

INCLUSION Project

Deliverable D2.1

First report on new ideas and concepts for PT innovations in prioritized areas

Version: 1.0

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Abstract	<p>Deliverable D2.1 First report on new ideas and concepts for Public Transport (from now on, PT) innovations in prioritized areas –summarizes the results and outcome of the first 13 months of activities in work package WP2 Social innovation, enabling ICTs and data intelligence. A first part of the deliverable will report on task T2.1 activities, including both the introduction of background and methodologic aspects of the work performed and a review of ICT-enabled Social Innovation experiences relevant to the objectives of the project, applicable to the background defined in WP1 and in general transferable at European level. A second part of the deliverable reports on the initial activities and results of task T2.2 Developing ideas and concepts for PT innovations in prioritized areas, with a description of the process of idea and concepts selection by the partners involved in the task, and a review of an initial set of ICT Ideas and concepts, which will be further enriched and detailed in the following months for the subsequent activities performed in the task and documented in the following deliverable D2.2.</p>		
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Executive summary

Deliverable D2.1 First report on new ideas and concepts for PT innovations in prioritized areas is the first deliverable in work package WP2 Social innovation, enabling ICTs and data intelligence. It summarizes the results and outcomes of the work package activities, including both activities performed in the context of task T2.1 Review of current experiences, (M3-M10) and part of the activities of task T2.2 Developing ideas and concepts for PT innovations in prioritized areas, starting in month 7.

An introduction focusing on WP2 activities in the context of the INCLUSION project is provided in **Section 1** of this deliverable.

Section 2 includes background information dealing with the concepts of social innovation in transport with a focus on the concept of ICT-Enabled Social Innovation which is relevant for INCLUSION and for WP2 in particular. The section introduces the methodological background directing the activities in WP2 to produce results that could be re-usable and possibly integrated or complementary to previous research activities. The methodological background has been selected based on a multi-year study on ICT-enabled Social Innovation (IESI) carried out by the JRC. It includes the development of a conceptual framework for the classification and analysis of the relevant solutions and experiences and adapts this framework to the specificities of the INCLUSION objectives. It thereby includes additional methodological elements and drivers coming from the background information set out by the project's general objectives and by the Work Package 1 analysis. **Annex I** at the end of this document includes the template that was used for the classification of existing experiences based on the methodology described above.

The following **Section 3** deals specifically with the outcomes of activities carried out in task T1.2 which aimed at reviewing ICT-enabled Social Innovation experiences. It includes the description of the basic criteria that were followed in the selection of initiatives/experiences, and the used classification criteria. The results of such activities are then included at the end of the document in **Annex II**, Inventory of ICT-Enabled Social Innovation Experiences.

Finally, **Section 4** documents the activities carried out in the initial period of task T2.2. Since this task continues after the issue date of this deliverable, only a preliminary version of the tasks' outcome are entailed in this document. The content included in this document should therefore be considered as a living document whose final version will be documented in the subsequent deliverable in WP2, D2.2 (Final report on new ideas and concepts for PT innovations in prioritized areas), due at month 28. The current results, in the form of a number of analysed ICT ideas and concepts, is provided at the end of this document in **Annex III**, Inventory of ICT-Enabled Social Innovation Experiences.

Contents

Executive summary	4
1 Introduction	10
1.1 The INCLUSION Project.....	10
1.2 Objectives of the WP2 research	11
2 Background	13
2.1 ICT-Enabled Social Innovation in INCLUSION	13
2.1.1 ICT as enabler of social innovation.....	14
2.1.2 Challenges, obstacles and risks	15
2.1.3 ICT-enabled social innovation in INCLUSION	17
2.1.4 Outcomes from the JRC IESI research	19
2.2 Background from WP1	19
2.2.1 Vulnerable user groups	20
2.2.2 Prioritized areas.....	21
2.2.3 Operators’ needs.....	21
2.2.4 Opportunities for digitalization.....	22
2.2.5 Needs and gaps in transport service provision	22
2.2.6 Pilot-specific needs and gaps	22
2.2.7 Challenges	23
2.3 Methodological background	24
2.3.1 The JRC IESI Framework	25
Potential of ICT-enabled innovation.....	25
Elements of social innovation.....	26
Levels of governance of service integration.....	27
Types of service integration	28
2.3.2 Conclusions on the methodological background	28
3 Review of existing experiences	30
3.1 Review methodology.....	30
3.1.1 Search methods.....	31
3.1.2 Classification Criteria	32
3.2 Outcomes of the review	35
3.2.1 Main facts about the reviewed experiences.....	35
3.2.2 Open data and Crowd-sourcing features	37
3.2.3 Potential of ICT-enabled innovation	38
3.2.4 Elements of social innovation	40

3.2.5	Service improvement introduced.....	42
3.2.6	Elements of open innovation	44
3.2.7	Prioritized areas.....	45
3.2.8	Impact of ICT	47
3.2.9	Enabling factors and replicability	48
4	New ideas and concept for PT innovations in prioritized areas	50
4.1	Identification of new ideas	50
4.2	Process followed for the collection of new ideas and concepts	52
4.3	Criteria for the collection of new ideas and concepts	53
5	Annex I – Template for the classification of existing experiences	55
6	Annex II – Database of ICT-Enabled Social Innovation Experiences	59
6.1	AftaRobot	59
6.2	App&Town.....	65
6.3	CIPTEC crowdsourcing platform	70
6.4	CMM – Central Moins Mobile	80
6.5	Shared Use Mobility Agency in ELBA Island	84
6.6	GOGOGRANDPARENT.....	93
6.7	GOKIDS.....	96
6.8	Green Move.....	99
6.9	Moosdorf Macht Mobil	104
6.10	Mobipunt.....	109
6.11	Mon Chaperon.....	115
6.12	MoveUs Project	119
6.13	Sommobilitat.coop	124
6.14	Wher	129
6.15	BlaBlacar – Ladies Only Service	133
7	Annex III – Catalogue of New Ideas & Concepts	139
7.1	Gamification	139
7.2	Aggregating transport demand through social media	143
7.3	Social Network as Car-Pooling platform.....	145
7.4	How to increase accuracy of data	150
7.5	Dynamic pricing	152
7.6	Blockchain Enabled Service Interoperability	153
7.7	Voice-based Conversational User Interfaces	156

7.8 Enhancing Security through Danger Situation Detection with automated Image and Video Analysis..... 159

8 References.....163

9 INCLUSION consortium166

List of figures

Figure 1 – ICT-enabled social innovation.....12

Figure 2 – relation of WP2 with other work packages12

Figure 3 – vulnerable user characteristics for pilot areas20

Figure 4 – Prioritised areas, spatial and economic characteristics21

Figure 5 – potential challenges of serving vulnerable populations (Age)23

Figure 6 – potential challenges of serving vulnerable populations (disability, income and gender).....24

Figure 7 – ICT-Enabled Innovation potential29

Figure 8 - potential of ICT-enabled innovation in reviewed experiences40

Figure 9 – Elements of social innovation in reviewed experiences.....42

Figure 10 – Service improvement in reviewed experiences.....44

Figure 11 – Open innovation in reviewed experiences45

Figure 12 – Prioritized areas in reviewed experiences.....47

Figure 13: Aftarobot, the new app to increase the efficiency and quality of taxi services.....60

Figure 14: App&Town.....65

Figure 15: Homepage of the CIPTEC crowdsourcing platform71

Figure 16: operational flow related to CIPTEC crowdsourcing platform.....72

Figure 17: On-line template for submitting new ideas74

Figure 18: Architecture and main components of SUMA86

Figure 19: SUMA Functionalities	88
Figure 20 – inauguration of the initiative	106
Figure 21: Mobipunt.....	110
Figure 22: Mobihub pilots	111
Figure 23 - Traffic feedback sent through mobile app	120
Figure 24 - Traffic feedback console.....	120
Figure 25 – Validation of a feedback.....	121
Figure 26: Sommobilitat App.....	125
Figure 28 – offering a ride with BlaBlaCar	134
Figure 29 - Example of gamification functionalities fostering the use of Public Transport, SASA PT Operator in Bolzano region of South Tirol in Northern Italy.....	140
Figure 30 - Technological architecture to operate gamification for the improvement of smart mobility in Rovereto	141
Figure 31 - An exemplary user interface illustrating an event and options for users to indicate intentions to attend and drive to an event or attend and not drive to the event.....	146
Figure 32 - An exemplary user interface illustrating determined matches for ridesharing	146
Figure 33 - An exemplary user interface illustrating a form to receive ridesharing information	147
Figure 34 - an illustration of the blockchain structure	154
Figure 35 - A representation of a deep neural network architecture for illustrative purposes.....	160

List of tables

Table 1 - Opportunities of digitalisation for prioritised areas.....	22
Table 2 – Main facts about the reviewed experiences.....	36
Table 3 – open and crowd sourced data in reviewed experiences	38
Table 4 – potential of ICT-enabled innovation in reviewed experiences	39
Table 5 – elements of social innovation in reviewed experiences.....	41

Table 6 – Service improvement in reviewed experiences.....	43
Table 7 – Service improvement in reviewed experiences.....	45
Table 8 – Prioritized areas in reviewed experiences.....	46
Table 9 – Impact of ICT in reviewed experiences.....	48
Table 10 – Enabling factors and replicability in reviewed experiences.....	49

1 Introduction

1.1 The INCLUSION Project

The main objective of the INCLUSION project is to understand, assess and evaluate the accessibility and inclusiveness of transport solutions in European prioritised areas, identify gaps and unmet needs, propose and experiment with a range of innovative and transferable solutions, including ICT-enabled elements, ensuring accessible, inclusive and equitable conditions for all and especially vulnerable user categories.

INCLUSION has defined at least eight core objectives:

- **Investigate and understand** the main characteristics of **prioritised** areas as well as the relevant factors that influence mobility and accessibility.
- **Identify the user** and social groups most exposed to transport **accessibility** issues and inequality in the different type of areas and undertake a comprehensive analysis of their mobility requirements.
- **Understand how ICT tools**, service and social innovation can help individuals to cope with accessibility issues and improve or increase inclusivity and transport equity for the concerned user groups.
- **Identify and critically assess existing** innovative, efficient, affordable, inclusive, equitable and economically viable forms of public transport, with a particular focus on the use of ICT applications and on transferability potentials for both the prioritised areas and social groups.
- Undertake **experimental validation** of innovative elements and ideas aimed to enhance transport accessibility in selected prioritised areas and transport environments for the concerned vulnerable users.
- Undertake a **quantitative assessment** of the impacts and a qualitative process evaluation in selected innovative transport solutions validated in the INCLUSION experimental sites.
- Investigate, develop and consolidate **business concepts** and models related to the assessed accessible transport options with the aim of transferring these findings to other European contexts
- **Disseminate** and **promote** the identified innovations, transferable solutions and recommendations with the aim of fostering the adoption of accessible, inclusive and equitable mobility solutions for European prioritised areas and vulnerable user groups

The project expects to understand the main transport challenges in different types of prioritised areas; to provide an in-depth examination of ten innovative public transport approaches and a wider catalogue of at least forty case studies of accessible, inclusive and equitable transport solutions; to deliver a set of recommendations and mobility solutions for vulnerable users' communities.

1.2 Objectives of the WP2 research

The project objectives are declined in the specific activities to be conducted in work package 2 as follows:

- Analyse and review existing experiences on ICT-enabled social innovation focusing on transport and mobility
- Investigate and develop new ideas and concepts with a potential to lower transport accessibility and inclusivity barriers for the targeted population groups and user segments.
- Assess and validate the new concepts and innovations with a co-participative approach

The scope of the WP2 research then combines the elements of social innovation and Information and Communication Technology (ICT). Both elements can have a significant impact in the provision of innovative transport solution.

Social innovation has strong connections with inclusiveness in transport as it can indeed trigger many transformations starting from the strong links with public needs and values. Social innovation is growing in a situation of increasing economic constraints and new social needs (which, in turn, would require no such economic constraints). The decentralization of resources and socialization of the processes is an answer originated by this controversial situation.

It can also be observed that the impact and effectiveness of many social innovation processes is enhanced or sustained by ICT. On the other hand, many social innovation processes and initiatives have been originated by social media or the availability of technology. All this suggest the importance of the links between ICT and social innovation. These aspects will be investigated throughout the course of the whole work package.

The following figure depicts where the main field of study of WP2 stands: social innovation in transport describes a new way of delivering transport services where typically the user act as a prosumer¹ and not simply as a consumer. The combination of social innovation with ICT which is defined in this report as “**ICT-Enabled Social Innovation**” is where WP2 focuses its activities.

¹ Prosumer is a term used to indicate a role that combines both the producer and the consumer.

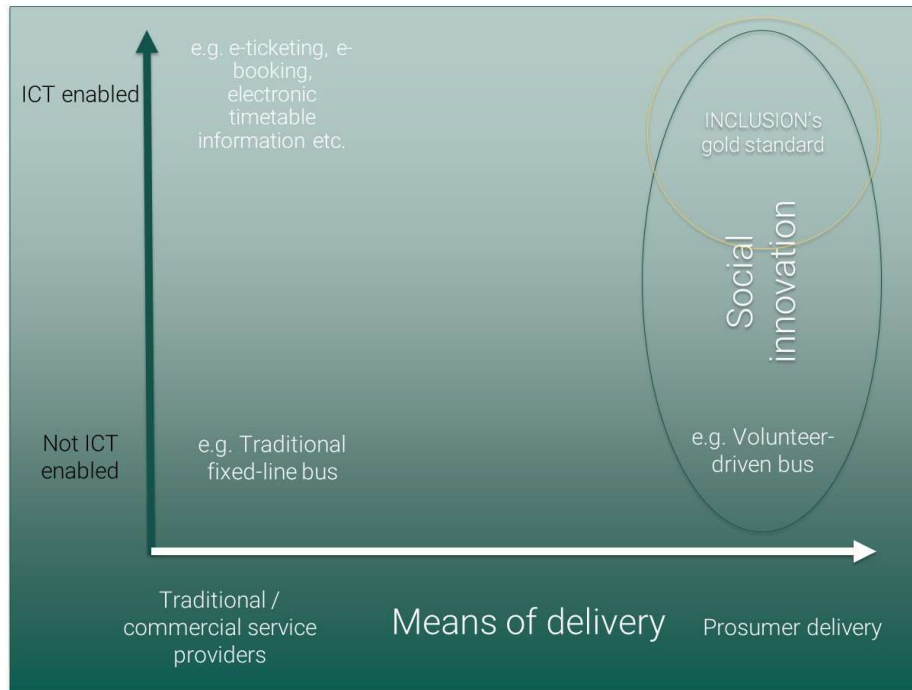


Figure 1 – ICT-enabled social innovation

The relations of work package 2 with other project activities are synthesized as follows:

- The contextual background of the project, including WP2 is defined in WP1.
- The findings of WP2 will be cross-checked with the outcomes in WP3.
- The innovative ICT solutions will be considered/applied in the pilot sites (WP4) and validated in WP5. On the other hand, the findings from WP4 will also serve as feedback.
- Finally, the development of business models (WP6) will take into account the WP2 analysis.

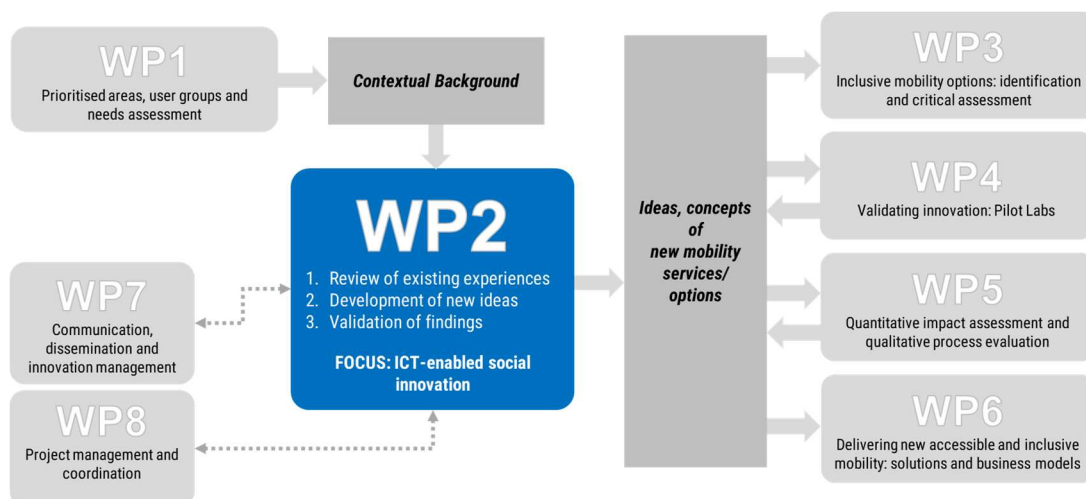


Figure 2 – relation of WP2 with other work packages

2 Background

2.1 ICT-Enabled Social Innovation in INCLUSION

ICT-enabled Social Innovation in INCLUSION relates to three areas of application:

- 1) Better transport organisation (governance level);
- 2) More efficient service provision (provider level);
- 3) More informed and tailored end-user services (user level).

New social-innovation paradigms flourish as answer to intractable social problems and rising costs, in areas where the institutions are most open to such innovations (Murray, R., Caulier-Grice, J., and Mulgan, G. 2010). Much of this innovation points towards a new type of economy which comprises:

- Intensive use of distributed networks to sustain and manage.
- New types of relationship enabled by mobile communication and other.
- Blurred separation between production and consumption.
- Emphasis on cooperation, values and missions.

This new social economy also gets a distinctive character from:

- The technology (networks; global infrastructures for information; social networks) and
- The growing emphasis on the human dimension; democratic processes, priority on individuals and relationships instead of systems and structures.

In a wider perspective the values that guides the social economy organizations can be identified as:

- Social utility, well-being for the greatest number of individuals.
- Solidarity, respect, mutual support and a sense of belonging.
- Economic sustainability.
- Democratic and participatory governance.

This 'human factor' seems to be one of the more controversial factors that characterises the move towards a more socially-oriented economy model. The so-called sharing economy platforms for example, fully fits the social paradigm only if they enable a real exchange of goods and services between peers: the price of goods and services offered or exchanged, must then be negotiated and agreed among users and not directed by external organizations. For instance, companies providing paid transport services although featuring some forms of sharing (e.g. car or bike sharing) aren't fully in line with a strong social and sharing economy paradigm.

The move towards a social-oriented economic and business approach has many implications. A plurality of actors, associations, mutual societies and social cooperatives exist together with foundations and new social and community enterprises. Traditional commercial enterprises may also become part of the game if they are willing to pursue the social and / or environmental objectives.

For public transport companies, due to their nature, such transformation should not constitute a problem. Nevertheless, another distinctive factor here must be considered, namely the fact that the social innovation mostly relies on distributed structures rather than on centralised ones. Complexity is distributed and not handled centrally. In this perspective the role of the consumer changes from a passive to an active player (Murray, R. et al., 2010). This feature has of course relevant implications in existing public transport companies but creates great opportunities at the same time, especially in inclusive transport as seen while analysing the experiences reviewed in this document.

Another side of the social innovation and sharing economy trends is the creation of a different architecture and logic of welfare. Public sector organisations become more “business oriented” and the state becomes an enabler of interactions of organisations involved in welfare policies.

This process certainly eases the move towards a more inclusive, human-centred approach but also implies a disruptive reorganization of work. For example, single funding is replaced by multiple sourcing including personal budgets or civil and enterprise funding. Centralised service provision practices are more and more replaced by local and community management approaches. The results are: a lower cost of coordination, enablement of de-centralization, fostering the shift from institution to collaboration and contributing in a sustainable way to social service transformation.

2.1.1 ICT as enabler of social innovation

In the above scenario, the challenges for ICT-Enabled Social Innovation are to enable or facilitate an open collaborative and participative approach. It can be observed that the new organization and management of social services is often triggered, sustained or enabled by technical factors and trends like:

- pervasive, *always-on-Internet* connection increasing the amount of services and content consumed and produced by users;
- open source software, easing the software development;
- massive data availability, often as open data, allow third-party developers to work on independent ICT-based information systems;
- co-creation, comments, rating, co-decisions connected to many practices and implying higher quality expectations from citizens.

The process of social innovation and the ICT trends have then a strong relationship. The present study analyses the potential of ICT as enabler to achieve the process of transformation of existing transport schemas into more inclusive ones.

More generally, ICT-enabled social innovation can be considered to complement the more general Social Investment Package (SIP), set out by the European Commission. The SIP addresses the growing risk of poverty and social exclusion arising from the crisis in some parts of Europe with rising poverty and massive levels of unemployment. This is done with the following actions:

- guidance of EU countries in using their social budgets more efficiently and effectively to ensure adequate and sustainable social protection;
- strengthen people’s current and future capacities, and improve their opportunities to participate in society and the labour market;
- focus on integrated packages of benefits and services that help people throughout their lives and achieve lasting positive social outcomes;

- promotion of prevention rather than cure, by reducing the need for benefits. That way, when people do need support, society can afford to help;
- investment in children and young people to increase their opportunities in life.

As pointed out by Misuraca et al, 2015, social innovation and in particular, ICT-enabled social innovation could play an important role in implementing the SIP, giving it a central role in addressing the Europe 2020 strategy's targets.

Social services and policies require an adaptation to emerging social trends and new challenges and social innovation can effectively address these issues. Thanks to new collaborative technologies; semantic interoperability approaches; linked open data; networked social sensors; Internet of things; etc. ICT can further increase the already known potential of social innovation for the implementation of the SIP.

This is achieved thanks to increased and more efficient participative and collaborative innovation. ICT becomes not a simply assistive factor but a real “game changer” for social innovation as it lowers the cost of coordination and help the move from institution to collaboration. At the end this will result in a transformation of social services in a more sustainable and effective way.

2.1.2 Challenges, obstacles and risks

Technical innovation is not sufficient per se to modernise social protection systems. There are barriers to the adoption of digital services and the achieved impact is often limited. This is usually a consequence of cultural reasons and organisational shortcomings. To fully deliver their promises and potential it is important to associate ICT-enabled innovation to social innovation.

Social Innovation, per se, requires an efficient and structured support from public policy, both for the new business models it creates and for the development and delivery of new services. Opening public data to private developers and re-allocation of public spaces to support new transport paradigms are examples applicable to the mobility sector². Nevertheless, opening resources to the public of course requires proper government and monitoring as the risks of uncontrolled management from the public is evident.

To be successful from the beneficiary's perspective, ICT-enabled social innovation needs also to contribute to the creation of *public value*. It can be observed that a “new public management” approach contributes in a new way to the creation of public value where service quality, outcomes and trust are the main components compared to the traditional management where the political directions, experts and policies are at the centre of the process (Kelly, G. & Mulgan, G., 2002). This should be achieved and sustained through cultural change, trust between service providers and beneficiaries, multi-sectoral and multi-disciplinary partnerships and collaborative design, implementation and evaluation of services (Misuraca et al 2015).

While technology enables new opportunities and has a potential to create public value (and this seems to be evident in public transport), it also has (or hides) noticeable implications and risks. Impact of ICT is a particularly critical point in transport, as digitally-enabled transport services will need to work across diverse areas and for heterogeneous populations. While new digitally-enabled possibilities exist today in the transport sector, problems like those of digital exclusion must be carefully considered. Technologies create

² An example is the open data that Transport for London has made available for developers to use in their own software and services. Software developers are encouraged to use these feeds to present customer travel information in innovative ways ('Open Data Users - TfL', n.d.).

new facilities but may also introduce -for some aspects- a new degree of inaccessibility which may reduce the overall degree of inclusion obtained with other measures.

The concept of *digital exclusion* in general may be considered as resting on a lack of one or more of the following:

- Access to technology (physical access).
- Devices (such as computers, smartphones, or tablets) that are connected to the internet and allow for communication and information gathering.
- Understanding of technology: The skills and understanding of how to use technology and technological interfaces for the purposes you desire.
- Presence of underlying infrastructure: The connective services, such as broadband or mobile data coverage, that enable use of digital devices and services.

An area or population may suffer from digital exclusion based on one or more of these factors but understanding how they differ is key to ensuring that activities undertaken, and policies developed to address them are responding to the right driver. For example, in areas that have adequate service coverage, the most beneficial action taken may be the provision of training to ensure that travellers (and others) understand how to use the enabled technology.

Martin et al., 2016 analyses the potential relation between digital and social exclusion. Internet access, for example, is put in relation to many usual facilities, actions, and activities such as: having access to a car, flying for leisure, having a driving licence, visiting cultural events, use of council services, and participation in sports or leisure activities. The percentage of people with internet access who have or had access to these facilities and activities is much higher than those of people with no internet access. For example, 85% of those with internet access had visited some cultural event or activity in the last 12 months compared to 52% of those who did not have internet access and similar values have been registered for other cases. The relation of digital exclusion with the use of public transport and mobility in general can be seen from two different perspectives:

- the use of public transport may be even higher for people with no internet access due to the need to physically undertake tasks that could be otherwise done remotely at home.
- On the other hand, the use of new transport services heavily based on ICT (e.g. booking a Demand-response service online or planning a journey efficiently) requires a minimum of technical skill. If such technical skills are not present the services themselves may be inaccessible.

Another study from the Low incomes tax reform group (Beazley, G., 2012) shows that a significant proportion of the UK population is digitally excluded because of lack of Internet access or low levels of digital literacy. This issue affects not only individuals but also small businesses. An interesting aspect is that digital exclusion is not only about lack of access to a computer or to the internet: citizens should also have a sufficient level of digital literacy to be able to recognise when information is needed and to have the skill to locate, evaluate and make use of the online systems.

To understand the specificities of the different clusters of welfare systems models about the deployment of ICT-enabled social innovation, it is worth looking at how different EU countries in each group perform against the Digital Agenda Scoreboard, and particularly against the Digital Economy and Society Index (DESI).

The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU member states in digital competitiveness. It includes 5 main dimensions (DESI, 2018):

- i. Connectivity, which measures the deployment and quality of broadband infrastructure;
- ii. Human capital, which measures basic and advanced ICT skills usage and development;
- iii. Use of the Internet, relating to contents, communication and transactions;
- iv. Integration of digital technology, in terms of levels of business digitisation and eCommerce;
- v. Digital public services, measured through the availability and take-up of eGovernment and eHealth services.

Four of the DESI dimensions are particularly important for better understanding how contextual factors affect the deployment of ICT-enabled social innovation. These are: connectivity, access to the Internet, human capital and digital public services. In fact, lack of reliable, quick and affordable broadband and limited access to the Internet negatively affect all the activities based on the use of the Internet, from e-learning to collaboration and matching platforms, to shared case management systems.

The findings of the DESI research (DESI 2018) shows that the above shortcomings are still present. These, often affect deprived and rural communities with negative consequences in terms of support of ICT enabled social innovations by local authorities and third sector organisations. The negative impact on the population can be that ICT-enabled services may be difficult to use because of users' limited ICT skills. This often happens in connection with poor ICT infrastructure. In these situations, the success of ICT-enabled social innovation initiatives becomes even more difficult.

2.1.3 ICT-enabled social innovation in INCLUSION

The role of social innovation in INCLUSION has been widely debated during the project activities and among the group of the INCLUSION Stakeholders' Forum in dedicated working sessions and debates around the following questions:

- How could ICT-enabled social innovation improve the accessibility to public transport?
- Could 'ICT-enabled social innovation' divide the society in two groups depending on the attitude and acceptance towards ICT?
- Which obstacles can be seen in heavy use of the technologies?
- What can authorities and operators do to spark social innovation by communities and social entrepreneurs?
- What can be interesting to try in the INCLUSION Pilot Cities?

About the accessibility to public transport, it's remarked that most decisions about public transport are still made by authorities and validated by politics with no influences or involvement by the public. A bottom-up approach is then desirable where authorities and politics understands the needs of the people and users have the possibility to inform in a direct way the authority about things running wrong (with a reaction by the authorities).

ICT is the way to go and to facilitate many tasks, but it is only a part of the overall solution. Furthermore, as already remarked in the previous sections, ICT-enabled social innovation may not be a totally positive process

to everyone, because sometime special groups are excluded while it is crucial to give the widest possible access to the PT system. On the other hand, social innovation in public transport is not necessarily to be considered as ICT-based: reliability in delivering the PT service, for example, is also social innovation.

Anyway, key innovation in public transport is expected to come from needs. Public transport authorities (PAs) and public transport operators (POs) should listen to the bottom-up initiatives and use the new ideas and needs in their everyday service. For example, in Madrid, everybody can give an idea on the topic of transportation. Dedicated budget ensures that the most useful ideas become reality.

To activate similar processes however, is not easy. Firstly, PAs and POs need a strong commitment to new ideas. It can be involved new thoughts and aspects. Secondly, sometimes PAs and POs don't have freedom. They need political permission to overcome obstacles.

PAs and POs have an important task to get a connection between users and communities (in the aspect of demand and supply). When somebody wants to be a volunteer driver for blind, visually impaired or disabled people, the transport authorities can help to the future volunteers to get a contact with associations of people with special needs. But here, again, in many cases the political and normative obstacles can limit what elsewhere is recognized to be a successful initiative.

The tasks and barriers of public and private sector in transportation are not clear. Talking about the future tasks of public transport services is very important in the first part of XXI. Century.

About the risks of dividing the society into two groups due to the growing presence of ICT in transport and as enabler of innovative transport solution, this risk is perceived as real and should be carefully analysed and considered. Smartphones for example, and consequently, all the transport-related mobile apps, are not very much used today by elderly people. This may be seen like a transitional phase but it's not easily predictable how long this transition will be and to which degree of complexity people will be prone to use technology. Therefore, *publicly usable* ICT, must be easy to use. Where such conditions are not met for all user categories, the technology itself can help to fill the gap. Examples of simplifications of use of complex systems exists, supported by ICT in a way that is totally transparent to the end user. See for example the reviewed experience GoGoGranddaddy in section 6.

Obstacles connected to use of ICT in inclusive transport can be found also in terms of poverty (for example lack of economic possibility to buy a smartphone), digital illiteracy, cultural and language barriers, lack of availability of ICT infrastructure and connection everywhere, dependency on electricity and WI-FI. All these factors risk to even further increase transport exclusion for certain categories.

Lack of integration and interoperability is another aspect. Integrated payment systems, planning services and MaaS solutions integrating all transport systems available in the area -including the new cooperative ones- are flourishing but they are still not spread everywhere, and the integration of tariffs is often partial. Rural areas are often excluded not only from the main transport networks but also in terms of ICT facilities. Finding a find a suitable mode of transport when the geographic conditions are not favourable, is then not supported or eased. It's true that many transport service providers offer efficient information and booking services in connection with integrated service offerings in rural areas, but the coverage is still partial.

The review of experiences and design of new concepts in this document carefully analyses the potential obstacles and risks connected with the specific ICT aspects found or identified case by case. These are among the key aspects to be considered in the evaluation of potential transferability and application of the new

ideas and existing experiences in the INCLUSION pilot sites. Here, pilot labs need a trial area, where they can try the initiatives, modifying and monitoring the transport service. The results ensure to analyse the positive or negative effects of initiatives. The best ideas can be realized during the intervention based on the results. This can be realized in a social innovation way by listening to the local needs and get a partnership with local stakeholders.

2.1.4 Outcomes from the JRC IESI research

In the context introduced in this section, an important multi-year research project on “ICT-enabled Social Innovation to support the Implementation of the Social Investment Package” (IESI) has been carried out from the Joint Research Centre, in partnership with the Directorate General for Employment, Social Affairs and Inclusion. The outcomes of the study focusing on ICT are summarized in Misuraca, G, Pasi, G., & Urzi Brancati, C., 2017:

- ICTs contribute to address emerging societal challenges, by promoting social innovation and social investment.
- ICTs enable a more targeted and personalized approach, focused on outcome orientation and demonstrable results.
- ICTs allow greater coordination between different levels of government - essential to improving system integrity and reducing duplication/gaps in service provision.
- ICTs support the simplification of procedures and in turn increase the take-up of services, such as the consolidation of the one-stop-shop/no-stop-shop approach.
- ICTs facilitate addressing the structural imbalance between growing social needs and the decreasing or limited financial resources.
- Technology is a necessary but not sufficient condition for social innovation and social investment to fully deliver their promises.
- ICTs development and implementation must be combined with re-engineering of organizational structures and a cultural shift in embracing social innovation.
- ICTs and social innovation play a crucial role in fostering the success of modernisation initiatives, and pursuing the objectives of the EU Social Investment Package

The study has been considered as a major input to evaluate the impact of ICT-enabled Social innovation in WP2. For this reason, the JRC methodology is analysed more in details in section 2.3 Methodological background.

2.2 Background from WP1

The findings from Work Package 1 constitutes the background for the review activity in task T2.1 and the aspects to be addressed by the new ideas and concepts defined in Task 2.2. The reference source of information for the INCLUSION contextual background is the report that presents the outcomes of project

Task 1.2, Deliverable D1.2 Review and classification of prioritised area types and user groups and identification of challenges and gaps.

The main aspects of relevance for WP2 are briefly outlined in the following sections.

2.2.1 Vulnerable user groups

The analysis of vulnerable user groups is one of the key findings of WP1. The outcomes of the analysis is fully documented in Deliverable D1.2 section 3, especially section 3.3.

The following table shows the vulnerable user characteristics relevant for the WP2 work.

		Vulnerable user characteristics for pilot areas					
		Age					
		Children	Teens	Young adults	Adults	Older adults	Elderly
Sex	Male						
	Female						
Disability	No disability						
	Some physical or cognitive disability						
	Mobility-restricting physical or cognitive disability						
Residency status	Native						
	Migrant						
	Tourist						
Student status	Student						
	Non-student						
Family status	Single						
	Adult(s) + Children/ Dependent adult(s)						
Income level	High						
	Medium						
	Low						
Employment	Employed						
	Unemployed, looking for work						
	Unemployed, not looking for work						
	Retired						

Figure 3 – vulnerable user characteristics for pilot areas

2.2.2 Prioritized areas

Prioritised areas have been classified according to a number of properties and in many cases matches the characteristics of the INCLUSION pilot sites as in the following table. The outcomes of the prioritised areas analysis are presented in Deliverable D1.2 section 3.3.

			Prioritised Areas - Spatial & Economic Characteristics										
			Topography				Economic vitality			Economic & Population trends			
			Hilly	Mixd	Flat	Island	Deprv. Area	Aff. area	Mixed area	Growing	Decl.	Stble	
Geographic area	Urban	Very large urban area											
		Large urban area											
		Other urban area											
	Peri-urban	Suburban area											
		Accessible small town											
	Rural/ Remote	Remote small towns											
		Very remote small town											
		Accessible rural											
		Remote rural											
		Very remote rural											

Figure 4 – Prioritised areas, spatial and economic characteristics

2.2.3 Operators’ needs

The operators’ needs have been identified in Deliverable D1.2 section 4.1.1 and are resumed as follows:

- Operate viable services in a sustainable way
- Maximise patronage
- Engage more potential users of PT
- Guarantee cost efficiencies in service provision
- Maximise occupancy and minimise dead running
- Identify suitable/improved technical support systems according to service scheme to be operated

- Integration with other modes/routes
- Ability to expand coverage area in a sustainable way

2.2.4 Opportunities for digitalization

The opportunities for digitalisation have been identified according to the following table. More details in Deliverable D1.2 - section 4.1.5.

Areas	Opportunities	
Environmental sustainability	To reduce direct emissions from public transport	By optimizing routes, time-tables, style of driving, vehicles sizes...
	To reduce in-direct emissions (from the non-public transport systems)	
	To improve land use	By reducing the space dedicated for car parking
Social Sustainability	To improve social equity and sustainable living in prioritized areas	By increasing accessibility of vulnerable groups to public transport
	To reinforce the feeling of social inclusion and life satisfaction ,	By increasing the coverage of public transport services.
	To increase the access to different activities	
	To improve personal safety	By increasing public transport safety
Economical sustainability	To save money by the Public Transport Providers	By optimizing the use of resources in public transport
	To minimize the travel time	By reducing the waiting time for transport services and optimizing routes

Table 1 - Opportunities of digitalisation for prioritised areas

2.2.5 Needs and gaps in transport service provision

Addresses needs and gaps in service provision are identified in Deliverable D1.2 section 3.2.2

- Information
- Frequency
- Reliability
- Payment
- Inter-modality

2.2.6 Pilot-specific needs and gaps

The INCLUSION pilots have different needs and targets which should be considered in the identification of new ideas and concepts. The following list is a short resume. More details can be found in WP4 deliverables.

- [Sieg-Rhein Area] young families with children needing mobility solutions for their daily multi-chain-trips
- [Florence] integrated payment system, booking services, service improvement (frequency, accessibility)
- [Cairngorms Area] Improved accessibility to public transport for vulnerable groups of residents who suffer most greatly from transport poverty (elderly and young people) and tourists visiting the area
- [Flanders] solution to get to their social activities within an affordable and economic way
- [Barcelona] On-demand services from point A to point B because of the public transport limitations. Safer, cheaper and more comfortable ways to travel, avoid taking private car.
- [Budapest] More inclusive, fair and helpful environment for users reduced in mobility

2.2.7 Challenges

In D1.2, the *challenges* have been defined in relation to the needs of vulnerable population and includes many situations like young families with children needing mobility solutions for their daily multi-chain-trips, improving accessibility to public transport for vulnerable groups of residents who suffer most greatly from transport poverty (elderly and young people), safer, cheaper and more comfortable ways to travel, avoid taking private car for users needing on-demand services from point A to point B because of the public transport limitations etc.

		Age				
		Children	Students/ early workers	Working age	Mature working age	Elderly
Rural/remote area	Deprived, hilly area in economic decline with an ageing population	Low	Medium	High	High	High
	Geographically isolated area with a seasonal economy and declining population	Medium	Medium	High	High	High
	Flat area with an increasing population and mixed or improving economy	Low	High	High	High	Medium
	Accessible rural town with a growing young population and changing economy	High	High	High	High	Medium
Peri-urban area	Traditionally deprived area in economic growth, with an increasing population	High	High	High	High	High
	Declining suburban area with ageing population	Medium	Medium	High	High	High
	Accessible small town located in a hilly area with a stable population and mixed economy	Low	Low	Medium	Medium	Medium
	Suburban area with increasing young population and stable economy	High	High	High	High	Medium
Urban area	Declining urban area with decreasing employment and population loss	High	High	High	Medium	Medium
	Stable urban area with mixed employment	Medium	Medium	Medium	Low	Low
	Growing urban area with increasing population and employment opportunities	Medium	Medium	High	High	Low
	Urban area with declining population, stable employment, and growing peri-urban areas	High	High	High	Medium	Medium
	Very large urban area with stable employment and a growing population	High	Medium	High	High	Medium
	Large flat urban area with declining employment and population	Low	Medium	Medium	High	Medium
	Urban area located in hilly area with stable employment and population	Medium	Medium	Medium	Medium	High

Figure 5 – potential challenges of serving vulnerable populations (Age)

		Disability		Income			Sex	
		Yes	No	Low	Medium	High	Female	Male
Rural/remote area	Deprived, hilly area in economic decline with an ageing population	High	Low	High	Medium	Low	High	Medium
	Geographically isolated area with a seasonal economy and declining population	High	Low	High	Medium	Low	High	Low
	Flat area with an increasing population and mixed or improving economy	Medium	Low	Medium	Low	Low	Medium	Low
Peri-urban area	Accessible rural town with a growing young population and changing economy	Medium	Low	Medium	Low	Low	Medium	Low
	Traditionally deprived area in economic growth, with an increasing population	Medium	Low	High	High	Medium	Medium	Low
	Declining suburban area with ageing population	High	Medium	High	High	Low	High	Medium
	Accessible small town located in a hilly area with a stable population and mixed economy	High	Low	Medium	Low	Low	Medium	Low
Urban area	Suburban area with increasing young population and stable economy	Medium	Low	Medium	Low	Low	Medium	Low
	Declining urban area with decreasing employment and population loss	High	Medium	High	High	Medium	High	Medium
	Stable urban area with mixed employment	Medium	Low	Medium	Low	Low	Medium	Low
	Growing urban area with increasing population and employment opportunities	Medium	Low	Medium	Low	Low	Low	Low
	Urban area with declining population, stable employment, and growing peri-urban areas	High	Low	High	Medium	Low	Medium	Low
	Very large urban area with stable employment and a growing population	Medium	Low	Medium	Low	Low	Medium	Low
	Large flat urban area with declining employment and population	High	Medium	High	High	Medium	High	Low
Urban area located in hilly area with stable employment and population	High	Low	Medium	Low	Low	Low	Low	

Figure 6 – potential challenges of serving vulnerable populations (disability, income and gender)

2.3 Methodological background

A working methodology is needed to direct the activities in WP2 tasks T2.1 and T2.2. It is especially important to produce results that could be re-usable and possibly integrated or complementary to previous research activities.

To this end, section 2.1 introduces the multi-year study on ICT-enabled Social Innovation (IESI) carried out by the JRC that comprises the development of a conceptual framework for the classification and analysis of the relevant solutions and experiences. This work is an ideal support the definition of the WP2 methodological framework.

The IESI research was conducted in a first phase in 2014 with three main outcomes providing the basis for understanding how ICT-enabled social innovation in the EU member states could contribute to better and more effective social services provision and to effective social policy reforms foreseen by the Social Investment Package and targets of the Europe 2020 Strategy (JRC Science and Policy Report, Misuraca et al., 2015). The basis defined by the JRC study have been: 1) the review of the state of the art in several fields; 2) the development of a conceptual and analytical framework as guide for the analysis and mapping; 3) the definition of the 'IESI Knowledge Map' as mean for interpretation of the initiatives mapped.

The methodological background for INCLUSION task T2.1 and in part for the task T2.2 are derived from the conceptual and analytical framework developed by the JRC IESI research. To specifically address the INCLUSION objectives, however, additional methodological elements and drivers have been considered from the background information set out by the project general objectives and by the Work Package 1 analysis.

The next sections describes more in detail how the review, analysis and classification methodology necessary for tasks T2.1 and T2.2 has been defined.

2.3.1 The JRC IESI Framework

The JRC IESI conceptual framework classifies the collected initiatives along **four dimensions** which **can be seen somehow as indicators of the effectiveness** of the initiative itself. The dimensions, briefly introduced in this report and recalled in Misuraca et al 2017 are:

1. potential of ICT-enabled innovation: it measures the degree and of ICT in the process (“How strong the impact of ICT is”)
2. elements of social innovation; (“What it changes”)
3. integration at governance level (“Which governance levels are involved”)
4. integration from the organizational perspective (“Which organizational aspects are involved”)

The first two dimensions are the most immediately interesting for INCLUSION from the point of view of the assessment and promotion of the solutions with the greatest impact. The third and second dimension are relevant framework conditions to be considered especially in relation to the assessment of transferability.

The following sections introduces shortly these dimensions.

Potential of ICT-enabled innovation

Bekkers et al. (2013) remarks that it is important to make a distinction between organizational development and service improvements on the one hand and innovations on the other hand. Both lead to changes but in the case of an innovation the change is more radical, more transformative, because an innovation changes the paradigm which people and organizations use.

The first dimension of the IESI framework aims at distinguishing the *transformative innovation* from the *changes at functional level* introduced by ICT. The first are seen as “strong” innovation, the second as “weak”. According to Misuraca et al 2017 the potential can be divided in:

a) **Strong** (or “**transformationalist**”) innovation

Often ICTs are considered simply as contributor to service efficiency and delivery, but its role can also be strong (or stronger) when it becomes integral part of the service design and constitutes the infrastructure upon which social services are built and the factor initiating the service innovation dynamics. When technology has a creative role in the service innovation process rather than a simple assistive role we refer to a **strong potential** of ICTs also identifiable as “transformationalist” which is conceptually related to the *discontinuity with the past*.

Strong innovation can be:

- Disruptive: when new services or new mechanisms for service delivery are created based on ICTs. Here ICTs is used to initiate or improve new services or to introduce new ways of service delivery (impossible to achieve without technology) resulting in a radical product or service innovation. “Disruptive” can then be associated with “new”.
- Radical: when there is a heavy use of ICTs outside of the usual setting or a radical modification of existing services provision due to ICT. There isn’t a completely new service, but the radical

modification/improvement of services provision enabled by ICT make it possible to have a new approach to solve the problems.

b) **Weak** (or “**functionalist**”)

Here the potential of ICT has a marginal or less disruptive impact and play mainly an assistive role:

Sustained: ICTs supports, facilitates or complements existing processes to improve organisational mechanisms of services provision. This may require changes at organisational, managerial, or governance/institutional level, such as the introduction of new management methods and techniques or new working methods.

- Technical/incremental: ICTs just improves the efficiency of service delivery for example by facilitating automation of repetitive tasks with consequent improvement of efficiency

Elements of social innovation

The *elements of social innovation* indicate where the innovation stands, which are the aspects and situations addressed, affected or interested by the social innovation. The classification is operated according to the following situations (from Misuraca et al 2017). More situations can apply to a single initiative.

1. **Need-driven/outcome-oriented production:** the IESI initiative and its outcomes are specifically designed to meet the social needs in a long-lasting way.
2. **Open process of co-creation/collaborative innovation networks:** Co-creation implies the participate in the development, implementation and adoption of the innovations by end-users and other relevant stakeholders. Relevant stakeholders bring in their knowledge, information, experiences and resources so that they can be shared in order to produce innovative outcomes that are relevant to them.
3. **Fundamental change in the relationships between stakeholders:** In this case the IESI initiative produces a radical change in the relationships between the stakeholders, how they interact with each other, and how they collaborate with each other. Social innovation tries to act as a ‘game changer’, breaking through ‘path-dependencies’. As a result of social innovation processes, it is argued that need-driven services require the establishment of new collaborative relationships and new institutional arrangements.
4. **Public value allocation and/or re-allocation.**
 One of the most known and adopted definitions of public value has been formulated by prof. Mark H. Moore³. An interesting summary of what is public value and how it can be created and sustained can be found in an article that compares the public value created with two different transport initiatives: one for people suffering deprivation and the second for the elite (Essay UK). The definition adopted for our activities assumes that the value is public when it is consumed collectively by the citizenry: it is not who produces it that makes value public but it is a matter of who consumes it. The value is measured and determined not only by the preferences and desires of citizens but citizens must be also prepared to give something up for it, for example in terms of taxes for services or enforcement powers given to the state.

³ In particular in: Mark H. Moore, *Creating Public Value: Strategic Management in Government* (Cambridge, Mass: Harvard University Press, 1995)

Creation of public value in mobility and transport sector in general should be responsibility of the government and it should not be a commercial activity according to the international standards and guidelines of the World Bank. ICT social innovation can contribute to create additional value not only with increased effectiveness or efficiency enabled by the innovation itself but most importantly because it increases the value of democratic citizenship and really addresses the needs of citizens.

Levels of governance of service integration

The JRC study remarks that the effectiveness and success of new ICT-enabled Social innovations requires support from public policies because its introduction and use almost always requires changes at organizational and management level. On the other side, the technology itself can be a driver or facilitator towards new forms of integration at governance level.

This dimension of the framework refers to the different ways ICT-enabled social innovations contributes to the enhancement of social service delivery through *integrated approaches and coordination at governance level* which comprises coordination of operations across traditional functional units in the public or non-public sectors. The levels to be considered in this criterion are summarized in Misuraca et al 2017, in growing order of relevance:

- i. **Isolated.** No integration of services at administrative or strategic level with government operations;
- ii. **Intra-governmental integration.** The integration occurs at the same, single level of government, e.g. integrated case management, designing service delivery according to the needs of individuals rather than service providers; frontline integration to offer clients a 'single window'; back-office integration to provide the necessary support structures; and co-location of practitioners, services and back-office functions;
- iii. **Inter-governmental integration.** Collaboration across multiple levels of government, e.g. database integration, coordinated case management, and joint procurement;
- iv. **Inter-sectoral integration.** Collaboration between government and service delivery providers in private or non-for-profit sectors, e.g. joint investment strategies, co-location of staff and formal networks of service delivery organisations;
- v. **Pervasive.** Service integration beyond the traditional boundaries of administrative/operational integration, embedded in a new modus-operandi where service providers and beneficiaries co-produce services innovating delivery mechanisms and reallocating resources/roles to maximise public value creation.

To detect if any integration at governance level (if any) is enabled by the technology in the reviewed initiative it can be useful to identify who are the governmental actors and if any new form of integration is created:

- The beneficiaries of ICT-enabled social innovation initiatives (e.g. the general travellers and society in general).
- The Intermediary actors delivering the services (e.g. volunteers and paid assistants).
- The main stakeholder/enabler
 - Public Transport (PT) Authorities
 - Mobility Authorities
 - PT operators
 - Mobility operators

Types of service integration

This criterion refers to the type of service integration created by the introduced (ICT-Enabled) Social Innovation. Service integration can be defined in several ways. For our research it is relevant to detect if ICT enabled social innovation enables one or more of the following types of service integrations at organizational level (Misuraca et al 2017):

- **Funding:** e.g. pooling of funds or pre-paid capitation at various levels;
- **Administrative:** e.g. consolidation/decentralisation of responsibilities/functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;
- **Organisational:** e.g. co-location of services; discharge and transfer agreements; inter-agency planning and/or budgeting; service affiliation or contracting; jointly managed programmes or services; strategic alliances or care networks; common ownership or mergers;
- **Service delivery:** centralised information, referral and intake; case/care management; multidisciplinary/interdisciplinary teamwork; joint training; around-the-clock coverage

A service integration (of the previous types) actually exists if it produces measurable benefits:

- from the providers' perspective (like improved quality of outcomes, increased efficiency and reduced costs).
- from the beneficiary's perspective (like simplified access, holistic and customised support, faster response times, improved outcomes and user experience).

2.3.2 Conclusions on the methodological background

The following diagram put in relation the potential of innovation and level of governance of service integration. High integration (pervasive, inter-sectoral or inter-governmental) combined with a high innovation potential brought by ICT (disruptive or radical) introduces the most effective and incisive changes.

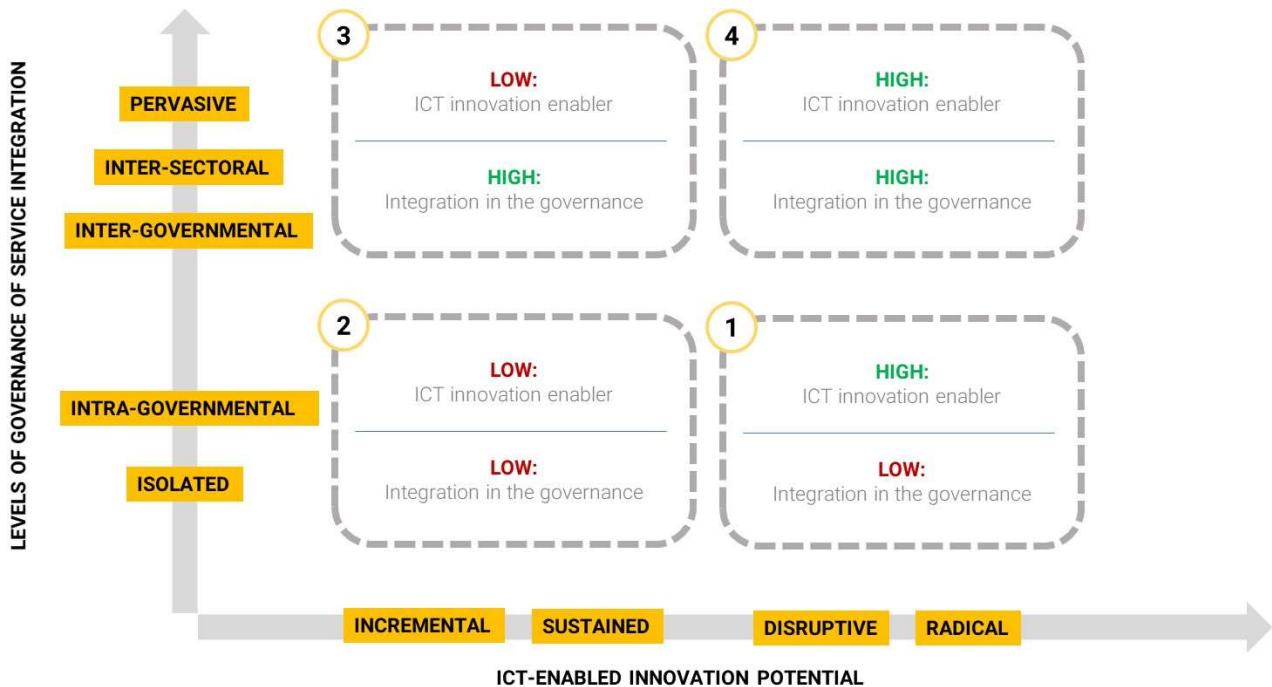


Figure 7 – ICT-Enabled Innovation potential

Source: own elaboration from Misuraca et al 2017

Having adopted the JRC IESI study as a starting point and main reference for this activity has been motivated by the need of maximizing the re-usability, exchange, usefulness and comprehension of the outcomes. The study is recognized as one of the most significant at European level in the domain of ICT-enabled social innovation.

The main methodological background introduced in this section is the foundation for the working methodologies, specifically developed for each of the two initial WP2 tasks (T2.1 and T2.2).

Both the review of existing experiences (Task 2.1) and the definition of new idea and concepts (Task 2.2) in the domain of ICT-enabled Social Innovation are carried out against a set of criteria derived from the main methodological background. In both groups of activities, the detailed information resulting from the research and analysis is collected through templates that emphasizes the features describing the impacts, potential, types and effectiveness of ICT-enabled social innovation in the INCLUSION mobility and transport domains, by critically assessing the potential negative aspects, the transferability issues and actual pertinence with the project themes and objectives.

The next sections describe task-specific methodologies and the outcomes.

3 Review of existing experiences

The objective of Task 2.1 is to review ICT-enabled Social Innovation experiences which are:

- i. Relevant for and pertinent with the objectives of the project
- ii. Applicable to the background defined in Work Package 1
- iii. Transferable at European level

The activities in this task aims at:

- Searching and analysing existing experiences with focus on ICT applied to social innovation
- Extracting and generalising the findings from a ICT-oriented perspective
- Complementing the review by socio-economic aspects (Social acceptance, business models,

The outcome is a set of **possible ICT solutions** applicable to new ideas and concepts in T2.2. T2.2 by itself can include ideas that are already implemented in production. Overall, the research of existing experiences is to show that ICT-enabled social innovation can ease the modernisation of social protection systems by:

- improving new services
- creating new mechanisms for service delivery,
- sustaining organisational reengineering and partnerships⁴ in the service delivery,

ICT enhances access to information and services, enables self-help and reduces dependency but it should be also embedded in the service delivery model rather than used as a substitute for the service itself.

Overall, technology should bring:

- a simplification of processes
- an easier take-up of services
- improved quality and new features

These advantages, introduced better in section 2, are the factors that motivates the present search and review activity. Of course, ICT-enabled social innovation can bring also potential disadvantages like the risk of digital exclusion (see section 2.1.2) and if not managed properly it may open the door to uncontrolled and undesirable results. It is not in the scope of the activities of task T2.1 to make a theoretical critical review of such risks but these are carefully analysed while reviewing each single experience considered.

3.1 Review methodology

The methodology for reviewing the existing experiences is based on:

- a) **search methods** made of practical criteria and conditions to be followed for the identification and selection of the experiences.
- b) **classification criteria** to make the analysis of the experiences more structured and prone to re-using, comparison, evaluation of the outcomes of this activity.

⁴ occurring across multiple levels of governments and between government and service delivery providers

This section introduces the search methods and the criteria adopted for the classification methodology.

3.1.1 Search methods

The basic criteria for selecting the initiatives/experiences to be reviewed are:

1. **Relevance:** the initiatives must address the objectives of the INCLUSION project including the user groups, prioritized areas and needs identified in work package 1 and resumed in section 0 of this report.
2. **ICT-enabled innovation:** technology must play a relevant role in simplification, modernisation, improvement of quality in social policies, service delivery process and administrative procedures. Relevant experiences which does not currently benefit from technologies, but which would dramatically benefit from it in a future scenario may also be considered as relevant for task 2.2.
3. **Evidence of policy outcomes:** there must be evidence of the role played by the technology to facilitate the identification of the key enabling conditions for success, policy opportunities and to formulate recommendations for possible transferability or replicability.

The reviewed experience should address the social investment goals from both the point of view of the service provider and of the consumers:

- **Service provider:**
 - Systems productivity.
 - Access and take up of services.
 - Quality and cost-effectiveness of services.
 - Policies meeting the needs of final beneficiaries.
- **Service consumer:**
 - Address all needs of specific target groups and areas identified in INCLUSION.

Helping questions when searching for existing experiences, may be:

- Does the initiative facilitate social inclusion?
- Which type of change in service delivery does it creates?
- Does the initiative make social services more efficient by sustaining organisational reengineering and partnerships in the service delivery?
- Is the initiative identifiable as 'Open Innovation'?
- Which type of partnership (e.g. public-private) it implies?

Concretely, the activities to conduct the research and classification of the existing ICT-enabled Social Innovation experiences are the following:

Practical search methods:

- Desk research.
- Consult existing studies.
- Query own contacts.
- Use data sources already identified in the project.
- Consider the experiences already identified in WP1 and WP3.

Main starting sources

- existing/known sources identified in the project can be found in Annex III:
 - sources identified in various activities of the project (e.g. KOM).
 - Findings from WP1.
 - Candidate WP3 case studies.

3.1.2 Classification Criteria

The first four of classification criteria comes from the JRC IESI Framework (more details in section 2.3.1). In addition to these, the review of the experiences is achieved considering further elements and classification criteria related with the objectives and scopes of the project and dealing with organizational aspects, acceptance, economic implications, enabling factors.

CRITERIA 01 - potential of ICT-enabled innovation

Check, classify against the “potential” as defined in the JRC IESI framework:

- Disruptive.
- Radical.
- Technical/incremental innovation.
- Sustained.

CRITERIA 02 - elements of social innovation

Check, classify against the following elements of social innovation according to the JRC IESI framework:

- Need-driven / outcome-oriented production.
- Open process of co-creation/collaborative innovation.
- Change in the relationships between stakeholders.
- Public value allocation and/or re-allocation.

CRITERIA 03 - Levels of governance of service integration

Check, classify and describe the Levels of governance of service integration based on the following references:

- Isolated.
- Intra-governmental integration.
- Inter-governmental integration.
- Inter-sectoral integration.
- Pervasive.

CRITERIA 04 – Types of service integration

Check and classify the experience based on the following types:

- Funding.
- Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning.
- Organisational.
- Service delivery.

INCLUSION-specific criteria

CRITERIA 05 – Service improvements and progress

In order to have an immediate view of the improvements and progress introduced by the reviewed initiative specify which of the following improvements/progress beyond traditional/SOTA services are present:

General improvements:

- improving access and take-up of services.
- increasing the quality of the services provided.
- improving cost-effectiveness.

Open innovation:

- sharing.
- Cooperation.
- plurality of participants.
- self-organisation.
- Decentralization.

CRITERIA 06 – Actors and user needs

To understand the user categories involved in the reviewed initiative, the criteria aims at describing:

- The beneficiaries of the initiative
- The stakeholders enabling/running the service or solution

More specifically, it is useful to understand if any specific user need among those identified in the analysis is addressed by the reviewed initiative. To this end, the criteria aim at specifying:

- The INCLUSION vulnerable user groups specifically addressed (if any)
- The addressed Operator's needs (if any) according to the INCLUSION classification

CRITERIA 07 – Prioritized areas

To understand if any of the INCLUSION Prioritised Areas is addressed by the reviewed initiative, the criteria allow to indicate the prioritised areas (if any) specifically covered by the reviewed service or solution.

CRITERIA 08 - Acceptance of ICT

As remarked in section 2.1.2 it is important to evaluate the aspects of acceptance of the ICT elements introduced with the reviewed initiative. To this end, the criteria aims at describing:

- Aspects of ICT that have an impact to the user
- Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators)
- Envisaged risks of digital exclusion (short description and considerations about any potential risk)

CRITERIA 09: Enabling factors

The enabling factors are the organizational, institutional, financial conditions allowing ICT to fully realise its potential in the reviewed initiative. The following elements can be considered as reference (Misuraca et al., 2017):

- Need for workforce development: to realize, develop or manage the ICT-based solution, some investments in empowerment of workers is needed to enforce skills and competences.
- Regulatory frameworks: the initiative needs new regulatory frameworks i.e. to allow/ease data exchange, execution of procedures, facilitation of integrated management by government agencies and private and third sector providers
- Financial sustainability: funding, contracting, long-term viability factors, possible use of European Structural and Investment Funds to finance ICT-based developments in the social sector
- Open government: openness, transparency and knowledge exchange (e.g. opening up public data and services) can enhance collaboration for the design, production and delivery of public services.

CRITERIA 10: Current status, scalability, replicability

The criteria aims at describing and critically analysing the following factors on replicability of the initiative in other EU countries:

- Status and maturity
- Current scale
- Scalability (geographic, in terms of users, technological)
- Evaluation of replicability and transferability

CRITERIA 11: Opportunities and limits

Looking at the activities in Task 2.2, this criteria allow to analyse and describe the current limits and opportunities of the reviewed initiative to identify which further work could be done or which new concepts/ideas could be created and applied to raise the potential and effectiveness of the solution. The focus is on ICT

The following aspects can be shortly described

- Limits of the initiative
- Enhancements / Extensions that may provide further value or increase the effectiveness of the elements described in Criteria 02.

3.2 Outcomes of the review

The following resumes and tables report the analysis of the existing experiences on ICT-Enabled Social innovation in transport which have been identified and reviewed according to the selection process and analysis criteria previously described.

This section resumes the following interesting aspects emerging from the analysis of the reviews and related of course to the methodological background:

- Main facts, including the purpose, the main social innovation factors, the target users, etc.
- Potential of ICT-enabled innovation
- Open data and Crowd-sourcing features
- Potential of ICT-enabled innovation introduced
- Elements of social innovation introduced
- Service improvement obtained
- Elements of open innovation provided
- Prioritized areas interested by the experience
- Impact of ICT
- Enabling factors and replicability in EU countries

The detailed catalogue of the reviewed experiences can be found in Annex II – Database of ICT-Enabled Social Innovation Experiences.

3.2.1 Main facts about the reviewed experiences

This section summarizes the main facts about the reviewed experiences to give an outlook of their objectives, features and users. The “main distinctive factors” are the aspects addressed by the initiative. Social innovation features are particularly emphasised.

Finally, most initiatives are in production which means available on a large scale and mature which is a sign of their success and appreciation from the citizens.

Name	At a glance	Main Social innovation distinctive factors	Target users	Mature/in production
Afta Robot	Better bus service organization through ICT	Service improvement thanks to user feedbacks and demand analysis	Elderly, Young, People with disabilities	Yes
App&Town Companion	Non-profit consumer cooperative offering mobility products	Accessibility of transport infrastructure	Elderly, Young, People with disabilities	Yes
BlaBlaCar Women	Cooperative transport, safe carpooling	Self-organization, cooperation on transport, cooperation on safe transport	Women	Yes
CIPTEC crowdsourcing platform	Multipurpose crowdsourcing platform	Co-creation, crowd-sourcing.	All, including mobility impaired	-
GoKid Carpool	ICT-enabled Carpooling solution for scholars	Organization of carpooling for young students.	Families with children	Yes
GoGoGrandparents	ICT-enabled simplified interface for Lyft sharing services	Eases the use of ICT (i.e. a mobile app) necessary to reserve a trip.	Mostly elderly people.	Yes
GreenMove	Innovative Electric Shared mobility	Integration, cooperation, sharing	All, including mobility impaired	-
Less Mobility Services	Transport services operated by volunteers with private cars	Support to self-organization on transport	All mobility impaired	Yes
Mobipunt	Integrated services for smart, collective, shared mobility	Support to vehicle sharing	All, including mobility impaired	Yes
Moosdorf macht mobil	Small scale (village), self-organized car sharing	Support to self-organization on transport	All, including mobility impaired	Yes
Mon Chaperon	Safety in walking trips	Cooperation on safety	Women	Yes
MoveUs	Feedback on traffic and incentives	Crowd-sourced data to improve information quality	All, including mobility impaired	-
Shared Use Mobility Agency in ELBA Island	Shared mobility agency	Coordination and management of vehicle sharing	All, including mobility impaired	-
Som Mobilitat cooperative Mobility Factor SCE	Non-profit consumer cooperative offering mobility products	Vehicle sharing operated through a consumer cooperative	All, including mobility impaired	Yes
WHER maps and cities for women.	Crowdsourcing for best and safest route	Cooperation on safety	Women	Yes

Table 2 – Main facts about the reviewed experiences

3.2.2 Open data and Crowd-sourcing features

One of the most interesting aspects and results of Social innovation is the increased availability of data, obtained either by opening existing data open or by collecting new data from the citizens (the so-called “crowd-sourced” data).

Data collection can be pro-active (explicitly indicated by the user through a form, for example) or implicit (data is collected based on users’ behaviour without an explicit action of data transmission). In both cases, of course, the service must be compliant with the applicable privacy and data treatment normative.

Pro-active data collection may be difficult to achieve in many cases. The MoveUs project has been included in the set of experiences despite it doesn’t focus expressly on inclusive transport, because it is a good example of incentive-based crowd-sourced data collection.

Crowd-sourced data can be “user feedbacks” that contributes to form the reputation of drivers in case of vehicle sharing with external drivers. This is the case of Afta Robot, BlaBlaCar or WHER. In other cases, the data collection is carried out to improve the quality of other datasets or services like for CIPTEC and MoveUs.

Not mentioned here but present in almost all cases is the feedback on quality of the service itself, available especially in mature (-in production) ones. This is achieved by means of the built-in user feedback facilities of the mobile markets or through dedicated quality assessment tools in case of projects (like MoveUs, GreenMove, CIPTEC)

The following table summarizes the experiences where open data and crowd-sourced data collection are key factors.

Name	Main ICT Elements	open data	Crowd sourcing
Afta Robot	Services available via mobile app / backend system	-	Yes
App&Town Companion	Services available via mobile app / backend system	-	-
BlaBlaCar	Services available via mobile app / backend system	-	Yes
CIPTEC crowdsourcing platform	Website, crowdsourced data collection platform	-	Yes
GoKid Carpool	Services available via mobile app / backend system	-	-
GoGoGrandparents	Interface to ease complex usage of ICT	-	-
GreenMove	Complex integration platform for communication, coordination, management, payment	Yes	Yes
Less Mobility Services	Support for management	-	-

Mobipunt	Support for management	-	-
Moosdorf macht mobil	Support for management	-	-
Mon Chaperon	Services available via mobile app / backend system	-	Yes
MoveUs	Services available via mobile app / backend system	-	Yes
Shared Use Mobility Agency in ELBA Island	Integration platform	Yes	-
Som Mobilitat cooperative Mobility Factor SCE	Services available via mobile app / backend system	-	Yes
WHER maps and cities for women.	Services available via mobile app / backend system	Yes	Yes

Table 3 – open and crowd sourced data in reviewed experiences

3.2.3 Potential of ICT-enabled innovation

The potential of ICT-enabled innovation is one of the features analysed by the JRC IESI methodology.

For the reviewed experiences, as described by the following table and diagram, ICT seems to reveal mostly a sustained and technical/incremental potential. BlaBlaCar, GreenMove and Som Mobilitat are reviewed as “Disruptive” since the new mobility schemas they support may be not realizable without ICT.

Considering for example GreenMove, the integration of electric mobility vehicle sharing with planners, other modes of transport and integration payment is something that cannot be operated without ICT. This is something happening at organizational/management level (like it would be for a MaaS service). The connections with social-innovation aspects relies in the support offered to manage the cooperative actions and operations present in the service (or necessary to operate it).

In practice, ICT provides support at different levels of importance and incisiveness to realize the “social” operations. In some cases (e.g. “technical/incremental innovation” or “Sustained” potential) the same result could be obtained in theory with other means (e.g. verbal agreements) but with a totally different effectiveness.

Name	Disruptive	Radical	Technical/ incremental innovation	Sustained
Afta Robot				Yes
App&Town Companion				Yes
BlaBlaCar	Yes			
CIPTEC crowdsourcing platform			Yes	
GoKid Carpool			Yes	Yes
GoGoGrandparents			Yes	
GreenMove	Yes			
Less Mobility Services				Yes
Mobipunt				Yes
Moosdorf macht mobil			Yes	
Mon Chaperon				Yes
MoveUs				Yes
Shared Use Mobility Agency in ELBA Island		Yes		
Som Mobilitat cooperative Mobility Factor SCE	Yes			
WHER maps and cities for women.			Yes	
Percentages	20	6,7	33	47

Table 4 – potential of ICT-enabled innovation in reviewed experiences

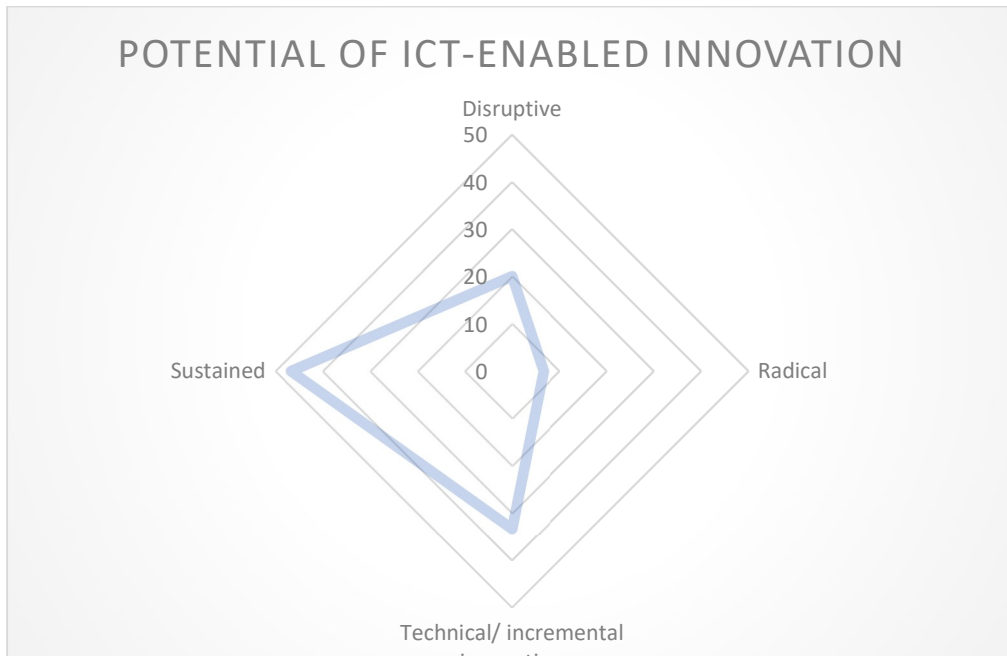


Figure 8 - potential of ICT-enabled innovation in reviewed experiences

3.2.4 Elements of social innovation

The elements of social innovation indicates the main aspects of societal change potentially obtained with the reviewed initiatives, using the formalism of the JRC methodology. Evidently, most of the initiative are seen as answers to concrete user needs (“Need driven”). The success of the initiatives (i.e. initiatives in production – see 3.2.1) shows that these correctly addresses this direction. About 70% of the initiatives supports open process of co-creation which is certainly one of the most interesting elements of social innovation in the economical frame introduced in section 0. For example, the database of streets and points of interest co-created with WHER and the resulting increased quality of information on safety is an example of efficient, distributed data gathering process which would have been difficult to realize without the support of a community and the use of ICT tools.

Name	Need driven	Open process of co-creation	Fundamental change in the relationships	Public value (re)allocation
Afta Robot	Yes		Yes	
App&Town Companion	Yes			Yes
BlaBlaCar	Yes	Yes	Yes	Yes
CIPTEC crowdsourcing platform	Yes	Yes		
GoKid Carpool	Yes	Yes		Yes
GoGoGrandparents	Yes			
GreenMove	Yes	Yes	Yes	Yes
Less Mobility Services	Yes	Yes	Yes	Yes
Mobipunt	Yes		Yes	
Moosdorf macht mobil	Yes	Yes		Yes
Mon Chaperon	Yes			Yes
MoveUs		Yes		
Shared Use Mobility Agency in ELBA Island	Yes	Yes		
Som Mobilitat cooperative	Yes	Yes	Yes	
Mobility Factor SCE				
WHER maps and cities for women.	Yes	Yes		
Percentages	93	69	40	47

(multiple answers allowed)

Table 5 – elements of social innovation in reviewed experiences

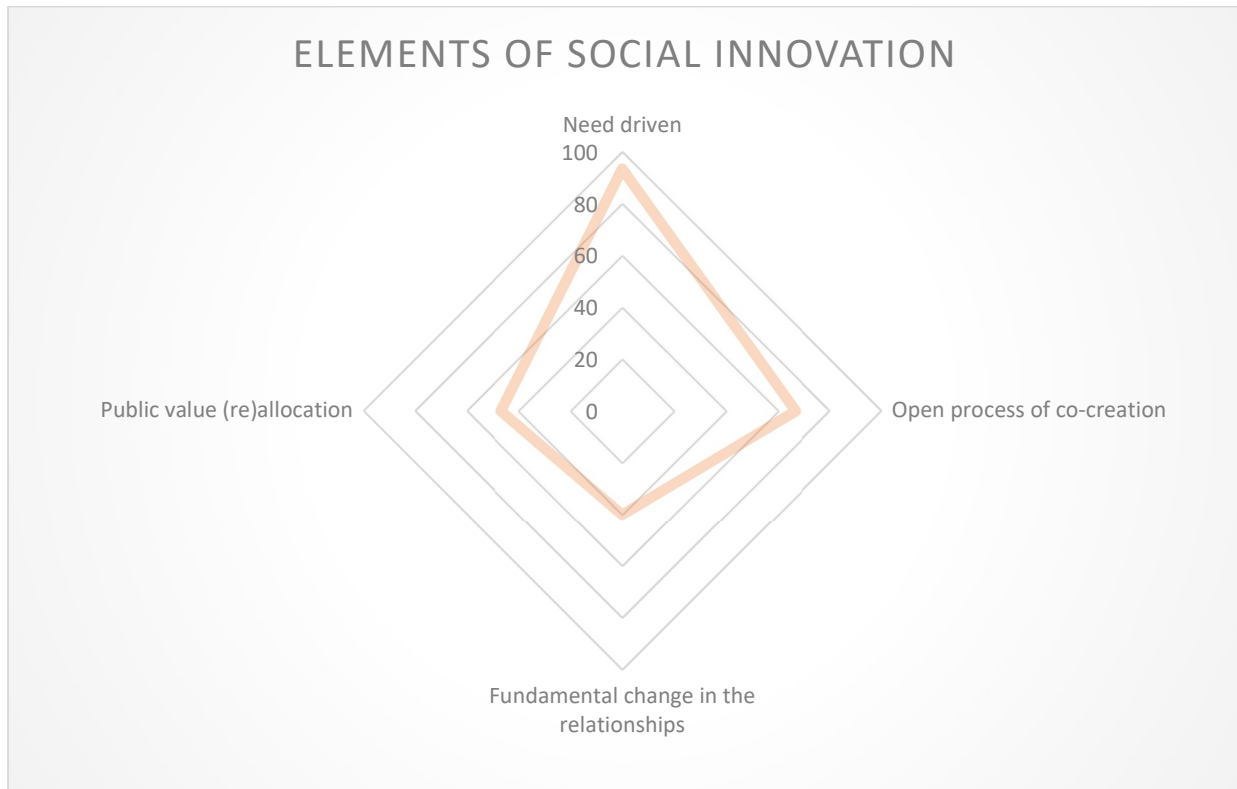


Figure 9 – Elements of social innovation in reviewed experiences

3.2.5 Service improvement introduced

Access and take up of service is the aspect most positively affected by the usage of ICT. This parameter should be read together with the potential of ICT-enabled social innovation (section 3.2.3) while analysing the question of *doing something with or without ICT*. Easier access and take up means essentially that a service may exist per se but it wouldn't be available, usable, accessible or even realizable in the same way (or totally) without ICT. GoGoGrandparent, with its simplified interface between the user and the more complex to use mobile app, is a brilliant example of improved access and take up of service. Here the improvement stands in an increased accessibility of the booking system by elderly people who are at the same time one of the user categories more interested in using the service (Lift sharing).

Improved quality of service and cost-effectiveness can be seen as consequences of the improved access and take up of service but they are not considered -at least in about half of the cases- as the most direct improvement introduced by ICT.

Name	access and take-up	quality of service	cost-effectiveness
Afta Robot	Yes	Yes	
App&Town Companion	Yes	Yes	Yes
BlaBlaCar	Yes		Yes
CIPTEC crowdsourcing platform		Yes	
GoKid Carpool	Yes		Yes
GoGoGrandparents	Yes		
GreenMove	Yes		Yes
Less Mobility Services	Yes		Yes
Mobipunt	Yes	Yes	
Moosdorf macht mobil		Yes	Yes
Mon Chaperon	Yes		
MoveUs		Yes	
Shared Use Mobility Agency in ELBA Island	Yes		Yes
Som Mobilitat cooperative Mobility Factor	Yes	Yes	
WHER maps and cities for women.	Yes		
Percentages (multiple answers allowed)	80	47	47

Table 6 – Service improvement in reviewed experiences

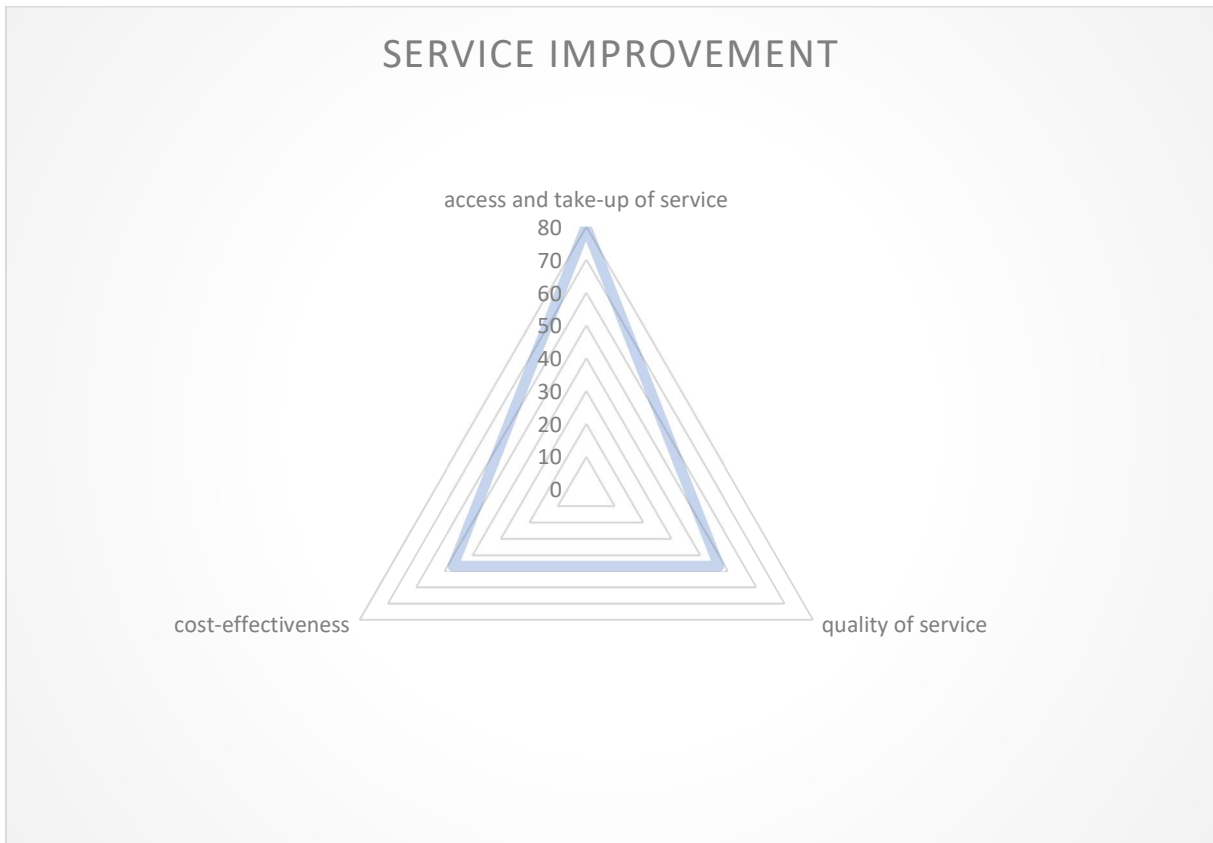


Figure 10 – Service improvement in reviewed experiences

3.2.6 Elements of open innovation

There are many elements of open innovation in the reviewed experiences according to the classification criteria and parameters proposed by the JRC IESI methodology. As shown in the following diagram these are well-balanced with no lack or predominance of single elements.

Name	sharing	cooperation	plurality	self-organization	Decentraliz.
Afta Robot	Yes		Yes	Yes	Yes
App&Town Companion			Yes	Yes	Yes
BlaBlaCar	Yes	Yes	Yes	Yes	Yes
CIPTEC crowdsourcing platform	Yes	Yes	Yes		Yes
GoKid Carpool	Yes	Yes		Yes	Yes
GoGoGrandparents			Yes		
GreenMove	Yes	Yes	Yes	Yes	Yes
Less Mobility Services			Yes	Yes	
Mobipunt	Yes		Yes	Yes	Yes

Moosdorf macht mobil	Yes	Yes		Yes	Yes
Mon Chaperon	Yes	Yes		Yes	Yes
MoveUs	Yes	Yes	Yes	Yes	Yes
Shared Use Mobility Agency in ELBA Island	Yes	Yes	Yes	Yes	Yes
Som Mobilitat cooperative	Yes	Yes	Yes	Yes	Yes
Mobility Factor SCE	Yes	Yes	Yes	Yes	Yes
WHER maps and cities for women.	Yes	Yes		Yes	Yes
Percentages (multiple answers allowed)	80	67	73	87	87

Table 7 – Service improvement in reviewed experiences

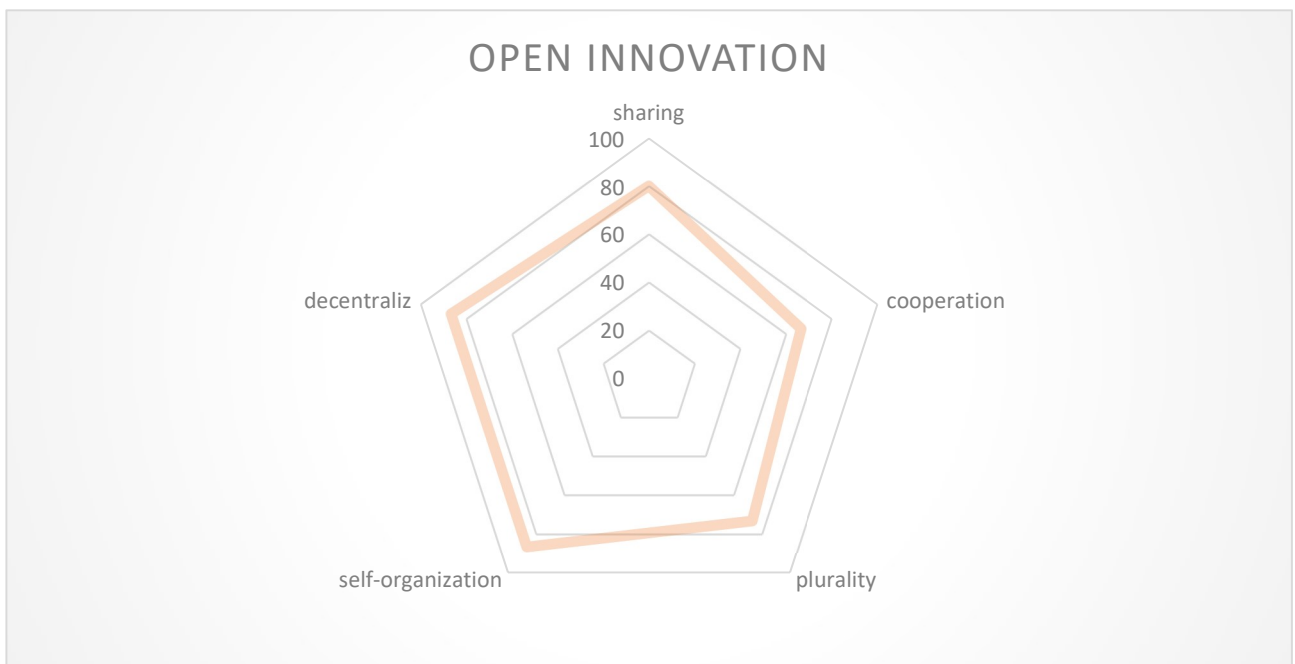


Figure 11 – Open innovation in reviewed experiences

3.2.7 Prioritized areas

The reviewed initiatives are distributed in a substantially homogeneous way in all types of prioritized areas (here aggregated in three categories) with slight less presence in rural (60% compared to 73% of urban and Sub-urban/peripheral areas). This can be partially due to crowd-sourced data collection features being typically applicable in areas with high or medium population density.

Name	Urban	Sub/Peri-urban / Peripheral	Rural
Afta Robot		Yes	
App&Town Companion	Yes		
BlaBlaCar	Yes	Yes	Yes
CIPTEC crowdsourcing platform	Yes		Yes
GoKid Carpool		Yes	Yes
GoGoGrandparents	Yes	Yes	Yes
GreenMove	Yes	Yes	Yes
Less Mobility Services		Yes	Yes
Mobipunt	Yes	Yes	
Moosdorf macht mobil			Yes
Mon Chaperon	Yes	Yes	
MoveUs	Yes		
Shared Use Mobility Agency in ELBA Island	Yes	Yes	Yes
Som Mobilitat cooperative Mobility Factor SCE	Yes	Yes	Yes
WHER maps and cities for women.	Yes	Yes	
Percentages (multiple answers allowed)	73	73	60

Table 8 – Prioritized areas in reviewed experiences



Figure 12 – Prioritized areas in reviewed experiences

3.2.8 Impact of ICT

Impact of ICT is expressed by means of two measures:

a) Impact of ICT on user

This parameter indicates the level of impact of ICT on the end user, namely if and how the user must interact with the ICT system to operate on the service or use it.

The table indicates, for each initiative, the level of impact:

H = High, relevant: the service cannot be used or operate without an direct interaction of the end user with ICT systems. This interaction requires some skills (see complexity)

L = Low, the system requires very few or no interactions with ICT systems (like mobile apps)

b) ICT Complexity

ICT complexity expresses the degree of complexness needed for the users to effectively use the service.

All systems are easy to use. The complexity level is indicated only for services where the impact on ICT is High. L = the complexity of the interface is low; M = the complexity of the interface is medium

Name	impact of ICT on user	ICT Complexity
Afta Robot	H	L
App&Town Companion	H	L
BlaBlaCar	H	L
CIPTEC crowdsourcing platform	H	L
GoKid Carpool	H	L
GoGoGrandparents	L	-
GreenMove	H	L/M
Less Mobility Services	L	-
Mobipunt	L	-
Moosdorf macht mobil	L	-
Mon Chaperon	H	L
MoveUs	H	L
Shared Use Mobility Agency in ELBA Island	H	L
Som Mobilitat cooperative Mobility Factor SCE	H	L
WHER maps and cities for women.	H	L

Table 9 – Impact of ICT in reviewed experiences

3.2.9 Enabling factors and replicability

There are usually many and different enabling factors for each initiative. Those that seems to be more relevant in terms of future replicability (for example beyond the national borders where they are implemented now) relate to the political framework.

The possibility of operating Ride Sharing services for example (including the well-known Lyft and UBER, although not considered in this review) is very much influenced by local policies and conditions. Even the replicability of small-scale services like the Moosdorf initiative may be affected by legal issues (which was indeed what happened in that case).

The table indicates the experiences whose potential transferability and replicability appears to be mostly affected by the political framework.

Scalability issues have been analysed mainly from a technological point of view and there are experiences that that have more implications than others in that respect. Changing the operations from a small to a large-

scale may require significant expansion of the supporting IT infrastructure. The table shows the experiences where this is more evident.

Finally, the economic factors and the business models behind each initiative are of course key factors for their replicability and transferability. These, together with the business models for new ideas and concepts are analysed with more details in Task 2.3 and reported in Deliverable D2.2.

Name	Enabling factors	Scalability issues
Afta Robot		
App&Town Companion		
BlaBlaCar	P	
CIPTEC crowdsourcing platform		
GoKid Carpool	P	Tech
GoGoGrandparents	P	
GreenMove	P	Tech
Less Mobility Services	P	Tech
Mobipunt	P	
Moosdorf macht mobil	P	
Mon Chaperon		Tech
MoveUs	P	Tech
Shared Use Mobility Agency in ELBA Island	P	
Som Mobilitat cooperative Mobility Factor SCE	P	Organiz.
WHER maps and cities for women.		Technical

P= political issues

Table 10 – Enabling factors and replicability in reviewed experiences

4 New ideas and concept for PT innovations in prioritized areas

This section summarizes the partial results of task T2.2 - Developing ideas and concepts for PT innovations in prioritized areas. Since at the time of the issue of this deliverable the task is ongoing, the outcome of task 2.2 reported is an initial set of new ideas and concepts for public transport innovations in prioritized areas based on the initial work performed. The final and more comprehensive set, together with the outcomes of the validation (Task 2.3) will be reported in D2.2.

The new ideas and concepts constitutes an input for some of the piloting activities in WP4. This will allow validating them (in WP5) and will contribute to the definition of new inclusive transport schemes and business models in WP6.

4.1 Identification of new ideas

Task 2.2 investigates and develop new ideas and concepts with a potential to lower existing barriers on transport accessibility and inclusivity for the user groups and segments identified. The task tries to identify, define and describe the new ideas in an articulated manner to show that they are:

- ICT-oriented
- Matching the social-innovation paradigm
- Innovative
- Beneficial for the INCLUSION objectives

It is important to remark that the experiences reviewed in T2.1 are generally not viewed as new ideas because there are other locations where they have not been implemented before.

On the other hand, the concept of “new ideas” in this task, can include ideas and concepts that are not new, per se, but they have not been implemented in inclusive transport or other INCLUSION-related sub-domains.

The main links of the outcomes of this task are with the prioritized areas, user needs, and other background elements identified and analysed in Work Package 1. Starting from this, the main criteria that driving and supporting the execution of the task activities are specified below.

Main drivers

As stated in the project Description of Actions the new ideas and concepts to be defined in Task 2.2 should have “a potential to lower existing barriers on transport accessibility and inclusivity for the user groups and segments identified”.

Besides the criteria identified as follows, the framework and boundaries of this task are established first with the following elements and conditions:

- **Social Innovation** should be a distinguishing factor
- **ICT** should be an enabler of the idea or at least, it must play a relevant role

- The concrete application of the idea or concept in one or more of the Inclusion **Pilot Sites** as a **proof of the concept**, although requested to a certain extent by the project Description of Actions, should not be considered always a constraint and a reason for exclusion/rejection of the idea to be proposed. The realizability may not always meet the conditions existing locally or may be not applicable according to budget restrictions.

Sources for new ideas and concepts.

The goal of task T2.2 is to investigate and develop new ideas and concepts to lower existing barriers on transport accessibility and inclusivity. In order to identify and develop the most promising of such potential ideas and concepts, the project partners have started to perform – and will continue throughout the tasks' duration – an analysis activity, exploiting a number of different sources. In particular, the identification and development of new ideas of T2.2 considers the following:

- The conclusions and identified priorities from WP1, in particular taking into consideration the different gaps, challenges and general needs in the current transportation landscape identified and highlighted during the work package activity and documented in deliverables D1.2 and D1.3.
- The findings of task 2.1 in the analysis of existing experiences on ICT-enabled social innovation, in particular considering possible improvements and extensions of some of the reviewed existing experiences.
- -Possible evolution of existing case studies their performed in work package WP3 and documented in deliverable D3.1, considering areas where ICT instruments could provide definite improvements in terms of transport accessibility and inclusivity. Contributions and suggestions from partners involved in the six Innovation Pilot Labs, including identification of problems, past experiences, envisaged improvements, etc.) (WP4)
- Exploitation of partners' know-how of evolution and trends in the ICT and technology landscape, leading to the identification of possible novel solutions potentially

Pertinence, domains of application, elements to address

The new ideas and concepts can be applicable to various aspects, sub-domains and dimensions of the inclusive transport. This includes for example:

- transport organisation;
- innovative aspects on service provisioning;
- new ways to engage the end users (e.g. survey and engagement tools);
- supporting ICTs (e.g. use of App and social media as a dual channel);
- communication tools to enhance awareness and quality of the information

furthermore:

- The ideas can be developed at **both stakeholder and expert** level.
- The **scale of implementation** of the initiatives and concepts can be very different: national, sub-national, regional, local or multi-national, etc.

Other aspects and constraints to consider

The following elements should be considered in the definition of the new ideas for the present analysis:

- Need for **efficient, cost-effective cooperation** with citizens and between different transport operators and other stakeholders.
- **Role and potential** of the transport and mobility organizations potentially involved like public companies and social enterprises.
- Dependencies that may exist between the effective use of ICT and the social disadvantages and conditions that may affect some user groups (like unemployment, poor education and low income). For instance, certain restrictions may cause some people to be **digitally excluded**.
- **Acceptance of ICT tools** by different user groups. For example, social networking in general is often adopted for social initiatives addressing young people, students etc. but the impact may be different among elderly people. An in-depth analysis of this aspect has been carried out in Project Deliverable D1.2 *Review and classification of prioritized area types and user groups and identification of challenges and gaps*, section 3.5.
- The degree of **risk-taking and allowed/accepted innovation** by the organizations that would implement the new concepts: public/private/social enterprises/sectors.

4.2 Process followed for the collection of new ideas and concepts

Starting from the different sources and considering the different aspects identified in the previous section, the project partners involved in task T2.2 will follow a process consisting in different subsequent phases, as is described in the following:

A first phase – currently ongoing – deals with activities for brainstorming, identifying and analysing ideas, with an expected outcome consisting in a (as large as possible) catalogue of possible ideas and concepts. A first set of ideas and concepts has already been produced by T2.2 activities and is documented in Annex III at the end of this deliverable.

Of course, being the task's activities still ongoing at the moment of the issue of deliverable D2.1, the contents of such Annex must be considered as a working document and will be constantly updated to reflect the findings of the task. As already mentioned, the final and more comprehensive set of ideas and concepts, together with the outcomes of the validation (Task 2.3) will be reported in the following deliverable D2.2.

In general, it is expected that the ideas and concepts arising from this initial phase will position themselves at different levels as far as their potential direct applicability in the context of the project prioritized areas and pilot sites. Some of the ideas will involve ICT concepts in principle feasible to be tested in prioritized areas and pilot sites or even partially evaluated/demonstrated/validated during the project lifetime.

Other are ideas whose applicability is currently feasible in terms of available technologies, but not in the time frame and with the resources available to the INCLUSION project. Finally, the list will include ideas and concepts that exploits ICT trends and novel advancements, but whose applicability is considered only in medium/long term.

A second phase of the task activities will start from the list identified in the previous stage and evaluate and select those ideas and concepts which deserve a more in-depth analysis: I&C will be discussed and evaluated among T2.2 partners to select the ones which are most fitting for what concerns their application in

prioritized areas or pilot sites. In a final stage, this more in-depth analysis will be carried out on the selected subset of ideas and concepts aimed at evaluating their potential application in pilot sites.

4.3 Criteria for the collection of new ideas and concepts

The template for the collection of new ideas takes into account the concepts and classification criteria established for the review of the existing experiences. However, it does not reflect exactly the same structure since the descriptions of new ideas does not include certain elements like the evaluation based on the results obtained.

The template is structured with the following elements:

Description

Detailed description of the idea, its purpose, organization, accompanied with graphs, pictures and schemas if needed.

Technological elements

Summary of the main technological elements with the identification of any aspect related to acceptance or envisaged risk of digital exclusion.

Elements of Social innovation

Indicate which of the following aspects are addressed:

- Need-driven / outcome-oriented production.
- Open process of co-creation/collaborative innovation.
- Fundamental change in the relationships between stakeholders.
- Public value allocation and/or re-allocation.

Envisaged Service improvement

Identify which of the following improvements can be achieved:

- Improving access and take-up of services.
- Increasing the quality of the services provided.
- Improving cost-effectiveness.

Identify which aspect of open innovation are introduced:

- Sharing.
- Cooperation.
- Plurality of participants.
- Self-organisation.
- Decentralization.

Addressed actors, needs and prioritized areas

Specify which are the main actors, addressed needs and to which prioritized area(s) (if any) the idea can be applied.

Enabling factors.

Specify which are the main enabling factors and conditions for the actual applicability and realizability of the idea from different perspectives like the organizational or legal point of view.

Scalability and replicability

Describe the potential and limits of the idea in terms of replicability and scalability.

INCLUSION Pilot site(s) where it is planned to apply the idea

Specify the INCLUSION Pilot site(s), if any, where it is envisaged or planned to apply the idea.

5 Annex I – Template for the classification of existing experiences

Name of the experience/initiative/service
PART I – General information
Short description of the initiative
<i>[Shortly describe the initiative here]</i>
Screenshots / Pictures
<i>[provide relevant screenshots/pictures if any]</i>
Level of maturity
<i>[describe if the initiative is in production, a research project, experimental, etc.]</i>
Main ICT elements / features
<i>[Main ICT elements / features]</i>
PART II – Analysis and Classification
CRITERIA 01 - Potential of ICT-enabled innovation
<i>[indicate one]</i>
<input type="checkbox"/> <input checked="" type="checkbox"/> Disruptive <input type="checkbox"/> <input checked="" type="checkbox"/> Radical <input type="checkbox"/> <input checked="" type="checkbox"/> Sustained <input type="checkbox"/> <input checked="" type="checkbox"/> Technical/incremental

CRITERIA 02 - elements of social innovation
<p><i>[indicate one or more]</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Need-driven / outcome-oriented production <input checked="" type="checkbox"/> Open process of co-creation/collaborative innovation <input checked="" type="checkbox"/> Fundamental change in the relationships between stakeholders <input checked="" type="checkbox"/> Public value allocation and/or re-allocation
CRITERIA 03 - Levels of governance of service integration
<p><i>Check, classify and describe the Levels of governance of service integration based on the following references:</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Isolated. <input checked="" type="checkbox"/> Intra-governmental integration. <input checked="" type="checkbox"/> Inter-governmental integration <input checked="" type="checkbox"/> Inter-sectoral integration. <input checked="" type="checkbox"/> Pervasive.
CRITERIA 04 - Types of service integration
<p><i>Check and classify the experience based on the following types:</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Funding; <input checked="" type="checkbox"/> Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning; <input checked="" type="checkbox"/> Organisational <input checked="" type="checkbox"/> Service delivery
CRITERIA 05 - Service improvements and progress
<p><i>[Check and evaluate the improvements/progress beyond traditional/SOTA services]</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> improving access and take-up of services, <input checked="" type="checkbox"/> increasing the quality of the services provided <input checked="" type="checkbox"/> improving cost-effectiveness <p>Open innovation:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> sharing <input checked="" type="checkbox"/> cooperation <input checked="" type="checkbox"/> plurality of participants <input checked="" type="checkbox"/> self-organisation <input checked="" type="checkbox"/> decentralization

CRITERIA 06: Actors and user needs
<p>Vulnerable User Groups <i>[indicate if one or more INCLUSION vulnerable user groups are specifically addressed - ref. sect. 2.2]</i></p> <p>Operator's needs: <i>[Indicate if one or more Operator's needs are addressed - ref. sect. 2.2]</i></p>
CRITERIA 07: Prioritized areas
<p><i>[Indicate if one or more INCLUSION prioritized areas are specifically addressed - ref. sect. 2.2]</i></p>
CRITERIA 08: Accessibility and acceptance of ICT
<p><i>[Provide an evaluation/description of the following aspects]</i></p> <ul style="list-style-type: none"> • Aspects of ICT that have an impact to the user • Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators) • Envisaged risks of digital exclusion (short description and considerations about any potential risk)
CRITERIA 09: Enabling factors
<ul style="list-style-type: none"> • <i>[Analyse the elements that can be considered as enablers of the initiative. Examples are: Need for workforce development, Regulatory frameworks, Financial sustainability, Open government]</i>
CRITERIA 10: Scalability
<p><i>[Analyse and evaluate the following factors affecting scalability and transferability]</i></p> <ul style="list-style-type: none"> • Status and maturity • Current scale • Scalability (geographic, in terms of users, technological) • Evaluation of replicability and transferability

CRITERIA 11: Opportunities and limits

[Analyse the limits and identify which further work can be done or new concepts/ideas can be created]

- Limits of the initiative
- Enhancements / Extensions that may provide further value or increase the effectiveness of the elements described in Criteria 02.

6 Annex II – Database of ICT-Enabled Social Innovation Experiences

6.1 AftaRobot

<p>AftaRobot</p> <p>The technology applied to social welfare</p>
<p>PART I – General information</p>
<p>Short description of the initiative</p>
<p><i>AftaRobot Minibus Taxi</i> Platform is a transport management technology platform that aims to assist both commuters and taxi owners from Africa. It was created by the company Sowertech (Pty) Ltd on February 2018.</p> <p>MiniBus taxi industry in South Africa transports billions of people annually as it is a common transport mode to go to school, university or to anywhere else they need to be, every day. In the past, there was no way to track drivers and consequently, commuters were spending a lot of time waiting for a MiniBus Taxi on the road without being sure when they would be able to use the service.</p> <p>This App improves efficiency and quality of taxi services allowing taxi owners having access to critical business intelligence information from routes and drivers. Moreover, using this App, commuters are able to see the availability of taxis, engage with the taxi providers and plan their travel more efficiently making a pickup request and knowing when and where they'll get a ride. Moreover, commuters can also use the App to give feedback (rating a drivers' safety, timeliness and availability of rides). From the other side, taxi companies can more efficiently dispatch drivers; Also, taxi drivers can be aware at any time where to go, and because their routes are clear, they can drive less frantically.</p> <p><i>AftaRobot</i> App works following three easy steps:</p> <ul style="list-style-type: none"> • Commuters send trip requests: What time will I get to work, school or anywhere? Will I even find a taxi? Will it be full? Will it be safe? • Owners get vehicle and commuter locations: Drive ratings and check-in validations. • Drivers get commuter locations: And check-in validation.

Screenshots / Pictures

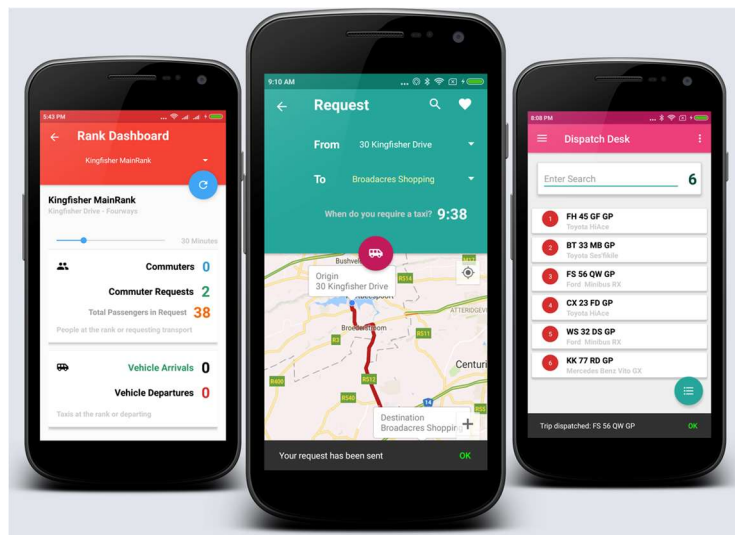


Figure 13: Aftarobot, the new app to increase the efficiency and quality of taxi services

source: Moloji, 2018, <https://www.iafrikan.com/2018/02/22/aftarobot-taxi-app-hails-in-a-new-paradigm-for-the-local-minibus-taxi-industry/>

Level of maturity

An estimated 15 million South Africans rely on minibus taxis daily for all kinds of travel (<https://www.mlab.co.za/startup/aftarobot/>).

Aftarobot is a start-up based on South Africa that is designed to help those who travel with mini-bus taxis in the Johannesburg Southern Suburbs Taxi Association (JSSTA).

The Beta phase of the app was released to 240,000 commuters in the selected pilot area of the Gauteng province. Within six months other areas in Gauteng, such as Randburg, were also included in the monitored areas to benefit from the service.

The majority of the company’s fundings come from winning competitions and receiving grant fundings.

For the future of Aftarobot, they aim to implement the solution in over 10,000 vehicles and over 4,000 taxi owners and also, they would like AftaRobot to be an integral part of formalising informal public transport on the continent.

Main ICT elements / features

Personal devices: Mobile Apps for iOS and Android. AftaRobot App is based on Qualcomm-enabled 3G/4G devices with Bluetooth, beacons and other advanced wireless technologies; the entire platform consists of a suite of

mobile apps running from a cloud backend. To that effect, the team is currently implementing the app to be used with minibus taxis from the Johannesburg Souther Suburbs Taxi Association.

Accessibility: The service is accessible with any Internet-enabled mobile device at R0.20 per dial.

The service aims to reduce commuter waiting times and provide an opportunity for drivers to generate an increased daily income for approximately 65% of the country's population with an income below R600 (US\$68).

Extra functionalities: Whereas most similar services only offer those needing transport options to locate drivers, the app enables both parties to supply information to each other.

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive*
- Radical*
- Technical/incremental innovation*
- Sustained*

ICTs Supports and facilitates or complements existing processes to improve public transport accessibility for people with disabilities and young or old people.

CRITERIA 02 - Elements of social innovation

- Need-driven / outcome-oriented production*
- Open process of co-creation/collaborative innovation*
- Fundamental change in the relationships between stakeholders*
- Public value allocation or re-allocation*

CRITERIA 03 -- Levels of governance of service integration

- Isolated*
- Intra-governmental integration*
- Inter-governmental integration*

Inter-sectorial integration

Pervasive

AftaRobot is a mobile application that provides a two-way solution to South African taxi drivers and commuters.

CRITERIA 04 - Types of service integration

Funding;

Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;

Organisational

Service delivery

CRITERIA 05: Service improvements and progress

improving access and take-up of services

increasing the quality of the services provided

improving cost-effectiveness

Open innovation:

sharing

cooperation

plurality of participants

self-organisation

decentralization

AftaRobot improves visibility of taxi availability and occupancy allowing commuters to avoid long taxi queues and reduce delays by being able to pre-order a taxi to pick them up at the designated spot.

This App also allows minibus taxi owners and associations to gather empirical information on taxi use according to routes and drivers enabling advanced business intelligence to improve customer relationship management strategies (improving route efficiently and managing enterprise resources)

CRITERIA 06: Actors and user needs

Vulnerable User Groups:

- Native People with Disabilities or not
- Students or not students
- Adults with children or without children
- People with High-Medium income level
- Old people

Operator's needs:

- Operate viable services in a sustainable way
- Guarantee cost efficiencies in service provision
- Maximise occupancy and minimise dead running
- Identify suitable/improved technical support systems according to service scheme to be operated
- Ability to expand coverage area in a sustainable way

CRITERIA 07: Prioritized areas

The main target area was Johannesburg Southern Suburbs and then, other areas in Gauteng were also included in the coverage of the service.

CRITERIA 08: Accessibility and acceptance of ICT

- ***Aspects of ICT that have an impact to the user:***

Through the App, the commuters are able to:

- See the availability of taxis, engage with the taxi providers and plan their travel more efficiently making a pickup request.
- Give feedback of the ride: rating drivers' safety, timeliness and availability of rides.

Through the App, the taxi providers are able to:

- Dispatch drivers more efficiently. Direction of the street detection and the pedestrian paths locations are indicated.
- To gather empirical information on taxi use according to routes and drivers enabling advanced business intelligence to improve customer relationship management strategies.

Through the App, the taxi drivers are able to:

- Get commuters locations and check-in validation more easily.
- Can be aware at any time where to go and plan better their trips.
- Get feedback from the users

- ***Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators):***

The AftaRobot App is easy to understand.

- **Envisaged risks of digital exclusion (short description and considerations about any potential risk):**

Not relevant. In case of low telco coverage level in some remote areas.

CRITERIA 09: Enabling factors

Operation/management:

The team has more than 16 years of combined experience with a mix of capabilities ranging from finance to IT.

Business model development:

The majority of the fundings of the company come from winning competitions and receiving grant funding.

From the user site, this App is free.

It is difficult to analyse the Business Model due to lack of information.

Marketing and promotion:

AftaRobot won the Gauteng Innovation Awards in the mobile category (2013). In 2014 they received financial support from the Start-up support program ran by the Innovation Hub. They also received support from Ericsson via their Enterprise Support Program in 2015 and 2016. Finally, AftaRobot received a grant from Qualcomm via their Wireless reach initiative in 2016 and 2017.

CRITERIA 10: Scalability

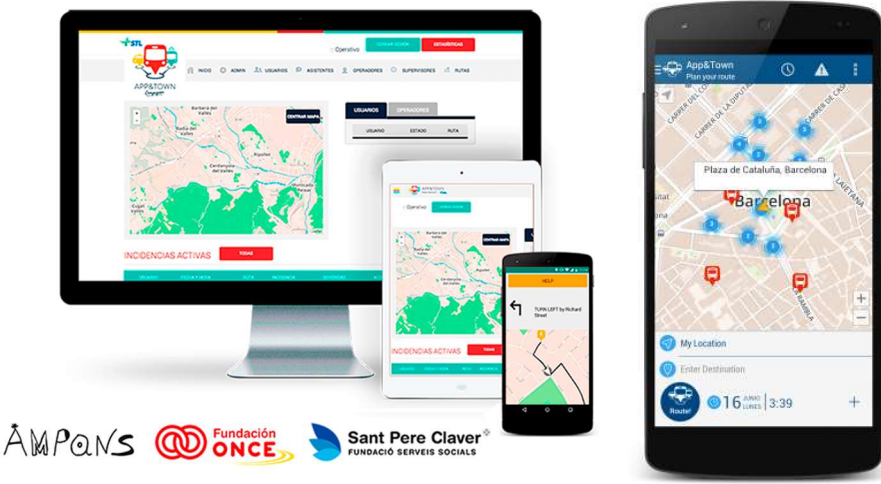
- **Current scale:** The technology maturity is a prototype.
- **Aspects of scalability (spatial, users, technology):** The future scalability potential of AftaRobot relates to include other areas to benefit from the service and increase number of users.
- **Replicability/transferability level/potential:** The same tool could be adapted for other cities throughout Africa, from Nairobi to Dakar, that use similar public transportation.

CRITERIA 11: Analyse the opportunities and limits

Enhancements / Extensions: Increase accessibility to Transport and reshape the experience of using Mini-Bus Taxis.

Limits of the initiative: There is not info available regarding the economic viability of AftaRobot

6.2 App&Town

<p>App&Town</p> <p>The technology applied to social welfare</p>
<p>PART I – General information</p>
<p>Short description of the initiative</p>
<p><i>App&Town</i> is a free App very easy to use that guides and helps people using Public Transport in Barcelona Metropolitan Area (AMB) with visual and auditory advices. It is very useful because of the real-time information about PT timetables, the unexpected incidents information and the proposal of alternative routes. https://www.appandtown.com/</p> <p>Linked with <i>App&Town</i> there is the project <i>App&Town Compagnon</i> awarded in the 2nd edition of Premios Uninnova of Fundació ONCE. It is an assisted end-to-end transport for disabled, old or young people that allows mobility of these people using TP through an App and a continuously monitoring of users from any place and device.</p> <p>https://www.youtube.com/watch?time_continue=3&v=gkDX1en5h58</p>
<p>Screenshots / Pictures</p>
 <p>ÀMPONS Fundación ONCE Sant Pere Claver® FUNDACIÓ SERVEIS SOCIALS</p>
<p>Figure 14: App&Town</p> <p>source: App&Town, 2018, https://www.appandtown.com/</p>

Level of maturity
<p>MaaS Factory Urban Accessible Mobility, S.L., is a high-tech company, spin-off of the “Universitat Autònoma de Barcelona” established in October 2012, following a final project of seven students led by PhD with the aim to create innovative products to add value to society. Their first company service was the mobile application “OnTheBus”, that nowadays is “App&Town Going with you” and “App&Town Compagnon”.</p> <p>App&Town was launched on 2017 by UAB and MaaS Factory. Now it is available in three important cities:</p> <ul style="list-style-type: none"> - Barcelona: TMB (Transports Metropolitans de Barcelona), FGC (Ferrocarrils de la Generalitat de Catalunya), Cetransa-AMB (Authosa, Mohn, Oliveras, Rosanbus, Soler I Sauret, SGMT, TCC2, TUSGSAL) including Nitbus, Tram (Trambaix i Trambesòs) and Rodalies. - Madrid: EMT (Empresa Municipal de Transportes de Madrid) - Laval STL (Société de Transport de Laval) <p>Also, it can be used in any place as a Route planner (doesn't matter if there isn't PT).</p>
Main ICT elements / features
<p>Personal devices: Mobile Apps for iOS and Android.</p> <p>Accessibility:</p> <ul style="list-style-type: none"> - The App has been developed following the 7 principles of the universal design to get a full accessibility without any discrimination to any user (https://es.wikipedia.org/wiki/Dise%C3%B1o_universal). - To allow blind people use the App, the interface can be readapted to be more accessible without the requirement of the map visual options usage. - The addresses can be introduced dictated instead of wrote. - The indications to arrive at the destination are auditive descriptions. <p>Extra functionalities:</p> <ul style="list-style-type: none"> - For being more functional for blind people there is the possibility to add clock system orientation (e.g. “Go to 2 o'clock”) - For the pedestrian mode, when the geolocation system and cartography allow it, there is the possibility to detect which direction of the street is the one that the user is going through and also, indicates when are pedestrian paths to cross the routes. - The app also includes route classifications depending on its accessibility and the architectural barriers of each route. (e.g. it is not the same to follow one wall using a walking stick as a guided system than to use it in one pavement with trees or other free accesses to green areas).

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive*
- Radical*
- Technical/incremental innovation*
- Sustained*

ICTs Supports and facilitates or complements existing processes to improve public transport accessibility for people with disabilities and young or old people.

CRITERIA 02 - Elements of social innovation

- Need-driven / outcome-oriented production*
- Open process of co-creation/collaborative innovation*
- Fundamental change in the relationships between stakeholders*
- Public value allocation or re-allocation*

CRITERIA 03 -- Levels of governance of service integration

- Isolated*
- Intra-governmental integration*
- Inter-governmental integration*
- Inter-sectorial integration*
- Pervasive*

Route planning services designed according to the needs of people with disabilities or other target users that helps them to have access to multimodal Public Transport in different languages and in different cities.

CRITERIA 04 - Types of service integration
<input type="checkbox"/> <i>Funding;</i> <input type="checkbox"/> <i>Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;</i> <input type="checkbox"/> <i>Organisational</i> <input checked="" type="checkbox"/> <i>Service delivery</i>
CRITERIA 05: Service improvements and progress
<input checked="" type="checkbox"/> <i>improving access and take-up of services</i> <input checked="" type="checkbox"/> <i>increasing the quality of the services provided</i> <input checked="" type="checkbox"/> <i>improving cost-effectiveness</i> Open innovation: <input type="checkbox"/> <i>sharing</i> <input type="checkbox"/> <i>cooperation</i> <input checked="" type="checkbox"/> <i>plurality of participants</i> <input checked="" type="checkbox"/> <i>self-organisation</i> <input checked="" type="checkbox"/> <i>decentralization</i>
<p>App&Town improves public transport accessibility by facilitating the use of Apps for disabled people allowing them to go through all the city with a route planner and continuous advices to arrive at the desired destination without any problems.</p>
CRITERIA 06: Actors and user needs
<p>Vulnerable User Groups:</p> <ul style="list-style-type: none"> • People with disabilities including some physical or cognitive disability or mobility-restricting physical disability. • Young people such as Children and Teens. • Old people. <p>Operator's needs:</p> <ul style="list-style-type: none"> • Operate viable services in a sustainable way: PT route planning and optimisation • Engage more potential users of PT: Improve PT accessibility for people with disabilities

- Guarantee cost efficiencies in service provision: Free app
- Identify suitable/improved technical support systems according to service scheme to be operated: continuous advices to users
- Integration with other modes/routes: Yes
- Ability to expand coverage area in a sustainable way: Yes

CRITERIA 07: Prioritized areas

Now, Barcelona (including Metropolitan Area), Madrid and Laval STL have the App with all the PT included. However, it can be used in any place as a Route planner (doesn't matter if there isn't PT).

CRITERIA 08: Acceptance of ICT

- **Aspects of ICT that have an impact to the user:**

Through the App, the user is able to:

- Possibility to add clock system orientation in order to follow the indications.
- Direction of the street detection and the pedestrian paths locations are indicated.
- Routes classification depending on its accessibility and the architectural barriers
- The interface can be readapted to be more accessible without the requirement of the mapping visual options usage.

- **Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators):**

The App has been developed following the 7 principles of the universal design to get a full accessibility without any discrimination to any user (https://es.wikipedia.org/wiki/Dise%C3%B1o_universal).

- **Envisaged risks of digital exclusion (short description and considerations about any potential risk):**

Not relevant. In case of low telco coverage level in some remote areas.

CRITERIA 09: Enabling factors

Operation/management:

App&Town requires an appropriate staff to be operated/managed. This team consists on:

- A Chief Research Officer and Co-founders
- A Chief Executive Officer
- Software Engineers
- Quality Assurance
- Sales Manager

Business model development:

This App has received financial investments.

From the user site, this App is free.

Marketing and promotion:

App&Town has received the support from Institut Català de Finances and Fundación ONCE, it has been part of the ‘Ogilvy Accelerator’ and it’s participated and was nominated in “momentum project” for companies with social impact.

CRITERIA 10: Scalability

- **Current scale:** App&Town Companion is developed by MaaS Factory Urban Accessible Mobility. Currently available in three important cities (Barcelona, Madrid and Laval) but it can be used also in any place as a Route planner (doesn’t matter if there isn’t PT).
- **Aspects of scalability (spatial, users, technology):** The future scalability potential of App&Town Companion relates to the network and stakeholders involved from different cities.
- **Replicability/transferability level/potential:** Very high to any other cities with PT.

CRITERIA 11: Analyse the opportunities and limits

Enhancements / Extensions: Increase accessibility to Public Transport of target users.

Limits of the initiative: There is not info available regarding the economic viability of App&Town.

6.3 CIPTec crowdsourcing platform

<p>CIPTec crowdsourcing platform</p> <p>Application of collective intelligence processes in Public Transport</p>
<p>PART I – General information</p>
<p>Short description of the initiative</p> <p>The CIPTec crowdsourcing platform is an online tool specifically developed for the purposes of the CIPTec project and it allows users to submit innovative ideas for public transport and/or to highlight needs the PT should answer to. The platform was operated in 5 different implementations: one related to a EU level campaign (available in</p>

English at <http://cipotec.eu/>) and four others related to local-level campaigns (each one available in the own national language of project sites, Rotterdam Den Haag Metropolitan Region, Thessaloniki, Frankfurth, Southern and Eastern part of Tuscany – operated by Tiemme, each one available at a different web address for example at <http://tiemme.cipotec.eu/>).

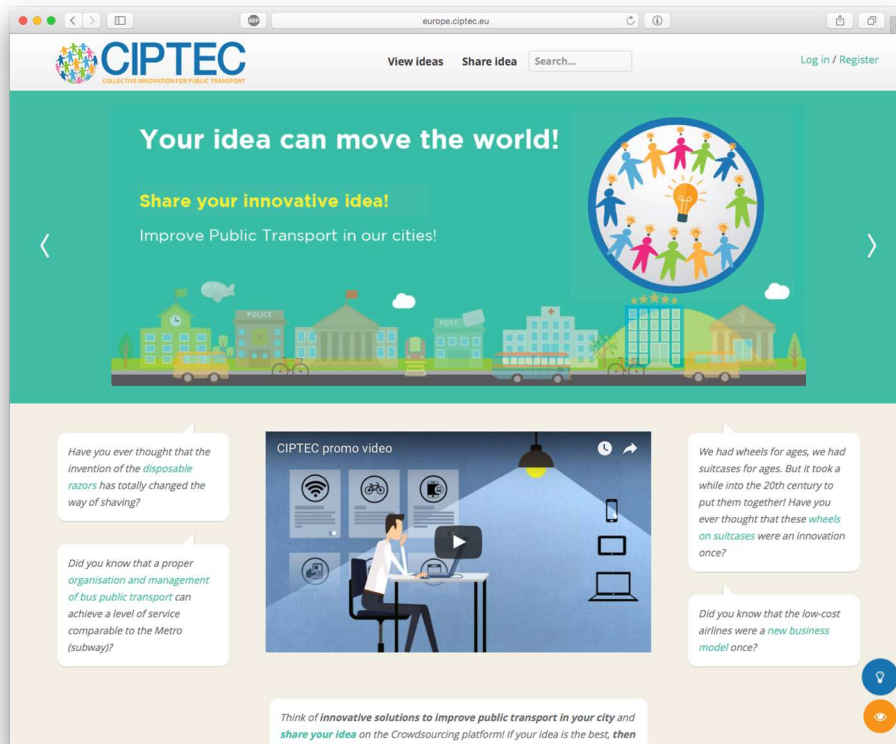


Figure 15: Homepage of the CIPTEC crowdsourcing platform

Source: <http://crowdsourcing.cipotec.eu/>

The main objectives of the CIPTEC crowdsourcing platform are:

- to generate innovative ideas/consolidate needs from different groups of individuals
- while at the same time stimulating dialogue and discussion among all parties involved in the PT sector

The crowdsourcing platform is the supporting ICT component for the operation of a crowdsourcing campaign (which can be associated to a prize award): the idea/need which will be selected for implementation at the end of the campaign (based on pre-defined set of evaluation criteria) is awarded with the prize.

The target audience of the CIPTEC crowdsourcing platform are the following ones:

- Authorities & Transport policy makers
- Mobility providers & PT operators
- Passengers & travellers associations / networks
- Citizens & Community Groups

- Trade Unions
- Marketing and Innovation Agencies
- Industry: Manufacturers & Supporting Technology Suppliers
- Experts

The workflow for submitting ideas is the following:

- Registration: A non-registered user registers either through the CIPTEC online registration form or using social media accounts (Facebook or Twitter or Google).
- Log in: A registered user logs in to the online platform.
- Submission: A logged in user submits new ideas.

The workflow for commenting and rating ideas is the following:

- Registration: A non-registered user registers either through the online registration form or using Facebook, Twitter or Google accounts.
- Log in: A registered user logs in to the online platform.
- Commenting / Rating: A logged in user can comment on existing ideas and can rate existing ideas.

The operational flow supported by the CIPTEC crowdsourcing platform is shown in the following figure.

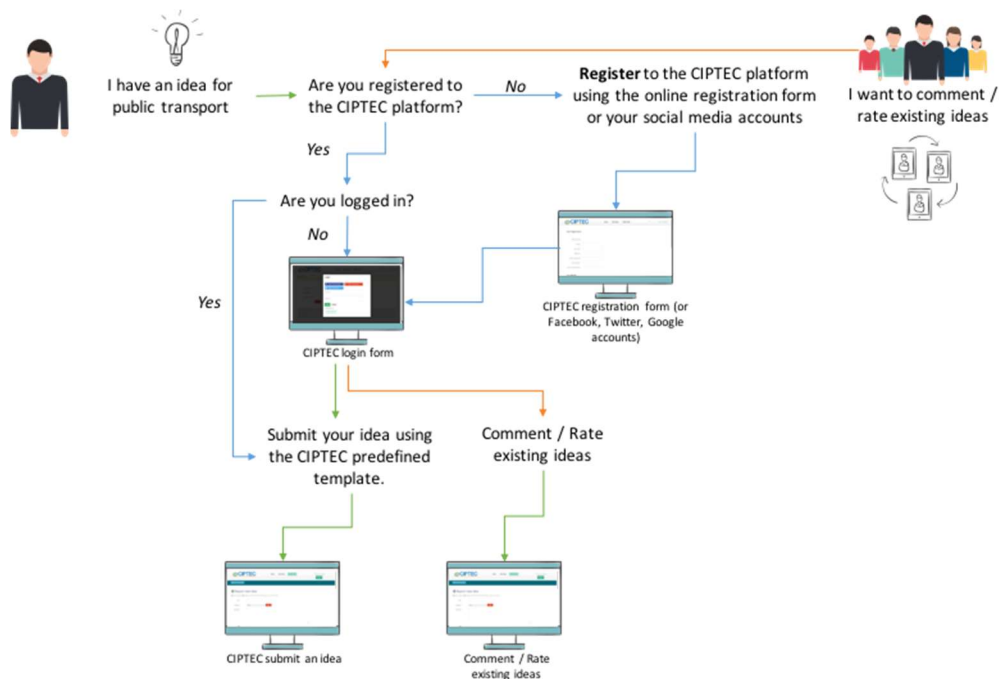


Figure 16: operational flow related to CIPTEC crowdsourcing platform

Source: CIPTEC (2016), D3.2 Crowdsourcing platform

The design of the CIPTEC crowdsourcing platform has been addressed to simplify the operational procedures require by the users to interact with it at few and well recognizable main steps.

Screenshots / Pictures

The layout of the CIPTEC crowdsourcing platform and the users interfaces have been designed as simpler as possible in order to minimize the interactions required by the user and to avoid usability barriers which could had limited the wide participation of the potential target of the campaign.

In the following some examples of the users interfaces (developed for the main functionalities provided by the crowdsourcing platform) are shown.

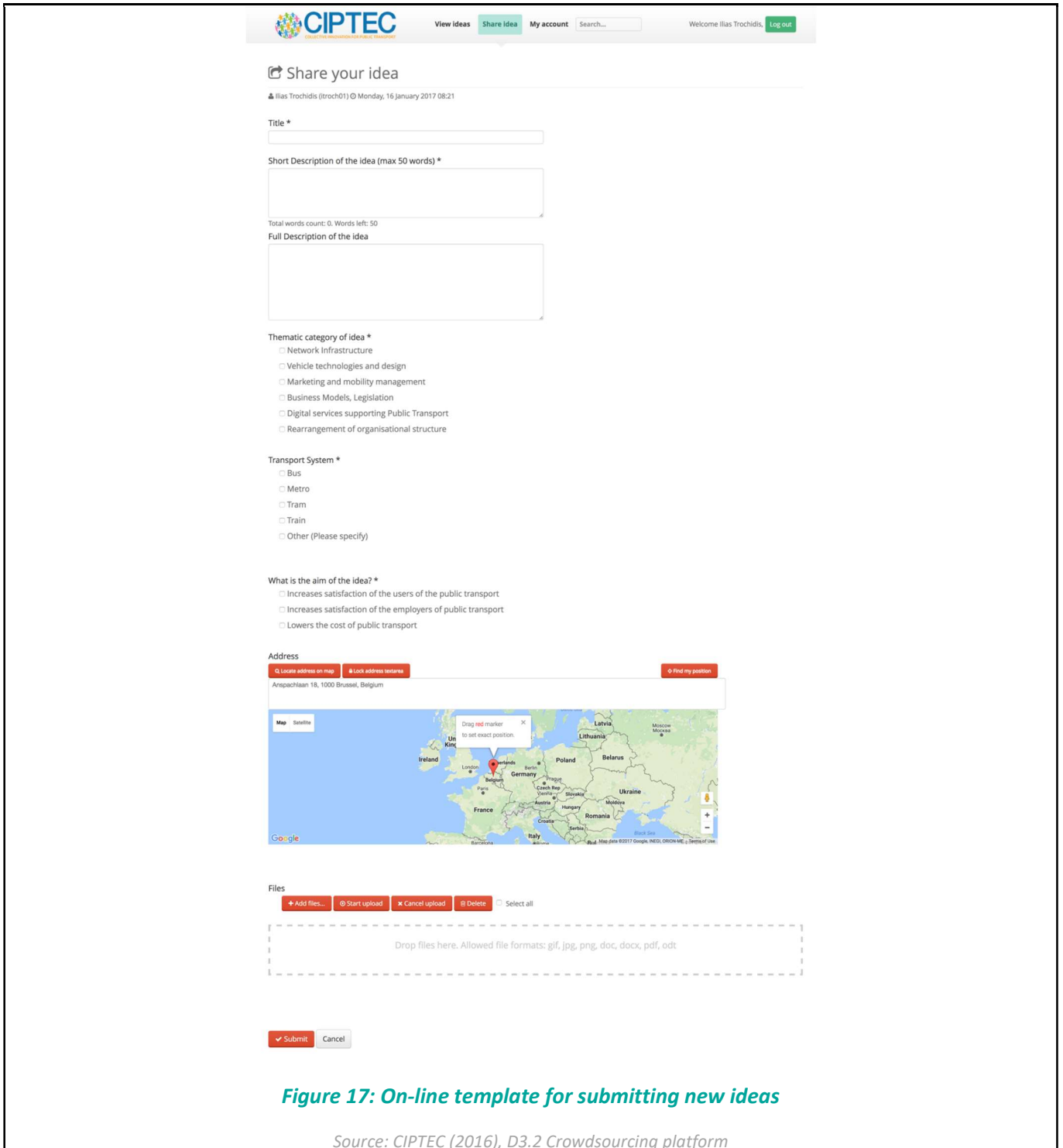


Figure 17: On-line template for submitting new ideas

Source: CIPTEC (2016), D3.2 Crowdsourcing platform

Level of maturity

The CIPTEC crowdsourcing platform has been operated in five different collective intelligence campaigns during the project over a six month period. The level of success of the campaign was different site by site demonstrating

that it is strictly depending on the promotion and dissemination activities rather than the design/graphical layout/interface of the IT platform.

The most successful experience in the operation of the crowdsourcing platform in CIPTEC project was in Thessaloniki.

The operation of the CIPTEC crowdsourcing platform in Thessaloniki site generated the following outcomes:

- 375 registered users
- >100 submitted ideas
- >200 comments
- >3200 unique visitors

Extending the view to the adoption of the crowdsourcing tools/platforms in the business practice, there are plenty of tasks and areas of interest where it has been applied.

According to the literature, the following are some of the basic uses of crowdsourcing:

- Gather data (e.g. reporting traffic problems, real-time coverage of weather events across the world) and develop new content with platforms such as Google Maps
- Collaboratively develop something (e.g. design a website, design a logo, design furniture etc.)
- Raise funds (e.g. crowdfunding to give money to a cause)
- Gather ideas on improving products.

Indeed, crowdsourcing is becoming a very popular tool that helps organisations acquire external knowledge by capturing user ideas and transforming them into innovations (Djelassi and Decoopman 2013, Feller et al., 2012). In the past decade, several firms have begun to realise that their innovation goals cannot be fully satisfied through internal resources and capabilities (Chesbrough 2003, Huston and Sakkab 2006, West and Boggers 2014).

It is important to note here the two basic types of crowdsourcing (Fähling et al., 2013): competitive and collaborative. In the collaborative crowdsourcing scenario, the crowd is collectively working on providing a solution to a specific problem. In the competitive crowdsourcing, independent solutions are gathered in a tournament-based style. As explained in this document, CIPTEC used both types.

Although the examples of using crowdsourcing in public transport are not as many as in other domains, the literature mentions one, big successful crowdsourcing initiative. A crowdsourcing campaign was successfully operated by Bombardier Transportation (BT), the rail equipment division of the Canadian firm Bombardier Inc. as internal tool enabling the employees to present/share new ideas on their work.

Main ICT elements / features

The platform has been developed using the following web technologies: HTML, CSS, PHP, MySQL and JavaScript using jQuery. The CIPTEC crowdsourcing platform is a standalone component that has been developed using the Joomla framework. Joomla is an open source content management system (CMS), which enables users to build Web sites and powerful online applications. Joomla has an application framework that makes it easy for developers to create add-ons.

The home page of the crowdsourcing platform is depicted in the following figure. The home page presents information about the crowdsourcing platform and how users can submit, rate and comment ideas. The most

popular and the most recent ideas are also presented at the bottom of the page. The core features (functionalities) of the crowdsourcing platform are the following:

- User registration and login
- Submit ideas
- View ideas
- Rate ideas
- Comment ideas.

The platform is mobile friendly. That means that any user from any mobile or tablet device can view, submit, comment, and rate ideas.

The screenshots related to this functionalities are shown in the previous section of the template

In order to check the contents (i.e. submitted ideas, comments about the ideas already submitted, etc.) and approve it for publication on the platform, an administration role and related functionalities is required.

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive*
- Radical*
- Technical/incremental innovation*
- Sustained*

The crowdsourcing platform can improve the quality and attractiveness of PT allowing to better cope with evolving needs and expectations of potential customers and end-users. In order to achieve this objective the platform represents a more effective modalities to collect new ideas/proposals from end users compared to the traditional focus groups and survey campaign: the benefits of the adoption of a crowdsourcing tool consist in the possibility to repeat the process over time improving the efficiency and the value of the result of the campaign.

CRITERIA 02 - Elements of social innovation

- Need-driven / outcome-oriented production*
- Open process of co-creation/collaborative innovation*
- Fundamental change in the relationships between stakeholders*
- Public value allocation or re-allocation*

The crowdsourcing platform contributes to reduce the gaps between the stakeholder and the users' perspective allowing to make the PT service more customers oriented and take the decision on the basis of a real understanding of their needs. On the same way, the crowdsourcing platform implements an open process of collective intelligence among the potential customers and the users of PT, stimulating the circulation of new ideas among different people and their cooperation in order to identify commonly agreed requirements.

CRITERIA 03 -- Levels of governance of service integration
<ul style="list-style-type: none"> <input type="checkbox"/> <i>Isolated</i> <input checked="" type="checkbox"/> <i>Intra-governmental integration</i> <input type="checkbox"/> <i>Inter-governmental integration</i> <input type="checkbox"/> <i>Inter-sectorial integration</i> <input type="checkbox"/> <i>Pervasive</i> <p>The crowdsourcing platform contributes to design PT services according to the needs of potential customers and users rather than service providers or stakeholders</p>
CRITERIA 04 - Types of service integration
<ul style="list-style-type: none"> <input type="checkbox"/> <i>Funding;</i> <input checked="" type="checkbox"/> <i>Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;</i> <input type="checkbox"/> <i>Organisational</i> <input type="checkbox"/> <i>Service delivery</i> <p>The crowdsourcing platform supports an “inter-sectoral” approach to PT design based on the assessment of needs through the implementation of a collective intelligence process.</p>
CRITERIA 05: Service improvements and progress
<ul style="list-style-type: none"> <input type="checkbox"/> <i>improving access and take-up of services</i> <input checked="" type="checkbox"/> <i>increasing the quality of the services provided</i> <input type="checkbox"/> <i>improving cost-effectiveness</i> <p>Open innovation:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>sharing</i> <input checked="" type="checkbox"/> <i>cooperation</i> <input checked="" type="checkbox"/> <i>plurality of participants</i> <input type="checkbox"/> <i>self-organisation</i> <input checked="" type="checkbox"/> <i>decentralization</i> <p>The crowdsourcing platform can contribute to increase the quality of PT services improving the effectiveness of the provided solutions compared to the evolving needs of citizens. The platform allows the user to submit new idea/need and share it, to view/check the ideas/needs submitted by other users, comment them thus contributing to the consolidation of the final concepts to be evaluated by the PT stakeholder who launched the collective intelligence campaign. Then the platform implements a cooperation process (sharing and comment) among a plurality of participants (citizens registered in the platform). The driven factors about PT design and possible improvements are then openly discussed and for decision taking process is decentralized engaging directly the end users in the pre-feasibility and planning stages.</p>

CRITERIA 06: Actors and user needs

A. Vulnerable User Groups

One of the main benefits of the crowdsourcing platform is the possibility given to PT stakeholder (Authority/Operator) to design the related campaign addressing specifically the needs of a certain vulnerable target users. The experience grown within the CIPTEC project demonstrated that “general-purpose” campaigns are not successful as it is more difficult to engage people when the debate is generic and the return of the provided contribution appears not clearly visible. The campaign is easier to implement when the user is asked to provide idea/express their needs on a specific topic and this is even more related to the opportunity to address a specific vulnerable user group (i.e. campaign addressed to disabled people: which service do you expect for facilitating the use of PT ? or campaign addressed to migrants: which info do you expect for better understanding how to use PT ?).

B. Operator’s needs:

The crowdsourcing platform can contribute to make the PT more customer oriented, for sure; on the other hand, it is not a direct consequence that it can also contribute to answer to some Operator’s needs. It depends on the ideas/needs which is selected through the platform and even more on the solution the PT Operator designs to implement to the selected idea or to answer to the need. In general, the Operator identifies the solution/service implementing the idea/answering the need based on a set of evaluation criteria as: feasibility, transferability to different contexts, adaptability to the operational procedures currently adopted and organization workflow, etc. It is reasonable that the solution could be compatible with the Operator’s internal business practices and related constraints (i.e. technologies, resources, finance, etc.) but it is not sure that it will also contribute to their improvement/efficiency.

CRITERIA 07: Prioritized areas

The crowdsourcing platform and the related campaign can be applied to any of the prioritized areas selected by the project.

CRITERIA 08: Acceptance of ICT

- **Aspects of ICT that have an impact to the user:** The crowdsourcing platform contributes to make the citizens really engaged in the PT design and experience it as “an attempt” to provide solution to their specific needs (or at least to the need which are emerging as more popular on the platform)
- **Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators):** The use is very simple, the functions to be managed by the users are a few ones and the operational flow is similar to other “sharing” platforms available on the market. The logic how the campaign works (how the winner will be selected) is very simple
- **Envisaged risks of digital exclusion (short description and considerations about any potential risk):** In the CIPTEC pilot site actions, this initiative has not experienced risks of digital exclusion. The functionalities provided by the platform and the users interfaces are very simple and the operational flow is reduced to a few steps and extremely simplified. The objective of the platform was clear as well as the logic and the rules for contributing to the crowdsourcing initiative. Indeed the main objective of the dissemination activity related to the promotion of the crowdsourcing platform and related campaign of participants’ engagement has been focused to clarify the target audience why participating to the campaign and how to use the platform

CRITERIA 09: Enabling factors

The promotion and dissemination activity is a key factor for guaranteeing a successful outcome of the crowdsourcing campaign and the wider use of the platform among the potential target audience. The experience of CIPTEC pilot sites demonstrates that the dissemination activity must be innovative (both in terms of strategies and channels) and “aggressive”: target users must be clearly identified in order to reach also the groups which are not (or rarely) users of Public Transport and who will be able to provide a different way to see at Public Transport environment.

The prize for the winner (idea/need selected to be implemented/answered) could act as incentive to increase the participation but it is not mandatory for the success of the initiative: for example, a campaign focusing on analyzing new needs of citizens and well targeted to answer to the expectations of a specific user groups can be successful even without the prize.

CRITERIA 10: Scalability

- **Current scale:** The CIPTEC crowdsourcing platform has been implemented in 5 sites with different features: two regional metropolitan area (Amsterdam-Den Haag, Frankfurth), one large urban areas (Thessaloniki) and medium-sized cities (Tiemme). In particular it is relevant the case of Tiemme where the crowdsourcing platform has been implemented as a “company service” then covering the four urban areas served by Tiemme (Siena, Arezzo, Piombino, Grosseto)
- **Aspects of scalability (spatial, users, technology):** From the technological point of view the architecture of CIPTEC crowdsourcing platform can host different sites without limitation of the spatial coverage.
- **Replicability/transferability level/potential:** The replicability potential of the crowdsourcing platform is very high both in terms of technology (it is implemented with solutions which are “de-facto” standard of the market), context (it can be introduced in different area types without limitations) and users (the supporting crowdsourcing campaign can be targeted to any specific users groups). Based on the selected users groups to be addressed, the promotional campaign should be targeted accordingly. Another opportunity to replicate/transfer the crowdsourcing platform is to use it as a “internal” tool (within an organization as, for example, a PT Operator) to sustain the circulation/sharing of the new idea/proposal among the employees/workers rather than an “external” tool for the assessment of end-users.

CRITERIA 11: Analyse the opportunities and limits

Limits of the initiative: The crowdsourcing platform is a tool to share/circulate new ideas, to identify/assess the needs of the citizens or of specific user groups and to establish a closer relation between PT stakeholder and target users who can be more strictly involved in decisions taking process in PT sector. It is clear that such a tool requires that the participants to the crowdsourcing initiative receive follow ups and tangible results/feedback that the stakeholder are taking care of their needs/requests/improvements ideas. Then is required a notification/update of the progress status of the analysis/feasibility/implementation of the solution selected to answer to the need highlighted by the crowdsourcing platform in order to let know to the participants that their contribution is taken into account (in same way) and their involvement is not waste of their time.

Enhancements / Extensions: As anticipated before, the platform can be used also as tool for the “internal sharing” of ideas/suggestion within an organization (i.e. a PT organization).

6.4 CMM – Central Moins Mobile

<p>CMM - Central Moins Mobile</p> <p>Management Centre of transport services for disadvantaged people</p> <p>with reduced mobility and low income</p>
<p>PART I – General information</p>
<p>Short description of the initiative</p>
<p>CMM – Central Moins Mobiles – are private transport services organized by Belgian Municipalities or CPAS (local centres which guarantee the provision of social services to low income residents). The services are operated by volunteers with their private car. The services are targeted to disadvantaged people who can suffer barriers for independent travelling due to the inability to drive/own a car and difficulties to get a lift (i.e. by relatives or friends). Thus the target groups of this service are: elderly, people facing difficulties/impairments for movements (temporarily or not), low income. Not the disabled as the vehicles are not equipped. The services are managed by a “center” (CMM) which receives the trip request by the users (48 hours in advance) and it is in charge to search for an available driver to satisfy the request and to schedule the service accordingly. The user has to be registered as a member of CMM paying an annual fee of Euro 10,00 (Euro 5,00 for 6 months). As reimbursement for the expenses sustained by the driver, the user is invited to pay an amount of 0,34 Euro/km for each trip. The CMMs are operated under the umbrella of Taxistop which provides the interested/engaged Municipalities or CPAS with know-how for service management, operation and dissemination, training of operators, promotional material, help desk services and insurances covering incidents both for drivers or passengers. In order to join the Taxistop umbrella the organization (Municipality/CPAS) which wants to operate a CMM pays a fee of 80 Euro/year. Organization and operation of the service, engagement of users are in charge of the local Municipality/CPAS.</p>
<p>Level of maturity</p>
<p>Currently 200 CMMs are operated in Belgium to coordinate/manage/operate local private transport services. The areas with higher concentration of CMMs are located in/around Brussels, Ghent and Antwerp.</p>
<p>Main ICT elements / features</p>
<p>The management of the trip request, its negotiation/confirmation and the scheduling of the service can be carried out according to different technological scenarios. In the experience promoted by Taxistop, the management of trip request is carried out by phone (this is mainly due to the features of the target groups who are mostly elderly people) and the service planning through manual procedures. In general, on-demand/flexible transport service schemes can be also supported by IT modules/tools i.e. by a management sw to schedule the planned service of each driver (which is required when the number of users/trip requests and the number of drivers is higher or when different service schemes are operated over the same area) and an APP interface to be used for the notification of trip request (users) and the updating of scheduled service (driver)</p>

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive*
- Radical*
- Technical/incremental innovation*
- Sustained*

As indicated above, ICT modules/tools are not mandatory for supporting the operation of on-demand/flexible services even their adoption increase the efficiency of collection of trip request and service planning, in particular in presence of a high number of users/drivers (vehicles). A sw for the management of the service enables also the coordinated management of different service schemes/areas at CMM level. ICT modules/tools impacts in the work process of CMM operator and driver as well. In the first case, the interaction with the sw replaces the manual procedures of collecting trip requests (by phone) and plan the service. In the second the trip list to be operated is communicated/visualized by the APP and updated (based on the integration of new requests coming) on the same way.

CRITERIA 02 - Elements of social innovation

- Need-driven / outcome-oriented production*
- Open process of co-creation/collaborative innovation*
- Fundamental change in the relationships between stakeholders*
- Public value allocation or re-allocation*

Transport services as the ones provided by CMM are specifically targeted to address the needs of vulnerable groups of users who have difficulties to travel: in particular the group of elderly is assuming a primary role in the actual trends of mobility demand. The extension of life duration and the good health conditions of people even in the old age are factors improving the need of elderly to travel in an autonomous way. The mobility needs of this group is typically concentrated in the low demand period and then it contributes to increase the flexible component of the mobility demand which can be hardly satisfied by the conventional public transport services. Then last-mile (door-to-door) and on demand/flexible services will be even more relevant in the future as a component of an integrated mobility offer.

CMM can be considered also related to “open process of collaborative innovation” as the transport services is operated by volunteers using their own resources (vehicle) which are offered/distributed to the public. For the same reason CMM can be also related to some changes in the relationship between the stakeholders as the citizens themselves play the role of “service operators”

The re-allocation of public value is generated by the reimbursement given to the driver by the passenger

CRITERIA 03 -- Levels of governance of service integration

- Isolated*
- Intra-governmental integration*
- Inter-governmental integration*
- Inter-sectorial integration*
- Pervasive*

The intra-governmental integration of CMM initiative relates to the coordination/integration of different CMM implementation under the umbrella of Taxistop which provides common supporting activities/resources for the CMM implementation and operation (i.e. help desk, training, etc.)

CRITERIA 04 - Types of service integration

- Funding;*
- Administrative: e /functions; inter-sectorial planning; needs assessment/allocation chain; joint purchasing or commissioning;*
- Organisational*
- Service delivery*

CMM initiative can be seen as a sort of “service affiliation” se to the umbrella role provided by Taxistop to various public organizations (Municipalities or CPAS).

CRITERIA 05: Service improvements and progress

- improving access and take-up of services*
- increasing the quality of the services provided*
- improving cost-effectiveness*
- Open innovation:**
- sharing*
- cooperation*
- plurality of participants*
- self-organisation*
- decentralization*

The role provided by Taxistop as umbrella organization (for the affiliation of various CMMs under the same initiative) facilitates the take up of the CMM model (and operated services) providing know-how, expertise and supporting services (i.e. training) to Municipalities and CPAS.

The service operated/managed by CMM complies with door-to-door scheme and are able to cope with the flexible mobility needs of the target group thus increasing the quality of the service perceived by the users/citizens.

The CMM model is cost-effective for Public Administrations and (public funding) as the service is operated through the participation of volunteers.

CRITERIA 06: Actors and user needs
<p>Vulnerable User Groups Vulnerable users groups addressed by the CMM are:</p> <ul style="list-style-type: none"> - People with temporary physical or cognitive disability - People with permanent physical or cognitive disability - Elderly - Low income households <p>Operator's needs: CMM enables to operate door-to-door services in a more sustainable way, guaranteeing efficiency in service provision. The integration of "door-to-door" services managed by CMM as feeder of the conventional Public Transport offer can contribute to expand the coverage both for area and hours which are not economically sustainable for the operation of conventional Public Transport.</p>
CRITERIA 07: Prioritized areas
<p>The CMM initiative can be introduced in different prioritized areas: urban districts/neighbourhoods, suburban areas, rural/remote areas. The initiative is not specifically addressed to any of these.</p>
CRITERIA 08: Acceptance of ICT
<ul style="list-style-type: none"> • Aspects of ICT that have an impact to the user: Low impact. As explained above, the CMM can offer different channels for the notification of the requested trip: phone, APP, desktop web application. This is the ICT aspect impacting on the user as the operation of a sw for the management/scheduling of the service related to the operation of a professional operator. • Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators): Low complexity as the main functionalities of the APP is related to trip request. The negotiation/conformation is carried out by phone by the CMM operator. • Envisaged risks of digital exclusion (short description and considerations about any potential risk: Any risk of digital exclusion as traditional modalities for booking the trip (i.e. by phone) can be mixed with innovative one (i.e. desktop or mobile web application)
CRITERIA 09: Enabling factors
<p>The service affiliation of various CMM to a common "umbrella" initiative enables the launch of new implementation as Taxistop provides supporting activities (i.e. training of the operators, help desk, promotional material, expertise, etc.)</p>
CRITERIA 10: Scalability
<ul style="list-style-type: none"> • Current scale: Each CMM manages service on a local scale • Aspects of scalability (spatial, users, technology): From the spatial point of view, a CMM can manage multiple service schemes (door-to-door, ridesharing, etc.) on multiple areas (i.e. a door to door service in a peripheral area of a city and a ridesharing services from the rural area to the city itself. From the users point of view, each service scheme managed by the CMM can be targeted to different (vulnerable) group of users. From the technology point of view different booking channels (i.e. phone,

APP, web application) can be offered. Furthermore the sw for the management and the scheduling of the service (if used) can manage different service schemes/area in the same CMM installation.

- **Replicability/transferability level/potential:** The replicability/transferability of CMM initiative is high as service schemes operated by volunteers are present in different EU countries. What should be learnt by CMM experience in Belgium is the application of service affiliation scheme of various CMM under the same “umbrella” initiative.

CRITERIA 11: Analyse the opportunities and limits

Enhancements / Extensions: The CMM concept can be integrated in the “Shared Mobility” Agency concept. Indeed the “Shared Mobility Agency” allows the management of different flexible and ride sharing services integrated with Public/Collective Transport: some of the flexible scheme operated by the “Shared Mobility Agency” can be operated by volunteers as in the CMM experience. Under this perspective the service affiliation could be extended to the whole “Shared Mobility Agency”

Limits of the initiative: The CMM initiative can be limited by the national regulation for the contracting of public transport services which in some countries limits the operation of service based on volunteers to restricted options whereas wide scale services (recognized as integration scheme of the whole collective public transport offer contracted by the responsible Authority) can not be operated in such a way. In particular this barrier limits the scale up potential of CMM initiative to “niche” service rather to become a viable options for the operation of wide scale services regulated under the Public Transport service contract.

6.5 Shared Use Mobility Agency in ELBA Island

Shared Use Mobility Agency in ELBA Island

Coordination of ride sharing services integrated with Public Transport

PART I – General information

Short description of the initiative

The Shared Use Mobility Agency (SUMA), currently under realization in ELBA Island under the CIVITAS DESTINATIONS project, is based on an ICT platform to operate/managed by an appropriate organizational structure (Agency staff). SUMA allows the management of different ride sharing services integrated with Public/Collective Transport, the centralization of information relates to PT and mobility services provided in Elba, the networking/coordination of different service providers (in particular the operators of bike/scooter/car/boat rent services) and the collection/management of data on mobility (data collection campaign, mobility survey, regulation for use/access to mobility services, data collected during the operation of the service).

SUMA works on three interrelated levels (collective transport, ride sharing and connected systems) in order to provide on-demand and shared services to the different citizens, users groups and/or mobility demand areas.

The innovativeness concept of the SUMA lies in the fact that users have a unique point of access to all information on the overall mobility offer in a consistent and efficient way (type of services, timetable, tariffs, access modalities, booking, etc.) and its “brokerage” role for aggregating the mobility demand and coordinating the different ridesharing services integrated with conventional public transport services.

SUMA platform is based on Internet of Services or Service Oriented Approach (SOA), providing several core facilities including:

- a) access to PT/mobility services’ information, multimodal travel planning, etc (Business-to-Clients (B2C) service);
- b) services for the co-ordination of different ride sharing and mobility schemes and the interaction with the relevant operators (Business-to-Business (B2B) services). This level of services includes also the provision of open-data exposing the centralized set of “rough” data used to deliver point a) and c) services.
- c) services supporting the interactions among different Authorities and Entities involved in the mobility planning and control of transport services (Business to-Administration (B2A) services). These include the monitoring of service key performance indicators and data mining processes for the extraction of knowledge from the repository of data on mobility as support of mobility governance and policies.

In particular, SUMA, as general concept/service model, allows the planning and the management of different ride sharing services that could be defined by the Authorities and operated by specific groups of citizens as social innovation transport schemes.

In the case of ELBA Island, the SUMA platform was tailored and personalised around to the mobility demand and territorial context in order to answer the needs of tourists and residents and the requirements of a rural area.

The base concepts of SUMA are:

- the aggregation of information on mobility/PT services targeted to tourists
- the networking of operators targeted to tourists and residents, in particular the groups living outside the urban area of Portoferraio and the small villages dispersed in the island (these groups are affected by limitations in accessibility to PT due to the restriction of hours/destinations coverage)
- the provision of ridesharing services as integration (and not as substitutive travel option) of the conventional PT in the scenarios (areas) where the PT is proven to be ineffective to answer to specific needs/service conditions (large differences in peak/low demand period due to seasonality, dispersed mobility)

Screenshots / Pictures

The following picture shows the architecture and main components of SUMA.

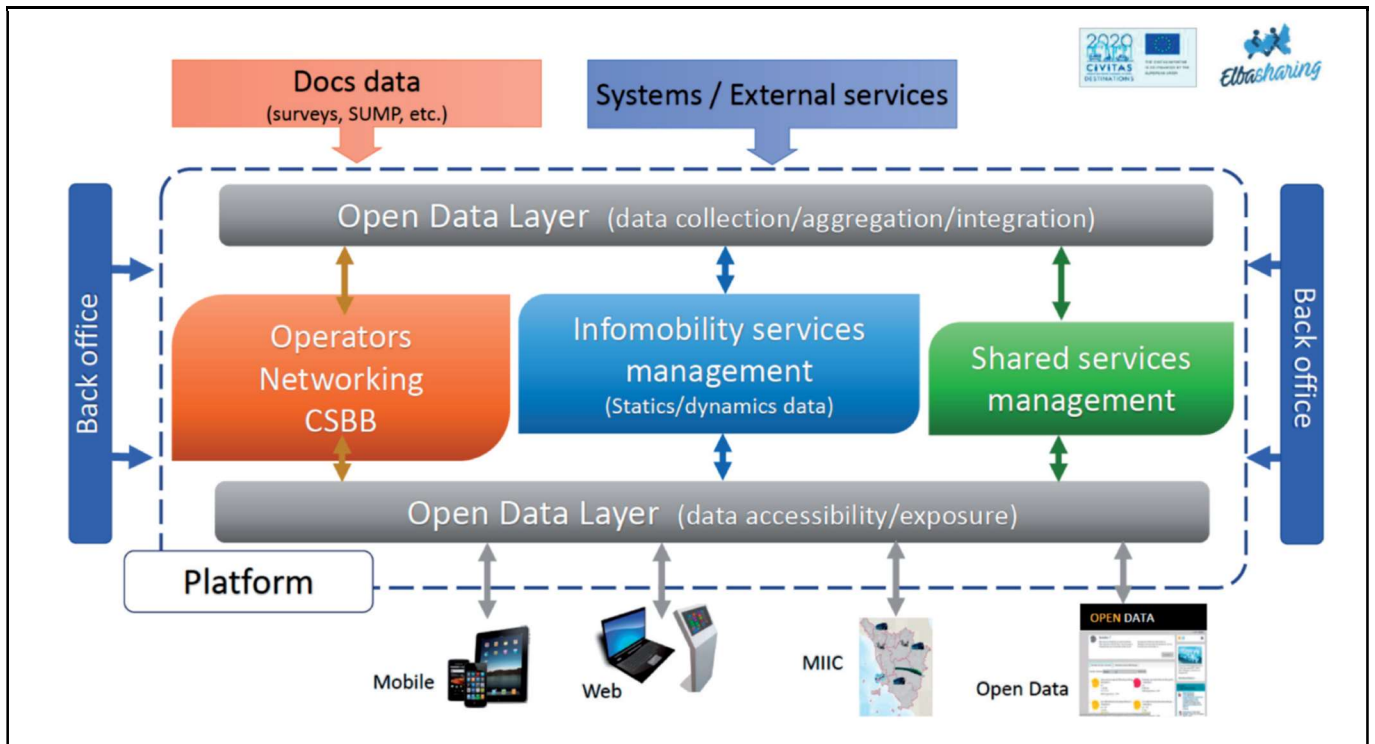


Figure 18: Architecture and main components of SUMA

Source: (Ambrosino, 2018)

Level of maturity

Related to SUMA implementation in Elba, the platform is under realization. The feasibility was defined including the specifications of the IT supporting platform, the organizational needs in terms of operating/managing structure (number, profile and workload of involved staff) and the CANVAS model (as base for the development of the related business model).

The tender for the implementation of IT supporting platform took place between December 2017 and May 2018 and the implementation is starting after the sign of the Contract.

Extending the analysis to the state of maturity of Agency concept across Europe, North America and Australia, it must be highlighted that it is extremely flexible thus it can be implemented in different ways (it means that the functionalities provided can be tailored to the specific context and local needs. Despite this, the Agency is operated still as “pioneer” experience in few areas even the model is now largely promoted as key solution to support the provision of an integrated of mobility offer as key solution to answer to current societal trends (i.e. increased flexibility of demand, urban sprawling, flexible working habits, etc.).

Main ICT elements / features

SUMA is based on an ICT platform (sw environment, sw procedures and HW components) allowing the aggregation of the different type of mobility demand and the management of related ride sharing services, infomobility and operators networking.

The main components of the platform are the following:

a) Middleware Data Layer: The Data Layer collect and integrate the data coming/transmitted from/by different data sources under a centralized and standardized data format. The data are available to the other components and exposed as open data

b) Provision of the infomobility services: This component provides specific multimodal info-mobility services (i.e. multimodal journey planner, real time arrival of the buses at each stop, etc.) through the elaboration of the data integrated by the Open Data Layer component.

c) Management of service operators networking and support to mobility observatory. This component networks the rental service offer exposing info and availability. This component aims also to realize and share a repository for all the information and documents supporting the mobility and transport services planning for Elba. These data and information should be collected by at least two modalities: automated (i.e. using online questions, implementation of collection campaign, etc.) or manually (i.e. acquisition in the repository of mobility documents by the input of a specific operator).

d) Provision and management of ride sharing services. This component manages some “Message board for sharing trips” have been defined: the user through the specific APP could declare his/her position and the destination he/she wants to reach by sharing the trip with other users/drivers. The “Message board for ride sharing” has been instantiated to answer to different use cases: to share a trip on private vehicle (in the short time, planning it in advance according to holiday dates), hitchhiking, to share a taxi trip.

Moreover, two main support functions for supporting the above ride sharing schemes have been detailed regarding the tracking of a shared trip and the certification of the reliability of the users

The SUMA platform functionalities are shown in the following figure

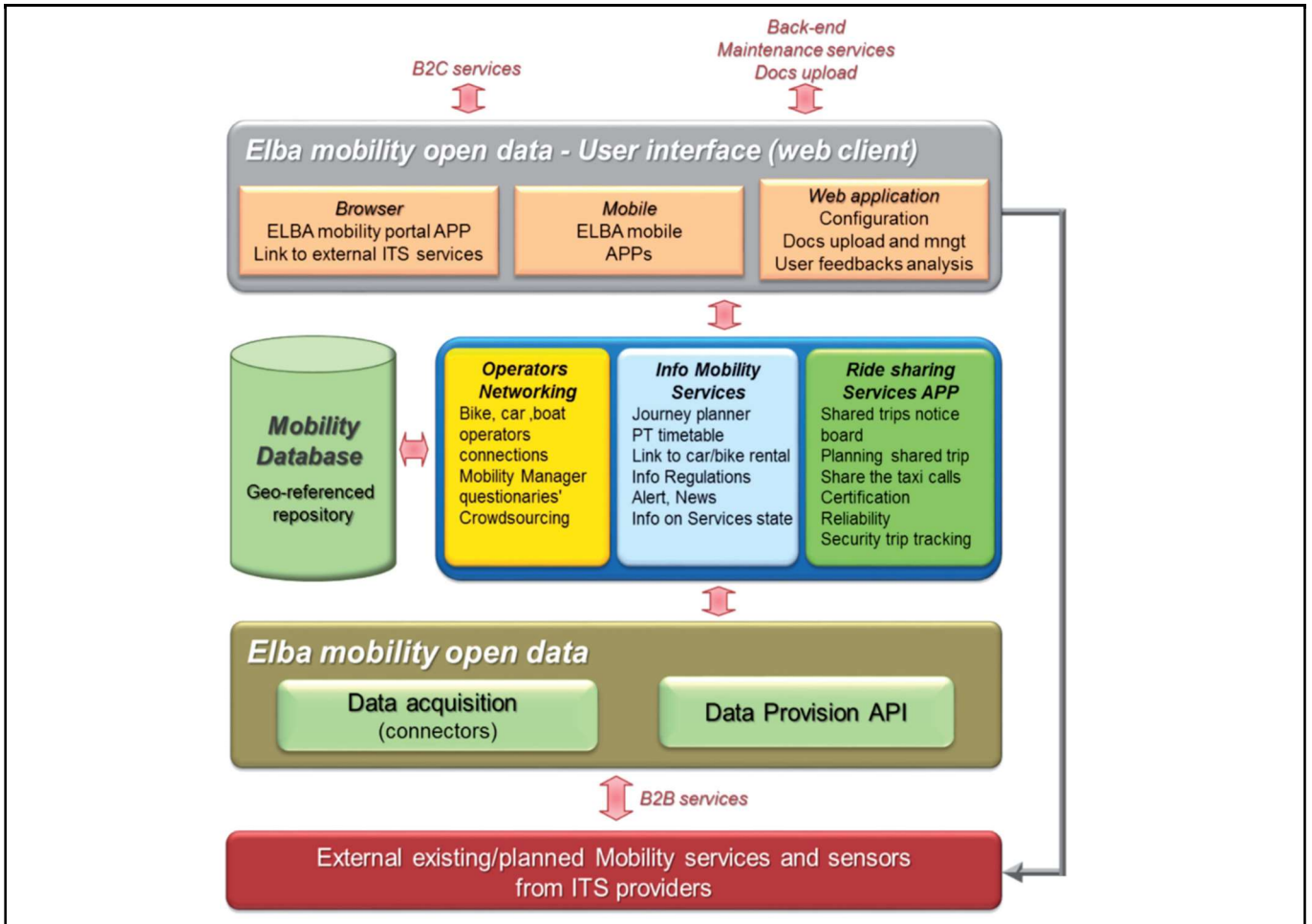


Figure 19: SUMA Functionalities

Source: (Ambrosino, 2018)

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive
- Radical
- Technical/incremental innovation
- Sustained

CRITERIA 02 - Elements of social innovation
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>Need-driven / outcome-oriented production</i> <input checked="" type="checkbox"/> <i>Open process of co-creation/collaborative innovation</i> <input type="checkbox"/> <i>Fundamental change in the relationships between stakeholders</i> <input type="checkbox"/> <i>Public value allocation or re-allocation</i>
CRITERIA 03 -- Levels of governance of service integration
<ul style="list-style-type: none"> <input type="checkbox"/> <i>Isolated</i> <input type="checkbox"/> <i>Intra-governmental integration</i> <input type="checkbox"/> <i>Inter-governmental integration</i> <input checked="" type="checkbox"/> <i>Inter-sectorial integration</i> <input type="checkbox"/> <i>Pervasive</i> <p>Different ride sharing schemes could be planned and managed by the SUMA platform and integrated with the Public Transport services. Moreover both the data (coming from different sources) layer for infomobility services and the services of mobility operators can be networked.</p>
CRITERIA 04 - Types of service integration
<ul style="list-style-type: none"> <input type="checkbox"/> <i>Funding;</i> <input checked="" type="checkbox"/> <i>Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;</i> <input type="checkbox"/> <i>Organisational</i> <input checked="" type="checkbox"/> <i>Service delivery</i> <p>SUMA fosters inter-sectorial planning in order to define the best level of integration between ridesharing schemes and conventional Public Transport. Furthermore SUMA allows the integration of delivery of collective transport service: from the operators' point of view through their networking (increasing their visibility and the possibility to make business) and from the end users' point of view (simplified accessibility to information, increased flexibility of collective transport services, increased accessibility). Furthermore SUMA supports the assessment of mobility needs thanks to the role of the observatory component.</p>
CRITERIA 05: Service improvements and progress
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>improving access and take-up of services</i> <input checked="" type="checkbox"/> <i>increasing the quality of the services provided</i> <input checked="" type="checkbox"/> <i>improving cost-effectiveness</i> <p>Open innovation:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>sharing</i> <input checked="" type="checkbox"/> <i>cooperation</i> <input checked="" type="checkbox"/> <i>plurality of participants</i> <input checked="" type="checkbox"/> <i>self-organisation</i> <input checked="" type="checkbox"/> <i>decentralization</i>

SUMA allows the improved accessibility of collective transport in low demand areas and the take up of ridesharing services based on a solution which can be managed directly by Public Administration outside the use of commercial providers or sharing platform (i.e. NTC).

SUMA increases the quality of the information provided and it improves the overall accessibility.

The cost effectiveness is based on the role of ridesharing services as mobility solution to be integrated with conventional Public Transport services where the last one has been demonstrated to be ineffective.

CRITERIA 06: Actors and user needs

Vulnerable User Groups

Specific sharing services could be organised also for different “vulnerable” user groups aggregating the related demand and providing similar transport schemes. In particular, for Elba, the target vulnerable groups are the tourists and the residents of rural areas. A secondary target user group consists of women (both as tourists and residents) due to the presence of tracking and alerting services.

Operator’s needs:

Different operators could be involved by SUMA. For example:

- Public Transport, Mobility Operators (parking, rental, etc.) and Authorities, etc. – SUMA contributes to the cost efficiencies in service provision (through the networking), to the engagement of new users and to the integration of the mobility offer
- Commercial operators (i.e. discos, restaurants, shops, etc.) which can develop marketing strategies being indicated in the platform as main points of the departure/arrival of “shared trips”
- Third-party developers accessing to Open Data Layer for develop new applications
- Public Administration, consultancy companies and professionals accessing survey/data make available by the Mobility Observatory.

CRITERIA 07: Prioritized areas

The Agency model can be applied to any contexts: urban areas, peri-urban, rural. In the case of Elba SUMA addresses rural areas.

CRITERIA 08: Acceptance of ICT

Aspects of ICT that have an impact to the user: Through the Infomobility component, SUMA provides aggregated “added-value” infoservices to end-users (on web portal/APP) which are now dispersed in various applications. On the same way the Networking component enables the end-users to have a unique “one window” point aggregating the info related to mobility operators (in the case of Elba, the rental operators). Finally the component for the management of ridesharing services allows the user to share ridesharing services

Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators): Users interface needs to be designed as more usable and intuitive as possible.

Envisaged risks of digital exclusion (short description and considerations about any potential risk): Not relevant. From the usability point of view, mobile applications and devices are becoming wider and wider among all the user groups (including the elderly one). Functions for voice-translation functions are supported by all the mobile operative systems (for blind people) and layout can be implemented according to accessibility rules for visually impaired people). From the technological point of view the performance (coverage) of telco network has been largely improved even it can be considered as a barrier for remoter areas.

CRITERIA 09: Enabling factors

Operation/management of SUMA: the SUMA requires an appropriate staff to be operated/managed. Basically the structure consists of: a supervisor, two operators for daily management (working in turns), a technician for network management and first-level interventions. The operational procedures are defined in order to allow the following activities: update/management of the static contents of the info channels (web portal, APPs, etc.), monitoring of connectivity and data exchange between the SUMA platform and external ITS/databases, update/management of documents to be manually uploaded on the repository of mobility observatory, interactions with mobility (rental services) operators networked by the SUMA, supervision of ride sharing service management component.

Business model development: A business model for the long-term financial viability of SUMA must be detailed on the basis of the first CANVAS concept (see below). The main challenge is related to the long-term viability of the SUMA. The costs of the management (staff operation, platform and structure, etc) could be partially covered by the external revenues deriving from these first hypothesis:

- a) annual fee (to be established on the basis of the performance of the first 2 years of activity), to be requested at the time of registration to users (both users and commercial activities/operators);
- b) annual contribution from renting operators (bikes, cars, scooters, boats, etc.)
- c) contribution from interested commercial operators (e.g. discos, restaurants, shopping centres, etc.) as main points of departure or arrival of "shared trips", in order to increase their attractiveness and safety level;
- d) possible contributions from local administrations or consultancy companies interested in the documentation and data on mobility and transport accessible through the appropriate "Open Data Layer" of the technological platform;
- e) services / studies realised by the Agency of mobility and transport, over the time (such as collecting and analysing traffic conditions, advertising on the portal, mobility management analysis etc.);
- f) management, in the future, of shared mobility services as part of the PT service contract.

Business relations to be established with the networked mobility (rental services) operators: Appropriate business agreements between the SUMA and the networked mobility (rental services) operators must be established in order to implement the business model defined. The agreements must be generalized to all the commercial operators identified as actors in the business model (see above).

Cooperation among stakeholder: a close cooperation among Public Administrations, Mobility and Transport Agencies and Operators is required to set the enabling framework for SUMA operation.

Marketing and promotion: a pervasive and effective promotional campaign is required to make the SUMA initiative recognizable:

- at local level, among the mobility stakeholder and the commercial operators to be networked/engaged for SUMA operation
- among the target users, in particular the tourists. To do that, a strong effort is required to engage the other actors (i.e. Tourism Associations, hoteliers association, Chamber of Commerce, etc.)

CRITERIA 10: Scalability

Current scale: SUMA is under realization in ELBA

Aspects of scalability (spatial, users, technology): The future scalability potential of SUMA relates to add-on functionalities and mobility service schemes which can be networked/brokered by the Agency (rather than on geographical scale up at Elba island level). For example Demand Responsive Transport schemes (eventually operated as dynamic DRT supported by IT platform and APP) could be included in the collective transport services managed by the Agency (and operated as integration of the conventional transport service). The scalability in terms of mobility services operated/functionalities provided brings an extension to other possible target groups (the user groups of the new mobility services managed by the Agency)

Replicability/transferability level/potential: very high not only to other rural/remote areas but also to suburbs and towns/cities. As already indicated the Agency concepts is very flexible and it can be easily adapted to a wide range of service schemes, territorial contexts and background conditions.

CRITERIA 11: Analyse the opportunities and limits

Enhancements / Extensions as already state the management of ride sharing services could be extended to innovative schemes based on the other citizen's needs (i.e. organization of children transport to leisure activities) as a sort of cooperation scheme between private and no profit organizations

Limits of the initiative:

- 1) modifications in the regulatory framework of public transport could be needed in case the operation of ridesharing services will be operated as cooperation scheme between private and no profit organizations
- 2) the economical viability of the SUMA is not still demonstrated

6.6 GOGOGRANDPARENT

GOGOGRANDPARENT	
PART I – General information	
Short description of the initiative	
<p>GoGoGrandparent is a private company located in Mountain View, CA providing a simplified booking system for ridesourcing companies like Lyft. The system operates without using a smartphone and is usable by owners of older cell phones or cable phones: after a registration, the user can simply book a ride from home by pressing 1 on the phone keyboard or by requesting a ride from the place where he or she stands in a certain moment by pressing 2. Other options are available by using the keyboard and it's always possible to talk with an operator. The service also provides friend or relatives with facilities to monitor rides and coordinate with drivers to check that everything goes okay.</p>	
Level of maturity	
The initiative is in production	
Main ICT elements / features	
<p>The technology relies on a phone responder suitable for cell phones or cable phones having a keyboard that generates tones. The keyboard act as interface instead of the UBER smart app.</p> <p>The booking interface is a proprietary product developed by GoGoGrandparent.</p>	
PART II – Analysis and Classification	
CRITERIA 01 - Potential of ICT-enabled innovation	
<ul style="list-style-type: none"> <input type="checkbox"/> <i>Disruptive</i> <input type="checkbox"/> <i>Radical</i> <input type="checkbox"/> <i>Sustained</i> <input checked="" type="checkbox"/> <i>Technical/incremental</i> 	
CRITERIA 02 - elements of social innovation	
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>Need-driven / outcome-oriented production</i> <input type="checkbox"/> <i>Open process of co-creation/collaborative innovation</i> <input type="checkbox"/> <i>Fundamental change in the relationships between stakeholders</i> <input type="checkbox"/> <i>Public value allocation and/or re-allocation</i> 	

CRITERIA 03 - Levels of governance of service integration
<input checked="" type="checkbox"/> <i>Isolated.</i> <input type="checkbox"/> <i>Intra-governmental integration.</i> <input type="checkbox"/> <i>Inter-governmental integration</i> <input type="checkbox"/> <i>Inter-sectoral integration.</i> <input type="checkbox"/> <i>Pervasive.</i>
CRITERIA 04 - Types of service integration
<input type="checkbox"/> <i>Funding;</i> <input type="checkbox"/> <i>Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;</i> <input type="checkbox"/> <i>Organisational</i> <input checked="" type="checkbox"/> <i>Service delivery</i>
CRITERIA 05 - Service improvements and progress
<input checked="" type="checkbox"/> <i>improving access and take-up of services,</i> <input checked="" type="checkbox"/> <i>increasing the quality of the services provided</i> <input type="checkbox"/> <i>improving cost-effectiveness</i> Open innovation: <input type="checkbox"/> <i>sharing</i> <input type="checkbox"/> <i>cooperation</i> <input checked="" type="checkbox"/> <i>plurality of participants</i> <input type="checkbox"/> <i>self-organisation</i> <input type="checkbox"/> <i>decentralization</i>
CRITERIA 06: Actors and user needs
Vulnerable User Groups <ul style="list-style-type: none"> • Elderly people Operator's needs: <ul style="list-style-type: none"> • Operate viable services in a sustainable way • Integration with other modes/routes • Ability to expand coverage area in a sustainable way

CRITERIA 07: Prioritized areas
<i>Any area, mainly Rural/suburban areas</i>
CRITERIA 08: Acceptance of ICT
<p>Aspects of ICT that have an impact to the user: None specifically, the initiative aims at reducing/avoiding any use of technological interfaces which would have been instead necessary to use lift sharing services without it.</p> <p>Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators): None. Traditional ways of communication are foreseen</p> <p>Envisaged risks of digital exclusion (short description and considerations about any potential risk): None</p>
CRITERIA 09: Enabling factors
<p>The political context in the U.S. generally does not impose bans or restrictions to ridesharing services was a key condition for the success of the initiative. Additionally, the project was self-funded with about \$20.000 earned by the founders with previous businesses (CNBC.com, 2016).(CNBC.com 2016). From the point of view of drivers, the most interesting financial opportunities seems to be associated to off-peak hour trips and rural areas ('GoGoGrandparent Driver FAQ', n.d.)(GoGoGrandparent Driver FAQ n.d.).</p>
CRITERIA 10: Scalability
<p>From the point of view of product technology, no constraint appears to exist for the transferability of the service.</p> <p>Transportation Network services on the other hand are not available everywhere and, in some countries, (including EU ones) are unauthorized or considered illegal.</p>
CRITERIA 11: Opportunities and limits
<p>Enhancements / Extensions that may provide further value or increase the effectiveness of the elements are described in Criteria 02.</p>

6.7 GOKIDS

GOKIDS	
PART I – General information	
Short description of the initiative	
<p>GoKids is a mobile app and web site that helps organizing carpools with kids. It has special features (regarding safety for example) that make it suitable for transportation e.g. from/to school, events, sport etc.</p> <p>Only parents (with kids) are allowed to drive (no external drivers). The best combination of pickups is calculated by the service. Besides the free basic version, the “pro” GoKids is available on a subscription basis.</p> <p><i>GoKids Connect</i> is a software platform that simplifies the planning of school carpools where buses and public transportation aren’t available. This <i>schoolpool</i> program is available for schools to help parents connect, organize carpools, and get kids to school whenever transportation is difficult.</p> <p>It addresses families with kids especially in areas where bus school or other suitable transportation services are not available.</p>	
Level of maturity	
The GoKids product is in production	
Main ICT elements / features	
<p>Gokid is a mobile app available for iOS and Android systems and as a web-based application (usable through a web browser).</p> <p>The service combines the requests and offerings from parents and verifies the necessary requirements by arranging appropriately the trip (for example by optimizing the sequence of pick-ups). Additional “pro” features like tracking and notification of arrival at destination are either under development or announced. (‘GoKid Carpool App’, n.d.)</p>	
PART II – Analysis and Classification	
CRITERIA 01 - Potential of ICT-enabled innovation	
<input type="checkbox"/> <i>Disruptive</i> <input type="checkbox"/> <i>Radical</i> <input checked="" type="checkbox"/> <i>Sustained</i> <input checked="" type="checkbox"/> <i>Technical/incremental</i>	

CRITERIA 02 - elements of social innovation
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>Need-driven / outcome-oriented production</i> <input checked="" type="checkbox"/> <i>Open process of co-creation/collaborative innovation</i> <input type="checkbox"/> <i>Fundamental change in the relationships between stakeholders</i> <input checked="" type="checkbox"/> <i>Public value allocation and/or re-allocation</i> <p>Initiative created from shared private cars due to strict transport needs, then evolved into a technologically supported facility/way of organizing the trips.</p>
CRITERIA 03 - Levels of governance of service integration
<ul style="list-style-type: none"> <input type="checkbox"/> <i>Isolated.</i> <input checked="" type="checkbox"/> <i>Intra-governmental integration.</i> <input type="checkbox"/> <i>Inter-governmental integration</i> <input type="checkbox"/> <i>Inter-sectoral integration.</i> <input type="checkbox"/> <i>Pervasive.</i> <p>School authorities integrating with parent organizations to carpool as complementary transport mode in addition to school bus.</p>
CRITERIA 04 - Types of service integration
<ul style="list-style-type: none"> <input type="checkbox"/> <i>Funding;</i> <input type="checkbox"/> <i>Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;</i> <input checked="" type="checkbox"/> <i>Organisational</i> <input checked="" type="checkbox"/> <i>Service delivery</i>
CRITERIA 05 - Service improvements and progress
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>improving access and take-up of services,</i> <input checked="" type="checkbox"/> <i>increasing the quality of the services provided</i> <input checked="" type="checkbox"/> <i>improving cost-effectiveness</i> <p>Open innovation:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>sharing</i> <input checked="" type="checkbox"/> <i>cooperation</i> <input type="checkbox"/> <i>plurality of participants</i> <input checked="" type="checkbox"/> <i>self-organisation</i> <input checked="" type="checkbox"/> <i>decentralization</i>

CRITERIA 06: Actors and user needs
<p>Vulnerable User Groups Families with children</p> <p>Operator's needs: None addressed specifically</p>
CRITERIA 07: Prioritized areas
<p>Potentially applicable to all areas, probably more interesting for rural and peri/urban areas where the need of private cars for taking kids at school is more significant.</p>
CRITERIA 08: Acceptance of ICT
<ul style="list-style-type: none"> Aspects of ICT that have an impact to the user <p>Mobile application</p> <ul style="list-style-type: none"> Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators) <p>None. Families with children are usually not expected to experience difficult understanding of using mobile apps.</p> <ul style="list-style-type: none"> Envisaged risks of digital exclusion (short description and considerations about any potential risk) <p>None envisaged</p>
CRITERIA 09: Enabling factors
<p>The service is today available thanks to new ICT possibilities (mobile apps, route planning systems).</p> <p>Funds were available thanks to crowdfunding platforms like iFundWomen (iFundWomen, n.d.).(GoKid – The Complete Carpool Solution n.d.). The project received other funding afterwards and the current investors includes: Village Capital, Inmotion VC (Jaguar Land Rover's Vc arm), Deutsche Bahn Digital Ventures, Techstars ('GoKid Carpool App', n.d.)</p>
CRITERIA 10: Scalability
<p>GoKids is a mobility solution for schools of any size connecting families within a school or school district through a secure website. Applicability in different areas can be intended always as limited to the school or institute or geographical area.</p>

The company anyway has plans to expend to support leagues, corporates and events (GoKid, 2016)(GoKid Pitch at Techstars Mobility Demo Day, 2016 2016) and this may require scaling up the ICT tools and deploying infrastructure

CRITERIA 11: Opportunities and limits

No context conditions seems to be an obstacle to transfer the case.

The GoKid app and GoKid Connect platform have been developed around the well-known carpooling concept and with specific requirements and features as key pre-requisites. The experience gained in the field allowed to refine and improve the product and these are the conditions for its success.

6.8 Green Move

Green Move
PART I – General information
Short description of the initiative
<p>Green Move is a project focused on sustainable mobility developed by the Milan Polytechnic and co-funded by the Lombardy Region with the aim of devising and testing a new car sharing system for the Milan area. The project developed an innovative vehicle sharing system based on light electric vehicles suitable for urban / metropolitan use together with methods and tools (including many ICT tools) for monitoring and profiling the service parameters in various situations and configurations of the service itself. The usual paradigm “from ownership to usage” was then defined with a number of precise indicators for different schemas of vehicle sharing.</p> <p>The pillars of the service are:</p> <ul style="list-style-type: none"> • Intramodality: integration of more modes of transport than the traditional ones provided in most sharing systems (car and bike for instance). • Multi-business and Multi-owner: thanks to a standardized way of joining the service, alternative and additional solutions can be integrated. Anyone meeting the requirements can join and share their private electric car or fleet allowing multiple possibilities. • Mobility credits: profiling the user behaviour allow to set up a credits system that can incentivize virtuous behaviour. <p>The project developed outcomes, ideas and recommendations synthesised with more details in Lué et al 2012 and the project website http://gm.polimi.it/ which includes the following:</p> <ul style="list-style-type: none"> • Interoperability and integration with other modes of transport are needed for an effective overall mobility offering and solution.

- Flexible tariffs address the different user profiles and needs
- Balanced vehicle types and geographical distribution of the fleet allow flexible schemas (like one-way trips)
- Peer-to-peer, community-based and company sharing schemas can be integrated (for example by taking advantage of social networking facilities)
- Flexible, online booking system must be in place to ease the service usage

Economic sustainability can benefit from multi-business and social economy elements which are in turn enabled by strong (ICT) elements of standardization and interoperability of the interfaces and communication and operations in the vehicle fleet.

This make the system configurable as a public service or standard for a city. The vehicle sharing solutions (like the condominium car sharing) may be adopted for instance as additional services or facilities when new condominiums are built.

Level of maturity

The project is concluded and produced concrete outcomes and studies.

Main ICT elements / features

Interoperability is a key requirement at all levels. Every vehicle must comply with a shared and **standardized** protocol, which allows it to enter the network (the sharing system) and ensure complete interoperability Building the system on platforms and technologies as open as possible and standard (therefore independent from specific suppliers) is the ideal solution. Whenever there are no standard procedures enabling interaction with the vehicle independently of the manufacturer the possibility of involving vehicle manufacturers in the development becomes fundamental.

The interoperability requirements applies to the **charging/docking stations** as well. Standardization of recharge: The interfaces (computer, electrical, mechanical) should be completely interoperable so that each vehicle can be hooked to each docking station. The telematic management of the service and the tariffing allow flexible and coherent way of managing all the sub-groups. Standardization here is in the interest of both of vehicle manufacturers and electricity suppliers.

ICT must also allow an easy **(re)-configuration** of the system not only because of the technological innovation itself but also in relation to new emerging needs and preferences of the actors (users, institutions, vehicle suppliers) or the evolution of legislation.

The strong distribution and continuous interactions between connected components via telematic networks requires designing it by keeping in mind **security and robustness** issues: opportunities for exposing the system to cyber attacks for example must be minimized and functionalities or services that are not useful for the system or for users are avoided. The software and vehicle devices must be robust also from a physical point of view, given the potentially non-optimal environmental conditions (very high or very low temperatures, adverse weather conditions, humidity, etc.).

Finally, accessing the system using only the **users' personal device** is today a must have feature.

The key ICT component developed is the *Green e-box* installed on the vehicle which allow communication between vehicle and the system. Onboard an Android based system allow communication with the user.

The data processing includes info on driving habits are includes charge status, GPS position and other. The dataset is sent to the central system for processing and are also available onboard.

Thanks to a website the user is able to make registration and request a vehicle. A mobile app allow to obtain an e-ticket suitable for using the vehicle and provides additional functions like opening and closing the doors of the car (even without internet connection) which overcomes the problem of exchanging keys with other users when the vehicle is shared. The system monitor the fleet even if they are not in use (e.g. to prevent thefts).

The collected data can be used to generate other datasets like real time traffic.

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive***
- Radical***
- Sustained***
- Technical/incremental***

ICT provides the necessary means to setup the service and to obtain the interoperability which is the basis for cooperation between all parties and stakeholders involved in the process.

CRITERIA 02 - elements of social innovation

- Need-driven / outcome-oriented production***
- Open process of co-creation/collaborative innovation***
- Fundamental change in the relationships between stakeholders***
- Public value allocation and/or re-allocation***

CRITERIA 03 - Levels of governance of service integration

- Isolated.***
- Intra-governmental integration.***
- Inter-governmental integration***
- Inter-sectoral integration.***
- Pervasive.***

CRITERIA 04 - Types of service integration
<ul style="list-style-type: none"> <input type="checkbox"/> <i>Funding;</i> <input type="checkbox"/> <i>Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;</i> <input checked="" type="checkbox"/> <i>Organisational</i> <input type="checkbox"/> <i>Service delivery</i>
CRITERIA 05 - Service improvements and progress
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>improving access and take-up of services,</i> <input checked="" type="checkbox"/> <i>increasing the quality of the services provided</i> <input checked="" type="checkbox"/> <i>improving cost-effectiveness</i> <p>Open innovation:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> <i>sharing</i> <input checked="" type="checkbox"/> <i>cooperation</i> <input checked="" type="checkbox"/> <i>plurality of participants</i> <input checked="" type="checkbox"/> <i>self-organisation</i> <input checked="" type="checkbox"/> <i>decentralization</i>
CRITERIA 06: Actors and user needs
<p>Vulnerable User Groups: Thanks to scalable and flexible sharing, vehicle and tariff schemas, the service is suitable to address transport poverty for all vulnerable users who are in condition to drive or to bike among the groups identified in INCLUSION.</p> <p>Operator's needs: No specific operator needs are addressed</p>
CRITERIA 07: Prioritized areas
<p>The system is suitable for metropolitan areas where for example there are the conditions to realize multiple sharing schemas like to one way trips and obtain at the same time a good balance in terms of number of vehicles available in the different zones.</p>
CRITERIA 08: Acceptance of ICT
<ul style="list-style-type: none"> • Aspects of ICT that have an impact to the user <p>The user of the service interacts with ICT tools in almost all stages of service usage from booking to vehicle usage.</p>

- Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators)

The ICT tools are easy to use. Their complexity isn't higher than those found in common everyday-use web-based or mobile-based tools.

- Envisaged risks of digital exclusion (short description and considerations about any potential risk)

The service usage requires a minimum of skill with common ICT tools (mobile apps etc. see previous point). Therefore if a person is not able to use these tools autonomously it may be excluded.

CRITERIA 09: Enabling factors

The service can potentially become a standard for vehicle sharing in cities. Intra-governmental regulatory frameworks are then needed to regulate the operations. Peer-to-peer vehicle sharing, partially based on social networking is an example of situation requiring a well-established normative framework.

In general in GreenMove various business models can coexist within the designed system and different users/stakeholders can be involved in the economic participation: car manufacturers, private companies, service providers, citizens.

For example: vehicles can be made available (for a fee):

- by a municipality for its own citizens,
- by a company for its employees (for trips between locations or for station-company connections), vehicles
- by an airport vehicle-rental company,
- by a hotel or by a fair body to its customers, etc.

Each actor can be free to purchase the vehicles (on which he imposes his own restrictions and tariffs) and to contribute to the network; the requirement is be part of "Green Move compliant" vehicle and recharging station interoperability standard, with connection and coordination with the management system.

In this way each actor maximizes the benefit for his own user / client, supporting only a small part of the entire system investment. GreenMove then provides social innovation with collaborative economic involvement. Multiple and flexible tariff schemas can be defined and applied depending on user preferences and needs (e.g. tariffs by mileage, by usage time, subscription etc.). The different sharing schemas (peer-to-peer or small scale like condominium or company share) can also have dedicated tariffs.

CRITERIA 10: Scalability

- Technologically the system has been fully developed and proved to be ready to use. Its scalability may just require infrastructural empowerment of the centralized management system.

- From the point of view of the technology and service operations the service is fully transferable in other cities. In this case the uncertainty related to the regulatory framework remain.

CRITERIA 11: Opportunities and limits

- Service schemas like GreenMove per se have a lot of potential to provide alternative and inclusive transport solutions. When combined with other modes of transport, the possibilities, advantages and opportunities are certainly higher. In that respect it seems a great opportunity to realize integration schemas (like the provision of e-cards for usage) from the ICT, organizational and normative perspectives of the different transport modes in the city. Similar experiences already exists (Reading EasyGo, Italy's Arezzo Card and other).

6.9 Moosdorf Macht Mobil

PART I – General information

Short description of the initiative

The municipality Moosdorf with 1636 inhabitants as of 1 January 2017 (Wikipedia, Moosdorf) is located in Upper Austria. Moosdorf realized the MOOSDORF MACHT MOBIL project for electromobility operated by volunteer drivers between the various districts of Moosdorf that are not accessible by conventional public transport services. The service permits people who don't own a vehicle to make trips to doctors, authorities, participate in local events and make any other social activity that requires transportation from home to the place where this activity is achieved.

The initiative came from the very limited number of public transportation services connecting the main village of Moosdorf with the main transport hubs and regional centres and by a lack of connections between the different hamlets of the municipality. Visits to doctors, supply of basic necessities at stores but also participation in social events and journeys to the workplace became very difficult and the Moosdorf community were at risk of transport poverty. To face this situation and looking at successful "Citizens' bus" initiatives in other parts of Central Europe, in 2011 the major of the village launched an initiative to support public and promoted a survey to identify exactly the different needs.

At the end of 2012 the no-profit association MOOSDORF MACHT MOBIL (= "Moosdorf mobilizes") was founded and an electric vehicle was purchased. The association has now more than 300 members, representing approx. 20% of total population of the community (SI-DRIVE, 2017). The initiative is sustained by social capital in terms of human resources (about 30 drivers) offering their availability on a volunteer basis. The electric vehicle is

recharged through a photovoltaic plant in the village and is shared among the community. Drivers are available on demand depending on the necessities of the people especially those mobility impaired⁵.

The initiative received public funding from the state of Upper Austria through the regional Agenda 21 Network action program and is currently supported by the company's sponsors and the municipality of Moosdorf. People using the service must be members of the association and pay a small fee per trip which depend on the trip distance (Salzburgwiki)

Moosdorf Macht Mobil, also referred as Dorfmobil in more recent years has been a very interesting social project. However, between 2016 and 2017 the Braunau Department of Trade and Industry drew the attention on it starting from an initiative of the Chambers of Commerce in Braunau and Linz. The authority came to the assumption that a trade-legal problem exists and an administrative penalty was filed with the charge of "commercial exercise of the taxi business without a license" against which an appeal was afterwards raised.

(Moosdorf live 2017). Eventually, the association successfully made clear that the initiative does not harm the business interests of the members as there is not enough "market demand" for a profit-based taxi or similar business given the number of participants. (SI-DRIVE, 2017). The users must anyway be members of the association to benefit of the services in the form of mutual support.

Moosdorf Macht Mobil represents one of the first examples of community-driven/social mobility service out of the conventional schemes but in that respect, it faced normative controversies as other similar and bigger initiatives in recent years.

The initiative doesn't make an heavy use of technological solutions for the management of the service. The ICT aspects are limited to the car being electric and recharged through photovoltaic panels. Nevertheless, it is interesting to examine which ICT-related aspects must be considered to support a scaled up initiative of this type which revealed to be, in its current scale, very effective.

Screenshots / Pictures

⁵ The car is also suitable for transportation of wheelchairs (Kommunalnet 2013)



Figure 20 – inauguration of the initiative

Source: Salzburgwiki.at published under the GNU Free Documentation License

Level of maturity

Mature, operated since 2013

Main ICT elements / features

Use of electric car recharged through photovoltaic panels

Bookings and requests made by phone and email

Manual (human) arrangements of reservations (no ICT tool for combining trip requests)

Manual (human) management of battery charge

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive*
- Radical*
- Sustained*
- Technical/incremental*

CRITERIA 02 - elements of social innovation
<input checked="" type="checkbox"/> <i>Need-driven / outcome-oriented production</i> <input checked="" type="checkbox"/> <i>Open process of co-creation/collaborative innovation</i> <input type="checkbox"/> <i>Fundamental change in the relationships between stakeholders</i> <input type="checkbox"/> <i>Public value allocation and/or re-allocation</i>
CRITERIA 03 - Levels of governance of service integration
<input checked="" type="checkbox"/> <i>Isolated.</i> <input type="checkbox"/> <i>Intra-governmental integration.</i> <input type="checkbox"/> <i>Inter-governmental integration</i> <input type="checkbox"/> <i>Inter-sectoral integration.</i> <input type="checkbox"/> <i>Pervasive.</i>
CRITERIA 04 - Types of service integration
<p>(from non-ICT point of view)</p> <input checked="" type="checkbox"/> <i>Funding</i> <input type="checkbox"/> <i>Administrative</i> <input checked="" type="checkbox"/> <i>Organisational</i> <input checked="" type="checkbox"/> <i>Service delivery</i>
CRITERIA 05 - Service improvements and progress
<input type="checkbox"/> <i>improving access and take-up of services,</i> <input checked="" type="checkbox"/> <i>increasing the quality of the services provided</i> <input checked="" type="checkbox"/> <i>improving cost-effectiveness</i> Open innovation: <input checked="" type="checkbox"/> <i>sharing</i> <input checked="" type="checkbox"/> <i>cooperation</i> <input type="checkbox"/> <i>plurality of participants</i> <input checked="" type="checkbox"/> <i>self-organisation</i> <input checked="" type="checkbox"/> <i>decentralization</i>
CRITERIA 06: Actors and user needs
Vulnerable User Groups <ul style="list-style-type: none"> • <i>Mobility-restricted/Mobility impaired</i> • <i>Part-time workers like women with children</i> • <i>Adults+children/dependent adults</i>

<p>Operator's needs: <i>none</i></p>
<p>CRITERIA 07: Prioritized areas</p>
<ul style="list-style-type: none"> • Remote Rural • Very remote Rural
<p>CRITERIA 08: Acceptance of ICT</p>
<ul style="list-style-type: none"> • No issue of acceptance because of no use of ICT client-side (except for some bookings sent via email)
<p>CRITERIA 09: Enabling factors</p>
<p>The initiative seems very tailored to the local needs and it has been developed over the years within a very precise, limited dimension of association with volunteer persons. This factor let the initiative to stay alive.</p> <p>The main enabling factor is the interest and work of local authority together with the population both in terms of co-creation of the service and execution (volunteers committed in offering their free time for the community). Local councils are very interested but the provincial government stayed cautious until it became clear that there was no conflict of interest with the commercial services. The Upper Austrian Government provided financial support for purchasing the electric vehicle and the national level functioned as additional enabling environment mainly through funding programmes (SI.DRIVE, 2017).</p> <p>A different dimension and organization would have probably caused legal, economic and managerial changes.</p>
<p>CRITERIA 10: Scalability</p>
<p>The project is mature since it started in 2013 and ran over all these years. Furthermore, the legal issues successfully encountered over the last years have proven the status of the initiative as small-scale no-profit transport sharing scheme.</p> <p>It seems not interesting for the promoters of Moosdorf Macht Mobil to scale up the service given its limited scope and purposes. In general terms, the type of initiative as volunteer-based sharing transport, is suitable to be scaled up to a very large shared transport scheme like Uber and Lyft which requires evidently a scale up in terms of management, organization, ICT-support and transport fleet.</p>

CRITERIA 11: Opportunities and limits
The initiative is very well suited for the needs of the community. The opportunities are related to the scalability of the project which would imply anyway its transformation into a completely different of offerings that seems not of interest for the current users.

6.10 Mobipunt

Mobipunt
A Transport Hub based at a neighbourhood level.
PART I – General information
Short description of the initiative
<p>The hub is designed to enable and promote multimodal transport at a neighbourhood level by allowing linkage of different sustainable and shared transport modes.</p> <p>The main function of a mobihub is mobility. However, other services could also be included:</p> <ul style="list-style-type: none"> • To provide opportunities for people to access information about neighbourhood activities. • As a meeting point • To provide mobility food units • To act as a delivery and collection points for parcels • To provide locker and storage facilities for bike helmets when using shared cars <p>Depending on the features and needs of a neighbourhood, the mobihub may also be useful to apply to business parks, shopping areas or housing projects.</p> <p>https://www.taxistop.be/wp-content/uploads/2017/09/MobiPunt-English.pdf?x55348</p>
Screenshots / Pictures



Figure 21: Mobipunt

Source: TaxistopAutodelen, 2018
<https://www.taxistop.be/wp-content/uploads/2017/09/MobiPunt-English.pdf?x55348>

Level of maturity

The concept has been developed as part of the Interreg North Sea Region Project Share-North and is co-financed by the Province of East Flanders.

The whole concept is a result of the international collaboration between industry experts and professionals as part of the Share-North consortium, providing a valuable platform in which to share experiences and ideas about shared mobility.

There are already two cities with policies on “Mobihubs”: Bremen and Bergen. The Share-North project includes sharing and transferring knowledge between these two cities.



Mobihub Bremen



Mobihub Bergen

Figure 22: Mobihub pilots

Source: TaxistopAutodelen, 2018 -<https://www.taxistop.be/wp-content/uploads/2017/09/MobiPunt-English.pdf?x55348>

Currently in Flanders there are already many carsharing stations with additional features, which are essentially mobihubs. However, there is little recognition of the mobihub concept, both for city planners and users.

Main ICT elements / features

Essential Functions:

- Carsharing parking lots. These carports would provide protection from the weather and should consider incorporating green technologies such as solar panels.
- Bicycle parking.
- Public Transport stop accessible for people with reduced mobility.
- Quality (LED)-lighting.

Extra Mobility Functions:

Bikesharing docks: with company bikes for work, or private use and also electric bikes and speed pedelecs.

- EV-charging: for cars and/or scooters or bicycles (E-wall).
- Kiss and ride zone and/or a lane for taxis and carpooling.
- Signage for hiking trails and cycle routes.
- Safe places to store (expensive) bikes.
- Public bicycle pump.
- Distribution point of prams.

Extra comfort:

- Bench/table.
- Bins and local recycling points.
- Shelter for carpoolers and users of PT.
- Drinking water supply unit.
- Public toilets.
- Rumble strip/rod safety features to aid visually impaired blind people.
- WiFi.

Additional features:

- ShareLocks.
- Cooled Lockers.
- Closet for free books.
- Digital notice board.
- Charging points for smartphones.
- Integration of green technologies on shelters and around the MobiHub.
- Mailbox.
- Distribution of free papers.

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive*
- Radical*
- Technical/incremental innovation*
- Sustained*

ICTs Supports and facilitates or complements existing processes to improve public transport accessibility for people with disabilities and young or old people.

CRITERIA 02 - Elements of social innovation

- Need-driven / outcome-oriented production*
- Open process of co-creation/collaborative innovation*
- Fundamental change in the relationships between stakeholders*
- Public value allocation or re-allocation*

CRITERIA 03 -- Levels of governance of service integration

- Isolated*
- Intra-governmental integration*
- Inter-governmental integration*
- Inter-sectorial integration*
- Pervasive*

CRITERIA 04 - Types of service integration

- Funding;*
- Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;*
- Organisational*
- Service delivery*

CRITERIA 05: Service improvements and progress

- improving access and take-up of services*
- increasing the quality of the services provided*
- improving cost-effectiveness*

Open innovation:

- sharing*
- cooperation*
- plurality of participants*
- self-organisation*
- decentralization*

Mobipunt facilitates and promotes multi-modal transport. Its functions are location dependent, so a mobipunt in a residential neighbourhood will look different from one based in a business area.

CRITERIA 06: Actors and user needs

Vulnerable User Groups

The target vulnerable groups for Mobipunt are:

- People from the neighbourhood where the Mobipunt is based.

Operator's needs:

- Guarantee cost efficiencies in service provision
- Identify suitable/improved technical support systems according to service scheme to be operated
- Integration with other modes/routes
- Ability to expand coverage area in a sustainable way

CRITERIA 07: Prioritized areas

The main target is any neighborhood that would like to have a transport hub to promote and engage users to use shared transport and other sustainable transport modes.

CRITERIA 08: Acceptance of ICT

- **Aspects of ICT that have an impact to the user:**

To understand the different mobility options that the user has when he is planning to do a trip.

- **Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators):**

Mobihubs provides information and technical support to explain how the user can use the technology.

- **Envisaged risks of digital exclusion (short description and considerations about any potential risk):**

Not relevant.

CRITERIA 09: Enabling factors

Operation/management: Taxistop and Autodelen.net launched the MobiPunt on September 2017.

Marketing and promotion: The work to develop the concept, logo, illustrations and further promotion is part of the Interreg North Sea Region Project Share-North and is co-financed by the Province of East Flanders.

The Share-North project includes sharing and transferring knowledge between the cities of Bremen (Germany) and Bergen (Norway). Both cities currently have a policy on 'Mobihubs'.

Since January 2018, the Flemish Department of Mobility and Public Works has been granting a project subsidy to further expand the concept of mobipoints both substantively and physically.

CRITERIA 10: Scalability
<ul style="list-style-type: none"> • Current scale: The technology maturity is a prototype. Today there are Mobihubs in Bremen and Bergen and there are also other car sharing locations in several Flemish cities that also connect with other modes of transport and are potential future Mobipoints. • Aspects of scalability (spatial, users, technology): The future scalability potential of Mobihub will depend on the Mobihubs' policies designed in each city. • Replicability/transferability level/potential: Very easy to replicate.
CRITERIA 11: Analyse the opportunities and limits
<p>Enhancements / Extensions: Increase accessibility to Transport.</p> <p>Limits of the initiative: There is not info available regarding the economic viability of Mobipunt.</p>

6.11 Mon Chaperon

Mon Chaperon
PART I – General information
Short description of the initiative
<p>Traveling alone in certain areas of a city and hours of the day can make travellers feeling unsafe, especially when walking and this creates conditions of exclusion from some traveling modes and options.</p> <p>Mon Chaperon is a mobile app that helps people to find a companion for their pedestrian travel to make it more enjoyable and safe thus regaining more flexibility in terms of locations and travelling time.</p> <p>Once registered to the system, users can indicate additional information about their profile to increase their reputation. The request for a companion is formulated by indicating the starting point, destination and time of the trip. Based on answers received from other members the user can choose the preferred companion and achieve the final agreements by means of the internal messaging facilities.</p> <p>The trip can be then made together. Optionally, one can decide to be alone and ask the companion to follow and keep an eye on him at a certain distance.</p>

It is possible to share live information on the journey in progress. Relatives or other members of the community can be notified about arrival and departure time and location. The user can be localized in real time thanks to the GPS position. In emergency situations a notification can be sent to the companion or to other members of the community present in the neighbourhoods. A direct call to the Police is also possible.

Review, rating & user experience functions are available to leave opinions and recommend travel companions to other members. A status is associated with the user profile depending on the number of travels together made.

It is also possible to become a “professional” traveling companion who will get paid at a certain rate for the service. All payments are made online in the application.

Mon chaperon PRO is a dedicated offer tailored for companies and organizations that helps employees travelling together by reducing the stress, isolation and lack of flexibility in terms of working hours due to traveling constraints. The offer includes a customized website, a first-matching system between collaborators, the possibility to travel as groups, a forum and other features.

Level of maturity

The system is in production

Main ICT elements / features

The system uses web technologies and mobile apps.

It includes iOS and Android apps, database and backend systems for the management of the users, the execution of algorithm for user matching, the notification via SMS, the availability of other features (like discussion forum etc).

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive*
- Radical*
- Sustained*
- Technical/incremental*

CRITERIA 02 - elements of social innovation

- Need-driven / outcome-oriented production*
- Open process of co-creation/collaborative innovation*
- Fundamental change in the relationships between stakeholders*
- Public value allocation and/or re-allocation*

The system has been designed from concrete security needs.

Added (re-allocated) flexibility on terms of time and travelling options can be obtained as a result of using the system.

CRITERIA 03 - Levels of governance of service integration

- Isolated.*
- Intra-governmental integration.*
- Inter-governmental integration*
- Inter-sectoral integration.*
- Pervasive.*

CRITERIA 04 - Types of service integration

- Funding;*
- Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;*
- Organisational*
- Service delivery*

CRITERIA 05 - Service improvements and progress

- improving access and take-up of services,*
 - increasing the quality of the services provided*
 - improving cost-effectiveness*
- Open innovation:
- sharing*
 - cooperation*
 - plurality of participants*
 - self-organisation*
 - decentralization*

CRITERIA 06: Actors and user needs

- Vulnerable User Groups:

Women, all persons feeling unsafe during their travel.

- Operator's needs:

Engage more potential users of PT

CRITERIA 07: Prioritized areas
Urban/peri-urban areas
CRITERIA 08: Acceptance of ICT
<ul style="list-style-type: none"> Aspects of ICT that have an impact to the user Users must be able and willing to use mobile applications. Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators) Standard mobile app interfaces Envisaged risks of digital exclusion (short description and considerations about any potential risk) None except the requirement of being able to interact with a mobile app.
CRITERIA 09: Enabling factors
Mon Chaperon runs as an autonomous system where people is able to request and offer their availability and time to be a travel companion of other people. The system handles personal data and therefore it complies with the related normative.
CRITERIA 10: Scalability
<ul style="list-style-type: none"> Status and maturity The system is mature and has reached more than 6000 users in February 2018 ('Midilibre.fr', 2018) Current scale The system is currently available in France Scalability (geographic, in terms of users, technological), Evaluation of replicability and transferability No issues seem to exist in terms of scalability of this solution as long as the accompanying technology is dimensioned accordingly. Replicability and transferability As long as the normative constraints (privacy) are bound, initiatives of co-traveling seem not to be affected by particular constraints.

CRITERIA 11: Opportunities and limits
<ul style="list-style-type: none"> • Limits of the initiative: none specifically • Enhancements / Extensions that may provide further value or increase the effectiveness of the elements described in Criteria 02: none

6.12 MoveUs Project

MoveUs Project – Traffic feedback from citizens rewarded with incentives
PART I – General information
Short description of the initiative
<p>MoveUs is a FP7 Project ended in 2016 that aimed at changing the European users’ mobility habits by offering intelligent and personalized travel information services, helping people to decide the best transport choice and providing meaningful feedback on the energy efficiency savings obtained as a result.</p> <p>Recommendations supported by incentives are provided to foster ‘soft’ mobility modes and the use of shared and public transport modes like buses.</p> <p>The Traffic Feedback service allow citizens to provide information (feedbacks) on traffic situations observed on the road. These are notified to a traffic information center (TIC) that filters, validates and uses them to improve the existing information offering.</p> <p>The validation of feedbacks is achieved with dedicated administration tools by filtering and comparing entries coming from more users either geographically and in terms of time.</p> <p>Users who sent feedbacks and whose feedbacks are validated are rewarded with a number of incentives according to the mechanisms and policies established in the project</p>
Screenshots / Pictures

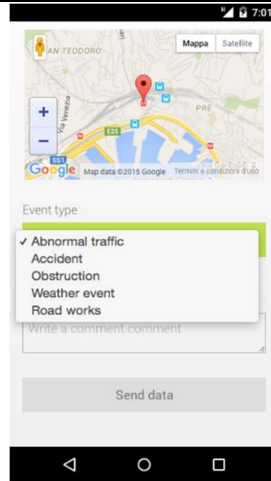


Figure 23 - Traffic feedback sent through mobile app

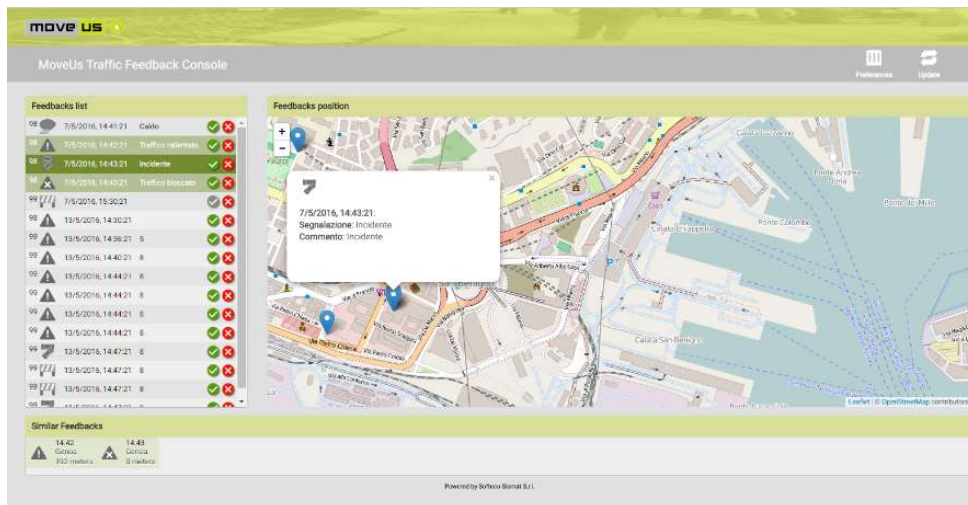


Figure 24 - Traffic feedback console

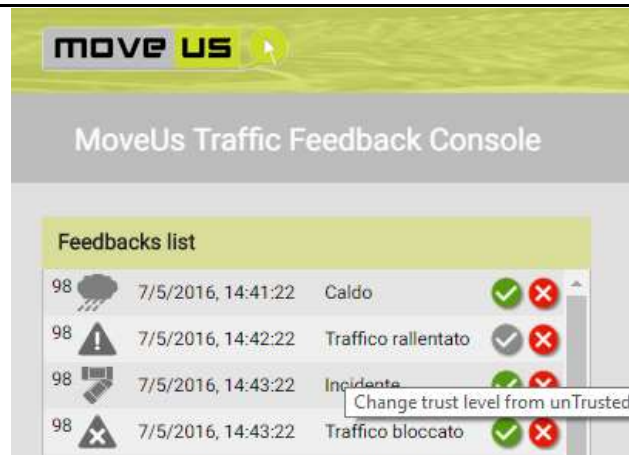


Figure 25 – Validation of a feedback

Level of maturity

Research Project (FP7)

Main ICT elements / features

Personal devices (mobile apps), web apps for the Operators

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive**
- Radical**
- Sustained**
- Technical/incremental**

CRITERIA 02 - Elements of social innovation

- Need-driven / outcome-oriented production**
- Open process of co-creation/collaborative innovation**
- Fundamental change in the relationships between stakeholders**
- Public value allocation and/or re-allocation**

CRITERIA 03 - Levels of governance of service integration
<input checked="" type="checkbox"/> <i>Isolated.</i> <input checked="" type="checkbox"/> <i>Intra-governmental integration.</i> <input type="checkbox"/> <i>Inter-governmental integration</i> <input type="checkbox"/> <i>Inter-sectoral integration.</i> <input type="checkbox"/> <i>Pervasive.</i>
CRITERIA 04 - Types of service integration
<input type="checkbox"/> <i>Funding;</i> <input type="checkbox"/> <i>Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;</i> <input checked="" type="checkbox"/> <i>Organisational</i> <input checked="" type="checkbox"/> <i>Service delivery</i>
CRITERIA 05 - Service improvements and progress
<input type="checkbox"/> <i>improving access and take-up of services,</i> <input checked="" type="checkbox"/> <i>increasing the quality of the services provided</i> <input type="checkbox"/> <i>improving cost-effectiveness</i> Open innovation: <input checked="" type="checkbox"/> <i>sharing</i> <input checked="" type="checkbox"/> <i>cooperation</i> <input checked="" type="checkbox"/> <i>plurality of participants</i> <input checked="" type="checkbox"/> <i>self-organisation</i> <input checked="" type="checkbox"/> <i>decentralization</i>
CRITERIA 06: Actors and user needs
Vulnerable User Groups None Operator's needs: Operate viable services in a sustainable way
CRITERIA 07: Prioritized areas
No Prioritized area addressed specifically

CRITERIA 08: Acceptance of ICT
<ul style="list-style-type: none"> • Main aspects of ICT for the user: mobile apps • Ease of use: medium/easy • Risk of digital exclusion: none
CRITERIA 09: Enabling factors
<ul style="list-style-type: none"> • Economic sustainability: the main challenge is related to the provision of incentives. The private sector can help • Mechanism for long-term viability: Authorities should make sure that public/private engagement (and possible partnerships) exist to ensure the provision of incentives. The incentive provision technological platform can be operated by a private IT operator or licensed to the authority. • IP / patents etc. Incentive provision technological platform patented/to be licensed. • Rol plans & experience: transferability of the experience can generate RoIs thanks to consultancy/technical maintenance.
CRITERIA 10: Scalability
<ul style="list-style-type: none"> • Current scale: Experimental / applied to a restricted test group • Aspects of scalability (spatial, users, technology): Scalable to regional/national level. Need scalable system architecture to suit the needs of more users • Replicability/transferability level/potential: good
CRITERIA 11: Opportunities and limits
<p>Enhancements/Extensions: incentive mechanism applied to other modes of transport and citizen's behaviours</p> <p>Other initiatives/ideas/concepts: derived from the above extensions</p>

6.13 Sommobilitat.coop

Sommobilitat.coop
PART I – General information
Short description of the initiative
<p><i>Som Mobilitat</i> is a non-profit consumer cooperative that offers mobility products and services to accelerate the transition towards a more sustainable mobility so that we can ensure that we generate an economy at the service of People and not vice versa.</p> <p>The first offered service consists of a rental service of electric cars (car-sharing). These cars can be either owned by the cooperative or by individuals, enterprises and public institutions (p2p). Vehicles can be used by means of accessing a digital platform (using a web-app) that allows you to make reservations, open and close the vehicle.</p> <p>In addition, this cooperative is working to incorporate new sustainable mobility services to the platform, such as bike-sharing, motorbike-sharing or car-pooling and ride-sharing. And our future aim is set on the autonomous vehicle as shared resource.</p> <p>https://www.youtube.com/watch?v=7GUEB-P0uV0</p>
Screenshots / Pictures

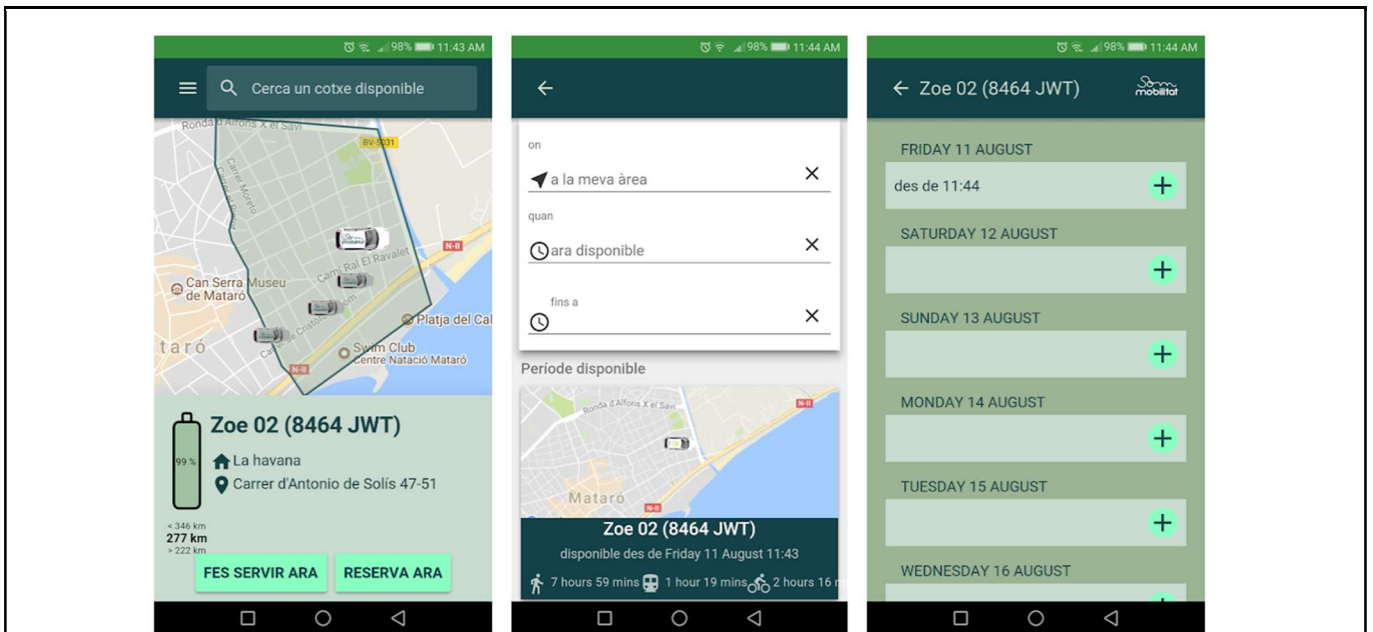


Figure 26: Sommobilitat App

Source: (Sommobilitat, 2018b)
https://play.google.com/store/apps/details?id=coop.sommobilitat.carsharing&hl=en_US

Level of maturity

It is an existing non-profit cooperative that is working on a **network at European level** to share good practices and resources with other sustainable mobility cooperatives to collaboratively face the global challenges of mobility and at the same time to build a social model that is a successful alternative to profit-oriented, private and vertical mobility proposals that are being implemented throughout Europe. In order to do so, they have created the first network of mobility cooperatives in Europe called **REScoop Mobility**, under the umbrella of the REScoop.eu cooperative federation.

Main ICT elements / features

Personal devices (mobile apps: vehicles locations, vehicles unlockers):

Individual Users:

- The user looks for an available vehicle and books for it through the App
- Tariffs 5€/h or 50€/day
- Unlocking the vehicle through the app

Companies:

- The service includes the mobility access, tolls and parking costs
- Possibility to renew the vehicles fleet of the organization with private sharing services
- The company can offer (to rent) the vehicles to the community when they are not using them.

- Pay per use: per hour, per month, fixed days
- Unique Monthly payment for all the services

City Councils:

- The city councils can increase the mobility options of their town/city.
- The mobility services are placed in neighbourhood parkings.
- The use of sharing vehicles are always go-return trips.
- The city council can offer the municipal fleet vehicles to the citizens during non-working hours.

PART II – Analysis and Classification

CRITERIA 01 - potential of ICT-enabled innovation

- Disruptive:** *new services or new mechanisms for service delivery are created based on ICTs*
- Radical**
- Technical/incremental innovation**
- Sustained**

CRITERIA 02 - elements of social innovation

- Need-driven / outcome-oriented production**
- Open process of co-creation/collaborative innovation**
- Change in the relationships between stakeholders**
- Public value allocation and/or re-allocation**

CRITERIA 03 - Integration

At governance level:

Pervasive – Service integration beyond traditional boundaries of administrative/operational integration, new modus-operandi where service providers and beneficiaries co-produce services innovating delivery mechanisms and reallocating resources/roles to maximise public value creation

At functional level:

Funding (<https://www.goteo.org/project/posem-en-marxa-som-mobilitat-a-barcelona>) - Crowdfunding to purchase new e-vehicles for the cooperative. € --> mobility hours

CRITERIA 04 - Service improvements and progress

- improving access and take-up of services,*
- increasing the quality of the services provided*
- improving cost-effectiveness*

Open innovation:

- sharing*
- cooperation*
- plurality of participants*
- self-organisation*
- decentralization*

CRITERIA 05: Actors

- **Beneficiaries of the initiative:** Partners of the cooperative
- **Intermediary actors:** cooperative, city councils, companies
- **Stakeholder/enabler:** CPO, public parkings,

CRITERIA 06: Assessment vs the INCLUSION context parameters

Vulnerable User Groups

Young adults and adults with low income level

Native or Migrants

Students or non-students

Single or Adults + children

Employed, Unemployed or retired

Operator's needs:

Operate viable services in a sustainable way

CRITERIA 07: Acceptance of ICT
<ul style="list-style-type: none"> • Main aspects of ICT for the user: Mobile Apps • Ease of use: Easy • Risk of digital exclusion: None
CRITERIA 08: Economic impact
<ul style="list-style-type: none"> • Economic sustainability: Crowdfunding initiatives to purchase new vehicles • Mechanism for long-term viability: Increasing number of cooperative partners • IP / patents etc. • Rol plans & experience: New roles in the cooperative and Local groups of the cooperatives to decide the future of the mobility services
CRITERIA 09: Scalability
<ul style="list-style-type: none"> • Current scale: Experimental – Already in 4 cities • Aspects of scalability (spatial, users, technology): Scalable to regional/national/international level. • Replicability/transferability level/potential: good
CRITERIA 10: Analyse the opportunities and limits
<p>Enhancements, extensions and other initiatives, ideas and concepts: To design different Business Models based on social innovation to be able to integrate other sustainable modes of transport and offer them, to different stakeholders (City Councils, private users, private companies, associations, public entities, etc.). Some of these ideas can be designed based on the proactive input of Local Groups (through the App, with Local Assemblies, Surveys, Workshops, etc.)</p>

6.14 Wher

WHER
PART I – General information
Short description of the initiative
<p>Wher is a mobile app that addresses the mobility needs of the women and is contributed by women themselves who, based on their experience, reviews the streets of cities suggesting the best and safest route. The app, similarly to Mon Chaperon, is the front-end of a socially-run service for the improvement of travel safety in certain conditions and times of the day.</p> <p>Based on such crowd-sourced data, mostly indicating the safety perception, the streets of the city are classified and coloured accordingly. Comments and suggestions can be indicated and made available to the public. The app also includes a collection of pertinent Point of interest like bus stops (with information on Public Transport service), pubs and clubs with opening hours, taxi and pink parking areas, 24/7 shops, etc. This information is particularly useful to improve the safety perception when travelling in unfamiliar cities or areas i.e. when traveling for work, education or tourism.</p> <p>Users can access with their Facebook profile and can connect to a Wher Facebook Community. Once logged in, users can create their own profile by describing their travel needs and selecting the city. The customized information includes the description of the different city areas and those considered safer. Detailed information is available by day period (day, evening, night) and is based on the combination of several objective parameters (brightness, crowding level, etc.) as well as subjective parameters (safety perception, emotions perceived when the woman was there, etc.), provided by the Community.</p>
Level of maturity
The app is in production
Main ICT elements / features
The app uses crowd-sourced data collection tools and techniques and use Open Data published on the web. The Wher APP is available on Android and iOS version.

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

- Disruptive*
- Radical*
- Sustained*
- Technical/incremental*

CRITERIA 02 - elements of social innovation

- Need-driven / outcome-oriented production*
- Open process of co-creation/collaborative innovation*
- Fundamental change in the relationships between stakeholders*
- Public value allocation and/or re-allocation*

CRITERIA 03 - Levels of governance of service integration

- Isolated.*
- Intra-governmental integration.*
- Inter-governmental integration*
- Inter-sectoral integration.*
- Pervasive.*

CRITERIA 04 - Types of service integration

- Funding;*
- Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;*
- Organisational*
- Service delivery*

CRITERIA 05 - Service improvements and progress

- improving access and take-up of services,*
 - increasing the quality of the services provided*
 - improving cost-effectiveness*
- Open innovation:
- sharing*

<input checked="" type="checkbox"/> <i>cooperation</i> <input type="checkbox"/> <i>plurality of participants</i> <input checked="" type="checkbox"/> <i>self-organisation</i> <input checked="" type="checkbox"/> <i>decentralization</i>
CRITERIA 06: Actors and user needs
<p>Vulnerable User Groups Women and all users feeling unsafe when travelling in certain conditions (night hours, alone)</p> <p>Operator's needs: Increase the usage of Public Transport (due to improved safety)</p>
CRITERIA 07: Prioritized areas
<p>Urban and peri-urban areas</p>
CRITERIA 08: Acceptance of ICT
<ul style="list-style-type: none"> • Aspects of ICT that have an impact to the user Users must be able and willing to use mobile applications. • Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators) Standard mobile app interfaces • Envisaged risks of digital exclusion (short description and considerations about any potential risk) • None except the requirement of being able to interact with a mobile app.
CRITERIA 09: Enabling factors
<p>Wher runs as an autonomous system where people is able to share their experience and opinions on streets and city places useful when travelling.</p>
CRITERIA 10: Scalability
<ul style="list-style-type: none"> • Status and maturity The system is mature • Current scale The system is currently (November 2018) available in major Italian cities and in London ('Wher web site', n.d.)

- Scalability (geographic, in terms of users, technological), Evaluation of replicability and transferability

No issues seem to exist in terms of scalability of this solution as long as the accompanying technology is dimensioned accordingly.

- Replicability and transferability
- none

CRITERIA 11: Opportunities and limits

None envisaged

6.15 BlaBlaCar – Ladies Only Service

<p>Name of the experience/initiative/service</p> <p>BlaBlaCar – Ladies Only Service</p>
<p>PART I – General information</p>
<p>Short description of the initiative</p>
<p>BlaBlaCar is a long-distance ridesharing platform which connects passengers (peer consumers) with car drivers who have empty seats (peer providers).</p> <p>BlaBlaCar is a French vehicle service that makes it possible for people who want to move to the same place at the same time to organize themselves to travel together. It allows to share the specific expenses of the trip (fuel and tolls) and also avoid the extra emission of greenhouse gases, by allowing greater energy efficiency in the use of each vehicle.</p> <p>The company does not own any vehicles; it is a broker which receives a 12% commission from every booking. Connections were free between users at first but it ended in 2011. It represented 20% of the cost.</p> <p>People looking for a ride can then use the app to find drivers making the same journey and book and pay for the seat. Then the passenger simply meets the driver at the pre-arranged spot and they share the journey. The benefits are simple – drivers offset some of the cost of their journey while passengers gain transport that they might not otherwise have been able to afford.</p> <p>After using the service, drivers and passengers can rate one another to further boost trust within the community and give future users more information about who they are travelling with. A secure messaging service means drivers and passengers can chat before sharing a ride – to find out more about one another and to arrange practical details about the journey.</p> <p>Members can also rate a driver’s ability and once they start using the service can move through the ranks from ‘newcomer’ to ‘ambassador’.</p> <p>Ladies only</p> <p>Female passengers looking for a ride that would prefer to travel with a female driver, can just log in and look for rides on the route they would want to travel to. They can then select the “Ladies Only” filter (only visible for members who are logged in), and then see all the Ladies Only rides offered by female drivers.</p> <p>On the other hand, female drivers with empty seats, can offer a ride for female members only - those rides will then only be available to women.</p> <p>Innovation</p> <p>The innovation BlaBlaCar lies in the way trust is created and maintained:</p>

- Collaborative Economy trust framework D.R.E.A.M.S.
- Transparency and relevant information to reassure and empower the users
- Shared-cost compliance mechanisms: 3 levels of protection

Apart from savings, BlaBlaCar rides offer a great social experience (as compared to riding / traveling alone). It also offers transparency and predictability on prices (as compared to other cab options like Uber). BlaBlaCar also helps contribute to the environment by increasing the average car occupancy from 1.7 to 2.8 and thereby reducing traffic and emission levels. Since the rider does not have any other benefits other than cost savings, it ensures the element of trust in the system, which is further strengthened by two-way reviews and ratings.

Screenshots / Pictures

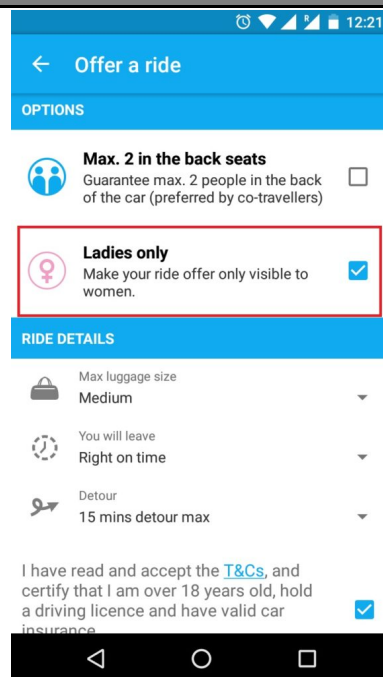


Figure 27 – offering a ride with BlaBlaCar

Source: blablacar.it

Level of maturity

This initiative is commercially available since 2004. The specific Ladies Only service was launched in 2012 in the Italian version of the web.

Main ICT elements / features

For peer consumers and peer providers to access the service they need to create an account. To register as a member, peers can either use a Facebook account or create an account by using their personal e-mail, personal

information (gender, name and birth date) and a password. The peer has to agree with the Terms and Conditions and confirm his mobile number before getting access to BlaBlaCar's services

Booking is made online, via the website or the app. The platform actively matches demand and supply through search functions. To book a trip, peer consumers have to first enter "from" and "to" which city they would like to travel and the travel date. The consumer can then choose a provider to travel with from a list of available rides presented on the platform app or website. The list includes the price, information about the peer provider (rating, feedback, activity on the platform, experience, preferences), information about the number of free places in the car, the space available for luggage, pick-up and detour possibilities.

If more information is needed, it is possible to post a public question to the peer provider, or to contact him through the online messaging system (before he accepts the transaction).

To offer a ride, peer providers have to enter a pick-up and a drop-off point, choose the date and time, select a price per passenger and choose between "manual approval" (to approve manually individual booking requests) and "instant approval" for immediate confirmation of bookings. The platform gives guidance for posting listings. For instance, the platform automatically proposes potential additional drop off points along the selected route that the peer provider can accept to offer.

Once a peer consumer has requested a booking in their car, the provider is automatically notified by the platform by email, app and SMS. For the transaction to take place, the peer provider has to accept the booking online, via the website or the app, unless he has selected the "instant approval" option when offering the ride – in this case, the booking is automatically confirmed to the peer consumer by the platform. The booking process ends with the exchange of mobile numbers between the peers to arrange final details.

PART II – Analysis and Classification

CRITERIA 01 - Potential of ICT-enabled innovation

Disruptive

CRITERIA 02 - elements of social innovation

- Need-driven / outcome-oriented production*
- Open process of co-creation/collaborative innovation*
- Fundamental change in the relationships between stakeholders*
- Public value allocation and/or re-allocation*

<p>CRITERIA 03 - Levels of governance of service integration</p>
<p><input checked="" type="checkbox"/> <i>Pervasive.</i></p>
<p>CRITERIA 04 - Types of service integration</p>
<p><input checked="" type="checkbox"/> <i>Funding;</i> <input checked="" type="checkbox"/> <i>Administrative: e /functions; inter-sectoral planning; needs assessment/allocation chain; joint purchasing or commissioning;</i> <input checked="" type="checkbox"/> <i>Organisational</i> <input checked="" type="checkbox"/> <i>Service delivery</i></p>
<p>CRITERIA 05 - Service improvements and progress</p>
<p><input checked="" type="checkbox"/> <i>improving access and take-up of services,</i> <input checked="" type="checkbox"/> <i>improving cost-effectiveness</i> Open innovation: <input checked="" type="checkbox"/> <i>sharing</i> <input checked="" type="checkbox"/> <i>cooperation</i> <input checked="" type="checkbox"/> <i>plurality of participants</i> <input checked="" type="checkbox"/> <i>self-organisation</i> <input checked="" type="checkbox"/> <i>decentralization</i></p>
<p>CRITERIA 06: Actors and user needs</p>
<p>Vulnerable User Groups It's easy to see why younger people would be a key audience for BlaBlaCar. With limited budgets yet likely to want to travel long distances to visit friends, to spend the week and at the beach or to attend a music festival; they are precisely the people likely to respond positively to a service such as BlaBlaCar.</p> <p>And as they are used to connecting with others on social networks or using the internet to collaborate with strangers, they're often less nervous than older generations about sharing a journey with a stranger. As a result, younger people are more likely to trust the power of the internet to match them with drivers or passengers in a way that older people may not feel comfortable with.</p> <p>And of course, there's another practical reason why mobile is so important for BlaBlaCar. Travellers are often nowhere near a desktop computer when they are researching transport options. They could be stood at a train station after finding out that the travel options they hoped to find there aren't available. Or they might be sat in a bar planning a social trip with friends.</p> <p>However, for many women, carpooling can raise concerns about security, and although BlaBlaCar has a number of <u>safety features</u> that create a secure and trusted community, it may happen that some women still don't feel</p>

comfortable sharing a ride with a man they don't know, specially young adults. That's why BlaBlaCar created Ladies Only, to allow members to plan a ride where the driver and all passengers are women.

Operator's needs:

None addressed specifically

CRITERIA 07: Prioritized areas

Barcelona. Young travellers attending leisure events. Those young women willing to attend a leisure event but that cannot be attended with a bus ride, can be redirected to a safe carpooling alternative.

CRITERIA 08: Acceptance of ICT

- **Aspects of ICT that have an impact to the user:**

- 1) Crowdsourced driver and passenger ratings collected through the app have a real impact in the trustworthiness of the peer to peer network.
- 2) Co-payment through the app. This allows for the cost-sharing of the expenses and the cost-efficiency of the mobility service
- 3) Passengers contact passengers through the app, thus empowering drivers with excess capacity to share their empty seats and users to take advantage of the offer and reduce costs by sharing the travelling costs

- Complexity of use/understanding of the ICT elements that have to be used by the public end users (not by the professional operators)

Not complex as anyone can use it.

- Envisaged risks of digital exclusion (short description and considerations about any potential risk)

Retired people, the user category with lower rates of App and mobile use is a growing segment in France (3% in 2015), so no risk of exclusion is envisaged

CRITERIA 09: Enabling factors

- *Increasing oil costs, high rail costs, decreasing car occupancy rates, increased leisure travelling, and sporadic events impacting the transport industry such as rail and air controller strikes.*

CRITERIA 10: Scalability

As of 2016, this proposed solution accounts with more than 40 million members across 22 countries; it moves 12 million peers per quarter and so far, has allowed peers to share more than 3 billion Km. In the EU, alone, the platform is available in 15 EU countries: France, Spain, United Kingdom, Italy, Portugal, Poland, Netherlands, Luxembourg, Belgium, Germany, Hungary, Croatia, Romania, Slovakia and Czech Republic.

CRITERIA 11: Opportunities and limits

- Limits of the initiative: It allows for a secure transport alternative for young women, that would avoid travelling with unknown men, but travel would still be made by car, which is one of the least safe modes of transport. Young women under 18 would not be able to use this platform unless booking is made by parents and the underaged passenger travels in company of its parent or legal tutor.
- Enhancements / Extensions that may provide further value or increase the effectiveness of the elements: described in Criteria 02.

7 Annex III – Catalogue of New Ideas & Concepts

7.1 Gamification

Description

Recently the concept of gamification has received attention as a promising pylon for creativity and innovation. Gamification can be described as the application of game elements to non-game contexts in order to generate a behavioral impacts on target users and change their habits/attitude through the introduction of incentives and prizes. The gamification can be applied to a wide range of everyday actions in order to make “virtuous” (from the collective point of view) behavior more attractive also from the perspective of personal benefits: the aim of the gamification is to facilitate the adoption of these habits as a part of common-day behavior even in the medium and long-term period when the incentives scheme will be removed. These game elements leverage people’s love for competition and reward and use it to encourage certain actions which can contribute to foster collective well-being.

In the last years gamification has been experienced also in the mobility sector: in this case the aim is to increase the use of sustainable modes (collective transport, cycling, walking) instead of the use of private car or, alternatively, to foster proper traveling behaviors (in particular for driving) among the citizens. Currently gamification has been recognized to be a powerful tool for motivating change in citizens’ behavior towards Public Transport and attracting more PT customers at limited costs.

An example of gamification is the web-based "Eco-Driving advice" service that supports eco-driving using CARWINGS which was launched by Nissan in January 2007. This service calculates average fuel consumption based on vehicle information sent to CARWINGS from the customer's car and displays monthly fuel efficiency rankings on their website. Through this service the users can enjoy seeing how well they do as eco-drivers while being encouraged to pursue fuel-efficient habits.

A second example is represented by the competitions managed at city or organization level (i.e. university, private companies) to foster use of public transport and sustainable transport modes to reach work, education or leisure location.

A third example is the accumulation of “virtual” points which can be carried out by users based on different use case scenarios: the use of public transport, collective or shared services, sustainable transport modes, the use of public transport services in specific time period (i.e. “low demand” hours), the use of specific payment modalities or specific tickets, the participation to surveys for the evaluation of services already operated or the assessment of new ideas/solutions to be implemented, the provision of data (i.e. trip diary) which can contribute to improve mobility policies and planning. The points can be then used to take advantage of discount or reward initiatives which can involve the public transport/mobility sector (i.e. discount on tickets prices) itself or external sectors (i.e. shops, café, etc.). There are many examples of initiatives of this type including:

- *Empower* project aiming to encourage travelers to choose alternative means of transport through personalized positive incentives
- INTERREG Mediterranean *MOTIVATE* project aiming to foster the use of digital tools (APP and web portal) to participate to mobility surveys and trip diary data collection.
- *TRACE* project (<http://h2020-trace.eu/trace-tools/intro-to-trace-tools/>) which developed ICT tracking technologies to promote walking and cycling and in particular 3 app based on gamification: Positive Drive (<https://www.youtube.com/watch?v= fpF9cO17RY>), Traffic Snake Game (<https://www.youtube.com/watch?v=jrivocwhrDM>) and Biklio (<https://www.youtube.com/watch?v=4198voFJAd0>). See also <https://www.youtube.com/watch?v=K5TNrXJ3FT0>
- *Bella Mossa* which won the CIVITAS award: <https://www.bbc.com/news/av/stories-45940844/the-city-that-gives-you-free-beer-for-cycling>
- SASA Public Transport company in Bozen (IT) promoting a mobile app with gamification functionalities fostering the use of PT (<http://www.sasabz.it/it/b/sasa-in-azione/>)

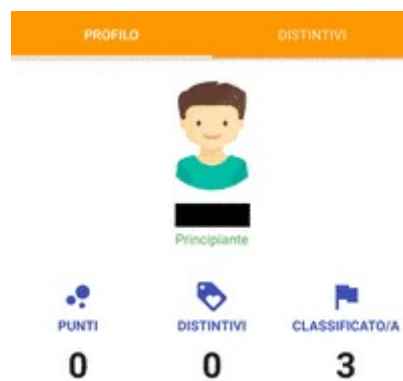


Figure 28 - Example of gamification functionalities fostering the use of Public Transport, SASA PT Operator in Bolzano region of South Tirol in Northern Italy.

Source: SASA SpA AG - <http://www.sasabz.it/it/b/sasa-in-azione/>

Technological elements

The adoption of gamification approaches and schemes to Public Transport and mobility is deeply pushed by the pervasive role of the ICT as key tool to provide “real-time”, “added-value” and “customized” services to the users. This was accompanied by the growing use of APP and “cloud” technologies enabling the “always-on” accessibility to provided services (i.e. journey planning, real-time info, payment, etc.), from one side, and the sharing of data among different applications, from the other. The application of this kind of technologies is fundamental to enable the range of possible use cases described in the previous sections. The operation of the e-ticketing system can also support gamification schemes related to the payment of mobility/public transport services.

Due to the deep penetration of APP use in the daily life, any risk of digital exclusion is envisaged. Even the approach to gamification is closer to the preferences of younger (i.e. e-games, etc.), it can be well understood and appreciated by all targets as demonstrated by the wide range of applications.

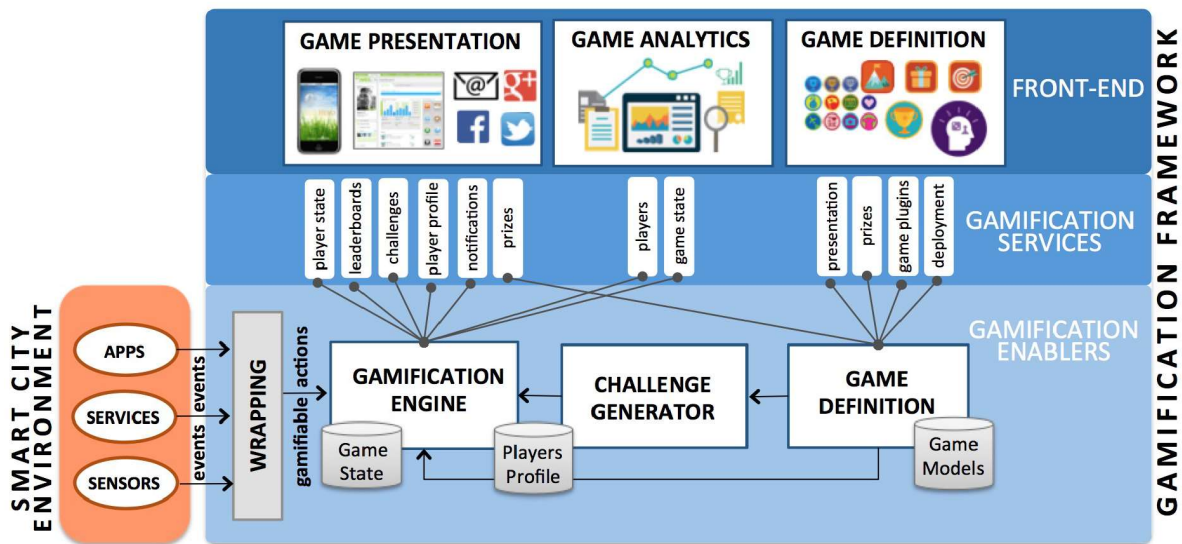


Figure 29 - Technological architecture to operate gamification for the improvement of smart mobility in Rovereto

Source: STREETLIFE project (Kazhamiakin, Marconi, Martinelli, Pistore, & Valetto, 2016)

Elements of Social innovation

Gamification supports:

- 1) Fundamental change in the relationships between stakeholders as it introduces incentives or promoting modalities which can overcome the “traditional” relationship established between Public Transport providers and customers/potential users
- 2) Public value allocation and/or re-allocation as it aims to foster behaviour/attitudes which contribute to decrease the use of private car and then to improvement the environmental sustainability of travelling habits.

Envisaged Service improvement

Gamification does not impact on the service quality or on the way they are offered or accessed or on the related costs. It can contribute to attract more customers towards public transport and sustainable mobility modes making the services available for a wider range of users. Secondly it improves the take-up of services allowing the implementation of targeted or personalized promotional campaigns.

Addressed actors, needs and prioritized areas

Gamification addresses the following actors: Public Transport/Mobility Providers and Authorities, City Authorities, citizens, third party commercial entities (i.e. shopkeepers, tourist services, etc.).

Relating to the prioritized areas and target groups identified at the beginning of INCLUSION project, gamification does not address any specifically but it can be implemented to support promotional campaign of public transport and sustainable mode use targeted to identified users groups (for example: use of smart cards released to a certain user profile or through the identification of some personal data during the registration phase)

Enabling factors.

In case of rewarding of points accumulated with the game, the Public Transport/Mobility Providers and Authorities need to establish commercial agreement with the commercial entities which provide gifts or discount in change of the accumulated points. All the stakeholder (public transport and commercial entities) can gain a “win-win” condition increasing their visibility towards the citizens and attracting more customers.

Scalability and replicability

The wide range of gamification applications and schemes demonstrates the replicability of the experiences. The need to engage external (to PT sector) actors is not a barrier as the reward or discount initiatives can be restricted to the public transport services (i.e. free tickets, discounted price for subscription, etc.). Anyway the engagement of commercial entities (external to public transport) can be a key factor in attracting new customers and can allow the Public Transport/Mobility Providers to find new funding channels i.e. sponsorship.

INCLUSION Pilot site(s) where it is planned to apply the idea

Florence site as future extension of ATAF2.0 APP

Links

- INTERREG Motivate project – the platform: <https://www.motivate.imet.gr/>
- H2020 Empower project: <http://empowerproject.eu/>
- Onyx Beacon: <https://www.onyxbeacon.com/gamification-in-public-transportation-passengers-win-points-in-ecological-competition-based-on-kilometers-of-travel-measured-by-onyx-beacons/>

7.2 Aggregating transport demand through social media

Description

In the prioritized areas where Public Transport services (conventional and “Demand Responsive Services” as well) are not financially sustainable due to low-demand or in the areas served only in restricted time coverage (i.e. only in the peak hours) due to a large flexibility of the demand itself, groups of citizens (who are deeply affected by the poor level of services provided) could share the trip on their private car with other passengers who have a common destinations. In particular “the ridesharing services” could be managed among a defined group of people with similar needs mobility (in terms of time and destinations) thus allowing them to offer (as a driver) the shared trip one time and to travel (as passenger) another time under a cooperative approach.

This concept can be extended from the group of citizens which participates to the initiative to their family. For example, an application of the concept could be the following: families living in peripheral/isolated areas with lack of the public transport services organize ridesharing services to bring the children to schools in the nearest town; similar applications could be to bring the children to leisure activities (i.e. sports, hobbies, etc.) when public transport services don't cope with flexible demand during the day. Other example could be workers sharing the trips to work and to reach a common interchange point (i.e. bus stop, park&ride area etc.).

The implementation of the concept requires the aggregation of the mobility demand and the management of related operational issues. The involved people need to be networked and to “schedule” the ridesharing services; this means to contact each other to plan who will offer the “shared trip” each time (depending also on car availability), who will be the passengers and to manage irregular conditions (i.e. change in the “planned services” due to unavailability of resources (drivers/cars), change of timetable, passengers planned to share the trip giving up).

Technological elements

The “networking” relationships among the participants which are required to implement the described concept can be realized in the different ways spanning from “simple” phone contacts to face-to-face daily meetings. The social media and their pervasive use in the daily life by all the people (regardless their age) represent a well-performing technological tool to manage the networking functionality in a simple way. Social media are widely used to aggregate/manage “groups” of people sharing common needs/interests (i.e. moms with children going to the same school): they allow to share information, to be updated on the groups initiatives and meetings, to fix appointment, etc.

Elements of Social innovation

The described concept covers all the identified elements of the social innovation, at certain level:

- Need-driven / outcome-oriented production: the aggregation of the mobility demand and the management of the ridesharing services provide targeted services for answering to the mobility need of the involved participants
- Open process of co-creation/collaborative innovation: the ridesharing services are operated under a collaborative approach where all the participants can provide their own contribution

- Fundamental change in the relationships between stakeholders: the concept drastically change the relationship between providers and users of the public transport services as the user become sometime also transport provider
- Public value allocation and/or re-allocation: the ridesharing services can familiarize the participants to share the trip then to use more public transport, the same trip is shared by various passengers then the aggregation of the mobility demand generates positive effects for traffic congestion and pollution

Addressed actors, needs and prioritized areas

The actors are represented by the citizens themselves providing self-organized transport solutions (based on ridesharing scheme) to answer to mobility needs which can not be effectively complied by any other alternative mobility solutions (despite the use of private car). In terms of prioritized areas the concept is likely to be applied in remote rural and isolated areas (i.e. mountains, hilly, etc.) and peripheral areas of cities. In terms of target groups, the concept can be horizontally applied event it is well suitable for young families with children.

The ridesharing service can be a replacement of conventional public transport services but in some conditions also an integration related to spatial and time coverage. Even indirectly, the concept can contribute to the enlargement of the available mobility options, the improvement of the quality of the whole mobility offer and its cost-effectiveness as any other alternative mobility solutions should be financially sustainable in certain context of the prioritized areas

The following aspects of open innovation are introduced through the concept implementation:

- sharing: as the trip is shared by more passengers
- cooperation: for the aggregation of the mobility demand, each component of the group can offer a ride one time and to be passenger another time
- plurality of participants: all the people in the group can join the initiative
- self-organisation: as the group provide a transport service with their own resources and based on the internal organization of the group itself
- decentralization: the provided services can be organized to integrate the public transport offer than their operation can be see also as a “decentralization” of the public transport services provision guaranteed through a social innovation approach.

Enabling factors.

The enabling factor is the self-organization approach of the involved group of citizens and the willingness to cooperate in order to answer to the needs of the group itself: i.e. to provide solutions to the changes required to the “scheduled service”. A coordinating role is required in order to manage the communication flow on social media and act as “moderator”: good attitude in reducing conflicting situation is required. A person involved in the group must be named in charge of this role. Social media as technological supporting tool are not mandatory but they can facilitate the management of the group, enable timely circulation of information and track the communication flow.

Scalability and replicability

The concept is quite flexible to be adapted to different context, target groups and mobility needs. Any significant limits in the replicability of the concept is identified.

INCLUSION Pilot site(s) where it is planned to apply the idea

Rhein-Sieg Pilot Lab

Links

- [1] CIVITAS Destinations Project – Elba Sharing Agency: <http://civitas.eu/measure/shared-elba-mobility-agency>
- [2] RideAustin – No-profit rideshare via app which allows riders and drivers to pair directly through the RideAustin: <http://www.rideaustin.com/>

7.3 Social Network as Car-Pooling platform

Description

There is a growing tendency for social media users to informally arrange lifts with friends through social media. This is due to a lack of existence, lack of awareness, lack of convenience or lack of trust in using formal carpool service providers. These barriers would be mitigated to a large extent if carpooling could be integrated within the social media platforms that the majority of the population use on a daily basis.

Facebook's Events pages currently allow users to select whether they are attending, not attending, or are interested in attending an event. Facebook have plans to incorporate a new ride-sharing feature that will allow individuals who have indicated that they are going to an event to also add whether they are 'going and driving,' or 'going but not driving.'

The car-pooling function comes into effect when users have selected the 'going and driving' option, allowing them to also add how many passengers they are willing to take, what time they will be leaving, and whether they just want to open up their ride to friends or the entire list of attendees.

Facebook will use personal information from a user's Facebook profile and preferences to pair drivers up with riders, based on common interests. After agreeing to a match, drivers and riders receive navigation information to guide them to the pick-up spots and event venue.

Because of the very high market penetration of Facebook, this makes far more people aware of carpooling possibilities. The Events pages bring together people with similar interest going to the same location at the same time. The platform will offer a very easy and convenient way to connect these people and engage with one another on Facebook.

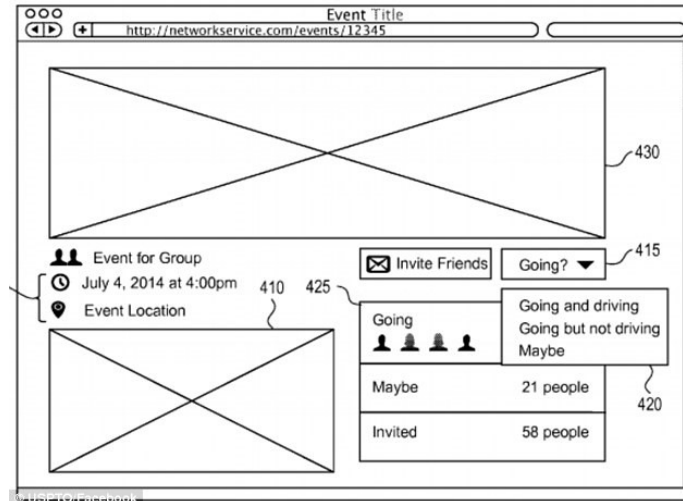


Figure 30 - An exemplary user interface illustrating an event and options for users to indicate intentions to attend and drive to an event or attend and not drive to the event

Source: (Richardson, Petrescu, & Finch, 2016)

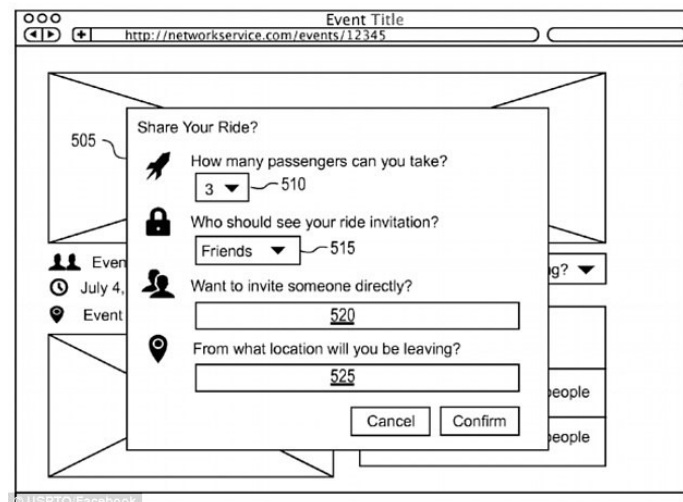


Figure 31 - An exemplary user interface illustrating determined matches for ridesharing

Source: (Richardson, Petrescu, & Finch, 2016)

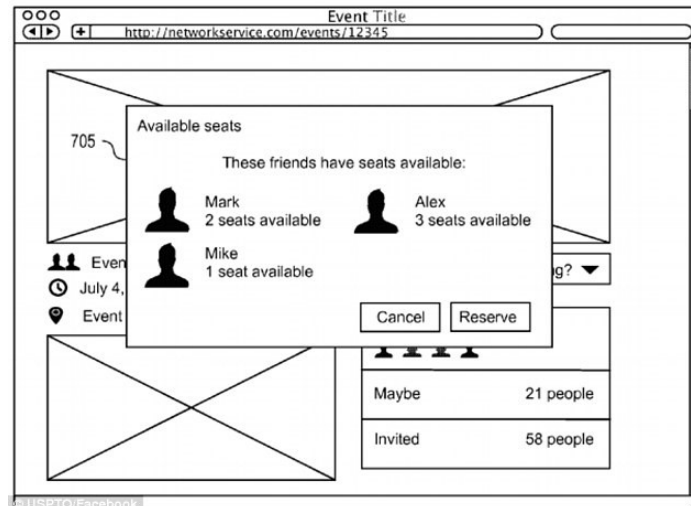


Figure 32 - An exemplary user interface illustrating a form to receive ridesharing information

Source: (Richardson, Petrescu, & Finch, 2016)

Technological elements

The technology required is a smart phone, an internet connection and a Facebook account. Facebook is by far the most widely used social media service across Europe with approx. 80% of the social media market share when accessed using mobile devices (<http://gs.statcounter.com/social-media-stats/mobile/europe>).

Once a group agrees to a carpool, the driver would additionally get a suggested route and the system would 'provide notifications to the passenger(s), e.g. of estimated pick-up time, of when the driver departs, when the driver picks up another passenger, when the driver is approaching, etc.

The development of the carpooling feature within Facebook Events is still in the development phase and so is currently not available for use.

Elements of Social innovation

Extending Facebook events as a ride-sharing/carpooling platform offers a fundamental change in the relationships between stakeholders, by removing the need to search for transport solutions from external car-pool providers. Instead the carpool platform is internal to the face-book page the user is accessing and as a result benefits from immediate access to a (large) pool of users with similar interests and requirements. It also removes the need for cumbersome multi-App sign-up and usage.

By providing a platform for shared rides, offered by private car owners, there is public value creation. Users of Facebook Events will be encouraged to offer a ride to friends, or request a lift if they have no way of getting there themselves.

The proposed feature could also let event attendees organise taking public transport together. For example, users who indicate they are 'Going but not driving' would be presented with an option to co-ordinate travel

with one or more other attendees who are 'Going but not driving'. So the tool can indicate other users who may wish to share a taxi to reduce costs or travel together on public transport for safety reasons (e.g. females returning from an event late at night).

Envisaged Service improvement

Improved access, awareness and take-up of carpooling is very likely due to the very high numbers of Facebook users. Promoting carpooling to specific events or for specific purposes through this medium has the potential to transform the coverage and level of use of carpooling providing a very cost effective transport solution where good quality public transport is lacking.

The suggested service also has the possibility to allow users to co-ordinate travel with one or more other non-driving attendees. If two users indicate that they plan to attend an event and travel to the event via a train line, bus line, taxi, the tool may suggest the users get on same train.

The aspects of open innovation which would be introduced include sharing, cooperation, plurality of participants, self-organisation and decentralization.

Addressed actors, needs and prioritized areas

The main actors in Facebook events ride-sharing are principally the attendees of the events featured, but could also involve the organisations involved in staging/hosting the event.

These events could be one-off music or sporting events, regular tourist site 'events', or could potentially even be 'everyday events' to which people need access. This opens up the potential of such a platform to a wide range of target users across different prioritized areas, for instance:

1. young people from rural or suburban areas with poor public transport accessing music or sporting events in cities;
2. tourists accessing rural attractions with poor public transport access -the event organisers could even use the platform to publicise and generate passengers for a shared car or minibus pick-up service operating between local hotels.
3. parents with young children accessing nursery or play group activities where the playgroup/nursery has created a daily event around their session. This would allow parents to find other parents attending the session who may be able to share a ride or travel together in a taxi. Users could even create their own events for group members such as "Lunch at Café Bistro".
4. Volunteer car services could create an 'event' based on the period of time they are volunteering their time – the event could be "10th Sept 2018, 08.00–14.00 hrs accessing the local hospital" and the volunteer selects 'Going and driving'. Any person who then has a hospital appointment without their own transport could request to a lift. Eligibility criteria could be added by volunteer drivers, e.g. pick-ups only from designated area and/or age or disability restrictions could be stipulated.

Enabling factors.

The Facebook platform and its Events pages bringing together users and actors with similar interest/purpose is the main enabler.

There are no specific barriers to deployment of this proposed feature. Costs are minimal for organizations who are hosting events – the only requirement is that they create and maintain a suitable events page. This is a very straightforward task.

Regulatory frameworks do not pose any barriers as long as no organization or individual is making profit from providing a transport service through the tools use. So, event organizers offering a shared car or minibus service would need to do so on a free basis. Individuals offering lifts (carpool drivers or volunteer drivers) can only receive payment to cover their costs (e.g. fuel and wear/tear). The Facebook Events ridesharing feature does not organize payments between users – this would be done face-to-face.

Scalability and replicability

This proposed solution, if deployed by Facebook, would be immediately ready for use at any location and in any EU country. Applications with target users where Facebook membership is more limited, such as with older persons, could involve a third party to represent and communicate with these users. For example, a care worker or an older persons charity could act as the Facebook member on behalf of the older people they represent.

Across the EU, 63% of internet users aged between 16-74 used social networks in 2016 with approximately 80% of these actively using Facebook. In total over 40% of 16-74 year olds in Europe are Facebook users. Among younger people aged 16 to 24 years, approximately 70% of the population are Facebook users. For 65 to 74 year olds, the proportion of Facebook users drops to below 25%. For over 75 year olds, only 44% are internet users and around 40% of these have a Facebook account (i.e. around 17% of population are Facebook users).

INCLUSION Pilot site(s) where it is planned to apply the idea

As the idea is not yet deployed, it is not currently planned for use at any INCLUSION site. However, it has potential for use at a number of sites should it be launched before July 2019. These include:

- Cairngorm National Park for tourist events.
- Cairngorm National Park for volunteer driver 'events'.
- Barcelona for music events.
- Rhein Sieg for daily parent and child 'events'.

Links

<https://www.theverge.com/2016/10/7/13192918/facebook-events-app-ios-android>

<https://www.digitaltrends.com/social-media/facebook-ride-sharing-patent/>

<https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20170713-1>

<https://www.telegraph.co.uk/news/2017/06/14/rise-social-seniors-number-over-75s-facebook-doubles/>

7.4 How to increase accuracy of data

Description

In order to improve data accuracy and data quality coming from the social networks, the number of touching points with the end-users (potential demand) need to be increased.

Direct or indirect Interactions with attendees are essential to understand users' preferences and needs as well as to identify gaps and opportunities of the transport service. Some ideas for this interaction are:

- Through an App/Web: Surveys about users' transport needs and preferences at the end of the payment process.
- Through in-situ surveys: Surveys to know the modality of transport chose by the users to attend to the event and identify possible gaps/problems and opportunities.

For the Barcelona Pilot Site is also crucial to increase social networks activity to gather and analyse better quality of data. To promote social networks activity one idea is the creation of a specific Twitter account for the initiative and incentivise potential attendees to participate on the Twitter discussions, for example @CanetRockBusUp

In this case, a communication strategy has to be designed to be very active in the social network and reactive to users' activity.

The aim is to push active and inactive users on Twitter to participate into discussions, competitions, raffles, etc. and take advantage of this activity to better analyse potential demand to attend the event.

Technological elements

- Twitter account creation specifically for the initiative: @CanetRockBusUp
- Design a High-impact communication strategy including on-line discussions generations, competitions, raffles, etc.
- Continuous monitoring of the activity generated by the potential attendees and the account's manager

Elements of Social innovation

- Open process of co-creation by creating discussions to know more about an issue/gap (e.g. parking options next to the event, find people from the same area to propose a common on-demand bus route, etc.)
 -
- Some of the social initiatives proposed by the users through this account can be taking into consideration by the service provider and implement them into the real case.

Addressed actors, needs and prioritized areas

The main actors for this idea are potential attendees, other organisations related to the event, on-demand bus service providers and technology providers.

- This initiative can improve the data gathering process of the existing BCN Pilot site.
- New potential-demand identification (more data and higher quality)
- By increasing the number of users' touchpoints, the service provider will have more feedback from the real event attendees and will be able to offer a better service quality adapted to user needs.

Enabling factors.

To attract influencers to follow and participate on the activity of this account is key to increase the popularity of this initiative.

To reach a high level of activity between the followers, some incentives such as competitions, raffles or interesting discounts may have to be carried out. To do that, establishing commercial agreements with other stakeholders may be needed.

Scalability and replicability

(About 50 words) Describe the potential and limits of the idea in terms of replicability and scalability.

In terms of the scalability and replicability of the BCN Pilot site idea, this concept can be applied to all the events/initiatives for on-demand transport services.

INCLUSION Pilot site(s) where it is planned to apply the idea

Barcelona Pilot site

Links

https://proticketing.com/canetrock/ca_ES/entradas/evento/11683/session/716069/select

7.5 Dynamic pricing

Description

Mobility on-demand services offers more reliable and convenient personalised transportation to satisfy specific user needs. Moreover, dynamic pricing can improve these services by incentivising and influencing users' behaviour.

At the same time, dynamic pricing module can significantly improve economic and environmental sustainability by influencing users' decisions and encouraging them to choose the most suitable trip.

Moreover, it will allow obtaining data about user habits, needs and preferences.

Technological elements

Dynamic Pricing self-learning algorithm adapts trip pricings based on different variables:

- real-time issues
- predictive science
- occupancy
- accessibility
- distance
- moment of the trip
- moment of purchase (early birth, last minute tickets, etc.)
- etc.

This module aims to fully satisfy offer and demand and improve on-demand mobility services by influencing users' behaviour.

Elements of Social innovation

By influencing users' behaviour to choose these new on-demand mobility services instead of taking their own car, as well as aggregating mobility demand with same destinations, generate positive effects for traffic congestion and pollution.

Addressed actors, needs and prioritized areas

The main actors are users of the service, on-demand bus service provider, transport operators and technology provider.

The prioritised areas are the ones with no (low) public transport accessibility (either because are located in isolated geographical or because there is not public transport during night time) to go to the event.

Enabling factors.

To have a complete view of the users' purchase patterns is key to better understand the context and provide the adequate dynamic pricing algorithm for the case.

Scalability and replicability

This concept is flexible to be adapted to completely different context.

INCLUSION Pilot site(s) where it is planned to apply the idea

Barcelona Pilot site

Links

- <https://www.omniaretail.com/dynamic-pricing>
- <https://www.uber.com/en-ZA/drive/resources/dynamic-pricing/>

7.6 Blockchain Enabled Service Interoperability

Description

Any Mobility as a Service (MaaS) scenario, where people can seamlessly travel via a wide variety of mobility options with increased flexibility and reduced (economic and environmental) costs, necessarily must rely on some sort of robust and reliable backbone providing access to mobility-related data. Huge amounts of such data are continuously created and exploited by public and private operators, and by commuters themselves, including information about booking, payment, etc.

Currently, however, this information, and the services provided on top of it, is largely siloed, due to the lack of standardization in data format and semantics, and to the desire of operators to keep control over their own proprietary data. This causes commuters to have to individually provide their registration data multiple times to multiple operators, then to query, mix, compare and book multiple specialized mobility services, which results in inefficiencies and difficulty of use.

A centralized mobility service ICT platform could in principle play the role of technological bridge allowing an effective implementation of a MaaS solution: In this scenario, a party acting as an intermediary oversees maintaining such a centralized platform, purchasing mobility solutions from the different operators and finally providing the entire service (as complete MaaS solution) to the end customers.

This approach has the drawback that many of the current mobility operators can legitimately feel uncomfortable with the idea of giving so much control over their own services (and access to the data collected to enable such services) to an external subject over which they have no direct influence. These legitimate fears are linked to the possibility that the central authority acting as a broker might have its own vested interests and corrupt people within that organization might unfairly use this power to their advantage, for instance, in the case in which the intermediary needs to provide access to a diverse array of alternatives, the choice could be biased, favoring some operators at the expense of others. Or again, some operators could suspect the central subject to take possession and exploit the data and information collected during service provision to establish a competing activity as direct mobility operator in the future.

An emerging technology called Blockchain could represent a solution to such issues, providing a viable method of coordination of parties that do not trust each other removing the need of such a central

intermediary or broker authority. Initially originated in the cryptography community to implement a system of digital “crypto” currency, this technology is predicted to have impacts on many sectors in business and society.

Technological elements

The Blockchain technology is well known for its first and most diffused application, the cryptocurrency Bitcoin. This currency came about in the year 2008, when Satoshi Nakamoto (a pseudonym used by a subject whose real identity is unknown), published a paper - "Bitcoin: A Peer-to-Peer Electronic Cash System" - in an online cryptography community.

The main invention supporting this system consisted in a new way to structure sequential data, which mathematically guarantees the possibility to reach a consensus about the sequence of operations applied to such data and the chronological order of these.

This is achieved through a mechanism which prevents participants in a network to - independently and without the knowledge by other parties - modify the sequence data, unless they have control over most of the computational power of the network. New transactions that happen in the network are gathered into a data object called a block. When this block is created it links to the previous block, forming a chain of blocks (originating the name Blockchain), whose links are sealed through cryptographic hashing techniques.

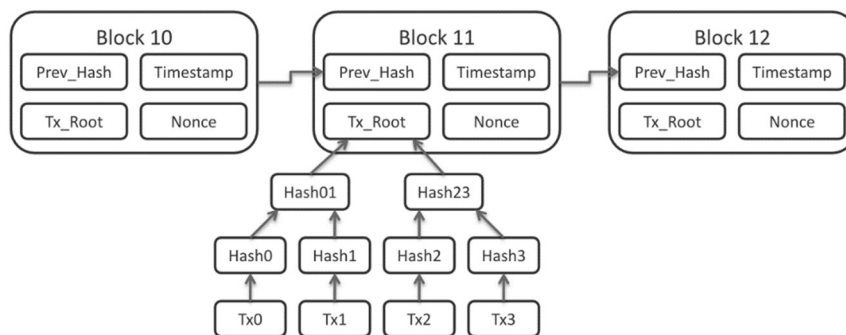


Figure 33 - an illustration of the blockchain structure

Source: https://commons.wikimedia.org/wiki/File:Bitcoin_Block_Data.png
file licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license.

The most important point to highlight is that the blockchain introduced a way of using mathematic methods to coordinate several actors with potentially diverging interests, without the need to impose constraints through legal or organizational methods, as was only possible before the introduction of this technology.

When using a blockchain, all entities participate in a network on equal terms: They share a common data model, all transactions performed in the network are by their nature public and updates are agreed and recognized by all the participating entities. There is no central authority that can control the network, or that

can be corrupted. The technology also entails further advantages such as the possibility to automating secure device-to-device transactions, reduce transaction costs, etc.

After its initial application in Bitcoin, the Blockchain technology inspired many derived projects. An extension of the initial concept was made available by the Ethereum system, which introduced the concept of **smart contract**, allowing arbitrary business logic to be embedded in the blockchain's data blocks and executed when appropriate. By exploiting the smart contract mechanism, software developers can devise completely decentralized applications for handling business transactions.

Blockchain-based systems are starting to be adopted in various sectors, from finance and banking, to healthcare, energy, logistics etc., both by public and private subjects, creating new business models and connecting an increasingly distributed and decentralized systems. Currently, potential applications of the Blockchain for Mobility as a Service are still under investigation, but it is foreseen that this technology could have a large impact on MaaS platforms development: Blockchain-based platforms are one way to realize interoperability between mobility a wide range of services like ridesharing, digital payment solution for parking, rental services, electric vehicle charging and many others. In general terms, the blockchain could help MaaS stakeholders address the challenges raised by automation and digitalization in the mobility sector.

Elements of Social innovation

By eliminating the need of some form of central authority or intermediary in charge of controlling the network, this technology has the potential to introduce a **fundamental change in the relationships between stakeholders**, where several actors with potentially diverging interests are now able to self coordinate, engaging in an **open process of co-creation/collaborative innovation** by operating a service with a collaborative approach where all the participants can provide their own contribution.

Envisaged Service improvement

Blockchain based technologies greatly improve the interoperability between different existing services, with undisputed benefits for the customers. Moreover, the elimination of the need of an entity acting as intermediary has definitely the potential to reduce overall costs of the resulting mobility solutions.

Addressed actors, needs and prioritized areas

The main actors affected by the introduction of this kind of technology are potentially the providers of any kind of mobility service, including both **public authorities** and private subjects. At the current stage of analysis, we haven't identified yet whether specific prioritized areas or target customer groups could be affected more than others by the introduction of a blockchain-backed service, besides general consideration that can be made concerning the provision of MaaS services in general.

Enabling factors.

The main enabling factor can be considered the open nature of the technology and the availability of different open source blockchain platforms that can potentially be exploited for the implementation of a mobility solution based on this technology, by for instance eliminating the risks of vendor lock-in. On the other hand, costs for the maintenance of the necessary ICT infrastructure must be taken into account, as well as some organizational or legal aspects could need to be explored in more details before the actual implementation of a solution of this kind.

Scalability and replicability

The technology is quite flexible and can be exploited in very different contexts, also considering the open nature of the technology there is in general little doubt concerning the replicability of this kind of solutions. On the other hand, in time several doubts have been raised concerning the actual scalability of blockchain-based solutions, since this technology is considered to require high processing capabilities and transaction times often compare poorly with respect to other more traditional transaction processing technologies.

INCLUSION Pilot site(s) where it is planned to apply the idea

Currently, no step has been carried out yet aimed at proposing the concrete implementation of this concepts to pilot sites during the project duration.

Links

S. Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, March 2009 <https://bitcoin.org/bitcoin.pdf>

7.7 Voice-based Conversational User Interfaces

Description

Diffusion and provision of information to users of mobility services via ICT-based systems or Smart technologies is proving to be a great value in terms of the increasing usability and accessibility of the service for their ability to provide both access to always up-to-date information - with prompt notification of events such as delays, change of schedule, etc. – and access to information potentially customized for each user, taking into account their characteristics and traveling habits. As highlighted in previous project deliverables, this trend is changing the ways in which people communicate and access mobility services.

However, current user interfaces of computer based applications, such as digital billboards, web pages, mobile application interfaces and other electronic devices have accessibility and usability issues for some categories of people such as elderly, visually impaired or otherwise disabled people.

Among the factors which could limit the ability of interaction with current ICT systems are **vision loss**, both due to medical conditions or to the normal aging process, preventing the ability to focus on text or graphics elements of reduced size, **cognitive issues**, with issues of declining cognition in areas like working memory, attention and problem solving and **reduced motor skills**, negatively impacting on the performance of controlling standard devices such as a mouse or a keyboard. Moreover, **literacy level** or lack of familiarity with technology could also have an impact in the ability to effectively access and exploit provided information.

Historically, computers have relied on graphical user interfaces, where communication is achieved either by entering syntax-specific commands via keyboards or clicking icons to translate the user's desired action into commands the computer understands. Voice-based Conversational User Interfaces (also called Voice Assistants) are an attempt to provide a more inclusive access to ICT-based information, by allowing the interaction with computer systems on more human-friendly terms. This kind of interfaces attempts to mimic natural language conversations with human actors.

Together with evolution in natural language understanding techniques due to the rapid advancement in Artificial Intelligent technologies taking place in recent years, voice-based system represent an opportunity to provide users with the experience of having any moment a personal assistant at their disposal, without incurring in the costs and scalability issues involved in the setup and maintenance of a call center of human operators providing user assistance.

Technological elements

Voice assistant technologies are rapidly spreading with many applications in several commercial sectors and addressing various user needs. One of the first widely adopted voice assistants was made available by Apple on iPhone systems with Siri, allowing users to get information and complete actions on their device simply by using their voice. From the iPhone, support for the Siri assistant was extended to all the other Apple devices. Shortly after, in 2014, Amazon introduced its voice assistant Alexa, allowing users to connect their homes appliances through a series of smart speakers such as the Amazon Echo. Users can now for instance turn off the lights, schedule washing machine cycles and other appliances activation, set reminders or make phone calls, all via verbal commands. Google followed suit introducing Google Assistant along with its own smart speaker, Google Home, in 2016. Samsung and Microsoft are also building competitive products, while in China the market is mostly owned by Alibaba and Baidu.

As mentioned, the technology behind these voice assistant is in rapid evolution. While the earlier voice assistants, as the first versions of Apple's Siri, were often target of users' irony for their accuracy, voice recognition error rates have dropped consistently over the years, having reached by now human-level performance.

In terms of Natural Language Understanding, Google recently demonstrated its advances with the presentation of Google Duplex at Google I/O 2018, a conversational AI making phone calls on behalf of Google Assistant users. The demo shows that once a customer asks Google Assistant to schedule a reservation at a restaurant, the assistant contacts the restaurant, asks for alternative times when the required ones are not available, choose among options and later provide the user with updates in a follow-up ping notification 15 minutes after the call takes place. The system is based on DeepMind's Deep Recurrent Neural Networks (RNN) technology and its performance have reached such levels as to raise fears and spark controversy – up to the point that some commentators labeled the technology as unethical and irresponsible, in that users might not understand they're interacting with an AI system, rather than a human subject.

Amazon and Google have opened their platforms to developers and hardware partners (this is not true for Apple's technology, though), allowing the creation of thousands of applications created on top of their platforms, and promoting partnerships with manufactures of home appliances, car manufacturers etc. and the new ecosystem is being leveraged by commercial brands to let their customers check accounts, pay bills, order pizza and accomplishing many other tasks by talking to their voice assistants. Microsoft and Samsung are also providing their own alternative technologies, while in China the leading actors are Baidu and Alibaba.

Elements of Social innovation

As explained in the description, this ICT concept addresses basic needs of many categories of people such as elderly, visually impaired or otherwise disabled people, as well as segments of the population with low

technology literacy levels, all of which experience limitation in their ability to interact with current ICT systems.

Envisaged Service improvement

The introduction of a voice-based interfaces will positively impact many aspects of services like up-to-date mobility information provision (notification of delays, changes in schedules, and so on) potentially increasing both the quality and the accessibility of such services. Moreover, as already noted, this kind of technology has also the potentiality to reduce costs, by replacing the need for human assistants with automated answering services.

Addressed actors, needs and prioritized areas

As mentioned, a possible solution providing information on mobility services through some Voice-based Conversational Interface assistant technology would address the needs of some of categories identified as relevant for Inclusion such as elderly and visually or motor impaired people, increasing the inclusiveness of the service itself and improving user experience for other categories of users as well.

Enabling factors.

The open nature of some of the currently available solutions, namely Google's and Amazon's, as well the availability of commercial cloud-based AI solutions for voice recognition and language interpretation services make the implementation of this kind of solution a concrete possibility if not in the short term at least in medium terms, depending on how the maturity of the technology evolves in relation to the specific needs and characteristics that have to be considered for the mobility application domain (e.g. the need to operate in external environments).

Scalability and replicability

As highlighted, the use of the mentioned ICT technologies would greatly increase the potential scalability of a solution with respect to its implementation through human-operator based assistance (call centers). Concerning replicability, a possible slowdown factor is represented by the availability (or lack thereof) of the implementation for national languages other than English and other major ones.

INCLUSION Pilot site(s) where it is planned to apply the idea

Currently, no step has been carried out yet aimed at proposing the concrete implementation of this concepts to pilot sites during the project duration.

Links

[1] https://en.wikipedia.org/wiki/Conversational_user_interfaces

[2] The Google Duplex Demo at Google I/O 2018 is visible on youtube at the address <https://www.youtube.com/watch?v=bd1mEm2Fy08>

7.8 Enhancing Security through Danger Situation Detection with automated Image and Video Analysis

Description

Travelers' safety and security issues can turn out to be real barriers to the usage of transport services for some categories of people, as well as one of the aspects contributing to the overall perception of the level and quality of the provided service by the users, drastically influencing users' level of understanding, trust and satisfaction with either parts or all the transport system.

These issues can be particularly critical for what concerns transport facilities located in enclosed and secluded areas – like isolated parking lots or transport service stations - and for some specific categories of users like women, children, elderly, visually impaired or otherwise disadvantaged people, but also for commuters in general who travel alone.

Besides the actual dangers, psychology aspects can also play an important role: Sometimes people's perception of a safety can become a barrier to travel itself, even when the perception does not correspond to the real situation. For example, a poorly lit rail station or bus stop may be a barrier to travel particularly for women and lone travelers even when no crime has occurred in that location. There is a clear need to tackle the perceived safety and security issues of travelers as well as the actual situation. If a location or service is perceived to be unsafe, then the actual barriers which create this feeling need to be tackled if passengers are to trust the location or service and hence change their behavior to use it.

Common measures taken to alleviate security and passenger safety problems – enabling people to easily move around transport facilities and to feel safe – consist in setting up efficient lighting for the concerned areas, providing reserved parking spaces for unaccompanied women, utilizing natural surveillance like a careful use of vegetation to avoid screening or installing video surveillance through CCTV areas.

Security cameras in particular can be of some help, but their effectiveness is limited by the fact that they are useful only when some operator is looking through them and actively checking for dangerous or risky situations. That means a human watching live footage, usually from multiple video feeds. In general cameras are used to passively recording video footage to be used after the fact by law enforcement authorities to identify perpetrators of criminal acts or to provide evidence, or just used as a deterrence. Rarely they prove to be useful for the prevention of such events.

It is not feasible, for reasons of economic costs and effectiveness in use of resources, to think of a continuous human surveillance for all possible installed security cameras that would allow an immediate and prompt intervention of law enforcers. This is particularly true when considering large suburban areas or sparsely frequented zones or facilities, which require a very large number of cameras for full coverage.

Recent advances in Artificial Intelligence image and video analysis techniques seem to go in the direction of allowing automated video stream analysis to detect potentially dangerous situations, like possible crimes or other accidents, analyzing scenes, activities, and movements and alerting human operators only when needed, with potentially huge implications in public safety.

Technological elements

The mentioned rapid progress in video and image analysis that are taking place in recent years are mainly due to advancements in the field of Deep Learning, a variety of machine learning which is growing rapidly and is experimenting tremendous success in a wide variety of application domains.

Deep Learning makes use of multilayer neural networks to reach unprecedented performance level, when compared to traditional machine learning or other approaches, not only in image and video analysis and computer vision, but also in many other areas among which speech recognition, machine translation, medical information processing, robotics, cybersecurity and bio-informatics.

With the development of Convolutional Neural Network (CNN) architectures, backed by big data for training and advanced computing technology, a computer now can surpass human performance in object recognition task under some specific settings, such as face recognition or image classification. Sequential image data (as in video sequences) is subsequently processed by Long Short-Term Memory (LSTM) Networks – another flavor of deep neural networks, performing well on a video classification tasks.

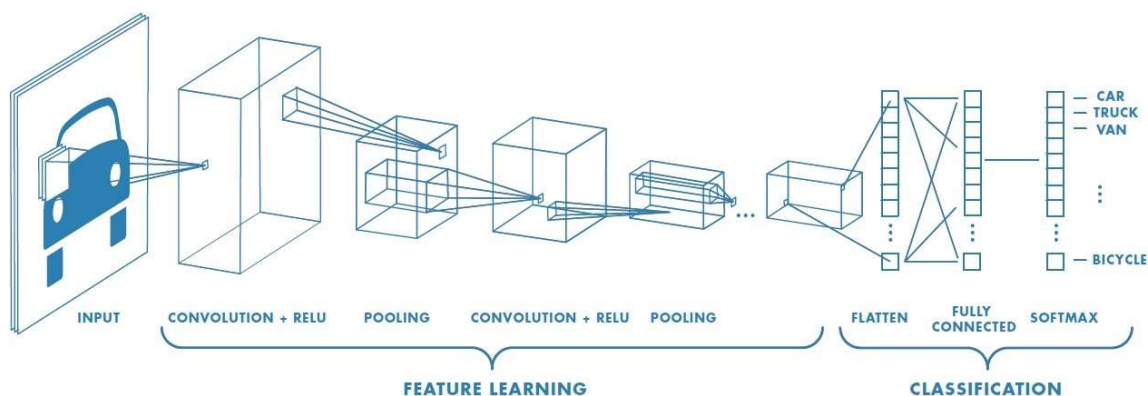


Figure 34 - A representation of a deep neural network architecture for illustrative purposes

source: <https://www.mathworks.com/videos/introduction-to-deep-learning-what-are-convolutional-neural-networks--1489512765771.html>

As mentioned, although Deep Learning has taken the computer vision field forward hugely in recent years, fundamental challenges still remain in getting computers to fully understand video in most real-world applications. One of these challenges is for instance related to having to rely on existing CCTV camera, whose resolution is quite limited for Neural Network analysis purposes, and cameras images are often grainy and often taken from unusual angles.

While AI is great at identifying the meaning of a video footage at high level, performing well in tasks such as following vehicle through license plate tracking automatically tracking one moving person across multiple cameras, it isn't currently able yet to extract vital context information. For instance, the network might be able to look at video footage and identify it contains a running person but not be able to distinguish between someone running because they're late for a bus or to save themselves from some dangerous situation. Another limitation, as already mentioned, is related to the well-known need of high levels of computational power and resources for carrying out the tasks of deep neural network training.

The rapid rate of evolution in the field, though, bodes well that current limitations will be overcome in the short to medium term.

Elements of Social innovation

This kind of technology can have major repercussion both on actual levels of safety or its perceived levels, eliminating what commonly turn out to be one real barrier to the usage of transport services for some categories of people. If a location or service is perceived to be unsafe, then the actual barriers which create this feeling need to be tackled if passengers are to trust the location or service and hence change their behavior to use it.

Envisaged Service improvement

The introduction of machine intelligence analysis of video streams contributes to improving both the overall perception of the level and the quality of the provided transportation service by the users. As noted, current security cameras effectiveness is limited by the need of human operators constantly and actively checking for dangerous or risky situations, whose costs could be prohibitive – so this could have also a positive impact on cost effectiveness of provided services.

Addressed actors, needs and prioritized areas

The safety level perception problem can be particularly critical for for some specific categories of users like women, children, elderly, visually impaired or otherwise disadvantaged people and for what concerns transport facilities located in enclosed and secluded areas, or when considering large suburban areas or sparsely frequented zones or facilities, which require a very large number of cameras for full coverage.

Enabling factors.

This kind of data analysis has become technologically feasible in recent years, thanks to the rapid progresses in video and image analysis due to the recent evolutions in the field of machine learning and artificial intelligence in general. Cloud-based analytics can now be used to upgrade existing, “dumb” cameras, with intelligent capabilities – providing a sort of “vision as a service” - or even artificial intelligence can be directly embedded into newly manufactured camera hardware.

Scalability and replicability

One factor that needs to be considered is the introduction of this kind of intelligent automated surveillance is exposed to a number of ethical and acceptance-related issues, as often happens with anything related to Artificial Intelligence evolution that bring machines to make decisions in areas normally reserved to human beings.

In particular, serious questions can be raised concerning privacy and personal freedom. The legitimate fears concern the ability for governments or other subjects to track huge numbers of people using CCTV: A recent example of this was reported by the Wall Street Journal concerning dissent from the Uighur ethnic group being suppressed by the China government in the western Xinjiang region with the help of automated face recognition software.

Other concerns touch the possibility of a biased algorithm running on the cameras, where the AI system “absorbs” prejudices of racial, sexist or social nature pervading the society that programmed them. This

means for instance that a system trained with video data in which members of some racial minority are statistically seen as committing more crimes, might give false positive alarms when only detecting the presence of people belonging to such minorities. Such false alarms from inaccurate AI surveillance could moreover lead to dangerous confrontations between law enforcement and members of the public who feel unjustly treated.

The maturity of such analysis techniques, though, is still in evolution. Accuracy and capability strictly depend on computational (and economic) resources dedicated to the tasks of training and video stream analysis. Current commercial home-automation systems, for instance, can automatically start recording footage when they recognize that something is moving in the recorded scene. But they can't at the current level, tell still can't tell the difference between a break-in thief and a bird, leading to many false positives.

On the other side of the spectrum, two of the biggest datasets for video analysis are maintained by YouTube and Facebook with the goal to help moderate content on their platforms. YouTube's dataset, for example, contains more than 450,000 hours of labeled video. Google DeepMind and IBM are also carrying out similar projects.

INCLUSION Pilot site(s) where it is planned to apply the idea

Currently, no step has been carried out yet aimed at proposing the concrete implementation of this concepts to pilot sites during the project duration.

Links

Wall Street Journal article on usage of face recognition in Xinjiang region:

<https://www.wsj.com/articles/twelve-days-in-xinjiang-how-chinas-surveillance-state-overwhelms-daily-life-1513700355>

8 References

- Ambrosino, G. (2018). *Shared Use Mobility Agency in Elba island: from the concept to the IT Platform*.
- App&Town. (2018). Welcome - App&Town. Retrieved 25 October 2018, from <https://www.appandtown.com/>
- Beazley, G. (2012). *Digital Exclusion. A research report by the Low Incomes Tax Reform Group of The Chartered Institute of Taxation*. Low Incomes Tax Reform Group.
- CNBC.com, J. H. (2016, June 18). The sharing economy booms for boomers. Retrieved 29 August 2018, from <https://www.cnn.com/2016/06/17/the-sharing-economy-booms-for-boomers.html>
- GoGoGrandparent Driver FAQ. (n.d.). Retrieved 29 August 2018, from <http://gogograndparent.com/driverfaq/>
- GoKid. (2016). *GoKid Pitch at Techstars Mobility Demo Day, 2016*. Retrieved from https://www.youtube.com/watch?time_continue=305&v=3JsidJsENDw
- GoKid Carpool App. (n.d.). Retrieved 29 August 2018, from <https://www.gokid.mobi/>
- iFundWomen. (n.d.). GoKid – The Complete Carpool Solution. Retrieved 29 August 2018, from <https://ifundwomen.com/projects/gokid-complete-carpool-solution>
- Kazhamiakin, R., Marconi, A., Martinelli, A., Pistore, M., & Valetto, G. (2016). *STREETLIFE project: A Gamification Framework for the Long-term Engagement of Smart Citizens* (1st IEEE International Smart Cities Conference, Guadalajara, Mexico, Conference Proceedings). Fondazione Bruno Kessler – Trento.

- Martin, C., Hope, S., & Zubairi, S. (2016). *The role of digital exclusion in social exclusion*. Ipsos MORI Scotland, CarnegieUK trust.
- Midilibre.fr. (2018, February 26). Retrieved from <https://www.monchaperon.fr/single-post/2018/02/27/Le-copi%C3%A9tonnage-pour-ne-pas-rentre-seule>
- Misuraca, G., Kucsera, C., Lipparini, F., Voigt, C., & Radescu, R. (2015). ICT-Enabled Social Innovation to support the Implementation of the Social Investment Package - Mapping and Analysis of ICT-enabled Social Innovation initiatives promoting social investment in integrated approaches to the provision of social services: IESI Knowledge ap 2015; EUR 27838 EN; <https://doi.org/10.2791/743181>
- Misuraca, G, Pasi, G., & Urzi Brancati, C. (2017). *ICT-Enabled Social Innovation: Evidence & Prospective*, EUR 28814 EN. Publications Office of the European Union, Luxembourg. <https://doi.org/10.2760/494727>
- Moloi, S. (2018). AftaRobot, South African minibus taxi app. Retrieved 25 October 2018, from <https://www.iafrikan.com/2018/02/22/aftarobot-taxi-app-hails-in-a-new-paradigm-for-the-local-minibus-taxi-industry/>
- Murray, R., Caulier-Grice, J., & Mulgan, G. (2010). *The open book of social innovation*.
- Open Data Users - TfL. (n.d.). Retrieved 22 November 2018, from <https://tfl.gov.uk/info-for/open-data-users/>
- Richardson, Ma. A., Petrescu, A., & Finch, M. A. (2016). *Event-based Ridesharing* (No. US 2016/0026936A1). United States Patent Application Publication.

Sommobilitat. (2018a). Home - Som Mobilitat. Retrieved 25 October 2018, from

<https://www.sommobilitat.coop/>

Sommobilitat. (2018b). Som Mobilitat Carsharing - Apps on Google Play. Retrieved 25 October 2018, from

https://play.google.com/store/apps/details?id=coop.sommobilitat.carsharing&hl=en_US

TaxistopAutodelen. (2018). *Presentation: Mobihubs in Flanders*. Gent.

Wher web site. (n.d.). Retrieved 20 November 2018, from <http://w-her.com/en/>

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