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Policy action plan on MaaS & ICT

WP5 Transport strategies and results roll-out

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Status: Final
Distribution: public
Date: 16.12.2021

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1 Introduction

1.1 The ICARUS project

The strategic goal of the Interreg Italy-Croatia ICARUS project is delivering new intermodal solutions which focus on passengers' mobility needs and on service flexibility in the benefit of transport users. The key project objectives are:

- Improving passenger intermodal connections within and among the Italian and Croatian coastal regions;
- Fostering transport user's behavioural change and increasing the use of intermodal low-carbon transport solutions;
- Delivering seamless, multimodal and environmentally friendly transport solutions;
- Easing sustainable transport integration of coastal and hinterland areas;
- Boosting existing and new maritime connections among the Italian and Croatian coasts and improving ports' landside accessibility.

The ICARUS partners implemented 8 pilot projects and feasibility studies; these are located in Emilia-Romagna, Abruzzo, Venice and Friuli Venezia Giulia (Italy), and in Primorje-Gorski Kotar, Istria (Croatia), as well as across Croatia.

1.2 The focus of this action plan

ICARUS focuses on three interrelated thematic pillars:

- Mobility as a Service (MaaS) and ICT in transport;
- Inter-modality;
- Behavioural change.

Transport technology innovation and the underlying organisational changes are means to integrate multimodal transport offer, ease public transport access, and increase sustainable transport modal share by fostering user's behavioural change. Despite the interrelations between the three pillars, this action plan specifically focuses on MaaS and ICT in transport. It aims at providing policy recommendations to develop MaaS applications in the ICARUS project regions. It is structured as it follows:

- Chapter 2 presents the MaaS concept, the ICARUS pilot projects and their technology features; it also presents the overall pilots' relevance to the Adriatic-Ionian and Alpine macro regional strategies (EUSAIR and EUSALP) with specific reference to MaaS and ICT in transport;

- Chapter 3 analyses the transferability, scalability of the ICARUS pilot projects, and it presents lessons learnt with the aim of providing authorities recommendations to develop MaaS applications.

2. Contribution of pilot projects

2.1 The MaaS concept

MaaS is a pretty novel concept that is emerging globally. MaaS applications are collaborative platforms involving transport and ICT providers: they integrate public and private transport offer based on user's needs. MaaS applications' value proposition is the focus on transport users and on providing the possibility to plan, book and pay transport services in a door-to-door perspective.

The key advantages of MaaS systems are:

- For passengers a single window which integrates transport services in a city or region;
- For transport providers an additional channel to sell services and increase ridership and demand;
- For public authorities enhanced services to citizens and increased public transport modal share.

MaaS applications vary significantly with reference to three dimensions:

1. Transport services

Typically, MaaS applications have public transport at their backbone, but they can include a variety of other transport services, such as shared mobility services (bike, car, scooter, kick scooter), on-demand bus or shuttle services, taxis, car-pooling services, car rentals and parking. Some applications also include touristic services.

2. Functionalities

The added value of MaaS systems is the possibility to plan and pay trips on one platform. Nevertheless, the extent of MaaS functionalities can vary in terms of:


- Type of fares: these may include pay as-you-go or bundled offers based on periods of validity, zones and services included;
- Level of integration: transport offer integration does not necessarily mean ticketing integration, and users may need buying separately single travel tickets (though on the same platform); this may depend on technology constraints or commercial agreements among transport providers;
- MaaS platform services: these can include integrated journey planning, real time alerts, offers based on specific needs (e.g. services accessible to Persons with Reduced Mobility) or conditions (e.g. routing based on congestion).



This suggest that MaaS development needs considering the specific characteristics of each city and region and that MaaS applications can evolve and integrate new services and functionalities.

2.2 The pilot projects

All the ICARUS pilot projects aim at fostering sustainable mobility, but they are diverse in scope and activities. The following table summarises the focus of each pilot project and its strategic scope.

Table 0.1: Overview of the ICARUS pilot projects

Region / area	Partners	Pilot focus	Strategic scope
Emilia-Romagna (IT)	 	<ul style="list-style-type: none"> • Tool to estimate air pollution emissions (<i>RogerAmbiente</i>) linked to the regional dynamic travel planning App <i>Roger</i>; it provides passengers information on emissions' saving when travelling by public transport instead using private cars. 	<ul style="list-style-type: none"> • Increasing passenger's awareness of private mobility environmental impacts, and fostering public transport use.
Abruzzo (IT)		<ul style="list-style-type: none"> • Travel and tourism App (<i>Happy Travel</i>); it provides links to transport providers' web sites and information on touristic destinations and services in Abruzzo region. 	<ul style="list-style-type: none"> • Promoting regional tourism and informing on transport services in the region.
Venice (IT)	 	<ul style="list-style-type: none"> • Bike racks installed on buses; and • Open-source web GIS which systematises existing transport data and information. 	<ul style="list-style-type: none"> • Promoting sustainable mobility; • Enhancing the current mobility platform of the city for planning purposes, and integrating into one platform multiple data sources.
Friuli Venezia Giulia (IT)	 	<ul style="list-style-type: none"> • Bike wheeling ramps installed at rail stations; and • Cross-border bike & bus services (<i>Parenzana</i> route). 	<ul style="list-style-type: none"> • Improving rail stations accessibility for bikers; • Fostering bike tourism.
Primorje-Gorski Kotar (HR)		<ul style="list-style-type: none"> • Web site (<i>icarus-mobility.com</i>) providing information on transport services and links to transport providers' web sites; it includes multiple modes (rail, bus, micro-mobility, ...) 	<ul style="list-style-type: none"> • Informing on transport services, and promoting sustainable transport modes when visiting Primorje-Gorski Kotar county.

Region / area	Partners	Pilot focus	Strategic scope
Istria (HR)		<ul style="list-style-type: none"> Bike and train promotion campaign, including bike share stations; Guidelines for a travel & tourism Smart Card – App deployment. 	<ul style="list-style-type: none"> Fostering bike tourism; Preparing a project follow-up and a Smart Card – App delivery.
Croatia		<ul style="list-style-type: none"> Technical specifications to improve the current HZZP (Croatian Railways Passenger Transport) on-line rail ticketing system and include train & bike services. 	<ul style="list-style-type: none"> Fostering bike tourism; Preparing future IT investments for ticketing.

Source: ITL analysis

The following table presents the pilots' technology features. These significantly differ with reference to:

- Information customisation** - Customised (●) or general (◐) travel information: information provision to passengers can focus or not on individual travel choices;
- Information embeddedness** - Direct (●) or indirect (◐) information provision: the ICARUS tools / applications can directly provide information to passengers or link to third parties' information provision (e.g. transport operators apps / websites);
- Dynamic information** - Real-time (●) or static (◐) information provision: the ICARUS tools / applications can provide real time travel information to passengers or static information which does not reflect real-time updates on services and transport conditions;
- Ticketing functionalities** - Focus (●) or not (◐) on ICT services which include ticketing: further than information provision the pilot projects can provide (or plan to provide) ticketing applications.

We note that:

- The pilot project in Venice did not focus on providing information and services to passengers and it primarily addressed transport planners; it is not included in the following table;
- The pilot project in Friuli Venezia Giulia focused on transport physical equipment and transport services; it does not have ICT nor MaaS features; it is not included in the following table;
- The train & bike pilot in Istria focussed on behavioural change and not on ICT; nevertheless, ICT topics were addressed by Istrian Development Agency by preparing guidelines to develop a travel and tourism Smart Card – App;

- Activities developed by HZZP (Croatian Railways) focused on a feasibility study and not a pilot project, but they addressed ICT topics;
- Other pilot projects include some ICT components with focus on passenger information.

Table 0.2: ICARUS pilot projects – technology features

	Emilia-Romagna (IT)	Abruzzo (IT)	Primorje-Gorski Kotar (HR)	Istria (HR)	Croatia
Information customisation	<ul style="list-style-type: none"> ● <i>Rogerambiente</i> provides emission saving information based on passenger's travel choices and behaviours. 	<ul style="list-style-type: none"> ● The <i>Happy Travel App</i> provides information based on traveller's / tourist's destination choice. 	<ul style="list-style-type: none"> ● The <i>icarus-mobility.com</i> web site does not provide customised information which is based on traveller's / tourist's destination choice. 	<ul style="list-style-type: none"> ● The Guidelines for a travel & tourism Smart Card – App deployment indicate information is not customised based on individual traveller's choices. Nevertheless, different types of subscriptions should be available, and the application deployment may include customisation features. 	<ul style="list-style-type: none"> ● The feasibility study focuses on Croatian railways' "ISPRO" ticketing improvement; this provides customised information.
Information embeddedness	<ul style="list-style-type: none"> ● The calculator directly provides user pollution emissions saving information. 	<ul style="list-style-type: none"> ● It provides links to transport and touristic providers' web sites; it embeds information on touristic attractions but not on transport services. 	<ul style="list-style-type: none"> ● It generally provides descriptions of available transport services, but links to external web sources for timetable information. 	<ul style="list-style-type: none"> ● The App should directly provide information to users. 	<ul style="list-style-type: none"> ● The current ticketing system embeds travel information.

	Emilia-Romagna (IT)	Abruzzo (IT)	Primorje-Gorski Kotar (HR)	Istria (HR)	Croatia
Dynamic information	<ul style="list-style-type: none"> The information on emission savings is regularly (daily) updated based on passenger's trip. 	<ul style="list-style-type: none"> The information is static. 	<ul style="list-style-type: none"> The information is static. 	<ul style="list-style-type: none"> The availability of real time information is not currently planned, but may be included. 	<ul style="list-style-type: none"> The integration of train & bike services does not focus on real time information provision.
Ticketing functionalities	<ul style="list-style-type: none"> The application does not focus on ticketing, which is nevertheless provided by the <i>Roger</i> App. 	<ul style="list-style-type: none"> The App does not include ticketing functionalities . It links to transport and touristic providers web sites to buy tickets. 	<ul style="list-style-type: none"> The App does not include ticketing functionalities . It links to transport providers web sites to buy tickets. 	<ul style="list-style-type: none"> The guidelines foresee that Passengers / tourist can buy services / tickets on the App. 	<ul style="list-style-type: none"> The focus is on ticketing functionalities .

Source: ITL analysis

2.3 Relevance to EUSAIR and EUSALP

The macro-regional strategies of the European Union¹ are policy frameworks to allow regions in specific geographic areas to jointly tackle and find solutions to territorial issues and better use their common potentials to foster territorial development. They aim at strengthening the cooperation between European regions and help them delivering more efficient policies and actions thanks to a joint effort in identifying territorial issues and potential solutions.

ICARUS involves regions which are mainly in the Adriatic-Ionian macro region, plus Veneto which is in the Alpine Space. This Chapter analysis the relevance of ICARUS to the two macro regional strategies with reference to project topic of MaaS and ICT in transport.

EUSAIR

The analysis of the EUSAIR Action Plan² and macro-regional strategy web site³ indicates that two EUSAIR Pillars are relevant to the ICARUS topics of MaaS and ICT in transport, as we describe hereafter.

Connecting the region

The Pillar focuses on improving connectivity within the macro-region and with the rest of Europe with reference to transport and energy networks. The Pillar includes actions on the improvement of accessibility to coastal areas by exploring new coordinated and market-based options, and cross-border facilitation thanks to physical and non-physical investments on specific transport axes.

The development of ICT and MaaS applications fully contributes to the Pillar by improving passenger's access to transport services thanks to non-physical investment.

Nevertheless, we note that the Pillar has limited emphasis on ICT applications in transport and this is an area that future EUSAIR strategic documents may further address.

Sustainable tourism

The objective of this Pillar is developing the sustainable and responsible tourism potential of the Adriatic-Ionian macro-region, by developing innovative and quality tourism products and services. It aims at promoting responsible tourism behaviours across the macro-region. It includes actions on setting-up

¹ Please see: https://ec.europa.eu/regional_policy/it/policy/cooperation/macro-regional-strategies

² European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions concerning the European Union Strategy for the Adriatic and Ionian Region, COM(2020) 132 final, 2.4.2020

³ www.adriatic-ionian.eu

modes for facilitating the transport of tourists, and on promoting the Adriatic-Ionian region as an accessible region.

The ICARUS regions have a strong touristic vocation and transport innovation can contribute to tourism sustainability. In particular, MaaS applications and ICT solutions can provide tourists with sustainable transport options and include touristic services.

We note that the sustainable tourism Pillar does not fully integrate the topic of transport, and this may be an area for further work in the future.

EUSALP

The analysis of the EUSALP Action Plan⁴ and macro-regional strategy web site⁵ indicates that one Action Group is relevant to the ICARUS topics of MaaS and ICT in transport, as we describe hereafter.

Mobility

It includes the specific objectives to promote inter-modality and interoperability in passenger transport, modal shift from road to rail, and cooperation and integration between the existing bodies and structures in the field of transport. In particular, the Action group Work plan 2020-2022⁶ specifically includes smart and low-carbon mobility, and innovative public transport solutions.

Therefore, ICARUS and its focus on ICT in transport is fully relevant and contributes to the Action Group.

⁴ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions concerning the European Union Strategy for the Alpine Region, COM(2015) 366 final, 28.7.2015

⁵ www.alpine-region.eu

⁶ Please see <https://www.alpine-region.eu/action-group-4-mobility>

3. Recommendations to the policy makers

This Chapter analyses the transferability and scalability of the ICARUS pilot projects; in particular:

- transferability refers to the pilots’ potential applicability to other regions in the Italy-Croatia Programme area, and more broadly in Europe;
- scalability refers to the potential for a wider territorial application and/or the inclusion of additional ICT services in potential pilot follows-up.

The Chapter also presents lessons learnt with the aim of providing authorities recommendations to develop MaaS applications.

The following table summarises the main project findings with reference to transferability, scalability and lessons learnt in the pilot projects. The table includes the ICARUS pilots with ICT / MaaS features.

Table 0.3: ICARUS pilot projects – transferability, scalability and lessons learnt

Region / area	Transferability	Scalability	Lessons learnt
Emilia-Romagna (IT)	The <i>RogerAmbiente</i> emission calculator is in principle transferable to any travel planner or public transport ticketing application (subject to technology interface development). Moreover, the ICARUS pilot results will be transferred to and integrated with another EU LIFE funded project (PREPAIR - lifepreparepair.eu) to study additional applications.	It has the potential to extend its scale of application to other regions in the north of Italy which are involved in the PREPAIR project. Moreover, after the pilot test phase it may be fully integrated into the <i>Roger App</i> and made available to any passenger using <i>Roger</i> .	GDPR aspects need to be carefully considered to ensure personal data transfer is compliant to EU regulations and to contractual provisions of mobility platforms concerning personal data treatment.
Abruzzo (IT)	The structure of the <i>Happy Travel App</i> is in principle transferable to other regions with touristic vocation.	Additional functionalities can be included in the App and its geographic scope can be extended to other Italian and Croatian regions.	Promoting the App was a challenge and additional efforts were necessary to extend its use. Including ticketing functionalities could have increased the App use.

Region / area	Transferability	Scalability	Lessons learnt
Primorje-Gorski Kotar (HR)	The structure of the <i>icarus-mobility.com</i> web site can in principle be transferred to other regions.	Additional information could be included in the website as needed, and information could also focus on neighbouring Croatian regions.	Informing users on sustainable transport options is just the first step to bring behavioural change, which is a long-term process.
Istria (HR)	A Smart Card – App solution has the potential to be transferred to other touristic regions. Technology adaptations and the App tuning the specific contexts is nevertheless needed.	The Smart Card – App development will be open to include additional services (including maritime services) and may be extended to additional areas of Istria region.	The Smart Card – App needs considering the availability of public transport services in the regions and adapt the MaaS concept accordingly.
Croatia	The possibility to buy rail & bike ticket is in principle transferable to any rail operators with suitable rail coaches.	Integrated ticketing with other rail undertakings is possible but needs specific agreements.	GDPR aspects need to be carefully considered, and the current HZZP ticketing systems needs upgrades to allow other modes integration and foreigners to buy tickets.

The development of the ICARUS pilot projects shows that transport technology delivery can be complex and needs considering multiple challenges.

We report hereafter the main challenges with reference to MaaS applications development. We specifically focus on MaaS because the number of ICT applications in transport is very wide and the scope of the ICARUS pilots is contributing to transport service integration in a MaaS perspective.

Transport services and infrastructure

A careful analysis of transport service and infrastructure availability is a pre-condition to develop MaaS applications. Public transport is the backbone of a MaaS platform. Nevertheless, European regions differ in the availability of public transport services and public transport may be limited in some regions. This needs to be considered before engaging in the development of a MaaS application.

Concerning other services (e.g. shared mobility, EV charging network) a careful demand analysis is needed, and additional transport services could be added only after offering core services.

Moreover, transport operators may perceive MaaS initiatives as competitors and this may limit the extent of services which are included.

Level of service integration

Planning trips and paying tickets is the major added value of MaaS applications. In particular, ticketing makes MaaS systems different from journey planners. At the same time MaaS applications may have different levels of ticketing integration. MaaS initiators should assess which services including in integrated ticketing functionalities, as this requires commercial agreement with transport providers. Some services could be sold via partners' ticketing platforms. Moreover, a payment service provider should be engaged.

Regulation and technology

Multiple aspects should be considered when developing a MaaS platform:

- transport providers may have different on-board ticketing equipment, and this will inform the MaaS platform's integrated ticketing technology;
- MaaS platforms development need assessing transport providers' systems interoperability and API (Application Programming Interface) openness;
- data exchange and GDPR issues must be carefully considered;
- data should be dynamic to allow checking service availability and status, and booking;
- the MaaS technology framework should be open to new service additions.

Fares

Available fares will depend on the specific context in which the MaaS platform operates. This may be pay-as-you-go fares, as well as packages based on services and modes, geographic scope, timing or trip duration. This will factor demand needs. Moreover, public transport pricing should be assessed based on public transport regulatory provisions. Touristic services may also be added to the MaaS packages.

MaaS governance models

Different MaaS models exist⁷:

- Private / commercial integrators: MaaS platforms initiated by business players which integrate the transport offer;
- Open back-end platforms: platforms initiated by an authority or a neutral party which are used by MaaS providers to run services;

⁷ Sources: ERTICO – ITS Europe (editor), Mobility as a Service (MaaS) and Sustainable Urban Mobility Planning, 2019; UTIP, Ready for MaaS? Easier mobility for citizens and better data for cities, May 2019

- Public transport integrator: public transport providers are the integrators of services.

This suggests that authorities are not necessarily the initiator of a MaaS system.

Marketing, sales and assistance

It is important to market the initiative, plan sale channels and customer assistance.

The analysis of the ICARUS pilot projects and of the broader MaaS experience in Europe suggests that developing MaaS platforms is complex and needs facing multiple challenges. A key point is building strict cooperation in the transport eco-system to engage key stakeholders in the MaaS platform development. The role of authorities can vary, but given their role in funding public transport their involvement is needed.