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Sustainable shared mobility interconnected with public transport in European rural areas (developing the concept of 'smart rural transport areas' (SMARTA))

Evaluation Framework

Final version

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EUROPEAN INTEGRATED PROJECTS SRL

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Purpose and Scope of this Note

The SMARTA project – Sustainable shared mobility interconnected with public transport in European rural areas - is a two-year project which aims to understand the current relevance and future potential of on-demand and shared mobility services integrated with public transport in the European rural areas.

The SMARTA project aims (**1**) to understand the market and framework in each European Country as these will determine the possibility of widespread deployment of interesting solutions; and (**2**) to use Pilots and Demonstrations to assess the impacts and sustainability of shared and on-demand mobility solutions in cooperation with public transport in practice.

This note summarizes all important aspects of the SMARTA project Evaluation Framework for assessing and evaluating the site demonstrations of Innovative Mobility solutions for Rural areas.

The focus of this note is to set out what is expected from the SMARTA and SMARTA 2 Demonstration Sites to make a good evaluation possible. "Good Evaluation" means *on one hand* to come to useful understanding and conclusions at the level of the site, which is relevant for the local operators and authorities; and *on the other hand* to contribute in a strong way to the formulation of advices and guidance at the European and national levels on the future actions to support rural mobility.

First the concept of the SMARTA Evaluation framework is described. This explains which questions we want to answer to which target audience, which knowledge sources we used to develop the framework and to come to an efficient evaluation plan for each site, which layers we have in the framework for which audiences.

Then this note indicates a set of "ideal" characteristics of the demonstration sites based on the wide range of rural shared mobility sites, both established and in preparation, examined by the SMARTA project during 2018. These characteristics, presented as required features of the Demonstrator and as elements of the implementation context, will allow the maximum flexibility in the nature of what could be demonstrated, while holding true to the goals set by the European Parliament and European Commission for SMARTA.

Further we give a more detailed overview of what SMARTA needs to know from the Demonstration Sites, which type of data/information are expected and which methods can be used. This should allow the sites to understand what level of efforts are needed to come to a good evaluation and will be the basis for the development of the final Evaluation Plan.

Finally, the needed cooperation between SMARTA and the SMARTA2 consortiums during the different stages of the projects is described.

Concept of the SMARTA evaluation framework

This note summarizes all important aspects of the evaluation approach of the SMARTA project setting the Evaluation Framework for site demonstrations of Innovative Mobility solutions for Rural areas.

Supporting the SMARTA objectives

The SMARTA evaluation aims to understand how the mobility and accessibility of rural areas should be improved in a sustainable way and to support strong and effective SMARTA conclusions. In this way, the evaluation findings should give case or evidence for policy-makers and authorities as justification for the policy they put in place.

It is important to note that there has been more than two decades of project work dealing with rural mobility in the different forms (from the conventional collective transport to on demand responsive and shared mobility services). SMARTA intends to build on this valuable existing knowledge, covering both rural mobility itself and suitable evaluation methods. The SMARTA Evaluation Framework should also be able to incorporate knowledge emerging from current recent projects in the domain.

SMARTA will give guidance to policy makers, local authorities and practitioners. It will help to answer their questions and present useful information to develop suitable policy and efficient operational solutions:

- *Practitioners (e.g. PT operators, mobility service managers):* business cases, operational aspects, technical aspects, optimisation aspects,
- *Local, regional authorities:* which services help to make rural areas more accessible and to sustain or restore their liveability, findings to convince local and regional authorities on the importance, how do we develop a context/support conditions to make services feasible and working
- *National and EU Authorities*: on which aspects do we have to focus, how can we push the implementation of efficient that make the difference

Supporting this, the SMARTA evaluation approach has to be a much broader and more significant process than just measuring simple KPI's at the pilot sites. Also, a strong understanding of the way the new services work, how they connect to the general public transport (rural, urban, regional), how ICT can help and other crucial aspects should be reported and analysed. This will contribute, to synthetize general conclusions, on a higher level than the individual sites, based both on elements from the good practices and the pilot sites, and on a wider societal, governance and sector/industry-level investigation of the change process to come to innovative and sustainable solutions.

For this SMARTA has developed a layered evaluation framework covering the important elements for an effective, feasible and accepted rural mobility. In this scheme, the evaluation knowledge built up in a range of previous projects is combined.

Key reference knowledge

To build up the layered SMARTA evaluation framework, interesting elements of key EU research and demonstration studies are used including: CREATE, CIVITAS, SAMPLUS, MIND-SETs, FAMS, SUNRISE and MASCARA.

Figure 1 Key references for the SMARTA Evaluation framework

In particular the **CREATE** project seeks to assist urban areas/cities in their planning to achieve sustainable mobility, reduced car-dependency with a new focus on livability. In the CREATE guidelines the elements of successful policies are organized in 8 groups each describing an important dimension of a positive change towards sustainable mobility.

The 8 groups or '8M' are:

- Mood: Increasing the acceptance of a new type of transport policy
- Motivation: Creating an environment that drives a change
- Mass: Increasing the capacity to make change happen
- Momentum: Accelerating the speed of change
- Mechanism: Processes to control and manage change
- Methods: Procedures used to address and solve issues
- Measures: type of solutions/services
- Money: Funding mechanisms

the CREATE project
elements of a successful policy
Mood
Motivation
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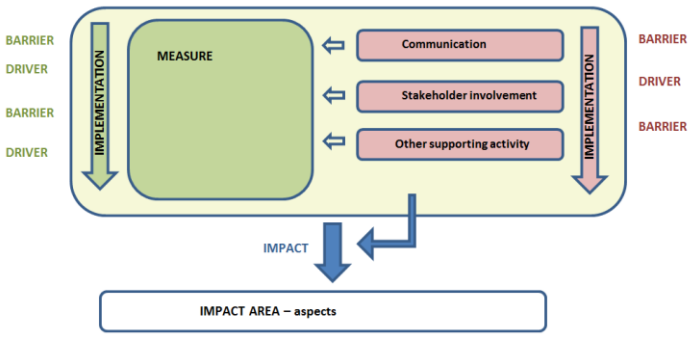
In the context of the SMARTA evaluation the question will be answered where we are in each aspect of this change process.

This will strongly contribute to understand the enabling conditions for innovative solutions.

The **CIVITAS** evaluation framework describes an integrated evaluation approach of measures to improve urban mobility. It combines an in-depth impact evaluation of the effects of the measure in the CIVITAS impact categories (Society-Governance, Society-People, Transport Systems, Environment, Economy and Energy) and an intensive process evaluation to understand the barriers and drivers and the importance of supporting activities for the implementation of a measure. The

framework includes also a range of indicators and related data collection methods that *can be used to operationalise the evaluation plans, eventually slightly optimised for rural areas e.g.*

- Awareness of a new service
- Acceptance of new service
- User cost of services
- Operational barriers for deficiency groups
- Number of accidents per mode
- Service reliability
- …



The **SAMPO, FAMS** and **SUNRISE** projects deal mainly with Demand Responsive Transport services in rural areas. Of particular relevance is that they developed and utilised evaluation planning, indicators and measurement methods specifically for rural mobility. The focus of the evaluation is:

- To assess the economic viability of each of the demonstrators
- To assess improvements in service provision resulting from the DRT implementations
- To assess the technical performance of each of the demonstrators

The **MASCARA** project includes an interesting Social Cost Benefit approach in which the investment and operational costs of the new services are balanced with a monetised synthesis of the benefits of a community.

The **MIND-SETS** Knowledge Centre is an intelligence facility to enable policy-makers, planners, researchers, or the innovators of new mobility products and services to better understand mobility and the role it plays in peoples' lives. Policy-makers, planners and transport operators, researchers and those developing or modifying mobility products and services can benefit from using the MSKC's intelligence bank through intelligence 'Insights', expert 'Editorials', videos and recorded conference presentations, virtual library of source material, discussion forums and links to professional social media channels, and a 'Radar Tool'.

Beside the providing of building blocks for this framework, these projects are also very useful as a source of inspiration for a creative and efficient evaluation plan for a specific site. (*Beginning March 2019, relevant documents from these and other selected projects are reproduced on the Downloads section of the SMARTA website, as reference material*).

The layered evaluation framework

The SMARTA evaluation framework consists of four main layers, as presented in the figure below:

- Understanding the enabling factors for change
- Measuring the impact on mobility and accessibility of the community
- Understanding the implementation process of the new services
- Understanding the important aspects for feasibility of implementation the strategies

For each layer also the main audiences interested in the layer are indicated.

To get sufficient understanding of each aspect in an efficient and feasible way, an integrated set of methods is recommended:

- Data collection methods and measurements of before and after quantitative indicators to analyse the impact of innovative services
- After surveys and process evaluation analysis to understand change and the story behind it
- Qualitative assessments of crucial context elements to make change possible and happen: interviews, focus groups, learning history, …
- Qualitative description of significant aspects of efficient innovative systems

A good balance between data collection efforts and qualitative approaches is important to have a good and cost-efficient evaluation approach.

How to gain the needed information and insights

Information and insights are gained in two main ways:

- Through Interaction and Dialogue with stakeholders across the sector, which allows a wide spectrum to be covered, but may be subjective and hypothetical

- Through Observation and Measurement of practical applications at Demonstration Sites, which allows in-depth examination in real-world conditions, but can be time-consuming and expensive

The remainder of this note will focus on the Demonstration Sites.

Demonstration Sites for SMARTA project

SMARTA Project, as already stated, deals with rural shared mobility connecting with public transport. It seeks to provide answers that are relevant and usable by European, national, regional and local stakeholders.

SMARTA will work with a set of Demonstration Sites that can implement rural shared mobility services and that can effectively measure their impacts. The "demonstration" may be dedicated purpose-designed demonstrators, or may be ongoing or permanent implementations that are also configured as demonstrators. Sites may implement new mobility services or may add new features to an existing set of mobility services. The essential aspect is that impacts and stakeholder responses can be assessed in a real-world environment following the Evaluation Framework described above for the site demonstration.

The nature of the "Mobility Services" implemented at a Demonstration Site can be very wide-ranging, being any form of "shared mobility" that is in a "rural context". The "Mobility Services" could consist of the provision and operation of the transportation services themselves; or provision of (e-)services for mobility such as booking, combining, reselling, MaaS, etc.; or a combination of these. In line with the SMARTA goals, the mobility services should be predominantly offered in rural areas. Services should offer convenient connection with the regular public transport. The demonstrated mobility services should provide the opportunity for trip combining and for current car users to shift mode for at least some of their trips. The primary focus of the demonstration should be the mobility services rather than the utilised technology.

A SMARTA Demonstration Site needs to provide a suitable context for Evaluation in line with what has been described in the previous sections. This has three main requirements:

- First, it should implement in real-world conditions to support an assessment of the mobility services themselves and the attitudes of various target groups towards those services.
- Second, it should be of sufficient scale and duration to identify actual and potential changes in travel behaviour, including trip combining and mode shift, and to support forecasting of changes over longer time periods and increased service coverage/intensity.
- Third, it should support assessment of stakeholder acceptance and the potential for sustainability, wider deployment and transferability of the demonstrated mobility services.

Demonstration Sites will have a structured evaluation that is consistent with the SMARTA Evaluation Framework, and will generate and provide to the SMARTA evaluation team the information set out in the next section.

It is highly desirable that baseline data is available, especially user needs, travel patterns and attitudes. These will support the evaluation to identify the extent of changes brought about by the demonstrated services and to better interpret their nature and probable causes.

It is also highly desirable that key stakeholders, including local communities, are involved in the demonstration. This will allow a better assessment of the prospects for uptake, sustainability and wider deployment of the demonstrated mobility services.

Main information required from the demonstration sites

This section sets out what the SMARTA Team needs to know from the sites for the purposes of the Evaluation, which type of data are expected and which methods can be used. This should allow the sites to understand what level of efforts are needed to come to a good evaluation approach meeting the requirements for SMARTA. It will be the basis for the development of the final Site-Specific Evaluation Plan.

The Site-Specific Evaluation Plan in not only about what is required for the SMARTA-level evaluation. It will also include items that are of specific interest to the stakeholders at the site.

Experience from working with many other sites over the years is that most of what is required for the SMARTA evaluation is also very relevant to the Site Stakeholders, but they might not have appreciated how much they could learn from their Demonstration or not yet included it in a structured evaluation plan. Thus, the Site-Specific Evaluation Plan aims to get the best possible value from a Demonstration, for both the local stakeholders and the European effort.

Crucial for the SMARTA sites is the timing of the operational phase of the demonstration having at least an operational period of 6 month to gather reliable information for the evaluation.

Documenting the site

To allow SMARTA to fully understand the evaluation findings, a precise and sharp description of the site and the new services implemented for the community or communities is crucial. Note that '*new service*' can be also understood as '*new ways to offer and to use existing services*'.

At least the following information is needed, much of which could be obtained from a recent study:

- A description of the community (or communities): number of inhabitants, age and gender, local services available, geographical situation, land-use structure, distances to surrounding communities and cities the community (or communities) is (are) interacting with for their regular activities (work, shops, services, leisure, …).
- A description the current existing mobility services available for the community (or communities).
- The specific local objectives of the new service(s) implemented.
- The operational characteristics of the new service and the operational interaction with other (existing and new) services e.g. the general public transport.

- An overview of all accompanying measures taken to implement the service and to make the service successful.
- The specific target group for the new service: size and significant characteristics.
- The stakeholders involved to implement the service.
- The financing of the service today and in the future.
- The existence (if any) of particular enabling factors e.g. the presence of tourists, a certain charismatic political person,….

Evaluation data

The table below gives an overview of the type of information needed from a SMARTA Demonstration Site. It is classified in categories, structuring the characteristics and impacts of the solutions implemented. For each category, the main required type of information is listed and high-level methods to collect the information are indicated.

The set is a mix of quantitative data of which the absolute values of the **actual situation** at different moments of the operational period are important but also the comparison with the **baseline** values, and qualitative descriptions of specific aspects of the community, of the user and non-users of the service and of other significant indicators.

	Categories of information	***Aspects and factors***	***Possible Methods***
1	Accessibility (ability to reach the mobility service)	• People within walking distance of the mobility service • Safety of access/waiting location • Variability in access conditions (weather, lighting) • Non-walking access to mobility services • Service comes to the person	• Measurement • Qualitative score
2	Mobility (ability to reach destinations/activities	• Access to urban centre: service frequency, service periods, travel times • Access to public transport hub • Primary needs (work, education, healthcare) • Access for tourists and visitors • Personal preferences (leisure, social, …)	• Measurements • Factor description
3	Response of user and non-users	• Awareness • Acceptance • Attitude • Suggestions/priorities • Inhibitions (barriers to use)	• Surveys • Interviews
4	Stakeholder acceptance	• Funders/sponsors • Local politicians • Regulatory authorities • Policy-makers	• Surveys • Interviews
5	Ridership	• Passengers carried • Travel behaviour - Mode shift	• Measurements • Factor description

		• Usage by original target groups • Usage by non-target groups	
6	Financial	• Revenue from users • Revenue from other sources • Costs, by category	• Factor description
7	Importance of supporting activities	• Marketing • Promotion • Engagement with community • Engagement with stakeholders • Engagement with activity centres	• Surveys • Interviews • Focus groups
8	Quality of service offer	• Coverage • No. vehicle trips/opportunities • Quality of pre-trip phase • Quality of service operations • Service reliability	• Factor description • Monitoring operational events • Focus group
9	Technical system performance	• Vehicle reliability, technical failure • Communication systems • ITS management and support • Payment systems	• Factor description • Monitoring technical events • Focus group
10	Sustainability of service (ability to sustain indefinitely)	• Financial aspects • Organisational aspects	• Factor description
11	Environmental impact	• Occupancy of vehicles • Cars entering the observed area • Vehicles-km travelled • Emissions • Parking	• Measurements • Calculations • Modelling
12	Community development	• Impact on local businesses • (De)Population	• Interviews • • Focus group
13	Expandability	• Ability to expand coverage area • Ability to increase service offer • Ability to handle increased users • Transferability (to a new area)	• Factor description • Focus group

Processing of the data

The responsible partner for the demonstration of the site is expected to do data collection, quality control and basic processing of the data collected on the community, the services and the target users as listed above e.g.

- Synthesis of the responses on the surveys
- Statistics of the measurements of the number of users of the services or other effected modes
- Structured synthesis of potential users in the areas covered by the new service.

The SMARTA team will carry out the following:

- Information processing and analysis for a defined set of site-specific aspects agreed in advance between the SMARTA team and the demonstration site team, as part of the support agreement
- Information processing and analysis for the European-level aspects of evaluation
- Multi-site and inter-site analysis
- Use of models if necessary

Cooperation between SMARTA and SMARTA 2

SMARTA envisage an effort-efficient cooperation between SMARTA and the Demonstration Sites in which the best choices are made to come to the best knowledge gathering with the resources used.

Stages in the cooperation

The following stages are foreseen, with indicative timelines:

- SMARTA team develops the basic evaluation approach, taking into account the requirements in this framework by the sites as part of the SMARTA 2 proposal. This will include a clear description of the site and the planned services as provided in the SMARTA 2 proposal phase
- Workshop between SMARTA and the SMARTA 2 Sites to define in detail the requirements and the method to develop efficient Site-Specific Evaluation Plans (SSEP): Month 1
- Interactive process to refine specific questions and challenges
- Site visits by SMARTA team to each site to assist them develop their SSEP: Month 2
- Detailed development and sign-off of the SSEP for each SMARTA 2 site: Month 3
- Delivering of the data listed above under 'documenting the site' and the baseline data – Month 4
- Delivering the evaluation data (Workshop see evaluation plan) – Months 6 through 12
- Workshop between SMARTA – SMARTA 2 sites to discuss the evaluation findings of the site: Month 14
- Final evaluation report of the site: Month 15

This cooperation schedule can be further optimised at the start of SMARTA 2.