



## Deliverable D7.4

### Outreach, Transferability and recommendations handbook

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## 1. Executive Summary

This document recaps the recommendations for transferability and outreach for the IP4MaaS project results, as an outcome of IP4MaaS Task 7.3 activities.

The main objectives of IP4MaaS Dissemination and Outreach activities are hereby listed:

- To raise awareness and disseminate IP4MaaS project developments to key stakeholders and external actors;
- To implement and update an appropriate online presence (web-site, social media) and other relevant dissemination material to ensure continuous outreach of the project outcomes, as well as transfer of knowledge;
- To organise key project events and demonstrations to ensure cooperation with the most important international fora, as well as liaise with related projects and initiatives;
- To foster knowledge among all project partners and to ensure that the project's results effectively reach the end-users and potentially interested stakeholders;
- To gain sustainability over the time therewith enlarging the communities (particularly in the demo sites) and liaising with organisations, key stakeholders and other projects by establishing cooperation and engagement in a long-term perspective;
- To ensure maximal exploitation of project results, including a roadmap to market opportunities.

To reach the above objectives, UITP (coordinator of the project and leader of the dissemination WP), supported by all project partners, carried out a certain amount of activities targeted at giving visibility to the project progresses and results. These are indicated in this document, in order to provide an overview on the different tools utilized to reach very broad audiences in Europe and beyond, sharing IP4MaaS outcomes in multiple ways, targeted on the different stakeholders approached. A focus on exploitation of project results is also included in D7.4, as outcome of the Task 7.4 led by the project partner FIT, together with a short overview on all demonstration activities, explored demo site per demo site (more information are available on the deliverable D5.2 to D5.7 dedicated to each of the IP4MaaS demos and presenting a more extensive overview). A dedicated section on the demo evaluation is also provided. Once again, this paragraph aims to present an overview on the impact assessment carried out in WP6. Full deliverables and a more extensive and complete overview on the evaluation and impact assessment activities is provided in D6.3 “Performance and impact assessment” and D6.4 “Final Assessment Report: conclusions about COHESIVE solutions efficiency and impact”.

Starting from the lessons learned on field, and presented by demo leaders/demo actors during specific meetings organized (mostly) in the frame of WP5, recommendations are provided, for transferring the project results and for improving the IP4 ecosystem and its tools, making them more user-friendly, attractive, reliable, multimodal and inclusive. This paragraph, drafted taking advantage of the results collected in similar experiences (in particular, RIDE2RAIL and Shift2MaaS project, recently closed) is also enriched using some insights collected in the discussions happened during the Stakeholders’ Workshop organized in Karlsruhe in May 2022.

From this document, a shorter version has been produced, to better recap the main elements and recommendations. It is uploaded on the project website ([https://www.ip4maas.eu/wp-content/uploads/2023/08/IP4MaaS-Transferability-Handbook\\_final\\_web.pdf](https://www.ip4maas.eu/wp-content/uploads/2023/08/IP4MaaS-Transferability-Handbook_final_web.pdf)) and on Zenodo and can be used for partners and all interested stakeholders’ consultation. The short version of the Handbook is also submitted together with this document in a .zip folder.

## 2. Abbreviations and acronyms

<b>Abbreviation / Acronym</b>	<b>Description</b>
CFM	Calls for Members
DL	Dissemination and exploitation leader
DoA	Description of the Action
EL	Ethical leader
ER JU	Europe's Rail Joint Undertaking
EU	European Union
GA	Grant Agreement
H2020	Horizon 2020
IP4	Innovation Programme 4
OC	Open Call
PC	Project coordinator
PM	Project manager
PMO	Project Management Office
PMT	Project Management Team
PO	Project Officer
QAIC	Quality Assurance and Innovation Committee
S2R JU	Shift2Rail Joint Undertaking
TC	Travel Companion
TL	Technical leader
WP	Work Package
WPL	Work package Leader

### 3. Background

The present document constitutes the Deliverable 7.4 “Outreach, Transferability and recommendations handbook” in the framework of task 7.3 of the IP4MaaS project (S2R-OC-IP4-01-2020).

## 4. Objective/Aim

The objective of Task 7.3 is to guarantee that project developments and outcomes are/can be transferable to other relevant mobility stakeholders for further roll-out. This task does not only involve with the technical aspect of the transferability but rather the business aspect, focusing on business impact and market uptake of technologies. The analysis is based on the impact assessment executed in WP6 aiming to provide transferability recommendations.

## 5. IP4MaaS Overview on Demonstration activities

Demonstration activities have been executed according to the Demonstration Execution Plan and Technology Integration Plan. The only way to demonstrate the added value of the IP4 developments is the involvement of various stakeholders in several different on field demonstrations, where local conditions and constraints can be considered.

For this reason, six demonstration sites are defined:

- Barcelona demonstration site
- Padua demonstration site
- Athens demonstration site
- Osijek demonstration site
- Liberec demonstration site
- Warsaw demonstration site
- Liberec-Warsaw long distance connection

The variety of the demonstration sites enabled the involvement of various stakeholders and actors at local level. In addition to long-distance and urban/suburban rail and bus operators, shared and private travel modes representatives have participated to demo activities, as well as transport authorities and ancillary services providers, supported by universities and research centers involved at demo level. For demonstration purposes, the local operators and travel service providers:

- Provided real data in an operational environment
- Provided a realistic and adequate environment to integrate and run the demonstration
- Defined a clear interface to their webservices and provided real data to facilitate integration and demonstration of the IP4 functionalities
- Provided access to their facilities and amenities, and supported activities related with the implementation and testing of IP4 Technology demonstrators
- Accompanied and participated in project activities supporting the engagement of users and the dissemination of the demos, attracting people to the demonstration activity and enhancing the project visibility.

In the sub-chapters below, a basic overview on the different demonstration activities carried out in the project is provided, together with statistics and information on the participants and their general feedback. For additional information, please refer to the project deliverables from D5.2 to D5.7, “Demo Execution Reports”, that are made available on the IP4MaaS website once approved.

### 5.1. Athens Demo

#### **1<sup>st</sup> Phase:**

**Demo Period:** 11-22 July 2022

**Number of participants (users)/demo statistics:**

- Number of registered users: 140
- Responses received from TSPs: 7
- Responses received from travellers (Greek): 7
- Responses received from travellers (English): 10

**Functionalities tested:**

- **End users:**

Journey planner for the whole Attica Region; Bike issuing; Taxi booking; Location based Experiences (LBE). LBEs for OASA (Metropolitan PT provider)

- **TSPs:**

Asset manager; LBE editor; Contractual management marketplace





Figure 1: Dissemination of the demo - Omonoia Station in Athens

## 2<sup>nd</sup> Phase

**Demo Period:** 27-31 March 2023.

### Number of participants (users)/demo statistics:

- Number of registered users: 79
- Number of calls for taxi: 31
- Number of bike coupons calls (via TC app): 23
- Number Registered Users at the BRAINBOX app: 16
- Bike Rentals: 37

### Functionalities tested:

- **End users:**

Journey Planner (JP)/ Offer Builder; Booking; Issuing; Mobility packages; Location-based experience; Navigation; Traveller's feedback; Trip sharing; Guest user; Preferences and profiles; Specific messages; Smart Locations; Map Content.

- **TSPs:**

Asset manager; LBE editor; Contractual management marketplace; Travellers Orchestration and supervision (new use case with taxi pick up)

### Brief description:

The goal of the Athens demo was to contribute to the unification of the multiple modes of transport that are available in Athens in one platform, hence making everyday trips in the city more sustainable, flexible, efficient and environmentally friendly, for both commuters and tourists. The Athens demo focused on enhancing multimodality by providing journey planning and integrated ticketing through a single application, involving several transport modes, including metros, buses, taxis, bikes and walking. Although an extensive list of personal transport modes was not included within journey planners, mode-specific considerations are performed on the basis of available infrastructure (i.e., public transport lanes, bike, and pedestrian routes, and car routes). The journey planner demonstrated in Athens included public transport, bike, pedestrian, and car routings to provide optimal means of traveling. Travelers could use other transport modes (e.g., electric skateboards, e-scooters, etc.) in the suggested routings by considering the regulations and traffic conditions of the region. The demo site was located within the urban area of Athens, including also a small Public Transport Operator (PTO), the Municipality of Iraklio, located 8.5 km from central Athens and directly providing PT services in its territory.

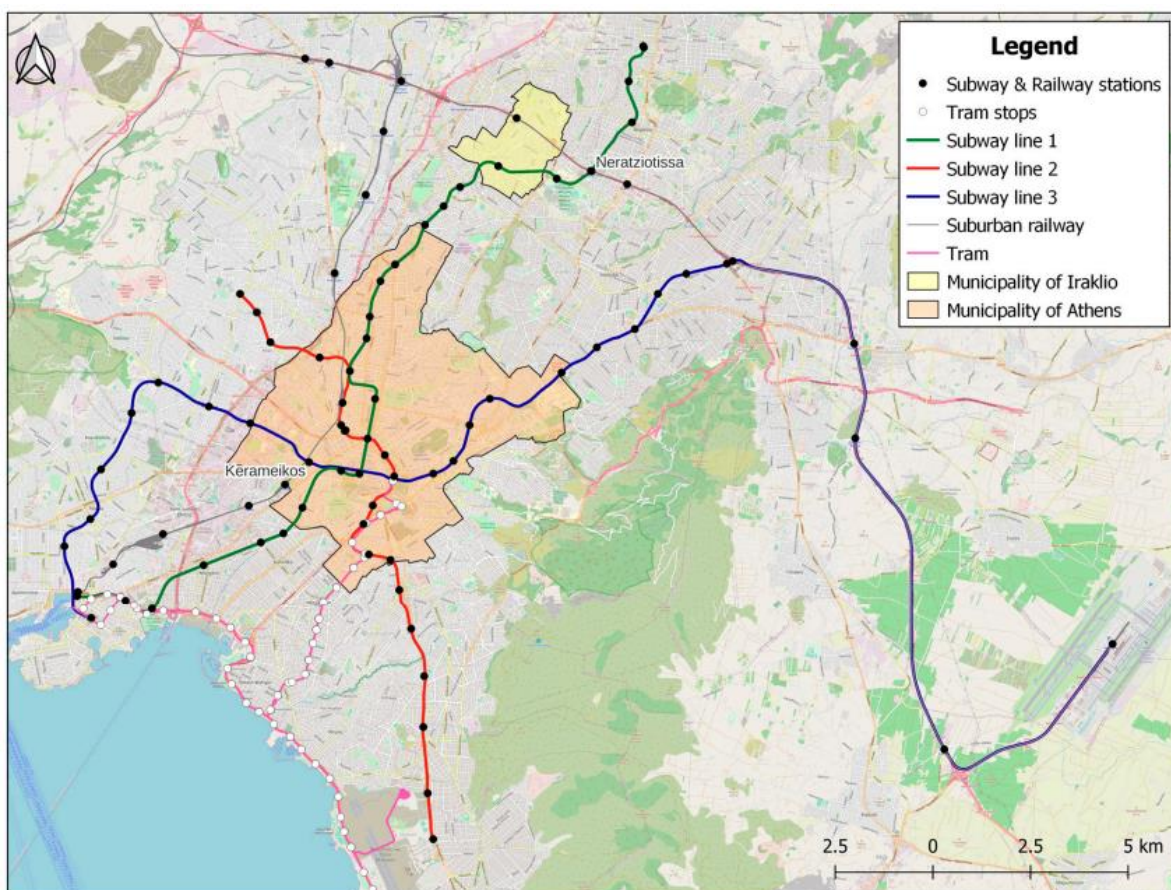


Figure 2: The Athens demo area (Phases 1 and 2).

**Results (+user feedback) and how the results are being/will be used:**

The feedback received from the users, showed that the overall feeling of the demo was very positive, as users were very excited to know that attempts were being made to develop a MaaS app for Athens. Despite the deep interest of users in implementing an app for simplifying multimodal trips in the city and its surroundings, the overall assessment of the demo execution contributed to the identification of significant challenges.

The Athens demo site used real data, real processes, and diverse transport stakeholders to provide a comprehensive proof of concept for demonstrating business processes and formulating business

rules to expand collaboration between transport providers and provide directions to actors to develop customized MaaS packages. Identification of challenges at the planning and implementation level could be used to guide decision making in other similar MaaS schemes, regarding mode selection, creation of incentives, development of mobility packages, and formulation of policies to shift travellers' behaviour towards using and benefiting from MaaS. The major challenges that were faced were related to technological and legal issues. To overcome these challenges, a set of supportive tools and methods were used, such as QR codes, re-direction to other apps by providing a link, and mobility package application. Although these solutions worked in the context of the demo, they also prove the need of addressing MaaS challenges for building a competing mobility service that is reliable, satisfies user needs and improves accessibility for all users.

## 5.2. Padua Demo

**Demo Period:** 17 – 21 April 2023.

**Modes involved:** Train, buses.

**Functionalities tested:** Trip planner, Navigation, Traveller's feedback, Issuing, Trip sharing, Guest user,

Preference and Profiles, Booking, Collaborative Space (travellers), Asset manager (TSPs), Collaborative

Space Portal (TSPs), Specific messages (TSPs).

**Brief description:** The demo took place in a 40 km radius surrounding the urban centre of Padua (Veneto Region, Italy) involving urban and regional mobility service (rail, bus) providers. The main objectives of the demo were:

- To improve urban-surrounding connections;
- To improve the efficiency of public transportation services: although most areas with transport infrastructures are well equipped, there is sometimes a lack of integration between different modes of transport, which makes travelling inconvenient.
- To reduce GHG emissions and traffic/parking congestion: bad travel habits, such as travelling alone or preferring car travel to public transport are largely used.

The demo was carried out in strict collaboration with Ca' Foscari university in Venice, as one of the main target groups of user was students commuting for university purposes.

**Number of app downloads:** 77

**Number of registered participants:** 9 travellers + 4 TSPs

**Number of completed USI questionnaires:** 13

**Total number of rides:** 387

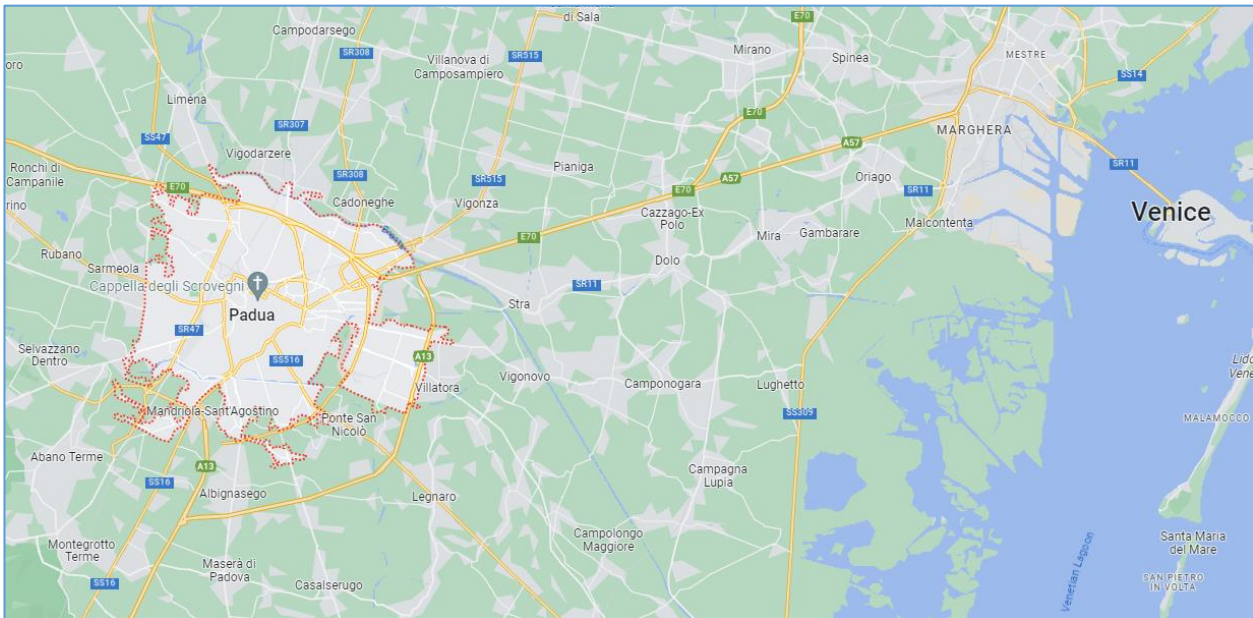


Figure 3: The Padua demo area

**Results (+user feedback) and how the results are being/will be used:**

Users really appreciated the application, as it improved of the urban-rural connections and reducing emissions. The functionality “travellers’ feedback” was particularly appreciated as it allowed to inform other travellers about the status of the trip increasing the user experience. The tested functionalities worked adequately with no bugs However, a training on the app, to be carried out before the demo, has been considered very important to properly exploit the potential. Adequate communication and the selection of a targeted user group was also considered important (target group for the demo was university students). The impossibility to find the TC on a commonly used app download platform has been considered in some cases discouraging.

5.3. Warsaw Demo

**Demo Period:** 15 – 19 May 2023

**Modes involved:** Metro, trams, buses,

**Number of registered participants:** 244

**Number of completed USI questionnaires:** 181

**Responses received from TSPs:** 7

**Responses received from travellers:** 204

**Functionalities tested:**

- **TSP:** Asset Manager
- **Travellers:** Journey Planning, Navigation, Traveller’s Feedback, Trip Sharing, Guest User, Collaborative Space Portal, Digital Onboarding, Travel Arrangement

**Brief description:** The main objectives of Warsaw Demo were to enhance the knowledge and practice of user profiling to support the development of the tools created and implemented by ZTM and to support the Warsaw’s MaaS readiness through extending knowledge on creating and managing MaaS schemes, with different functionalities integration.

The demonstration covered the whole area of operation of Warsaw Public Transport (Warsaw and 34 communes, 2 693 426 people, 2 751 km). Initially, the use cases for the Warsaw demo were defined as concentrated around several areas/destinations: Młociny public transport node, and

two Universities: SGGW and UKSW. Later, it was extended to the whole city/suburban area.

**Results (+user feedback) and how the results are being/will be used:**

Both the general goal of the demo within the scope of the IP4MaaS project (to test the usefulness of the tools and understand the engagement of people) and the local goal of the City of Warsaw as the IP4MaaS consortium partner (to get experienced with MaaS tools) have been accomplished. Warsaw delivered 204 USI questionnaires for travellers and 7 USI questionnaires for TSPs to AITEC. These surveys allowed to understand the general impressions of the demo and of the tools, that in any case have been very positive. This was facilitated by the work carried out by the demo team in order to properly instruct the users and inform them about the features of the tools. The reported highlights and faults clearly indicate that the Travel Companion application, has a great potential, but indeed it requires improvement and refinement in order to be used on a commercial basis on a large scale. Warsaw's testers' feedback has been considered helpful as some of the reported issues have already been refined in the following version of the Travel Companion, in a “continuous learning” process.



Figure 4: Screenshot showing information displayed on MZA webkiosk

#### 5.4. Liberec Demo

**Demo Period:** 15 – 19 May 2023

**Modes involved:** Trams, buses, trains

**Number of registered participants: 124**

**Number of completed USI questionnaires: 112**

**Functionalities tested:**

- **Active:** Journey Planner/Offer Builder, Improved Intermodal Travel/Individual Last Mile, Smart Locations, Booking, Issuing, Validation and Inspection, Trip Tracking, Alternatives calculation
- **Passive:** Travel Companion Web-Portal, Guest user, Trip Sharing, Travel Arrangement, Navigation, Traveller's feedback

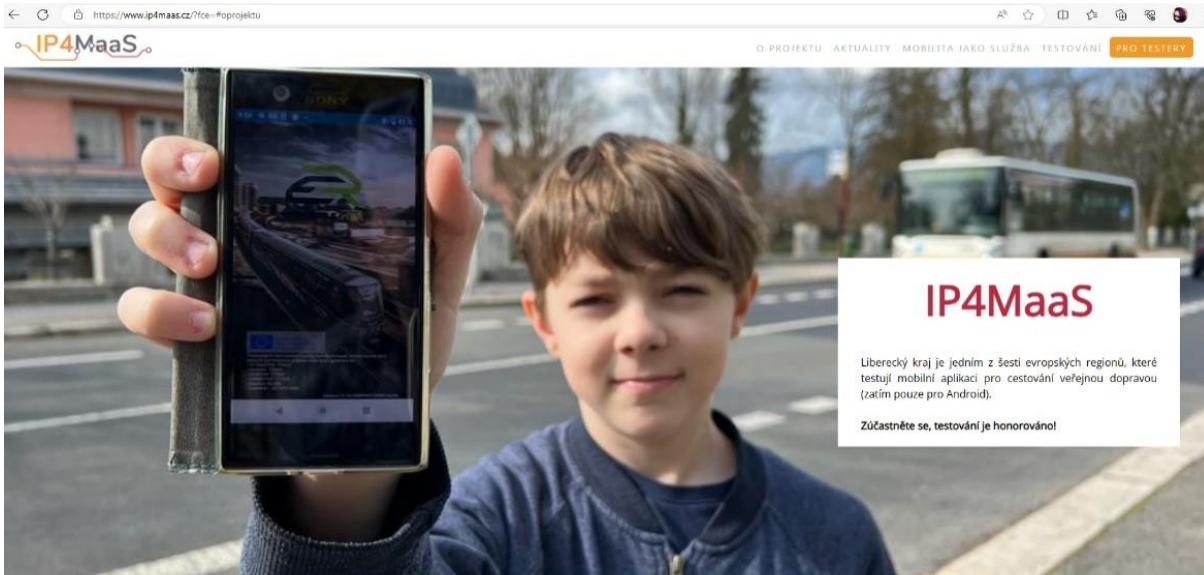


Figure 5: Liberec Demo website

### **Brief description:**

Liberec region is a mountainous region with scattered settlements in the countryside but on the other hand with industrial centers focused on automotive. The public transport is fully integrated and managed by KORID and represents the involvement of 19 operators (in total) with one integrated ticket. The main objectives of Liberec Demo were:

- to achieve better and smoother travelling in the Liberec region
- to improve the integration of all available public transport mode
- to enhance quality, availability and comfort of public transport services
- to understand passenger needs and preferences

The main information source for communication with testers was website [www.ip4maas.cz](https://www.ip4maas.cz), i.e. the website dedicated to Liberec demo, providing information about the IP4MaaS project, the demo and also information material such as user guides, links to download the app, USI survey, etc.

### **Results (+user feedback) and how the results are being/will be used:**

124 testers were involved in the demo totalizing 2,036 journeys. The demo was very successful and it fulfilled the expectations of all involved partners, mainly thanks to intensive cooperation among all involved actors. Testers were asked to fill out the USI survey. The main outcomes were that the testers emphasized that apps are use-friendly and easy to use, as they integrate all transport modes into one travel solution and also support for eco-friendly transport solutions. On the other hand, the testers could indicate the improvements to be made to the app in order to increase its user-friendliness and efficiency.

## 5.5. Long Distance Liberec-Warsaw Demo

**Demo Period:** 15 – 19 May 2023

**Modes involved:** Buses, trains

**Number of participants:** 10

**Functionalities tested:**

- **Active:** Journey Planner/Offer Builder, Smart Locations, Booking, Issuing, Validation and Inspection
- **Passive:** Trip Sharing, Travel Arrangement, Navigation



Figure 6: Long-Distance Pilot

### **Brief description:**

The purpose of the Long-Distance Demo was the testing of multimodal cross-border connections between Liberec and Warsaw. In the framework of this demo, services that had been integrated within Liberec and Warsaw demos were used together with AMS (long-distance buses) services.

### **Results (+user feedback) and how the results are being/will be used:**

10 testers (4 from UNIZA, 3 from OLTIS and 3 from KORID) tested the above-mentioned services, travelling from Liberec to Warsaw by train and from Warsaw to Liberec by various combinations of transport modes, primarily by bus. The testers were recruited internally, and they were very satisfied with the IP4 idea itself, particularly the connection of a large number of services within one application and thus the possibility of using one app for travelling in Liberec, cross-border and Warsaw.

## 5.6. Osijek Demo

**Demo Period:** 29 May – 2 June 2023

**Modes involved:** Trams, buses, shared bikes

**Number of participants (users)/demo statistics:**

- Number of registered people (travellers+TSPs): 43
- Number of participants: 43

- Surveys completed: 41
- Incentives provided (number): 12

**Functionalities tested:** Guest user, Journey Planner / Offer Builder, Journey Planning - New functionalities: Trip Planning Hierarchy, Improved Intermodal Travel, Improved Travel Shopping, Individual Last Mile, Navigation, Trip Sharing, Travel Arrangement, Preferences and Profiles, Group travelling/Group creation, Trip price overview

**Brief description:**

Osijek demo site area was defined by administrative borders of Urban agglomeration Osijek (UAOS), which consists of the City of Osijek and 18 neighbouring municipalities. Demo execution was focused on the area where public transport service/network is available. Objectives of the demo are:

- To test and demonstrate Shift2Rail IP4 functionalities by connecting different back-end systems (GPP & Nextbike APIs) and provide added value to public transport users;
- To explore the potentials of creating a MaaS ecosystem in the Osijek area, facilitated by IP4 solutions;
- To test and demonstrate the integration of traditional modes of public transport (trams and buses) with innovative new services (e-bike & bike sharing);
- To gain the knowledge and experience of creating a MaaS ecosystem and ultimately speed up the future uptake of IP4 technologies.

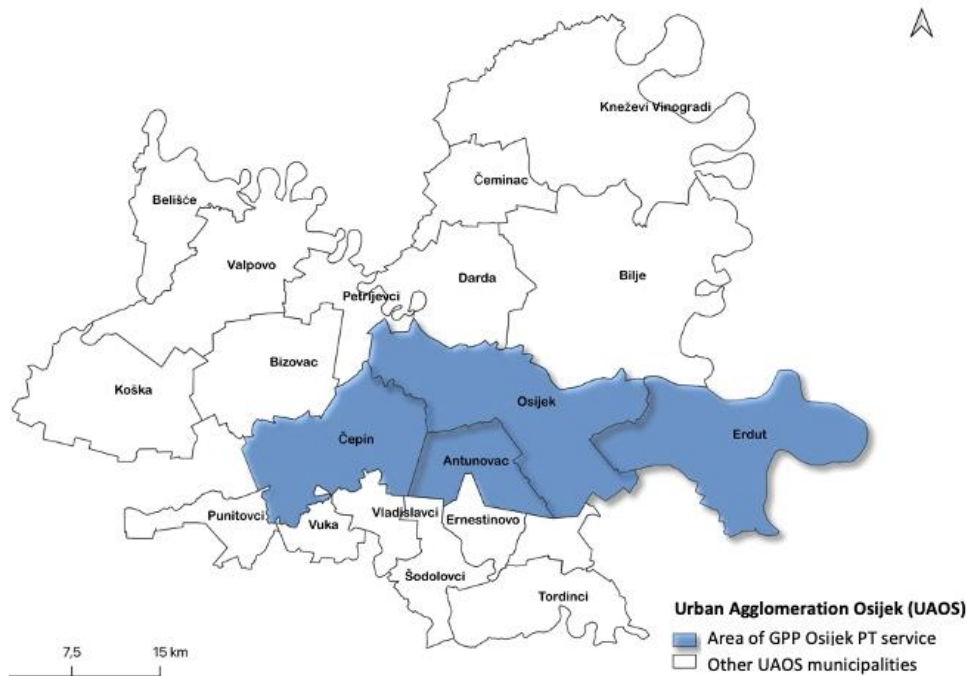


Figure 7: Osijek demo area

**Results (+user feedback) and how the results are being/will be used:**

In Osijek, the selected S2R IP4 functionalities were successfully tested and demonstrated. The demo aimed to obtain the knowledge and experience of creating a MaaS ecosystem and give insight into the usefulness of certain MaaS-related technologies/functionalities, contributing to improved multimodal traveling in the area.

Testing and demonstrating different S2R functionalities added value to public transport users and made it possible for both the Osijek demo team and app users to explore the potential of



establishing such a MaaS system from scratch.

Demo testing contributed to the successful integration of traditional modes of public transport, i.e., GPP's trams and buses with innovative e-bike & bike sharing services in Osijek. The service was offered through the Journey Planner function, which was used by more than 60% of the testers. The Journey Planner was the best solution demonstrating to the users the advantages of the synergies between bike sharing and public transport. Through the demo experience, users could report issues that contributed to improving the ecosystem.

The TC app could attract more people to use sustainable modes of transport and combine them, improving the efficiency of public and shared transportation and reducing GHG emissions.

Users recognized and appreciated the potential of the tools, despite in some cases the technological solutions need further development and improvement to meet the growing demands for multimodal mobility.

## 5.7. Barcelona Demo

**Demo Period:** 05 – 09 June 2023

**Modes involved:** Metro, Trams, Buses, Shared/on demand buses

**Number of participants (users)/demo statistics:** 31

**Functionalities tested:** Journey planner, booking and issuing (for BusUp), collaborative space

**Brief description:** Barcelona demo focused on commuters and students and tried to test the integration of transport on demand and public transport services. In particular, test cases were focused on the urban-rural connections from the city centre to the outskirts of the city and vice-versa, despite the overall demo area was the whole city of Barcelona and its surroundings, where TMB and the other TSPs involved operate their services.

**Results (+user feedback) and how the results are being/will be used:** very positive, particularly after the focus group (involving a practical utilization of public transport and shared modes). Testers shared their feedback very proactively providing inputs for improvement. In Barcelona, 3 types of testers/volunteers have been targeted, using 3 different approaches: i) the volunteers from a social media campaign/online communication; ii) the volunteers participating to the UITP Global Public Transport Summit, in which the project was presented; and iii) an ad-hoc organized focus group. The feedback of the focus group was proven to be the most useful and the interaction proved to be beneficial from both IP4MaaS and CFMs sides, as the participants understood the complexity and the concept of the functionalities and the CFMs understood better the travellers' needs.

The 3-hours focus group was held at the premises of TMB and its objective was to have the explanation of the functionalities to be used in the demo, and then to test the application in real environment. Each functionality was extensively presented and the participants could test it in a controlled environment, submitting to the technical partner the issues encountered. The focus group was a success as it allowed the testers to freely express their opinion and provide suggestions for the different functionalities presented, and promptly solve possible misunderstanding on a functionality, with focused people committed to go in depth in all the testing phase. Finally, the testers do not only reported issues but also proposed improvements for the functionalities presented. These improvements were on the usability, issues encountered and minor comments to optimize the usage of the app.

## 6. Summary of IP4MaaS Performance and Impact Assessment

The outputs derived from the demo activities of IP4MaaS fed the project's evaluation actions, aimed at assessing performances and impacts generated by the project through COHESIVE demonstrations in relation to the overall project objectives and, after setting performance and impacts goals, to evaluate how they are met in the demonstration sites. These actions were designed through a methodology leading to:

- Define common metrics to assess and benchmark environmental, transport and socio-economic performances of IP4MaaS demos considering combined effects among them.
- Measure ex-ante/ex-post KPI values.
- Understand MaaS implications in local mobility models.

A large set of indicators were retrieved from both IT systems (Operational KPIs) and involved users (both testers and TSPs surveyed and leading to the generation of User Satisfaction Indexes – USIs). The evaluation of impacts reported in D6.3 and D6.4 demonstrated the viability of the IP4MaaS solution: overall the feedback was positive and provided significant inputs for the improvement and evolutions of the proposed services.

Regarding IP4MaaS “Performance Assessment”, a toolbox including five modules executed sequentially based on a mathematical approach has been prepared. According to the capability of this toolbox, it can be extrapolated to assess and evaluate new IP4 functionalities of the Travel Companion (TC) not considered in the IP4MaaS project, or the same functionalities considered in IP4MaaS but in other different demo sites.

Outputs of this transferable “**IP4MaaS performance assessment toolbox**” are the following (more information are included in the D6.3. Performance and Impact assessment<sup>1</sup>):

- To figure out the most influent benefits regarding the acceptability of the TC's functionalities by travellers and TSPs (Module 1 of the Toolbox- AHP analysis).
- Figure out what benefits are the most correlated with others, so that improving the first one automatically improves the second (Module 2 of the Toolbox- Regression analysis).
- Conduct impact assessments based on predictions: “What is the effect on the satisfaction regarding the other benefits of the TC functionalities in case that one benefit is drastically improved?” (Module 3 of the Toolbox- Bayesian Network analysis).
- Identify those functionalities with significant differences regarding satisfaction in relation to socio-demographic profiles of travellers (Module 4 of the Toolbox- ANOVA test).
- Calculation of the metric “Effectiveness” about a specific functionality offered by a TSP and used by a profile of travellers, as an average of the satisfaction shown by Travellers, TSPs and some “operational KPIs” (D3.3. Sections 9.3.1, 9.5, 10<sup>2</sup>) (Module 5 of the Toolbox- Calculation of USI travellers, TSPs and Effectiveness).

Some limitations were encountered, and they helped to outline barriers and to design future upgrades; they are shortly summarised hereafter:

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<sup>1</sup> IP4MaaS Project Deliverable D6.3 Performance and impact assessment, <https://zenodo.org/communities/ip4maas/>

<sup>2</sup> IP4MaaS Project Deliverable D3.3 Final version of the methodological framework for future projects, <https://zenodo.org/communities/ip4maas/>

- the effort allocated to internal tests before the launch of the demos needs to be increased, errors deriving from data mismatch have been encountered and sometimes led to suboptimal journey solutions. The integration of a large set of providers usually brings unexpected complexities that should be faced with a careful risk management.
- the user experience of mobile apps, especially when engaging in concrete behaviours like mobility habits, is crucial: low performances risk to compromising user acceptance. The IP4MaaS tests were on priority designed as back-end integrations among IP4 and TSPs. A refinement of the final front-end product was recommended to improve the user experience in order to reduce the encountered limitations in terms of responsiveness, intuitiveness, linguistic correctness, etc. These limitations were reported by users and contributed to abandon rates.

The IP4MaaS experience should however be seen in the overall MaaS evolving concept, with an ecosystem characterized by the presence of several actors, each of them pursuing different objectives:

- **operators**, both transport service providers and aggregators or resellers (MaaS Integrators and MaaS Operators) mainly pursue business and therefore profit objectives, through the provision of transport and mobility services;
- **users** mainly pursue practicality, comfort, innovation and digitization objectives: the more the mobility service is smart and accessible, the more users are inclined to use it; as a secondary objective, users take into account the goal to meet sustainability for their travels;
- **policy makers** pursue social and sustainability objectives, encouraging new mobility services from a shared and green perspective, also through the definition of a framework of rules, also ensuring fair competition and market growths finally favouring the creation of new services for the benefit of citizens.

In this context, the feedback from IP4MaaS evaluation, gathered by all classes of actors and reported above leads to the overall recommendation that the users' mobility experience is closely linked to the availability of effective digital applications, but for the consumers to be stimulated and convinced to change their habits (leaving the daily "comfort zone") it is necessary to define a level of convenience for the change. IP4MaaS proved that the idea of integrating TSPs in a large EU network like the IP4, could create the ideal conditions to raise the convenience for this behavioural change and overcome some of the current barriers for a large MaaS adoption. The evaluation methodology designed and applied to the project may be a reference for future assessments when implementing complex mobility scenarios in EU cities.

## 7. Summary of IP4MaaS Exploitation Strategy

Mobility-as-a-Service is still not completely mature business area. IP4MaaS has been a collaborative effort among all relevant stakeholders in order to move MaaS forward to a state where Europe can harvest the environmental, societal and financial benefits.

The added value of IP4MaaS is to enhance existing local transport services by implementing and demonstrating large and standardised IT integrations around IP4 services.

The project consortium was composed by different categories of actors, each one expressing

specific business requirements. Thanks to the experience gained from development and test activities and from the large amount of data collected during the experimentation, the project exploitation phase was devoted to identify concrete value propositions that are summarised in the following table:

<b>Actor category</b>	<b>Value proposition</b>
Public entities	Improved knowledge about the creation of MaaS ecosystems and their governance
Academics and research centers	Advanced knowledge on new methodologies for design, analysis, assessment of MaaS solutions and services
Consultancy and IT companies	Tools and methodologies bringing added values to potential customers (MaaS operators, Transport Operators, Public Authorities): technologies, data processing methods, evaluation and analysis applications.
Transport Service Providers	IT modules for MaaS integration

The individual exploitation strategies will therefore be based on the following guiding principles:

- The solutions tested in IP4MaaS have a clear impact in individual partners businesses. The innovative character of IP4 solutions can give the project results high potential in a commercial environment. IP4MaaS use cases and related functionalities can feed the development of new assets for the creation of second generation of MaaS platforms.
- The individual partners' interests in participating to the project guided the IP4MaaS business model generation process reported in D7.5. The business models support individual strategies of the project members in order to guide future investment plans.
- The market context analysed helps IP4MaaS partners to identify and evaluate opportunities for their exploitation and to monitor other initiatives (commercial or research driven) towards a stronger market positioning.

Based on these assumptions, the IP4MaaS exploitation strategy has been outlined around the following actions:

- Action 1 - Knowledge Agents: the consortium is well equipped to serve all relevant IP4MaaS target groups. The project partnership seeks to develop and maintain a culture of service orientation favoured by MaaS schemes both at respective local level in demo sites and at EU level within the Europe's Rail Joint Undertaking.
- Action 2 - Community marketing: WP7 made use of the available social community assets, and involved the high performing online communities, being a driver for project's outputs and partners' value propositions.
- Action 3 - Activation of multipliers: UITP as project coordinator and largest association for Public Transport can accelerate the take-up of project results for MaaS 2<sup>nd</sup> generation, taking advantage of collaborations activated with CFMs.
- Action 4 - Exploiting synergies with relevant parallel activities: a number of IP4MaaS consortium members are involved in other activities such as TRA, other IP4 or Horizon

Europe research projects, international data spaces (IDS) standardisation actions. These synergies are multiplying the exploitation efforts of IP4MaaS partners.

## 8. Summary of IP4MaaS Dissemination and Outreach Activities

The main objectives of IP4MaaS Dissemination and Outreach activities are hereby listed:

- To raise awareness and disseminate IP4MaaS project developments to key stakeholders and external actors;
- To implement and update an appropriate online presence (web-site, social media) and other relevant dissemination material to ensure continuous outreach of the project outcomes, as well as transfer of knowledge;
- To organise key project events and demonstrations to ensure cooperation with the most important international fora, as well as liaise with related projects and initiatives;
- To foster knowledge among all project partners and to ensure that the project's results effectively reach the end-users and potentially interested stakeholders;
- To gain sustainability over the time therewith enlarging the communities (particularly in the demo sites) and liaising with organisations, key stakeholders and other projects by establishing cooperation and engagement in a long-term perspective;
- To ensure maximal exploitation of project results, including a roadmap to market opportunities.

The above objectives have been achieved by focussing on various aspects:

- Establishing IP4MaaS as a brand while disseminating project objectives, raise awareness on topic of multimodality enabled by digital tools, generating interest through various channels;
- Active involvement of local practitioners and stakeholders: dissemination of demos and their objectives/set-up on website and social media, heavily utilising partners' networks for this. Local dissemination has played an important part in IP4MaaS seeing demo audiences were to be targeted locally, in local languages;
- Promote the findings of the project, promote the exploitation of the project activities and results: through events (both organisation and participation) website, scientific publications, social media articles, newsletters, UITP Project Brief, final leaflet, and other.

As an overview, the following dissemination and communication activities have been conducted throughout the IP4MaaS project:

- Setting up/publish the communications and dissemination strategy to outline the activities to be conducted in the project (D7.2);
- Develop a coherent IP4MaaS visual identity including logo, graphic charter, templates, and supportive material such as a project roll-up, used in all project events;
- Create and maintain the project website ([www.ip4maas.eu](http://www.ip4maas.eu)) with events, news and insights (deliverables, publications) developed by the project;
- Create and maintain IP4MaaS Twitter (113 followers) account to disseminate project news to a wide array of stakeholders;
- Publications: general project leaflet (also printed), factsheet (D7.6, wrap-up of project

results, due in June/July 2023), the UITP Project Brief recapping all project results (due in June/July 2023), the Transferability Handbook (also printed, due in July 2023);

- Sending out 4 E-Newsletters to (3 already issued at mid-June 2023, the fourth is due after end of June 2023);
- Creating one [animated video](#), shown at the final event and other conferences, and also shared via social media and more in general online by UITP (dissemination leader), UNIFE (main contributor to the video production) and all other partners;
- During the project lifetime, all 26 partners were constantly encouraged to act as IP4MAaaS Ambassadors and disseminate the project towards own networks and audiences. This took the form of social media posts, web articles, press releases, events, newsletter, demo events, workshops, direct communication to demo participants and interested stakeholders, scientific publications, among many others;
- Disseminate project info to press and media outlets, while encouraging partners to publish information on their own websites. 20 articles so far (until mid-June 2023, number will increase afterwards) have been published in three languages with additional promotion online (social media/websites) performed in seven languages;
- Publication of 5 Scientific and Peer-reviewed publications;
- Creating liaisons with other Shift2Rail/Europe's Rail projects, as well as other initiatives on MaaS and public transport (RIDE2RAIL, ERRAC, TRIPS, ExtenSive, CONNECTIVE, COHESIVE etc.): creating joint events, disseminating material, among others;
- Organization of Final Project Event with accompanying Press Release issued by UITP. It is important to mention that the Final Event, organized in Barcelona on June 6<sup>th</sup> 2023, was a perfect exercise of collaboration among actors, as it was jointly organized with ExtenSive and CONNECTIVE projects, bringing together 3 projects, showing to a large audience their results and how the collaboration established at the beginning of these experiences turned into valuable and successful outcomes;
- Production and presentation of 2 project posters (TRA 2022; UITP Global Public Transport Summit 2023);
- Development of various dissemination material about demos by local partners: from demo events organized in many demo sites (mainly for training users and increase project visibility), to leaflets, to signage material, to stickers, to banners, to press articles, to social media posts;
- Organisation and participation in over 30 external conferences, workshops and other events (complete list to be found in dissemination tracker), including:
  - A Stakeholders' Workshops in May 2022 (Karlsruhe, Germany, in line with IT-TRANS Conference);
  - One edition of IT-TRANS (May 2022);
  - 10th International Railway Summit (February 2021, Online);
  - International Mobility Congress (September 2021, Sitges, Spain);
  - 7<sup>th</sup> ITS Hellas Conference (December 2021, Athens, Greece and Online);
  - Two editions of the S2R Innovation Days (December 2021 and 2022, Online);
  - InnoTrans 2022 (September 2022, Berlin, Germany);
  - International Rail Forum&Conference (October 2022, Prague, Czechia);
  - ASSTRA Conference on sustainable door-to-door mobility (October 2022, Rimini, Italy);
  - TRA 2022 (November 2022, Lisbon, Portugal);
  - COHESIVE Project Final Event (January 2023, Toulouse, France);
  - UITP Global Summit Barcelona 2023 (June 2023, Barcelona, Spain. Activities include: Final Event, dissemination at UITP stand, presentation at "Innovation in te

Spotlight” session, e-poster presentation).

Ensure visibility in various UITP bodies and activities, including Committee meetings such as the UITP RSR Committee (Cairo, Egypt, March 2023), UITP Light Rail Committee (Brussels, Belgium, October 2021), UITP MENA Conference and Exhibition (Dubai, UAE, February 2022), and the UITP Asia-Pacific Annual Meeting (Online, May 2021), inclusion of IP4MaaS info in the UITP Activity Report, the UITP Keep it Rail! Campaign/Digizine, various UITP newsletters (UITP Direct, EU Express, Rail newsletters, Financing & Funding Newsletters), among others. Additionally, the project activities have been disseminated via partners’ newsletters (POLIMI, UNIFE, ZTM among others), via a website created for the Liberec demo, and also via S2R/Europe’s Rail newsletters.

## 9. Recommendations for Transferability

This section is drafted based on the outcomes of the meeting on “lessons learnt from Demos” and IP4MaaS WP5 Meetings organized regularly by the WP5 Leader Oltis Group. Additionally, it includes some outtakes emerged from the discussions during the Stakeholders’ Workshop organized in Karlsruhe (Germany) on 12<sup>th</sup> May 2022, jointly held with RIDE2RAIL project. Demo leaders, key technical partners, CFMs, Europe’s Rail and MaaS solutions developers have been invited to the event, to share the ongoing activities and also some insights about how to improve door-to-door mobility in Europe and beyond.

### **Recommendations concerning the IP4 ecosystem and the Travel Companion app**

Despite the overall feeling about the IP4 solutions tested on field has been in general very positive, users (being them TSPs and travellers) at different levels and in different demo sites reported some issues occurred while participating to the demo.

The vast majority of comments and suggestions that came from the TSPs and travellers involved in testing of the TC and more in general of the IP4 solutions were linked to technological issues affecting the app/system malfunctioning and to the rigidity of the system. In some cases, lack of user friendliness and technical immaturity of some of the solutions have been mentioned as cause of issues.

Below, a list of recommendations directly coming from the on-field utilization of the tools is provided, with special focus put on “macro categories”. Once again, the below are based on the direct feedback received from users and from the presentations and discussions organized by UITP in strong collaboration with WP5 leader and all demo leaders, when the lessons learned from each demo experience have been presented to the project partners, in order to learn from mistakes and understand what worked well and what had to be improved. As some of the comments affected the technological part, CFMs were invited in some of these meetings, and more in general have always been in close contact with each demo team and the WP5 leader, in order to promptly correct technological issues and improve the service, whenever possible.

### ***Attractiveness & user-friendliness***

To succeed in the competition with other already existing applications, the solution must be easy to use. In other words, it must be understandable for its users, as simple as possible so that it becomes intuitive. A strong focus should be put on user experience, in particular in a mobility context populated by several applications which are already ready for satisfying mobility needs of users Europe-wide (and beyond). The experience of IP4MaaS proved that travellers understood the very high potential of the Travel Companion, its multiple functionalities, the ecosystem itself, but agreed on the fact that its maturity makes it still needing work for being prepared for

accomplishing its ambitious mission of being the reference for the mobility in the continent, integrating multiple modes and allowing smooth and seamless movements whenever in Europe. Features like various user preferences, additional search options or offer ranking together enable the application to offer computation results, i.e., travel connections, tailored to particular users. Despite users appreciated most of the functionalities, they reported some issues/system malfunctioning<sup>3</sup>:

- In some cases vocabulary is complex to be understood without a proper training. On this aspect, the role of the demo leader as “facilitator” is still considered very beneficial;
- Sometimes, the Travel Companion showed routes that do not exist and that don’t have a name (unknown line to unknown destination) or suggested waiting times of up to 6 hours. When reported to CFMs, they tried to correct this problem and the app was indeed better working in the following releases;
- In some cases, loading time reported by users was very high, as well as long time for searching connections;
- Some testers declared that they found, looking for a trip from A to B, very few route variants, lack of possibility to scroll to see earlier/later connections;
- Accuracy of the localization was in some cases poor;
- The app suggested in some cases long walks. Despite walking and biking, as “soft modes” need to be encouraged, walking for more than 1km can be considered not ideal by many;
- In some cases, the system did not recognize some places indicated as starting/ending points, and did not recognize with high accuracy the current position of the user;
- When some users modified the route while using the app, the system did not recognize this change and did not update the “new” route;
- When typing a specific address, in some cases the application linked it to the same address in other cities/villages in the demo area;
- In the TC app, there were POI (Points Of Interest) belonging to another area (IP4MaaS or previous demos). This was in some cases misleading for users;
- Connections are shown in straight lines (beelines) instead of mapping the actual route, and this was found not very user friendly;
- The application was believed in some cases difficult to install without the user guide and/or a specific training. It was considered not really user friendly the fact that the app is Android only and cannot be downloaded from a commonly used download platform, but only via a .apk download link sent by the demo team. This was considered one of the major barriers preventing a widespread use of the tool and preventing more users to be attracted. On a similar aspect, LBE have been considered an extremely interesting feature, something that really distinguish the TC from other similar applications, but the whole installation process (a different/separate link, with a different procedure to follow) was considered very complicated and not easy as it should be;
- Translations have been considered very important for attracting people, however it is paramount that the translators are supported in their work, as in some cases it is complex

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<sup>3</sup> What it is important to mention here, is that the below are the results of the feedback collected via USI surveys and direct experience “on field” by demo leaders and demo teams more in general, collected from a huge sample of users (more than 300 overall).



to have a valuable translation without understanding the context and having a good knowledge of the ecosystem;

- Loading time for photos/videos on the collaborative space for travellers have been in some cases believed too long;
- Saved or shared journeys cannot be deleted;
- Not all the TC functionalities were “active” in all demos. But unfortunately they could not be hidden or deleted. The user had to be instructed prior to the demo, about the functionalities that he/she can use and about those that could not be used;
- Some users reported that they were asked to log in every time they opened the app;
- Users were provided a pre-defined set of credentials to access the application. Despite this allowed all involved partners to comply with GDPR using anonymous credentials, it affected the widespread usage of the tool.

As a suggestion, a specific focus group for co-designing the interface of the TC and its functions can be organised. Co-creation of Mobility Packages with TSPs and demo actors have also been highlighted as very important for improving and fully exploiting the functionality.

### ***Information support***

More notification messages (e.g., confirmation of actions, notifications about successful ticket purchasing, etc.) can better help in navigation of a user before, during and after the trip and make him/her feel more comfortable in the travel experience. Besides it, the experience of some IP4MaaS demos showed that it is important to provide adequate information to users in their languages. Translations have been performed with the huge support of demo leaders. However, this task was performed on a voluntary basis and in most of the cases without involvement of professional translators, capable of adapting the translation to the context. It is suggested for the future to think about a professional translation of the whole ecosystem and of course of the application, as it increases the number of people attracted to the demo. Information material is also very important, and essential for allowing the user to know exactly what to do and how. User guides have been provided (translated in the local languages when believed necessary). Despite they were really helpful, some users believed that they were also very complex, technical and not self-explanatory. It is recommended to CFMs to produce a lighter set of user guides, easier to understand for a “general” public. To mitigate this problem and to provide all instructions to users, demo leaders organized training sessions before the demo, held in the local languages, and useful for showing the tools and guiding the users in their experience. This was important as it allowed demo leaders to understand users’ questions and promptly reply to them.

### ***Integration***

The more data is used, the more TSPs/providers/operators are involved, the more after-sales and other additional services are integrated into the ecosystem, the better. In order to attract the user’s attention, various travel modes should be used for connection search, so that the travel offers are intermodal, i.e., including transfers between different travel modes within a journey. Besides public transport, shared mobility becomes popular and other transport modes (on-demand, private cars or bikes, etc.) should be included as well. This was done in IP4MaaS, taking advantage of the experiences previously implemented in other projects. A recommendation can be to work on the ecosystem in order to expand the set of standards and data formats accepted for being easily integrated, and to increase the flexibility for accommodating easy integration in particular of on demand and shared modes. For example, more than one TSPs integrated in the

project had to change slightly their processes and systems for having the chance to be integrated (for example, adapting the issuing process to the requirements/formats of the ecosystem). In other words, the recommendation is to develop further the IP4 ecosystem to be more flexible for allowing the integration of all kinds of TSPs without big issues, without asking the TSPs to adapt part of their processes to the ecosystem for being integrated.

### ***Guidance***

It is paramount to provide customers not with just information itself, but also with some kind of guidance. This is very key in general, but even more in a research project. Once the ecosystem has access to real-time data, information more relevant to the current situation can be provided. For example, the navigation function should provide high quality and detailed information about approaching the destination/interchange and about time to get off a vehicle, as well as intermediate stops and operator info. This was partially achieved in IP4MaaS, but due to technical issues emerging in some cases, users reported that their position was lost (particularly in metros/underground, but not only) and that the set of alternatives offered was in some cases not very attractive.

### ***PRM and customisation of services***

Based on the experiences collected in some of the demos, a recommendation about accessibility issues is to extend the PRM functions: e.g., provide information about infrastructure limitations, such as a large gap between the platform and the train doors or updated information on buses in service with the accessibility ramps.

### ***Reliability***

The information that the ecosystem provides to its customers with must always be trustworthy and reliable. That applies to all functionalities, from connection search results to the final payment for the service to be consumed. Availability of tariff discounts together with the best-price approach helps customers in the shopping process.

### ***Competitiveness***

Fast performance is crucial, no one wants to wait long for the response. However, the results provided by the ecosystem must always be the best in order to preserve and exploit the huge potential of the tools developed and make them more and more accepted. If a better travel offer exists in response to the given mobility request, but it remains hidden from the user, the entire solution becomes useless and will never be accepted by end-users. Speed and content of provided results are crucial and every other detailed information counts, but on the other hand, the way the information is provided, the user interface, that is the Travel Companion application in this particular case, must remain user friendly. This means the well-arranged design, some kind of help functionality and the overall comprehensibility of the application. Without supporting other languages and currencies, it can't be widespread. Finally, it is important to note that demos proved to be very beneficial in terms of support for CFMs in improving the technology increasing its maturity, to bring the ecosystem to a upper TRL level. It was largely remarked that the application and the technology are very satisfactory in the frame of a research project, with a go-to person (the demo leader) supported by a team capable of assisting the users and guiding them in case bugs appear or the app has unusual behaviour.

### ***Interoperability***

It is necessary to sustain and promote original concepts. Support decentralisation, make the most of remote services. Local providers of any data or interfaces always know best, what has just been

updated and how to proceed with the particular request properly. For example, in ticketing, it's always better to use the local source of tickets, than try to process all rules, issue own tickets and hope for their later validation. However, when it comes to interoperability, there is also another important point of view. For all the new coming stakeholders interested in joining the ecosystem, it must be possible to do so with minimal efforts and costs on their side. Otherwise, it might be difficult to persuade them that it makes sense. This point is strictly linked to what mentioned above about integration.

### ***Demo organization/User engagement/Communication***

One of the issues reported by the demo team, is that demo period is crucial. To extensively test the tools, to properly instruct and assist the users, to increase the user experience, the user friendliness and to allow travellers and TSPs to familiarize themselves with the technology, a longer demo/test period is paramount. Additionally, to allow the demo leaders/demo teams to better serve the users, it has been unanimously believed that 1 week of internal testing is not sufficient to get acquainted with all the specificities of the tools, and to become experienced enough to smoothly serve the testers. To partially overcome this barrier, it was agreed to organize a training session before the Phase 2 of the demos, with CFMs explaining all characteristics of the app to all demo teams, allowing them to get familiar with the tool and to ask questions. Indeed, the demo teams received the app with the local TSPs integrated only few days before the demo start. This mitigation measure was appreciated by all demo teams.

A proper communication is also very important. In this case (as always in this project's development) there was a "continuous learning" process, with CFMs and demo teams constantly interacting for sharing insights on the preparation of the demos, their execution, the issues encountered and the results. Technical issues were reported by the demo teams using the Mantis tool, extensively used by HaCon, to which access was granted. Regular WP5 meetings and ad hoc meetings were also occasions for discussing and preparing the next steps. Communication was held also via email. Initially, the group of people involved in the communication process was very wide. As a lesson learnt from Athens Phase 1, it was decided to restrict the communications to a "core group" composed of few CFMs, IP4MaaS representatives, and when needed, the projects' coordinators. This resulted in a more smooth and fast communication.

Communication was also very important with the users. Athens, particular in Phase 1, organized a huge dissemination campaign, with IP4MaaS posters distributed in several rail stations. Other partners opted for on-line dissemination, via websites, social media, newsletters, articles. Incentives have been utilized in several demos for increasing the attractiveness of the project, and numbers confirm that this was particularly useful. The whole communication with the single user was held by the demo leader, who coordinated all activities on field, including the training sessions (or focus group, as done in Barcelona). The strategy to defining targeted groups of potential testers (students, public transport users, dedicated focus group to mention some in IP4MaaS) is crucial for user engagement as it makes promoting the testing much better tailored in terms of channels of communication as well as content and provides better return. Social media proved to be one of the best communication channels, very used by young people, familiar with application, interested in testing new solutions (a target that perfectly matches the project target groups).

Users were asked to complete a survey after the demo. This was the prerequisite for getting the incentive (normally, a voucher). This was also a "continuous learning" process, again with Athens Phase 1 as leader. From the experience in Athens, it was learnt that people should not be sent many information (Terms and Conditions, pre-defined credentials, user manuals, .apks to download, various links) but simple, clear and easy messages; and that the survey procedure should be made more simple. Phase 2 was organized differently in this sense: demo leaders

organized workshops and demo events for training users, and they had the chance to explain all steps (including the survey process) directly to people, without exchange of long messages full of information. Indeed, this was considered very positively.

Finally, when it comes to demos it is also important to understand that timing and the local context are both very important factors, affecting the potential impact of the solutions and their attractiveness. It is the case to mention that, for example, the Phase 1 demo in Athens was highly impacted by the moment of the year in which it was organized. The demo took place in July 2022, in parallel with a very strong heat wave in the city, preventing people from being available to test IP4 solutions, and also in line with the start of summer holidays, when the city is less crowded and “active” and people tend to be less willing to be involved in research activities. Padua demo was organized right after the Easter holidays period, and this partially affected the participation rate. In both examples (but more in general in all demo sites) the calendar of demo depended strictly on the calendar of integrations, and took into consideration many technical aspects, such as the time needed to complete the integrations in each site, to test internally the tools (i.e. internal test among CFMs and internal test among demo actors), the time needed to release new versions of the TC, the availability of demo leaders and demo actors, the calendar of all project activities, with unavoidable rigidities. Despite the final calendar was not ideal in some of its aspects (also concerning the duration of the demo, that all actors believed having been relatively short), it was a good exercise of compromise, taking into account all partners’ exigencies and needs, and trying to mitigate all potential negative aspects with contingency measures. As a recommendation, it is important to establish from the very beginning a constant dialogue with CFMs in order to plan in detail the integrations and the schedule of demos, taking into account that technical issues delaying the activities are natural in such projects.

## 10. Additional general recommendations

The outcomes of the project’s results and related evaluations, lead to the delivery of other relevant conclusions and recommendations for the future of Europe's Rail Joint Undertaking efforts in contributing to define and deploy European rail-focused MaaS offers able to compete with this evolving market. They are summarized below (for more information, please refer to D6.4 “Final Assessment Report: conclusions about COHESIVE solutions efficiency and impact”, available on IP4MaaS website):

1. To make MaaS paradigm a reality and reap benefits for citizens and enterprises it is needed to build and maintain a **Community of practice**. IP4MaaS demonstrated that collaborative efforts brought by technical companies (CFMs and project developers), Academy, TSPs, Public Authorities and specialised consultant companies led defining a framework for design, development, testing and evaluation of complex actions that, besides the deployment of services, support the travellers’ behavioural change.
2. The MaaS community works around the principle to have the user at the centre of offer development. Making transports more accessible and sustainable for all, reducing private mobility modes and negative externalities are the **MaaS societal objectives** that improve inclusion and social cohesion. IP4MaaS evaluation demonstrated that these objectives are highly considered by end-users and should be key aspects when designing transport offers.

3. The prerequisite for successful MaaS offers is a clear **Data sharing policy**: services, tariffs and mobility packages can effectively address user needs if they are built on open and balanced access to information in the MaaS ecosystem. IP4MaaS defined standards for data sharing at the EU level by successful integrating heterogeneous transport systems and several different operators.
4. Among all possible MaaS models, IP4MaaS tested and demonstrated, in real-field conditions, the feasibility and effectiveness of the **Open Backend platform**<sup>4</sup> that becomes a reference model when a centralised environment acts as an aggregator around shared interests, that are represented by the realisation of a digital ecosystem for door-to-door travel in a seamless, multimodal and European-wide transport system based on the railways.
5. The identified Open Backend platform requires as key actor the **MaaS aggregator**, which is the orchestrator ensuring MaaS functioning by coordinating partners' relationships, by ensuring that principles and rules are well-applied and by facilitating data and services intermediation. IP4MaaS demonstrated that the IP4 community, working around CFMs, whose effort is prosecuted in Europe's Rail Joint Undertaking may have a role beyond research project lifetime and can build stable collaborations looking for a subject/organisation undertaking this pivotal role for future railways promotion.
6. MaaS communities are evolving ecosystems in a very competitive market. Besides the focused Europe's Rail Joint Undertaking objectives to deliver, via an integrated system approach, a high-capacity, flexible, multimodal, sustainable, reliable and integrated EU railway network for European passengers, the **Open approach** is a requirement to be met to avoid monopolies or exclusivities and incentivise service evolution to always address user needs.

## 11. Conclusions

Considering the feedback received in IP4MaaS demo activities, from users involved at different levels in the 6 project demo sites, is it possible to get some conclusions on how to make replicable and better transfer the results of the project? For sure, the answer is "yes". In the context of a research project with IP4MaaS' TRL level, it is important to highlight that feedback collected has been in most of the cases very positive, with people understanding, recognizing and appreciating the value and the potential of the idea behind the Travel Companion and the IP4 ecosystem as a whole. However, to make a shift to the "next level" enhancing these solutions and increasing not only their attractiveness but also their usability, it is important to focus on some recommendations, presented in the pages above. User experience is paramount, and it is increasing its importance in a more digitalized world. Customer-centricity is a keyword often used in the transport sector. To offer an integrated, customized, flexible and tailor-made transport door-to-door solution is the only way for public transport to make important steps towards the needed modal shift essential for achieving Sustainable Development Goals and carbon neutrality.

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1. UITP - Ready for MaaS? Easier mobility for citizens and better data for cities – available at <https://www.uitp.org/publications/ready-for-maas-easier-mobility-for-citizens-and-better-data-for-cities/>

In this regards, to have a single “one-stop-shop” solution, with several modes integrated, customized on the user needs appears to be a great idea, and people appreciated it. However, the recommendation is to work on the good results for increasing the flexibility of the ecosystem, for allowing more and more diverse TSPs to be easily integrated, to offer to the customer an increased set of working functionalities and to correct the technical problems that happened during the demo (and that are for sure accepted in the context of a research activity such IP4MaaS, but probably less if the solution is brought to an upper level). It is also recommended to involve users in co-creation activities. This is something that people really appreciate (in particular when it comes to people with specific needs, such as PRM) and that would deliver a certain added value to the IP4 solutions.

The local context is important, as said, but also the local language. This is particularly true in some Countries. Despite the app was translated, it is important to consider this task not something to be done on a voluntary basis, but something that is integral part of the solution development, with a professional translation considered. This would for sure increase the attractiveness of the solution.

Availability of information is paramount. That is why one of the key aspects of the demos was to organize training sessions, as a lesson learnt from the first demo. Training sessions allow people to know better what is asked to them, how they can participate, what they have to do, replacing long and complex pages of user manuals and guidelines. As a recommendation, it is important to consider the simplification of the manuals themselves, and of the whole ecosystem, in order to make it more intuitive and self-explaining. A training for TSPs to be involved might also be beneficial, in order to allow them to understand what it is necessary to be integrated (this was largely done in IP4MaaS). As a prerequisite, it is important to illustrate the technical requirements needed for the integration of a service provider, the data format, the process to follow, the technical implications.

Needless to say, the post-COVID scenario also somehow plays a central role when it comes to demo organization. People, for a relatively long time after the first peak of the pandemics, were afraid of crowded spaces, and despite it was proven that public transport was safe compared to other similar “public” contexts, it was very challenging for the sector to restore passengers’ trust. This indeed lasted for many months and might be considered as a factor affecting the participation rate and the availability of people to be involved in extensive utilization of metros, buses, trams, trains, shared modes.

Another consequence of COVID-19 was indeed the new mobility patterns developed not only in Europe. New mobility habits, such as widespread development of teleworking and new peaks in Public Transport utilization (for example, in Paris, the average of home-working days per week is 2.5, four to six commuting trips out of ten have simply disappeared, Monday and Friday in some cases are “teleworking” days, with public transport less used compared to Tuesdays or Thursdays)<sup>5</sup>, appeared. As a consequence, it appears even more important the demo duration time. As a recommendation, it is paramount to organize demonstration activities that last for longer than 1-2 weeks, in order to embrace more “mobility peak times” and minimize the impact of teleworking, of people moving outside the urban areas, of people moving differently. In IP4MaaS, despite considered, this was not possible because of the limited time slot for organizing and executing all 6 demos, from the planning to the integrations, to the execution, to the follow up (this timeframe was March to June 2023). As a recommendation for future similar experiences, it is important to mention the extension of the demo period, achievable either reducing the number of demos or allowing more than 1 demo to be carried out in parallel. The first option would decrease the number of sites involved but would allow both CFMs and Open Call project

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<sup>5</sup> <https://www.uitp.org/news/how-to-improve-public-transport-demand-management-lessons-from-covid-19/>;  
<https://www.uitp.org/publications/what-does-new-normal-mobility-look-like/>

partners to decrease the pressure for managing a complex calendar of activities.

## 12. References

UITP Knowledge Brief “What does “new normal mobility” look like?”, UITP, June 2023. Link:

<https://www.uitp.org/publications/what-does-new-normal-mobility-look-like/>

UITP Report “Ready for MaaS? Easier mobility for citizens and better data for cities”, UITP, April 2019. Link: <https://www.uitp.org/publications/ready-for-maas-easier-mobility-for-citizens-and-better-data-for-cities/>

## 13. Appendices

A shorter version of this Handbook has been produced and disseminated by UITP in August 2023. It can be downloaded from the IP4MaaS website (“library” section)

[https://www.ip4maas.eu/wp-content/uploads/2023/08/IP4MaaS-Transferability-Handbook\\_final\\_web.pdf](https://www.ip4maas.eu/wp-content/uploads/2023/08/IP4MaaS-Transferability-Handbook_final_web.pdf).

The short version of the Handbook is also submitted together with this document in a .zip folder.