



Conférence Européenne
des Directeurs des Routes
Conference of European
Directors of Roads

MAASiFiE

Final Report

Report Nr 1.2

May 2017



austriatech



CHALMERS
UNIVERSITY OF TECHNOLOGY

Coordinator:

VTT Technical Research Centre of Finland Ltd.,
Finland

Project Partners:

AustriaTech - Gesellschaft des Bundes für
technologienpolitische Maßnahmen GmbH, Austria

Chalmers University of Technology, Sweden

Project Nr. 850704
Project acronym: MAASiFiE
Project title:
Mobility As A Service For Linking Europe

Report Nr 1.2 – Final Report

Due date of deliverable: 31.05.2017

Actual submission date: 31.05.2017

Start date of project: 01.06.2015

End date of project: 31.05.2017

Authors of this deliverable:

Jenni Eckhardt, VTT, Finland

Aki Aapaoja, VTT, Finland

David König, AustriaTech

MariAnne Karlsson, Chalmers

Table of content

Table of content.....	3
1 Introduction	4
1.1 MAASiFiE project description	4
1.2 Expected Results of MAASiFiE	4
2 Progress of MAASiFiE.....	6
2.1 WP1: Project management and dissemination	6
2.2 WP2: Roadmap 2025	7
2.3 WP3: Business and operator models.....	8
2.4 WP4: Impact assessment.....	8
2.5 WP5: Technology for MaaS.....	8
2.6 List of Meetings	9
2.7 List of Deliverables	10

1 Introduction

The trans-national research programme “**Call 2014: Mobility and ITS**” was launched by the Conference of European Directors of Roads (CEDR). CEDR is an organisation which brings together the road directors of 25 European countries. The aim of CEDR is to contribute to the development of road engineering as part of an integrated transport system under the social, economical and environmental aspects of sustainability and to promote co-operation between the National Road Administrations (NRA).

The participating NRAs in this Call are Finland, Germany, Norway, the Netherlands, Sweden, United Kingdom and Austria. As in previous collaborative research programmes, the participating members have established a Programme Executive Board (PEB) made up of experts in the topics to be covered. The research budget is jointly provided by the NRAs who provide participants to the PEB as listed above.

1.1 MAASiFiE project description

The current technology trends, e.g., digitalisation, servitization, crowdsourcing and automation, create a potential basis and future for entirely new types of mobility related service concepts. In the transport sector, this new paradigm of interconnected transportation ecosystem and network is called “Mobility as a Service” (MaaS). The ultimate goal of MaaS is to bundle services of transport sector into an interconnected system that fulfils consumers’ needs through an ecosystem of mobility operators and service providers.

This MAASiFiE project aims to create a roadmap for the development of MaaS in Europe and especially in CEDR member states. In the end, the roadmap will focus on increasing the understanding of the national road administrations regarding the prerequisites for a wide-scale implementation of MaaS. This is important especially for traffic management professionals at national road administrations and traffic control centres.

This Interim Report describes the progress and activities of MAASiFiE during the first year of the project.

1.2 Expected Results of MAASiFiE

The MAASiFiE project is made up of five work packages (WPs) that together produce results through which the overall aim of the project can be achieved. WP1 focuses on the project management and dissemination of the project while the project work itself is done in WP2, 3, 4 and 5. The objectives and expected results of each work package are:

WP2 – Roadmap 2025:

- Clarify the MaaS concept and definitions for partners and stakeholders;
- Create a general MaaS vision and separate sub-visions for each operating environment;
- Build a Roadmap 2025 for MaaS taking different actors and legal issues into account

- To ensure the continuity of MaaS development in Europe by defining next steps towards implementation;
- In the definition of the final roadmap, WP2 summarizes and combines the results of WP3, 4 and 5 and confirms the essential elements in discussions with stakeholders.

WP3 – Business and operator models:

- Identify currently existing business models in project implementations considering available mobility service models;
- Conduct a State-of-The-Art analysis, screening and identifying established mobility concepts and cooperation models, including public and private stakeholders, their corresponding roles and responsibilities will be analysed;
- Review previous surveys, deployments and project results (e.g., Swedish Go:Smart/UbiGo and the Austrian multimodal traveller information system 'Verkehrsauskunft Österreich, VAO');
- Identify MaaS service combinations for data and service provision.

WP4 – Impact assessment:

- Evaluate two case studies (Go:Smart/UbiGo and VAO) from a user group, organisational, partner network and societal perspective;
- Assess the consequences of introducing MaaS concepts on a broader scale from different perspectives;
- Assess the socio-economic impacts and potential of MaaS;
- Assess the environmental impacts of MaaS;
- Provide a basis and support for stakeholders when taking decisions with consequences for the introduction of MaaS.

WP5 – Technology for MaaS:

- Define technology requirements and corresponding high-level system architectures being applied for MaaS packages;
- Evaluate different technology deployments and strategies (e.g., multimodal travel chain information and ticketing);
- Identify required technologies to be used for defined MaaS packages;
- Formulate recommendations for MaaS package implementation.

2 Progress of MAASiFiE

2.1 WP1: Project management and dissemination

Project management included progress monitoring and risk management. Progress was monitored in project group monthly meetings, including follow-up of the risk management table. Monthly telcos, project group face-to-face meetings and meetings with PEB are listed in Chapter 2.6. In addition other project group meetings on specific topics took place, and the project was presented in CEDR N7 meeting in Vienna in February 2016.

Performed project dissemination activities include:

- A press release was announced in October 2015
- A leaflet/brochure was prepared in October 2015 and distributed e.g. in ITS World 2015 in Bordeaux, in MAASiFiE project workshops, via Smart mobility & ITS Austria newsletter and forum, and via ERTICO Network
- Project PPT presentation was prepared in October 2015, and presented and shared as handouts e.g. in ITS World 2015 in Bordeaux.
- Project's web pages were published in January 2016 (<http://www.vtt.fi/sites/maasifie/>)
- The following conference papers on MAASiFiE results have been published:
 - König, D., Sochor, J. & Eckhardt, J. (2016). State-of-the-art survey on stakeholders' expectations for Mobility-as-a-Service (MaaS) – highlights from Europe. 11th ITS European Congress, Glasgow, Scotland, 6-9 June 2016.
 - Sochor, J., Eckhardt, J., König, D. Karlsson, MA. (2016). Future needs and visions for Mobility as a Service: Insights from European workshops. 23rd ITS World Congress, Melbourne, Australia, 10–14 October 2016.
 - König, D., Sochor, J., Eckhardt, J. & Böhm, M. (2016). State-of-the-art survey on stakeholders' expectations towards Mobility-as-a-Service (MaaS). 23rd ITS World Congress, Melbourne, Australia, 10–14 October 2016.
- The following conference papers on MAASiFiE results have been accepted:
 - Eckhardt, J., Aapaoja, A., Nykänen, L. & Sochor, J. (accepted Scientific Paper). Mobility as a Service business and operator models. 12th ITS European Congress, Strasbourg, France, 19 – 22 June 2017
 - Aapaoja, A., Eckhardt, J., Nykänen, L. & Sochor, J. (accepted Technical Paper). MaaS service combinations for different geographical areas. 24th ITS World Congress, Montréal, Canada, October 29 – November 2 2017
- The following conference papers/abstracts on MAASiFiE results have been submitted:
 - König, D.; Piri, E., Sochor, J., Eckhardt, J., Karlsson, M., Aapaoja, A. (submitted Technical Paper): Technology for MaaS, TRA 2018 Vienna, 16–19 April 2018
 - Eckhardt, J., Aapaoja, A., Nykänen, L., Sochor, J., Karlsson, M., & König, D.

(submitted Scientific Paper). The European Roadmap 2025 for MaaS, TRA 2018 Vienna, 16–19 April 2018

- Karlsson, I.C. M., Aapaoja, A., Eckhardt, J., König, D. & Sochor, J. (submitted Scientific Paper), A Tentative Assessment Framework for MaaS. TRA 2018 Vienna, 16–19 April 2018
- Nykänen, L., Eckhardt, J. & Aapaoja, A. (submitted Scientific Paper). The European Roadmap 2025 For MaaS. Tampere, ICoMaaS 2017
- Eckhardt, J., Nykänen, L. & Aapaoja, A. (submitted Scientific Paper). Business models for MaaS. Tampere, ICoMaaS 2017. *(The paper presents both the MAASiFiE project and a Finnish rural MaaS project results on business models)*
- Project presentations have been held in:
 - Swedish transport forum organized by VTI, Linköping, 10-11 January 2017
 - FEHRL Infrastructure Research Meeting (FIRM17), Brussels 5-6-7 April 2017
- Project presentations will be held in:
 - Final Conference of the CEDR2014 Call Mobility & ITS, Vienna 8-9 June 2017
 - 2nd Workshop on Infrastructure Cloud – Operation and Services organized by the European Commission, Brussels 9 June 2017
- Final seminars have been organised in Austria 10 -11 April 2017, in Sweden 4 May 2017 and in Finland 11 May 2017
- An international webinar was organised 30 May 2017
- A press release on project results is under preparation and will be announced in June 2017

2.2 WP2: Roadmap 2025

MaaS concept was clarified and the MAASiFiE project's MaaS definition is: "Multimodal and sustainable mobility services addressing customers' transport needs by integrating planning and payment on a one-stop-shop principle" (MAASiFiE project, 2016)

Workshop 1 "The need for change" on MaaS vision was organized in December 2015 in Finland, Sweden and Austria. The workshops had a similar program including MAASiFiE presentation, Finnish MaaS White Paper presentation (by Finnish Transport Agency) and group work.

Workshop 2 "Impact assessment" evaluated impacts of selected MaaS cases including socioeconomic assessment and taking into account the perspectives of different stakeholders. Workshop 2 was organised in Sweden in February 2016 based on UbiGo case. In Finland the impact assessment workshop took place in September 2016 on Ylläs Around pilot in the Ylläs ski resort area in Northern Finland. In Austria the workshop 2 took place in December 2016 on VAO service/ SMILE project.

Workshop 3 “Creating a new model” aimed at creating national MaaS roadmaps defining short (1-3 years) and medium-term (4-9 years) actions and transition needed to reach the vision created in workshop 1. National MaaS roadmap workshops were organised in Finland in September 2016, in Sweden in December 2016 and in Austria in January 2017.

Workshop 4 “Implementation and consolidation of MaaS” was an international workshop organized in Finland in February 2017. The main purpose of the workshop was to consolidate project results and recommendations, as well as to define next steps in MaaS implementation.

2.3 WP3: Business and operator models

The State-of-The-Art analysis of MaaS, and existing pilots, cases and business models was conducted and updated for deliverable 2 (literature, MaaS cases). The methods used for the analysis included literature review, a survey and interviews. The survey and interviews provided information for WP4 and WP5 in addition to WP3 State-of-The-Art and MaaS package identification and development. 30 interviews were performed including e.g. authorities, municipalities, MaaS operators, ICT companies, transport operators and a mobile payment provider.

MaaS value chain was elaborated describing different actors with their roles in MaaS ecosystem and their interaction, as well as monetary and information flows. Also MaaS service combinations in different geographical areas were defined. In addition MaaS business and operator models were developed, and roles and responsibilities of different stakeholders defined.

2.4 WP4: Impact assessment

A literature study was completed to identify relevant impact areas and key performance indicators (KPIs). Identified impacts and KPIs on an individual, organisational/business and societal level then formed the basis for the design of a web-survey which has been distributed to different stakeholders to determine which impacts were deemed by different stakeholders to be the most important to consider when conducting an impact assessment of MaaS.

A tentative assessment framework was created and used in order to evaluate the two main study cases (UbiGo, Gothenburg and SMILE, Vienna) as well as to assess the impacts of an additional sample of MaaS and MaaS related services. The findings from the literature study, the web-survey and the analysis were used as a basis for assessing the potential impacts of MaaS on a user, organisational/business and societal level as well as the likely socio-economic and environmental impacts of a further development and implementation of MaaS.

In addition, recommendations were formulated to adhere to the general lack of empirical evaluations and hence evidence of the actual impacts of MaaS.

2.5 WP5: Technology for MaaS

Based on the state-of-the-art analyses together with literature findings and gained workshop results, MaaS related technologies could be identified. Main MaaS ecosystem findings together with value chain elaborations done in WP 3, allowed a detailed scope on the technologies required for MaaS value proposition. With this respect requirements on the data, service and communication/physical interface level were elaborated. For instance new technologies like 5G, roaming and the integration of different mobility services over common interface specifications provide some key technologies/innovations enabling an extensive

MaaS roll-out. Following the MaaS ecosystem developments, a conceptual technical system architecture describing required technologies and processes for generating the added value was identified. Since most technologies are organised as web-based applications and service features, the focus of the system architecture was put on internet-based technologies. Since MaaS services need to be made available to the broad mass, without excluding any populations, MaaS technology has to consider user requirements, like learned user experiences, usability of services and acceptance. Therefore user experience and requirements surveyed in UbiGo were taken into account and described in the context of the MaaS service architecture.

Further, in order to allow service interoperability, standardisation as an important pillar pushing technologies and harmonisation forward examined in the context of MaaS within WP 5 as well. The provision of communication standards like 5 G, providing data standards like DATEX II or deploying European Commission legislations and communications will enable the extensive set up of MaaS ecosystems.

2.6 List of Meetings

Nr.	Meeting	Location	Date
1	Project kick-off meeting	VTT, Oulu, Finland	3.9.2015
2	Project group monthly meeting	telco	1.10.2015
3	Project group monthly meeting	telco	2.11.2015
4	Meeting with PEB	TNO, Delft, Netherlands	24.11.2015
5	Project group monthly meeting	telco	11.12.2015
6	Project group monthly meeting	telco	7.1.2016
7	Project group monthly meeting	telco	5.2.2016
8	Project group face-to-face meeting	AustriaTech, Vienna, Austria	4.3.2016
9	Project group monthly meeting	telco	8.4.2016
10	Project group monthly meeting	telco	9.5.2016
11	Project group monthly meeting	telco	1.6.2016
12	Project group monthly meeting	telco	7.7.2016
13	Project group monthly meeting	telco	31.8.2016
14	Project group monthly meeting	telco	4.10.2016
15	Meeting with PEB	FFG, Vienna, Austria	8.11.2016
16	Project group monthly meeting	telco	9.11.2016
17	Project group face-to-face meeting	Chalmers, Göteborg, Sweden	23.11.2016
18	Project group monthly meeting	telco	14.12.2016
19	Project group monthly meeting	telco	18.1.2017
20	Project group monthly meeting	telco	9.2.2017
21	Project group monthly meeting	telco	13.3.2017
22	Project group monthly meeting	telco	10.4.2017
23	Project group monthly meeting	telco	8.5.2017

2.7 List of Deliverables

Nr.	Deliverable Name / Report Name	Due date	Actual Submission Date	Approved by PEB/ Revised Submission Date
1.1	Interim report	31.5.2016	8.6.2016	
1.2	Final report	31.5.2017	31.5.2017	
2	European MaaS Roadmap 2025	31.3.2017	31.3.2017	31.5.2017
3	Business and operator models for MaaS	31.7.2016	29.7.2016	22.9.2016
4	Impact Assessment of MaaS	31.12.2016	31.12.2016	10.4.2017
5	Technology for MaaS	28.2.2017	28.2.2017	31.5.2017