Getting citizens on board: new ways to involve citizens in transport planning. The LOOPER platform

Dr. Imre Keseru – Jesse Pappers – Dr. Cathy Macharis

Vrije Universiteit Brussel, MOBI Mobility, Logistics and Automotive Research Centre
telephone: +32 2 6148323
e-mail: imre.keseru@vub.be, jesse.pappers@vub.be; cathy.macharis@vub.be

Abstract: This paper presents the LOOPER participatory co-creation methodology and online platform bringing together citizens, stakeholders and policy-makers to iteratively learn how to address urban challenges (road safety, traffic calming, air and noise pollution). The platform enables transport planners to initiate bottom-up planning and design of new transport interventions. The process starts with the identification of the problem using participatory sensing (carrying out measurements with the citizens), co-design of the solutions, co-evaluation using the multi-actor multi-criteria analysis methodology and then co-implementing the solutions together with the citizens. In this paper, paper we propose participatory tools and methods that can be applied in participatory transport planning in order to identify the problems (participatory sensing), to collect ideas and solutions (online and off-line co-design) and evaluate the solutions (multi-actor multi-criteria analysis).

Keywords: public participation, co-creation, sustainable mobility, air quality,

Introduction

Increasing problems with air pollution, greenhouse gas emissions, noise and liveability have induced concentrated efforts to improve transport in cities all over the world. After decades of planning that was based on the 'predict and provide' principle, trying to satisfy the ever-increasing demand for road traffic, a paradigm change towards sustainable urban mobility has gained momentum. The involvement of stakeholders is a key principle of sustainability. It is necessary to get an idea of the needs and objectives of citizens and companies on the impact of the changes in the mobility system, in order to further evolve towards a more sustainable system. The Urban Mobility Package of the European Commission [1] sees participation as a necessary condition to get towards sustainability. Until recently, participation in this sector was low. It was the engineers and planners who proposed, analysed and evaluated new solutions to transport problems with little, if any, public participation apart from what was obligatory. Recently, inclusive and participatory decision making, citizen involvement has become important and a shift towards participative planning and evaluation has been detected integrating stakeholders into different stages of the decision-making process [2].

Co-creation is an umbrella term for a wide range of participatory and open-design processes that has been widely used in urban planning and design. It is an approach to creative practice by moving beyond consultation towards collaboration between the citizens impacted by particular issues. It puts the user and citizen as the 'expert' of their own life at centre stage of the design process [3]. Co-creation in transport planning has rarely been applied, therefore we have little knowledge about the benefits of such approach to transport planning and the tools that can facilitate such a participatory approach.

1. The LOOPER Co-creation methodology

The Learning Loops in the Public Realm (LOOPER)[1] project funded by JPI Urban Europe is a collaborative project that is developing a co-creation methodology and platform to address urban challenges such as traffic safety, traffic congestion or air pollution. Since co-creation is a relatively new field in transport planning and it requires considerable human resources and planning the methodology and online platform aims to provide guidance to implement a co-creation process from the very beginning (problem identification) to implementation. The methodology and the platform is tested in three living labs in Brussels, Verona and Manchester.

[1] See www.looperproject.eu

There are multiple ways to classify the various stages of co-creation. In the LOOPER methodology, the co-creative planning process is conceptualized by the LOOPER platform, which comprises three sequential planning stages (Figure 1).

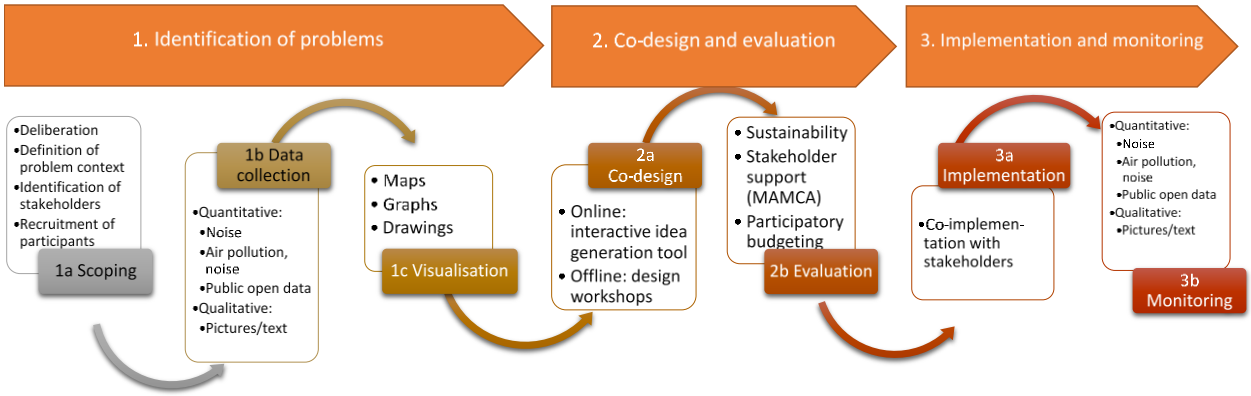

Figure 1 The co-creation process in planning

The main stages of the LOOPER methodology are as follows:

1. **Identification of problems and opportunities**: The aim is to identify the problems of a local community through a three-step process. This stage can be framed positively, referring to opportunities rather than problems:

    1a. **Scoping:** The affected communities and the context of the problems will be identified. The problems are framed in a way to enable the tangible aspects to be identified through data.

    1b. **Data collection:** Data to identify the scope, location and type of problems is collected with the participation of stakeholders via participatory sensing, via public databases and through face-to-face discussions.

    1c. **Visualisation:** Visualisations of collected data are published on the LOOPER online platform and discussed at local workshops.

2. **Co-design and evaluation of alternative solutions**: The aim of this stage is to assess the problems identified in the previous stage, co-design and evaluate solutions, and select the solution(s) that will be implemented.

    2a. **Co-design:** Participants engage in qualitative and interactive online and face-to-face deliberation activities to propose solutions. Participants co-create alternative scenarios, explore new synergies in design or policy and define pathways for action.

    2b. **Evaluation:** After the co-design stage a more standardized method like a multi-criteria analysis is used to appraise the sustainability of alternatives and the Multi-Actor Multi-Criteria Analysis (MAMCA) is applied to identify stakeholders' preferences.

3. **Implementation and monitoring**: Based on the results of Stage 2, stakeholders implement a range of solutions and monitor their efficiency, using the same or comparable data used for the problem definition (Stage 1).

    3a. **Implementation** in the living labs involves citizens and stakeholders through their voluntary contribution.

    3b. **Monitoring:** Monitoring the impact of co-designed solutions uses the same set of tools as in Stage 1. This may involve participants through participatory sensing and open data or through other qualitative means of appraisal like reconducting interviews.

In this paper, paper we propose tools and methods that can be applied in participatory transport planning in order to identify the problems (participatory sensing), to collect ideas and solutions (online and off-line co-design) and evaluate the solutions (stakeholder-based multi-actor multi-criteria analysis).

2. Crowdsourcing data to identify problems and monitor the implementation of solutions

The first stage of co-creation in planning is the identification the problem that needs to be addressed through new solutions. Since transport planning aims to respond to the real problems of citizens and other stakeholders, it is crucial that the citizens are involved in co-creation already at this early stage.

Data collection for mobility (e.g. travel surveys or traffic counts) is usually organised in a top-down manner, when data collection is commissioned by transport authorities or research organisations. Recently, however, there has been an increasing tendency towards bottom-up initiatives when citizens and stakeholders initiate and implement data collection campaigns through participatory sensing. Participatory sensing relies on handheld mobile devices with multiple built-in or connected sensors (e.g. smartphones) to enable citizens to collect, analyse and share data and knowledge about their environment and their own behaviour [4].

In the LOOPER project we have been using the following participatory measurement devices and methods (Table 1):

Table 1 Participatory measurement deivces used in the LOOPEr living labs

Data type and indicator	**Measurement device/method**	**Location (city)**
Air quality: particulate matter 1	Airbeam 2 portable monitors[2]	Manchester, UK
Air quality: particulate matter 2.5	Airbeam 2 portable monitors	Manchester, UK Verona, Italy
Air quality: particulate matter 10	Airbeam 2 portable monitors	Manchester, UK
Air quality: NO_2	Fixed monitor	Manchester, UK Verona, Italy
Traffic safety: speed of vehicles in km/h	Portable radar	Brussels, BE Manchester, UK
Traffic safety: traffic counts	Pen and paper form/mobile app	Brussels, BE
Noise: noise levels in dB	Fixed noise boxes	Verona, Italy
Traffic safety: citizens' perception	LOOPER geotagging tool[3]	Brussels, BE Manchester, UK Verona, IT
Quality of environment: citizens' perception	LOOPER geotagging tool	Manchester, UK Verona, IT
Quality of greenspaces: citizens' perception	LOOPER geotagging tool	Manchester, UK Verona, IT

There are, however, a number of challenges that need to be resolved in connection with participatory sensing, such as the protection of privacy, the lack of incentives for participants resulting in a low commitment level, the quality of the retrieved data, and technical limitations such as the reduced battery-life of the smartphones due to the data communication [5].

The three LOOPER living labs have had differing experience with participatory data collection depending on the types of data collected, the type of measurement devices and the socioeconomic profile of the citizens involved in co-creation.

- In Manchester, the residents did not show particular interest towards participatory measurements despite the continued effort to involve them in the data collection. The possible reasons for this

[2] See http://aircasting.org/

[3] See www.loopertagging.eu/brussels/

could be their level of education and the fact that most people claimed that they were already aware of the problems before the measurements.

- In Brussels, citizens were eager to use the mobile radar to see how fast cars are driving and to collect data on number and type of road users. Around 20 citizens participated in three different occasions to collect data on traffic. The LOOPER geotagging tool was set up to collect data about which streets citizens believe to be unsafe, but its usage was hampered by technical difficulties. Nevertheless, around 10 citizens used the tool to submit their experiences with traffic in the Living Lab neighbourhood.
- In Verona, data on air quality and was collected using both fixed monitors as well as mobile ones; data on noise pollution was collected using fixed monitors. Citizens were very engaged to walk around with the AirBeam monitor to collect data on air quality in order to compare it with official data from the Italian government, and also allowed the Living Lab organisers to install fixed monitors near their homes.

3. Co-design tools for idea generation

The co-design stage of the co-creation cycle aims to find solutions to the problems that were identified in the previous stage and supported by data. While previous traditional planning approaches usually only consulted the citizens and other stakeholders once a first technical design has been completed, co-design aims to involve the citizens in the design process building upon their potentially creative ideas and in-depth knowledge of the local circumstances. Co-design, however does not happen by itself. Co-design is usually facilitated by a professional, who might choose a certain approach, and within that various methods or tools to spark creativity and keep a process of reiterative questioning, refining, reflection going. Scenario or prototypes can be built and reviewed. While co-design as an approach asserts users to be capable experts of their own experiences, they must still be supported through tools that allow them to express themselves [3].

In order to reach the broadest possible audience, it is recommended to use both online and offline tools for co-design. In the LOOPER platform we have used an online idea generation tool[4] that allows citizens to propose new ideas (solutions) and consult and react to the ideas already submitted or identified at face-to-face workshops. Ideas include a map marker (location), subject, title of the idea, description of the idea, category, optional photo, name and optional e-mail address.

When uploading a new idea, citizens first select which category their idea corresponds to: action/campaign; improving an existing object; new functionality or object; and an event. Then, they can select what use of public space their idea corresponds to. Citizens then name their idea and enter a description. Then, they can localise their idea by putting a pin on a map before submitting their idea.

Based on our experience with the tool in LOOPER we concluded that digital or online tools should be easy to use for citizens. In Brussels, the online idea generation tool was used by more citizens than the LOOPER geotagging tool, most likely because no account creation was necessary for the online idea generation tool and submitting an idea was a rather straightforward exercise. However, in Manchester the online idea generation tool was not used by citizens. It is unclear whether this is because of disinterest in the project or because the citizens lack digital skills to use the tool. No direct discussion between citizens, however, took place online. Whereas lively discussions about traffic safety and air quality took place during physical meetings, this was not the case online. Citizens used the online idea generation tool to submit ideas and view ideas of others but did not use the commenting function.

In addition, we have organised face-to-face meetings with citizens in parallel to the online co-design tools. These meetings served as a way to present the project to citizens, to get a debate started between citizens about the problems that the living lab would address, and to get citizens involved in finding solutions for the problems identified in the living lab. Moreover, these physical meetings allowed for the participation of those that were not able or did not wish to participate online.

The face-to-face meetings usually lasted around two hours and were led by the Living Lab coordinators: the universities and the local implementation partners. The meetings always had a predefined objective and agenda, but also allowed for flexibility in order to meet the needs and wished of the participants. In

[4] See http://brussels.looperproject.eu/ideeen/

Brussels and Verona, most participants were already engaged in the topic of the Living Lab and had a relatively high educational background. In Manchester, no public meetings were held due to lack of engagement from citizens. Instead, the Living Lab coordinators visited citizens in order to get input on what the problems are in the neighbourhood and how they could be solved.

4. Stakeholder-based evaluation of co-designed solutions

The third point in the LOOPER methodology where citizens and other stakeholders can participate is the evaluation of solutions that were proposed in the co-design phase. The LOOPER methodology applies the multi-actor multi-criteria analysis (MAMCA), a methodology developed by Macharis [6], [7] that assesses stakeholder preferences. The MAMCA approach was developed for the evaluation of transport projects, in which stakeholder inclusion can balance competing and conflicting interests and thereby achieve a better integration of environmental, social and economic considerations [8]. Examples of stakeholder groups in transport projects are the users or passengers, the investors, the operators, society as a whole, and the different levels of government [9].

The MAMCA methodology consists of seven steps that are shown in Figure 2. A MAMCA starts with the identification and classification of possible alternatives that will be evaluated. This is followed by a stakeholder analysis, in which the groups whose opinions should be taken into account are identified and contacted. In step three, each stakeholder group defines their criteria and gives weights to the criteria. The weights reflect the importance a stakeholder gives to each criterion. In step four, the criteria identified by the stakeholders are 'operationalised' by constructing indicators in order to measure the impact of an alternative on each criterion. Then, the alternatives are analysed and ranked, the results of which are shown in step six. This step also includes consensus making between stakeholders. If no consensus is found, new alternatives can be created and a new MAMCA is performed. Lastly, the results of the MAMCA inform the implementation of the alternative once it has been chosen [9].

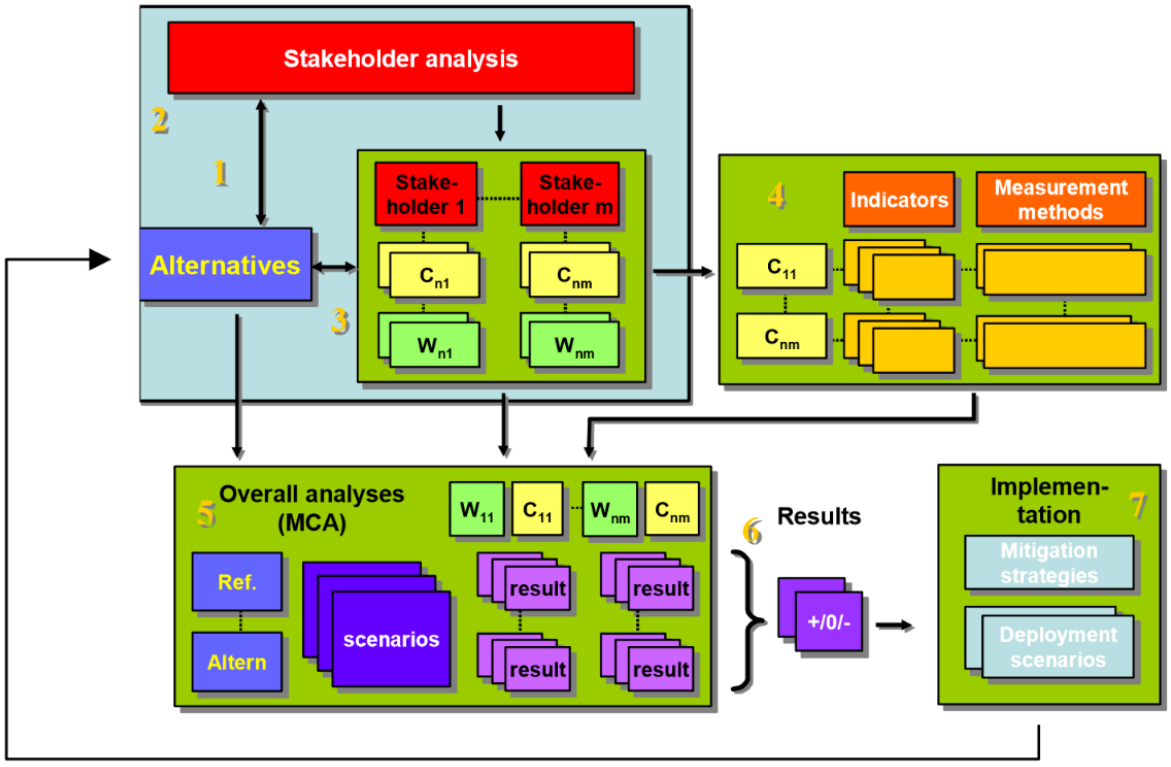

Figure 2. The steps of multi-actor multi-criteria analysis [9]

In the LOOPER project we have applied MAMCA to evaluate the stakeholder support of the solutions proposed during the co-design phase. The aim was to find solutions that are not only preferred by the citizens who co-designed them but also the other stakeholders that are affected by them, i.e. municipalities, cycling associations, public transport operators, and regional authorities.

Combining co-creation with MAMCA is not a straightforward exercise. Whereas co-creation is a loosely structured, bottom-up method, the MAMCA method for evaluation is very structured and can be perceived as complicated. Nevertheless, the added value of using MAMCA for evaluation is to see to what extent the co-designed ideas are expected to be supported by stakeholders, based on the objectives of stakeholders. In order to define these objectives, Living Lab coordinators interviewed stakeholders that had been identified by citizens and that could affect or be affected by the implementation of the co-designed ideas.

Although the MAMCA method can be perceived as complicated, the outcome was easier to explain to citizens. During one workshop, the results of the evaluation were presented to citizens. Here, the evaluated ideas were ranked on expected stakeholder support, based on the objectives of the stakeholders. An issue that came up during the evaluation with MAMCA was how to use input from citizens: are they seen as one stakeholder group or are they multiple ones? And if citizens are divided into multiple stakeholder groups, on what would this division be based? Due to time constraints and the relative homogeneity of the participants in the Living Labs, stakeholder citizens were identified as one stakeholder group.

5. Bringing it all together: the LOOPER platform

The LOOPER online platform will offer access to the tools for data collection, visualisation, idea generation and evaluation including guidance on how to use these tools. The platform has been developed in three local iterations in Manchester (http://manchester.looperproject.eu/), Verona (http://verona.looperproject.eu/) and Brussels http://brussels.looperproject.eu/) in the local languages to ensure that there is a broad access to them among the citizens.

The platform is currently being tested in order to determine the usefulness and transferability of the tools to other locations and different issues. Further developments on the projects can be followed up on the LOOPER website (www.looperproject.eu).

Conclusions

The LOOPER methodology and platform outlined in this paper aim to contribute to improve participation in transport planning by offering a set of methods and tools to better engage citizens and other stakeholders in the full planning process through the three stages of co-creation. While it may seem that such an approach may prolong the planning process and may lead to lengthy discussions, such a participatory process can help to achieve consensus or compromise and avoid future negative consequences due to negative impacts on the citizens, not addressing real problems and implementing solutions that are not taken up by the intended users. At the same time, the way the co-creation process is implemented should reflect the decision-making and participation culture, the topic it is addressing and the target population. The engagement methods (digital vs. offline) and the tools should be selected taking into account these circumstances.

Acknowledgement: The support of Brussels Capital Region – Innoviris (Belgium), Ministero dell'Istruzione dell'Università e della Ricerca (MIUR) (Italy), the Economic and Social Research Council (UK) and the European Union is gratefully acknowledged.

References

[1] European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Together towards competitive and resource-efficient urban mobility'. European Commission, 2013.

[2] Booth C. and T. Richardson: Placing the public in integrated transport planning, Transport Policy, vol. 8, no. 2, pp. 141–149, Apr. 2001.

[3] Voorberg W. H. - Bekkers V. J. J. M., - Tummers L. G.: A Systematic Review of Co-Creation and Co-Production: Embarking on the social innovation journey, Public Management Review, vol. 17, no. 9, pp. 1333–1357, Oct. 2015.

[4] Amintoosi H. and Kanhere S. S.: A Reputation Framework for Social Participatory Sensing Systems, Mobile Networks and Applications, vol. 19, no. 1, pp. 88–100, Feb. 2014.

[5] Lane N. Miluzzo D. - Lu E. – Peebles H. - Choudhury D. - Campbell A. T.: A survey of mobile phone sensing, Communications Magazine, IEEE, vol. 48, no. 9, pp. 140–150, 2010.

[6] Macharis C: Strategische modellering voor intermodale terminals. Socio-economische evaluatie van de locatie van binnenvaart/weg terminals in Vlaanderen., PhD Dissertation, Vrije Universiteit Brussel, Brussels, 2000.

[7] Macharis C.: The importance of stakeholder analysis in freight transport, European Transport \ Trasporti Europei, no. 25–26, pp. 114–126, 2004.

[8] Baumann C. - White S.: Making better choices: a systematic comparison of adversarial and collaborative approaches to the transport policy process, Transport Policy, vol. 24, pp. 83–90, Nov. 2012.

[9] Macharis C. - de Witte A., - Ampe J., The multi-actor, multi-criteria analysis methodology (MAMCA) for the evaluation of transport projects: Theory and practice, J. Adv. Transp., vol. 43, no. 2, pp. 183–202, Apr. 2009.