgium	UNEW
Presentation of MyCorridor Features at the Union of Greek Intercity Bus Operators	4 May 2020	Virtual	AMCO
MaaS Alliance Technology and Standards Working Group meeting	21 September 2020	Virtual	CERTH
IRU members meeting	October 2020	Virtual	IRU Projects
MyCorridor 3rd Pan European Workshop	27 October 2020	Virtual	All
MaaS Alliance Plenary Meeting	5 October 2020	Virtual	UNEW
Virtual ITS European Congress	9-10 November 2020	Virtual	CERTH
POLIS Webinar: Mobilising Mobility: MaaS - crossing (modal) borders	19 November 2020	Virtual	UNEW
3rd European conference on results from transport research in H2020 projects	1 December 2020	Virtual	UNEW

Table 16: MyCorridor publications.

Title of publication	Date	City and Country	Who
"MyCorridor"	January 2018	Washington DC, USA,	CERTH
"TM2.0 as an enabler of MaaS and its employment in MyCorridor" at the ITS World Congress	September 2018	Copenhagen, Denmark,	MAPtm/ Swarco Mizar
"The symbiosis between Traffic Management and Mobility as a Service" at the ITS World Congress	September 2018	Copenhagen, Denmark	MAPtm
"Mobility as a Service (MaaS) in a multimodal European cross-border corridor" at 8th International Congress on Transportation Research	September 2018	Thessaloniki, Greece	CERTH
Mobility services data models for open and inclusive MaaS infrastructures at IcooMaaS 2019	3-4 December 2019	Tampere, Finland	Authors: Maria Gkemou, CERTH; Athanasios Salamanis, CERTH
A multi-faceted evaluation framework to evaluate service providers' and travellers' experience with MaaS enabling technologies at IcoMaaS 2019	3-4 December 2019	Tampere, Finland	Authors: from CERTH, Touliou, K. Gkemou, M. Zankl, C., Panou, M., Bekiaris, E.

Title of publication	Date	City and Country	Who
Traffic Management & MaaS at IcooMaaS 2019	3-4 December 2019	Tampere, Finland	Author: from MAPtm, Patrick Hofman; Ruud van den Dries
Children, young people and mobility as a service: opportunities and barriers for future mobility.	28 February 2020	N.A.	Author: from UNEW, Roberto Palacin; David Golightly
MyCorridor MaaS: A stakeholder-inclusive MaaS platform at Transport Research Arena 2020	27-30 April 2020	Virtual	Authors: from CERTH, Maria Gkemou, Athanasios Salamanis
MaaS – an enabling tool for Collaborative Traffic Management at Transport Research Arena 2020	27-30 April 2020	Virtual	Authors: Laura Coconea, Swarco Mizar; Stephanie Leonard, Tom Tom; Ruud van den Dries, MAPtm; Maria Gkemou, CERTH; Vasileios Mizaras, Swarco Mizar
A multi-modal approach to Traffic Management at Transport Research Arena 2020	27-30 April 2020	Virtual	Author: from MAPtm, Ruud van den Dries; Patrick Hofman

Below is a list of publications where MyCorridor contributed or was mentioned:

Table 17: MyCorridor publications cited

Title of publication	Date	Who
Chapter in Book for Springer, originated from Mobility4EU: A user and stakeholder-driven approach for cross-border, seamless and personalised MaaS provision Mobility4EU - Springer	February 2019	Authors: from CERTH, Maria Gkemou, Maria Anna Devetzoglou, Katerina Touliou, Athanasios Salamanis, Evangelos Bekiaris
Traffic Management 2.0 – Mobility as a Service Task Force Final Report.	June 2019	Authors: Stephanie Leonard, TomTom; Laura Coconea, Swarco Mizar; Vassilis Mizaras, Swarco Hellas
Mobility as a Service (MaaS) and Sustainable Urban Mobility Planning (SUMP), Practitioner Briefing	August 2019	Developed by ERTICO – ITS Europe, also as a host of the MaaS Alliance, in collaboration with UCL - MaaSLab, University of Aegean, TRT Trasporti e Territorio, UITP, CERTH, EMTA, Polis Network, the City of Antwerp and Forum Virium Helsinki

15.5.2 1st Project Workshop

The MyCorridor 1st Pan European Workshop was hosted by the MyCorridor Consortium Partner Osborne Clarke LLP and was held on 9 February 2018 at Osborne Clarke's office in London, United Kingdom (https://maas-alliance.eu/maas-focus-point-first-mycorridor-project-workshop/). The Workshop had over 50 participants attending from various backgrounds, which included (among others) Osborne Clarke's clients from the transport, mobility and IT/software industries.

The following presentations were given:

- *Mobility as a Service (MaaS): where we are and where we are heading* by Christopher Irwin, Member of European Passengers' Federation (EPF) Council.
- *MaaS: a legal perspective* by Jeremy Godley, Associate Director in the transport team at Osborne Clarke LLP and Marie-Claire Smith in the digital services and data protection team at Osborne Clarke.
- MyCorridor Project: the vision & the approach by Maria Gkemou, CERTH/HIT.
- How to make a difference – interactive session by Evangelos Bekiaris, CERTH/HIT.

A full report of the Workshop's outcomes can be found on MyCorridor's website: http://www.mycorridor.eu/2018/02/first-london_workshopidentifies-_trust-as-key-to-maas-success/, whereas further details on the outcomes and how they were used in the project, can be found in D1.1

Figure 126: MyCorridor 1st Pan European Workshop.

15.5.3 2nd Project Workshop

The MyCorridor 2nd an European Workshop was held on 16 November 2018 in Rome, Italy (http://www.mycorridor.eu/event/2nd-pan-european-mycorridor-workshop/).

The following presentations were given:

- TM & MaaS – Moving one step further by Laura Coconea, SWARCO MIZAR.
- MaaS role in sharing mobility by Sandro Bartolucci, RSM.
- Update on legal issues in MaaS: Competition law and case studies by Jeremy Godley and Marie-Claire Smith, Osborne Clarke.

- *MyCorridor one-stop-shop & interactive discussion* by Athanasios Salamanis, CERTH/ITI and Kostas Kalogirou, CERTH/HIT.
- *Interactive business model session* by Vassilis Mizaras, SWARCO Hellas & Oktay Türetken.
- *Joining MyCorridor* by Maria Gkemou, CERTH/HIT.

The Workshop had 20 external participants attending from industry (transport and mobility service providers), research, authorities and associations. A full report of the Workshop can be found on MyCorridor's website: http://www.mycorridor.eu/2018/11/second-mycorridor-workshop-in-romemaas-for-transport-service-providers/.

Figure 127: MyCorridor 2nd Pan European Workshop.

15.5.4 3rd Project Workshop and Final Event

The MyCorridor 3rd Pan European Workshop was held on 27 October 2020 (http://www.mycorridor.eu/event/3rd-pan-european-mycorridor-webinar-what-we-learned-frommaas/). Due to COVID-19, the MyCorridor 3rd Pan European Workshop was hosted virtually and took place later than originally planned. The Workshop consisted of three sessions:

Session 1: MaaS in Europe – future challenges and opportunities

- *MaaS in the Netherlands* by Eric Mink, Ministry of Infrastructure and Water Management, the Netherlands
- European challenges and opportunities of MaaS by Sagar Singamsetty, IRU
- *Achieving roaming, scalable MaaS* by Piia Kajalainen, MaaS Alliance
- *MaaS from the operator's point of view* by Sonila Metushi, KNV – Royal Dutch Transport Federation.

Session 2: Lessons learned and experiences from the three MaaS projects (MyCorridor, IMOVE and MaaS4EU)

- *MyCorridor* by Katerina Touliou, CERTH/HIT & Kostas Kalogirou CERTH/HIT and Tom Meinders, MAPtm
- *IMOVE* by Alessandro Barisone, algoWatt
- *MaaS4EU* by Akrivi Kiousi, Intrasoft.

Session 3: Interactive session organised by MyCorridor

- Quantitative impacts achieved in the different project pilot sites
- Results summary of additional qualitative impacts from other stakeholder groups

- Insights on future deployment recommendations coming from other local stakeholder consultations (covering a range of business-related, regulatory, policy-related issues).
- This included discussion on the future of cross-border MaaS including the implications of living in a post-COVID19 world.

The Workshop had 72 participants attending which included transport associations, research institutes, universities, authorities, mobility service providers and consultancies focused on mobility. A full report of the Workshop can be found at MyCorridor's website: http://www.mycorridor.eu/2020/11/third-and-final-mycorridorworkshop-what-we-learned-from-maas/.

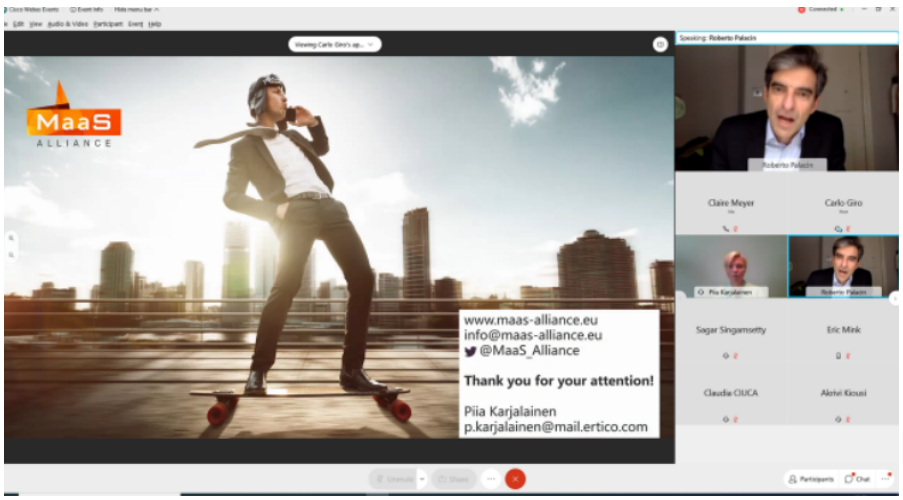


Figure 128: MyCorridor 3rd Pan European Workshop.

15.5.5 Cluster and other meetings

On 8 February 2018, MyCorridor organised a collaborative meeting with MaaS4EU and I-MOVE, hosted by Osborne Clarke in their London office. During this meeting, the project partners explored opportunities for synergies and agreed to align on certain communication and dissemination activities, while also exploring the potential cooperation in other MaaS-related fields. The project partners also discussed key commercial and legal issues impacting MaaS, such as access to data, ticketing and potential policy frameworks. The cluster meeting in London paved the way for the second cluster meeting in Rome in which a common MaaS API was agreed. This, in turn, was endorsed by the MaaS Alliance with its logo being used to promote it.

On 15 November 2018, MyCorridor organised its second cluster meeting in Rome, Italy in which both MyCorridor and IMOVE agreed to publicly announce the endorsement of the MaaS API and thus the intention to explore potential implementation in their technical solutions. During this meeting, UNEW, CERTH/HIT, CERTH/ITI and SWARCO Hellas participated on behalf of MyCorridor while Softeco and Fit Consulting participated on behalf of IMOVE. Stakeholders of the two projects had the chance to demonstrate technical architectures of the platforms that have been implemented, and provide several technical details. In particular, MyCorridor partners presented the designed architecture of the MyCorridor MaaS platform and described the functionalities and the implementation details of its main modules.

On 7 November 2019, upon the invitation of the MaaS Alliance, project partners from MyCorridor and IMOVE were invited to a cluster meeting to share best practices and lessons learned. In order to achieve a wide deployment of MaaS services, the main objectives were defined as the following:

- Understand the goals and results of IMOVE and MyCorridor
- Identify those results which are of interest to MaaS Alliance in general and to the Technology and Standards Working Group
- Initiate work on a common approach to MaaS
- Help to maintain project results after projects are finished.

On 21 September 2020, the MaaS Alliance's Technology and Standards Working Group held a meeting on the technical aspects of MaaS. Given IRU's liaison activities with MaaS Alliance, CERTH was invited to present on behalf of MyCorridor the technical work conducted in the context of the project. Athanasios Salamanis (CERTH) presented the MyCorridor data modelling approach and the technical products developed in the project. MyCorridor's data models used for representing the transportation services were of great interest to the meeting's participants. The Hybrid Trip-planner, the Matchmaking Module and the mobile apps, were recognised as significant technological components and the lessons learned during their implementation were deemed of significant support to the Working Group's activities related to the technical standardisation of the MaaS ecosystem.

Figure 129: Summary of the content presented by MyCorridor during the MaaS Alliance's Technology and Standards Working Group meeting.

15.6 Dissemination KPIs

The last update of the dissemination plan can be found in the submitted D8.4: Dissemination strategy and actions. The project performance upon the dissemination Key Performance Indicators (KPIs) has been updated in line with the actual results during the 42 months of the project and is as follows:

Table 18: Dissemination KPIs.

Key Performance Indicators (KPI's)			Performance (till M42)
Year 1	**Year 2**	**Year 3**	
Leaflet, brochure and poster printed in good quality and web site functioning.	At least 3 publications in journals and 5 project papers in Conferences.	At least 6 publications in journals and 12 project papers in Conferences.	A series of leaflets, posters and roll-ups have been released during the project duration. The project has had 15 publications in journals, conference proceedings and magazine articles, which is slightly less than the target (COVID-19 effect) during the last year.
Interest Group encompassing all key stakeholder representatives and with 20 (by Month 6) and 40 (by Month 12) external members.	Project web site with at least 100 visits every month.	Project web site with at least 150 visits per month.	The Interest Group consists of over 180 stakeholders. The web site has had constant growth and 100 visits per month by average. (see below for exploitation plans)
-	Draft exploitation agreement available. Detailed exploitation plans for at least half of the MyCorridor end-products/ services.	Viable exploitation plans for all MyCorridor main products.	Exploitation plans have been released for all main products and all project beneficiaries – provided in *D8.9: Exploitation plans.*
-	Realisation of the second project workshop.	Realisation of the third project workshop	Three workshops have been held during the project duration. The third project workshop was successfully organised and held virtuallt due to the Covid19 pandemic in October 2020.

16 Risk Assessment

The MyCorridor Consortium, in order to minimise the risks that would be arisen in the project across all its phases, has applied from the beginning and in an iterative manner a risk assessment. For the risk assessment, an extended version of the FMEA methodology (eFMEA) has been applied. Risks have been identified and rated by the Consortium, whilst, finally, mitigation actions have been proposed. Feedback from the project Advisory Board has been also sought.

The extended FMEA methodology is based on the classic FMEA methodology, which includes the indicators of *hazard consequence severity, occurrence probability, detectability* and *recoverability*, and extends it, covering not only technical risk, as anticipated in classical FMEA methodology, but including

also other types of risk. The risks addressed in MyCorridor are namely Technical (T), Behavioural (B), Demonstration/Pilots (P), Ethical and Social (E), Legal (L), Business (BS) and Project Management (PM).

There were two iterations of risk assessment conducted during the project, the first one in view of the first evaluation round and the second and last one in view of the 2nd evaluation round.

As an outcome of the first risk assessment and out of 34 in total risks recognised, there were identified 41% technical risks, 38% demonstration/pilots related risks, 35% project management related risks, 9% behavioural risks, 12% ethical & social risks, 9% legal risks and 18% business related risks. Overall, no extremely severe risks were identified, whereas 76% of them are characterised by moderate severity, 18% of them are severe, and 6% of them slightly severe. The most severe risks recognised were as follows:

- Consortium partner withdrawal.
- Consortium partner does not fulfils partially or fully their tasks (underperformance).
- External mobility providers have limited will to participate, thus not sharing significant mobility information.
- Low participation of users for cross border activities.
- Services engaged for integration (mobility basically but also infomobility) are not sufficient for sound MaaS services provision.
- Travellers are not ready for MaaS experience.

The second round of the assessment revealed many more risks (52 in total) and much more specific ones as the understanding of the Consortium around the project got more mature leading to the recognition of a series of specific pilot related and technical risks. The severity level per risk has been assessed. Assessing the severity of risks, in the first round of risk collection 9 severe, 44 of moderate severity and 2 of slight were identified, while in the second round, these numbers were 22, 37 and 22 respectively. The fact that none extremely severe risk occurs in neither risk round proves that the project has been properly monitored and managed in terms of actions and timing. Regarding the type of risks of the 2nd round, those were technical (22), pilot related (23), behavioural (14) and business related (9).

Severe risks were related with un-will or inability of service providers to be involved in pilots, unavailability/ impossible to integrate application functions (i.e payment), late delivery of application and/or pilot results, lack of users' interest to participate, lack of proper incentives and business favourable environment for the involved stakeholders. Additionally, a list of moderate severity risks were mainly related with technical and pilot execution issues, considering users participation and engagement, application performance and system components along with risks related with business model and project management issues.

Still, mitigation strategies were applied in time for all risks identified and, as such, only a few of those risks were finally present at the end of the project, relating mostly with the deployment aspects of MaaS beyond the project and, thus, are there to consider for future consideration.

Full reporting of Risk Analysis rounds conducted in the project can be found in *D2.3: Risk analysis.*

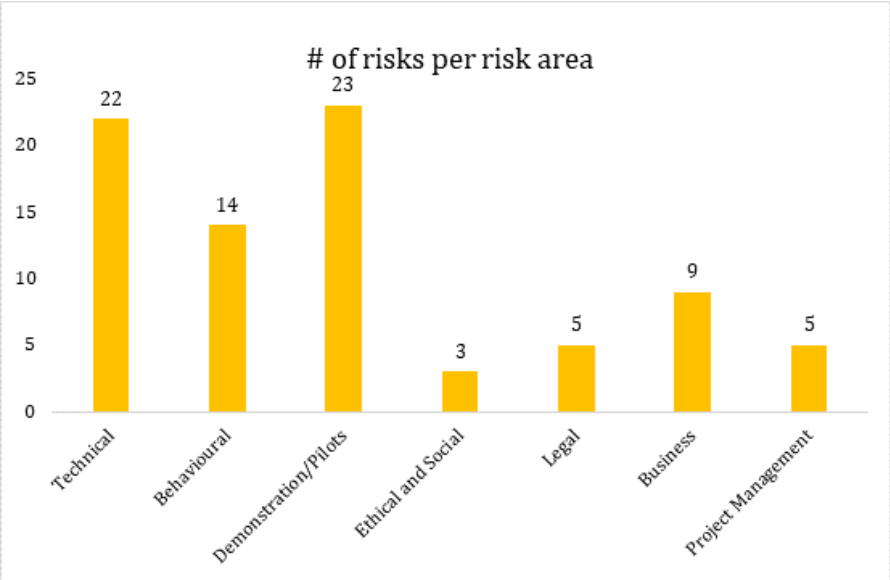


Figure 130: Number of risks per risk area identified – 2nd assessment round.

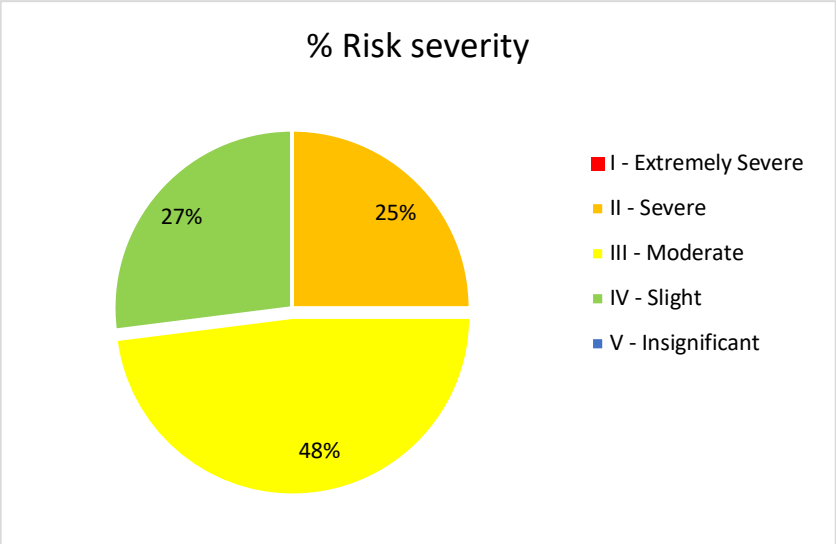


Figure 131: % of risk severity identified – 2nd assessment round.

Table 19: Summary of 2nd round risks regarding their severity.

Severity	T	B	P	E	L	BS	PM	Total
Extremely severe	0	0	0	0	0	0	0	0
Severe	3	3	9	0	1	5	1	22
Moderate	10	5	13	1	0	4	4	37
Slight	9	6	1	2	4	0	0	22
Insignificant	0	0	0	0	0	0	0	0
Total	**22**	**14**	**23**	**3**	**5**	**9**	**5**	

17 Data Management, Open Access & GDPR

17.1 Data management

In the context of the MyCorridor project, a detailed Data Management Plan (DMP) was devised to outline the data management policy applied to the project with regard to all data generated and/or collected within the project development lifecycle. The initial DMP was prepared in the form of deliverable *D2.1: Data management plan* in M7, whereas updated versions were prepared as of *D2.2: MyCorridor interoperable, open and seamless architecture and MyCorridor subsystems and modules specifications*, submitted in M27, and *D6.1: Pilot plans framework and tools*, as updated and resubmitted in M36. This Chapter summarises the main aspects of the applied DMP and a few recent updates regarding data collected at the pilot sites.

17.1.1 Data collected and processed to accommodate the operational functions of MyCorridor one-stop-shop

1a. Personalisation data*:* MyCorridor one-stop-shop offers personalised, context-aware and inclusive MaaS services. In order to do so, it encompasses the following processes:

a) user profiling for matchmaking algorithms (running in the back-end) operation resulting in personalised services (context and user specific). In specific, matchmaking takes place in the back-end of the system, receiving the travellers' profiles and personalisation indices and using these to propose the most appropriate mobility solution for them as output. This matchmaking input-output – which is associated to personalisation – is perhaps one of the most interesting uses of data that will be available in MyCorridor, as they will associate traveller's preferences and profiles to mobility recommendations/outputs/products, the acceptance of which will be later objectively validated through actual usage

b) device-oriented adaptation (e.g., to specific types of devices, Hardware model, Operating system and versions, on different screen sizes and screen resolutions, Preferred language, Time zone settings to address individual preferences, adhering also to key accessibility principles).

The above processes require the collection, processing and the management of different types of data, the main categories of which were: a) User's profile; b) User's preferences c) Traveller behaviour history of searching and selecting/using services and d) Traveller position (location data), with that user's consent.

1b. Data logged during usage: A series of data were logged during performance – meaning **during travellers' interaction with the one-stop-shop** through the app. Indicative examples of data logged during use of the MyCorridor app by the travellers include Number of MaaS&Go trips, Average number of legs per MaaS&Go trip, Average number of different services per MaaS&Go trips, Average number of mobility/infomobility/TM services/added value services selection per MaaS&Go trip, Average number of different transportation mode services selection per MaaS&Go trip, Average weight of different services per MaaS&Go trip, Average rating of different services per MaaS&Go trip, Number of MaaS packages, Average number of different services per MaaSPacks purchase, Average number of mobility/infomobility/TM services/added value services selection per MaaSPacks purchase and more (more details can be found in the DPIA included in *D6.1: Pilot plans framework and tools*, as updated and resubmitted in M36). Moreover, during the "traveller" MaaS session, i.e., the time period during which the traveller interacts with the platform in order to purchase MaaS offerings, the following data is recorded: a) Session interaction time, b) Time for completion of a user request, c) Visit times and frequency, d) No.

of registrations and e) Issues and errors reported. Accordingly, **during service providers' interaction with the one-stop-shop**, i.e., a "service" MaaS session, the following data is recorded: a) Session duration, b) Visit times and frequency, c) No. of registrations, d) Issues and errors reported, e) Service registration/integration success and f) Number of tries. Traveller data were pseudonymised, meaning that the identity data (i.e., email and username) were encrypted before stored in the data repositories. Also, no device identifier data (i.e., IMEI[5]) was stored in the data repositories. Moreover, the service provider data in the respective MaaS sessions were anonymised.

1c. Traveller feedback data*:* Through the Traveller Feedback Module of A3.4 and as reported in D3.2, an upper level (subjective) evaluation of the one-stop-shop as a whole and its products on individual basis is enabled. This feedback helped the development team to assess how travellers generally perceive the mobile application and if it was well-received. Besides this, the traveller can provide feedback about his/her user experience through closed-ended questions after having a MaaS product/service experience. In this context, the following data were collected:

1. **Subjective feedback** of the travellers on the one-stop-shop and on the mobility products they have selected/used. In specific, feedback may be (optionally) provided by the traveller on the following:

    a. The integrated application (MyCorridor one-stop-shop platform) in terms of Level of satisfaction (ranking on a 5-point scale), Ease of use (ranking on a 5-point scale), ease of use, and satisfaction.
    b. The mobility products/services used in terms of Ranking on a 5-point scale rating, Free comments and Image (only for the service).
    c. Each trip taken by the traveller.

2. **Operational data logged during usage** and associated with the traveller feedback module including frequency of a MaaS product/service use and combinations of mobility services by travellers (and frequency/ popularity of combinations).

1d. Data related to payment transactions: No payment transaction data are processed by the system. All the payments are being done in an encrypted manner using VivaWallet's payment facilities (which have a banking institute license), without the need for local storage or processing of any type of payment data.

1e. Data related to back-office negotiation:

- Data regarding the mobility product selection by the traveller (e.g., start and end point of the trip, date, time, etc.)
- Data regarding the selected mobility products, by the service provider (e.g., timetables with routes, availability of service for specific date, etc.)
- Data regarding the cost of the selected mobility product, by the service provider.

17.1.2 Data that were logged in the mobile devices during Pilots

The data that were logged locally in the mobile devices, running the mobile apps, were namely: a) Traveller e-mail and password, b) Traveller mobile device token and c) History of usage of the mobile app. The first two data items were transferred to the back-end of the system, whereas all of them were

[5] *Franchi, L., Tarle M. (2017). Dissemination strategy and actions (1), Deliverable 8.2, MyCorridor (Mobility as a Service in a multimodal European cross-border Corridor) project (G.A.: 723384), http://mycorridor.eu/*

saved as system variables with no other mobile app having access to them and were deleted with the mobile app uninstallation from the device.

17.1.3 Metadata from the services that will be created by the system to support the system functionalities

This metadata is provided by the service providers that integrate their services in the MyCorridor one-stop-shop platform. They refer to those data that can describe the services and include: Name of the service, Cluster of the service, Subcluster of the service, Mobility product of the service, A set of operation locations of the service, A set of operation time periods of the service and more. Moreover, MyCorridor delivered Value-Added Services, i.e., services giving added value to the user and enhancing user experience. They may be closely associated to mobility or not. In this direction, the platform integrates data from open sources (e.g., weather forecasts, points of interest – POIs, and concerts and festivals in the area of destination) and provides the respective information to the user depending on his/her preferences denoted in his/her profile (see personalisation data). The specific data that are used and processed (but not stored), if a user selects to receive VAS, are the category of interests/activities (e.g., museums, concerts, etc.), the time and the place (in terms of coordinates).

17.1.4 Data that were collected during focus groups, workshops, surveys and during Pilots

Data collected during **focus groups** and **workshops** (WP1/WP6) -with travellers and service providers, respectively- were anonymous. Audio recordings and notes were collected. As soon as audio recordings were transcribed, they were deleted. Data were reported only aggregated under topics and themes (reported in D6.1). No verbatim information was shared or used. Further, focus group data collection was conducted after the end of the second Pilot with stakeholders and travellers alike. The same data types were collected under the following topics:

Table 20: Data types collected.

Travellers	Stakeholders & service providers
• Personalized travelling preferences • Packages • Behavioural change • Learning curve (drawing) • Best and worse experiences (for further information, please see D6.2).	• Benefits to the city (pilot site region) • Market penetration • Sustainability and Growth • Next steps in business wrapping • Other urban areas • Implementation scenarios for Impact assessment with consideration for geographical area (e.g., urban interurban) and ownership (private vs. public transportation) (for further information, please see D6.3).

Surveys were carried out and served WP1 needs and were completely anonymous. Data collected were mainly close-ended questions with no personal information. The survey items can be found in D1.1, Annex 2: Online MaaS survey. Respondents consented before participation. A survey was also conducted during the second evaluation phase to address the baseline impact assessment requirements (A6.4). Data collection was pseudonymized and included demographics, mobility patterns (both open and close-ended questions). All documents presented to individuals linked out to the MyCorridor Privacy Policy which could be accessed through the MyCorridor mobile application.

Detailed description of the data collected during the qualitative surveys, focus groups (WP1 & WP6), workshops (WP7) and, of course, pilots (WP6) can be found in the DPIA included in the *D6.1: Pilot plans framework and tools*, as updated and resubmitted in M36.

17.2 Implementation of FAIR Principles

MyCorridor DMP adheres to the FAIR principles, i.e. its goal is to make data Findable, Accessible, Interoperable and Reusable.

Findable:

- Datasets are described with rich metadata in adherence to a set of standards (e.g., ETSI TS 102 894-2, etc.) to ensure that the appropriate metadata will be provided, making data visible in a searchable context based on the semantics of data
- All the datasets have a Digital Object Identifiers provided by the MyCorridor public repository (ZENODO; please see below).
- The reference used for each dataset follow the format MyCorridor_WPX_AX.X_XX, including clear indication of the related WP, activity and version of the dataset
- The standards for metadata are defined in the "Standards and metadata" section of the dataset description table (see Annex 1).

Openly Accessible: Selected project datasets are stored in a ZENODO private cloud-based project-specific repository which comprises a free service developed by CERN under the EU FP7 project OpenAIREplus (grant agreement no.283595). The repository also includes information regarding the methods, software, tools and instruments that were used by the dataset creator(s) so that secondary data users can access and then validate the results (see "Data sharing" section of the dataset description table in Annex 1). In addition to the above research data peer-reviewed scientific research articles (published in academic journals) have been uploaded in the repository. Along with that, the project has also tried to target Open Access journals during its lifespan. In addition, information and publications / presentations from MyCorridor participation in scientific events and organized workshops, together with the project dissemination material (MyCorridor: the vision and the approach, Roll-ups, Newsletters, Press releases, etc.) and Public Deliverables have been maintained and publicly accessible on the project web site (under "About / Project library" section).

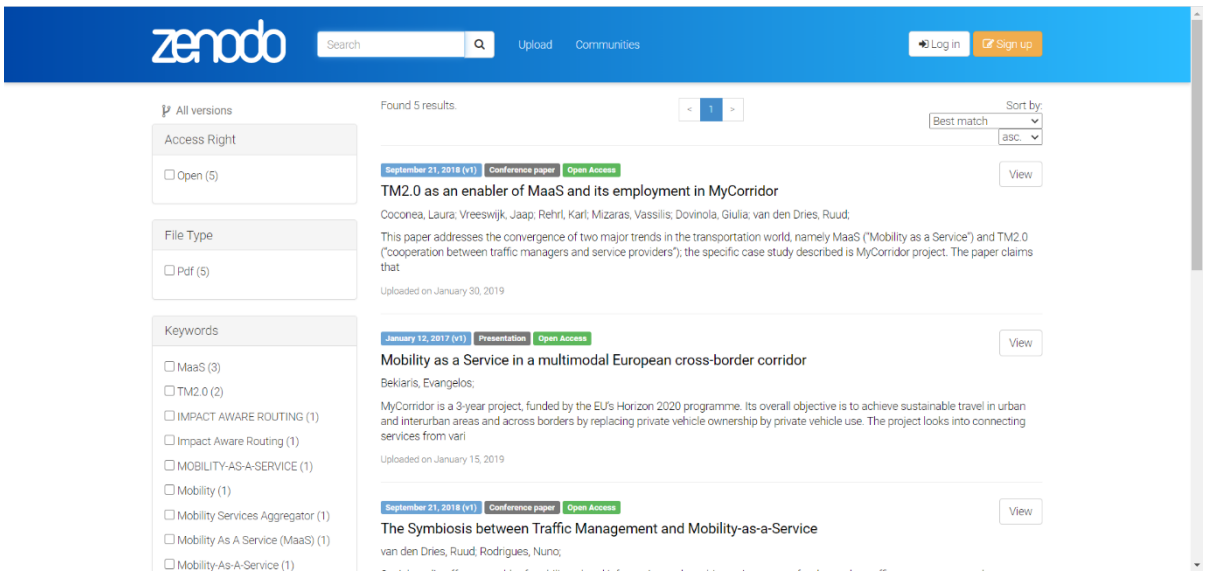


Figure 132. Publications in ZENODO repository.

Interoperable: Data interoperability is foreseen in the project, through conformance to relevant standards (stated in the "Standards and metadata" section of the dataset description table). More details can be found in *D2.2: MyCorridor interoperable, open and seamless architecture and MyCorridor subsystems and modules specifications.*

Reusable: MyCorridor participates in the Pilot on Open Research Data launched by the European Commission along with the Horizon2020 Programme. As such, selected data produced by the project have been published with open access and made available through ZENODO so that they will become available to any interested research community. By default, these data are available for reuse only for scientific publication validation purposes. If any constrains exist, these are explicitly stated in the "embargo period" or "restricted flag" section of the dataset description table (see Annex 1).

17.3 GDPR management

17.3.1 Key GDPR roles

For the purposes of ensuring that all personal data processed as part of the MyCorridor Project is processed in accordance with applicable data protection laws, the following roles have been allocated within the MyCorridor Consortium:

1. **Data manager** is the natural or legal person that coordinates the actions related to data management, is responsible for the actual implementation of the DMP successive versions and for the compliance to Open Research Data Pilot guidelines. In MyCorridor, this role has been undertaken by **Aimilia Bantouna (WINGS)** who is the leader of DMP Deliverables in the project (D2.1 and its updates).

2. **Data controller** has the meaning given to it in Article 4 of the GDPR, being the natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data. In MyCorridor this role is undertaken primarily by **TTS**, as TTS is responsible for the evaluation WP (WP6) and the impact assessment task (A6.4) of the project and, secondarily, by **CERTH/HIT** being the leader of *A6.1: Pilot plans and impact framework*; jointly determining which type of data will be logged/collected/stored and processed and for which purpose.

3. **Data processor** has the meaning given to it in Article 4 of the GDPR, being a natural or legal person, public authority, agency or other body, which processes personal data on behalf of the controller and under its guidance. In MyCorridor, the data processors are all entities participating in user trials as well as entities holding modules of the one-stop-shop as follows:

    - **CERTH/ITI:** Implementer and holder of the back-end platform of the one-stop-shop.
    - **CERTH/HIT:** Implementer and holder of the front-end part of the application.
    - **AMCO:** Implementer and holder of the back-office module (external module to the back-end of the one-stop-shop).
    - **VivaWallet:** Implementer and holder of the payment module (external module to the back-end of the one-stop-shop).
    - Operational (meaning recruiting local users) test sites: SRFG, MAPTm, SWARCO MIZAR, RSM, CERTH/HIT, Chaps, AMCO.

Notes/clarifications:

1. In the context of the first pilot round, which was a lab test, and in the context of the focus groups of the second pilot round as well as in the context of the focus groups of WP1, pseudonymized data of the participants were collected on local level. Still, the performance/usage data of the travellers related to mobility –logged in the context of the 2nd real life pilot round – were all automatically logged in the back-end platform of the one-stop-shop mobility platform.

2. The front-end modules (Android and iPhone devices that were running the mobile applications that have been developed), even if they store any personal or other data locally belong to the travellers themselves; as such, it is not an objective of MyCorridor data management.

3. "Processing" for the purposes of applicable data protection laws encompasses also any type of "data storage", temporary or not.

4. **Data Protection Officer ("DPO")** has the meaning given to it in Article 37 of the GDPR, being an enterprise security leadership role to oversee data protection strategy and implementation to ensure compliance with the requirements of applicable data protection laws. The DPO assists the controller and processor in all issues relating to the protection of personal data. As of 25 May 2018, the GDPR has made appointing a DPO mandatory in certain circumstances, including (without limitation), where the core activities of the controller or the processor consist of processing operations, which, by virtue of their nature, scope and/or purposes, require regular and systematic monitoring of data subjects on a large scale. It is therefore likely that a commercial operator of a MaaS platform and some of the corresponding stakeholders would be required to appoint a DPO. As the MyCorridor project is a research project, carrying out processing on a small scale, for the purposes of research trials, each of the MyCorridor entities, which are data controllers and/or processors, as listed above for the purposes of the MyCorridor project have carried out and documented their assessment of whether they are individually obliged to appoint a DPO in accordance with the applicable data protection laws, and, where necessary, have appointed one accordingly, as detailed further in the Data Management Plan included in D6.1.

5. **Supervisory Authority** has the meaning given to it in Article 4 of the GDPR, being an independent public authority established by a Member State, responsible for monitoring compliance with GDPR. Roles of a Supervisory Authority include (without limitation):

   - advising and providing guidance relating to compliance with applicable data protection Laws
   - monitoring compliance with applicable data protection Laws
   - addressing and investigating complaints from data subjects[6]
   - enforcing the applicable data protection laws and issuing sanctions, where appropriate.

Each entity processing personal data has checked with their relevant Supervisory Authority to determine whether it is obliged to have a DPO, and whether it is required to register with, obtain approval from, pay a fee to, or otherwise notify its relevant Supervisory Authority, prior to carrying out any processing of personal data for the purposes of the MyCorridor project.

17.3.2 Data Privacy Impact Assessment

[6] *A data subject has the meaning given to it in Article 4 of the GDPR, being an identified or identifiable natural person. For the purposes of the MyCorridor Project, data subjects are all those participating in focus groups, user surveys and Pilot activities. However, we use the terms "user"/"participant"/"traveller" exchangeably to refer to pilot participants, throughout this document, as it is more appropriate to both their involvement and role in the MyCorridor Pilots.*

In line with guidance from local regulators the MyCorridor consortium has decided to carry out a Data Protection Impact Assessment ("DPIA"). Assessment as required under Article 35 of the GDPR (EU) 2016/679, in order to assure the possible high-risk result of context processing. The first complete version of the DPIA has been prepared and submitted as part of the 2nd Data Management Plan included in the deliverable *D2.2: MyCorridor interoperable, open and seamless architecture and MyCorridor subsystems and modules specifications*. DPIA was accordingly updated in view of the pilot activities that started in June 2020 (M37) and included as part of the 3rd Data Management plan annexed in D6.1. For any information requested by the users who participated in the pilots, a specific user GDPR compliant consent form was signed by the users. All data controllers and processors have kept records of data set descriptions using the corresponding GDPR compliant templates.

18 Ethics

As an H2020 project, MyCorridor is bound by a set of ethics requirements that lay out standards on the use of human participants and the protection of personal data (POPD). Ethics Issues in MyCorridor were scrutinised in close synergy with data management, pilot and legal issues activities.

D10.1: POPD - Requirement No. 1, at the very beginning of the project, defined the ethics policy and code for carrying out research and development during its lifespan. This was further updated and maintained in the context of *D9.2: MyCorridor Ethics Manual*. Both above deliverables have served as a reference for MyCorridor ethics standards throughout the project duration.

Core ethical issues within MyCorridor have been related to:

1. Data privacy protection, confidentiality and transparency;
2. Informed consent;
3. Incidental findings;
4. Transparency of the collected data management by the final system and during its pilots;
5. IT-Security and identity management;
6. Risk assessment (Insurance);
7. Delegation of control;
8. Incentives (Financial inducements, etc.).

An Ethics Board was established from the beginning in the project, consisting of the **Ethics Management Panel** (Ethics Manager, WP6 (evaluation) leader, Coordinator, Technical & Innovation Manager & External expert) and the **Local Ethics Representatives (LER)** (one representative per pilot site & representatives from TomTom, IRU and VivaWallet) with the task to supervise the ethical activities of the project and make sure that they are in alignment with the Ethics Code of Conduct.

Local Ethics Representatives were the main contact point for any ethics related issues (e.g. submission of research protocols for approval, etc.) from the pilot site point of view. Their role was to comply with the MyCorridor Ethics Code of Conduct of Research and report back after each pilot round by means of an ***Ethics Controlling Report*** across all the following issues:

A) **Participants and informed consent**
B) **Ethical control instruments**
C) **Privacy**
D) **Safety**
E) **Risk assessment**
F) **Reimbursement**

In each pilot site of the project, ethical and legal issues were supervised by one responsible person on local level that carefully investigated the upholding of the ethical issues. Ethics Controlling Reports served as control means during the project Pilots and were executed in two rounds. The Ethics Controlling Reports aimed to depict up to which extent the ethical policies defined in the project have been followed/covered throughout the project activities (mainly the evaluation activities). It were completed before and after each pilot round by the local ethics representatives and provided to the Ethics Board for cross-check of compliance to the project Ethics Code of Conduct.

In addition, one of the main tasks of the nominated LER was to co-ordinate and be responsible for obtaining approval by the local/regional/institutional ethics committee before any pilot related activities take place (e.g. even before recruitment starts) - if needed.

The key points of the Ethics policy that constitute the MyCorridor **Ethics Code of Conduct of Research** are defined are as follows:

- **Ethics control and monitoring**: In relation to ethical controlling forms updates, the aggregated responses from the test sites were included in the pilot plans Deliverables. Whenever applicable, the entities submitted an ethics application to their designated Ethics Committees.
- **Personal data protection**: Adherence to the principles defined in the Data Management Plan issues of the project.
- **Informed consent**: Participants signing GDPR compliant informed consent forms giving them the opportunity to opt out.
- **MyCorridor policy on privacy, transparency, confidentiality and risk assessment and acknowledgement to the participants of MyCorridor studies**: In all cases, the test sites will abide with the internal and/or national safety regulations applying in their case. For example, in Italy, risk assessment concerning breach of privacy and / or breach of safety is performed according to the national regulation Dls 81/08. All the pilot project leaders have established internal company quality assurance procedures according to the ISO9001 norms, which was adopted to guarantee high level quality in the MyCorridor activities performance. The oral consent of a participant in presence of a witness is not appropriate in accordance with Italian and Austrian national legislation, while it is accepted in Czech Republic, Greece and Holland. Concerning "Privacy", each pilot country has in force national regulations, which are complementary to the GDPR (General Data Protection Regulation) (Regulation (EU) 2016/679) and have to be fulfilled. The list of the national regulations for each project pilot Country have been reported in the project.

19 SWOT

While in the project, and as reported in D8.9: Exploitation plans, there has been a SWOT conducted for each of the exploitable products of the project. Below, the one that corresponds to the integrated one-stop-shop solution, which constitutes the core product of the project, is depicted.

Strengths	Opportunities
• Open flexible, modular and standard architecture • Single access solution for planning, travel support and ticketing • B2C and the B2B deployment approaches • Personalised services • Traffic Management services • iOS and Android • Dynamic storage of traveller data • Multiple actors business rules and schemes • Incentives and loyalty based tokens • Cross border roaming services	• Emerging MaaS market • Current trend one stop shop web sites • Emergence of multi-country vendors of carsharing/ pooling schemes • EU/ National Governments support • ITS directive • Customers dissatisfaction with traditional mobility approaches
Weaknesses	**Threats**
• Need for critical mass of services and sites • System which is based on cooperation principles while there is a lack of willingness of service providers to cooperate & lack of trust between mobility operators who are competitors • Cost of connecting and maintaining services to the overall platform • Security consideration • Need for strong incentivisation	• Resistance of car drivers to leave cars • National and local data/ content services handling regulations and operational schemes • Users expect additional functionality for free • Lack of PPP culture • Competition by big multinationals (i.e. Google) • Slowdown in EU economy – price competition • New non-traditional competitors (e.g. telecommunications companies) • Transport monopolies • COVID-19 pandemic limiting cross border trips and posing mobility restrictions

Figure 133: SWOT for the integrated one-stop-shop solution of MyCorridor.

20 MyCorridor Selling Points

The final ratified innovation of MyCorridor is substantiated in the following selling points of its core product, as they have been recognised during the project and closed at the very end of it, on the basis of the experience collected throughout all project activities:

1. The service delivery platform has been developed in compliance with the emerging standards in the MaaS area (e.g. the MaaS Alliance guidelines) and, as such, it gives the potential of interfacing the also compliant with the guidelines 3rd party services or other one-stop-shops in the field.

2. The service delivery platform has been designed with the principle of extendibility using constructed data models, among other, which allows a vast market potential as it can host numerous mobility and mobility related services of various types in the future.

3. The back-end of the solution is considering both the B2B and the B2B deployment approaches, allowing future penetration in the market but also collaboration with other MaaS operators/aggregators, shifting also the governance criteria of the solution depending its holder.

4. The solution, and, in specific the hybrid trip planners, allows (potentially) multimodal cross-border travel and allows the inclusion for further (local or not) trip planners in the future.

5. The services provided to the travellers are personalised, meaning the specific needs and preferences of the travelers are taken into account in both a static but also semi-dynamic way, allowing custom services creation and provision.

6. Among the services that have been addressed in the solution, TM services are also provided, enabling the inclusion of car users in the MaaS paradigm. This is a win win relationship for both MaaS and TM: MyCorridor provides a series of TM services for a variety of mobility users, while

on the other hand, TM uses MyCorridor system as a potential platform for multimodal mobility management and a tool to influence end user behaviour

7. The front-end mobile interfaces for travelers are provided through iOS and Android operating environments, which comprise together the biggest market share at the moment, serving as an additional enabler for the future MaaS commercialization.

8. Along with the mobile interfaces for travellers, the solution offers a service registration tool that enables easy semi-automatic registration of service providers without requiring special skills on their behalf.

9. The solution offers one single access point for trip planning, support during travel and, finally, redemption of the tokens created.

10. The design of the solution has considered inclusion of all transport modes, and, as such, the interfacing of all possible mobility options.

11. The back-end of the solution encompasses a mechanism responsible for the dynamic storage of traveller data for further processing for research, business but also market reasons.

21 Conclusions

MyCorridor project has been concluded having achieved all its objectives despite the numerous and of various types challenges met. Due to COVID-19, the project had to apply (and get finally) a 6 months extension closing on Month 42 (November 2020) instead of M36 (May 2020). During its lifespan a series of challenges were met dealing mostly with the real-life nature of the project.

Starting from the design phase, and lacking, especially at that point, concrete standards for design and development of MaaS solutions, the design aspects of the MaaS solution developed in the project has undergone a series of optimisations, whilst, at a later phase, it was deemed necessary to follow the emerging standards from MaaS Alliance, as it was indeed done.

In turn, the inclusion of real-life services was not an easy task, as especially when COVID-19 entered daily routines, it has been hard to attract and engage service providers that were external to the project. Payment transactions also required a long series of steps in order to be a reality. Finally, the most affected aspect of the project, has been the real life evaluation activities that were anticipated in the project across Europe that were turned to be truly challenging due to COVID-19. Still, the project, thanks to the collaboration and the tight management undergoing throughout its 3,5 years, it managed to fulfil its goals, offering valuable outcomes and lessons learned to share with the broader research community.

While, being a research project, there is definitely room for improvements and optimisation, leading to higher degree of user acceptance, it is MyCorridor Consortium belief that this challenging project has been a success in proving and assessing the MaaS paradigm and has built a solid basis for further innovation.

References

All MyCorridor Deliverables, public and Confidential.

Annex 1 - Dataset Description Template

Dataset Reference	MyCorridor_WPX_AX.X_XX: Each dataset will have a reference that will be generated by the combination of the name of the project, the Work Package and Activity in which it is generated and its version (for example: MyCorridor_WP5_A5.1_01)
Dataset Name	Name of the dataset
Dataset Description	Each dataset will have a full data description explaining the data provenance, origin and usefulness. Reference may be made to existing data that could be reused.
Standards and metadata	• The metadata attributes list • The used methodologies
File format	All the format that defines data
Data Origin	Specify the origin of the data.
Data Size	State the expected size of the data
Data Sharing	Explanation of the sharing policies related to the dataset between the next options: • **Open**: Open for public disposal • **Embargo**: It will become public when the embargo period applied by the publisher is over. In case it is categorized as embargo the end date of the embargo period must be written in DD/MM/YYYY format. • **Restricted**: Only for Project internal use.
Archiving and Preservation	The preservation guarantee and the data storage during and after the project (for example: databases, institutional repositories, public repositories, etc.)
Re-used existing data	Y/N. If Yes, state the re-used data and how/from where they were retrieved.
Data Utility	Outline to whom the dataset could be useful – potential secondary users.
Link to Dataset	Url link to actual dataset with the same filename (if **Open**)