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LONG ABSTRACT

Stakeholder engagement in the Sustainable Urban Logistics Planning: the case of the Metropolitan City of Rome

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According to official guidelines, participation of both citizens and stakeholders in the drawing up of a Sustainable Urban Mobility Plan (SUMP) enhances the public acceptance and support and thus facilitates the implementation of the plan itself (Eltis, 2019).

Urban logistics (UL) represents one of the most important and tricky challenges since it produces negative externalities while it is also necessary to ensure city growth, competitiveness, accessibility and inclusiveness. It is important to achieve sustainable UL, i.e. That is, a goods distribution system that effectively and efficiently meets market demand. All while maintaining a satisfactory level of environmental and social sustainability (Taniguchi & Thompson, 2014). Nevertheless, under this respect, there are two possible causes of low quality urban planning when dealing with UL (Le Pira et al., 2017).

On the one hand, the presence of very different stakeholders (senders and receivers, logistics operators/service providers, citizens/consumers, administrators, and regulators) makes preference heterogeneity even more relevant and significant within the decision-making process (Marcucci *et al.*, 2012). Stakeholders actually have often contrasting values and goals, and also very different utility functions (Stathopoulos, *et al.*, 2012), thus being expected to be differently affected by intervention measures; indeed, the lack of awareness of the complexity of the system can widen the heterogeneity of policy acceptability (Gonzalez–Feliu, 2014).

On the other hand, the horizontal competition among stakeholders, such as transport operators, provokes lack of data and knowledge with respect to market functioning, producing low levels of cooperation (Bjorgen et al., 2021; DeSouza et al., 2014; Lindawati, 2014).

Leaving aside the difficulty of gathering data, which can easily be overcome using new technologies, the real problem often lies in the under-use, misuse or bad use of this data. While it is true – and understandable - that the private sector may be reluctant to share its strategies with potential or effective competitors, it is not comforting to learn that only 60% of cities that have implemented smart city projects – and are thus aware of their importance - actually use the data obtained (Osservatori Digital Innovation, 2022).

Indeed, data are under-utilised for several reasons. These include not only the being endowed with competence in both collecting and processing information, but also the lack of coordination, the instability of governance and, shifting the focus to more purely cultural aspects, the lack of trust in the institutions.

Yet, these data, whose importance for the private sector lies in efficiency, can be used by the public sector not only for assessing policies but also to communicate their main outputs. This allows administrators to enhance a mutual exchange of data and information with citizens and operators, to take shared and sustainable decisions, and to reinforce public engagement and participation. Within this context, participatory planning and stakeholder engagement play a fundamental role in balancing private sector requirements for higher efficiency and low-cost operations, and public needs for ensuring city liveability, high safety and environmental sustainability.

This can be especially useful to improve the situation, especially when dealing with the recent increase of e-commerce, even enhanced by the covid-19 pandemic outbreak in 2020, and the consequent huge rise of B2C (business to consumers) urban deliveries. The active involvement of citizens and stakeholders turned out to be fundamental. Nevertheless, it is not easy to implement such a process, due to (at least) two different problems.

First, there is a formal issue, due to the numbers of potential people and representatives to involve and the available resources to do it; second, an essential issue is represented by the complexity of the topics to be addressed.

To shed light on these issues, many studies discuss different tools to engage citizens and stakeholders in a possibly fruitful and lasting dialogue; among theses the Living lab (LL) action-oriented approach (Nesterova & Quak, 2016), while developing knowledge, provides fertile ground for testing innovative solutions.

The aim of a LL is primarily to encourage participation of all relevant stakeholders and user groups, due to their various and different backgrounds, favouring a better understanding, knowledge and supporting innovation by listening to multiple needs and experts' suggestions.

Its nature aims to make stakeholders agreeing common ambitions and working together towards common goals, feeling listened, involved, and engaged (Maltese et al., 2023).

The living lab concept fits the complexities of the urban freight system well (Quak et al., 2016); indeed, the scope can be focused on a single specific issue limited in space or consider logistics across the whole city.

In UL it turned out to be crucial, since due to the large number of stakeholders, often with conflicting interests, the needed for collaboration is very hard to implement.

Accordingly, co-created solutions are proved to be more effective, since they are built on the synthesis of logistics and behavioural studies (Wang et al., 2021).

Actually, the scanty knowledge on UL, also due to multiple distribution actors, and the predominance of small companies, is one of the challenge LL must cope with (CITYLAB 2018).

Data exchange, which is crucial for individual and collective evaluation, at every stage (ex-ante, in itinere, ex-post) of the assessment process (Marcucci et al., 2019) may transform the ex-ante evaluation in a co- participated and transferable process for discovering in advance the effects of the decision to be taken (LEAD 2021). Cooperation is based on communication and dissemination of outcomes, knowledge sharing, and information exchange between stakeholders and decision makers (ibidem).

Furthermore, LL should be replicable and scalable, as it is intended to be a generic decision-making framework for stakeholder interaction (Ballantyne et al., 2013).

Last but not least, within the Sustainable Urban Logistics Plans (SULPs), aimed at ensuring efficient and sustainable logistics within urban areas (Fossheim & Andersen, 2016), LL can

ensure a coherent and complementary relation between bottom-up and top-down approaches.

Finally, it is a useful approach as long as the implementation of specific solutions within a collaborative environment can be crucial for their effectiveness.

In particular, the LLL of the City of Rome constitutes a participatory co-creation laboratory aiming at systematically involve public and private CL actors to carry out innovative and shared pilot projects. In this case, LLL although conceived and deployed as a standalone stakeholder engagement tool, needs to be complemented with structured, technical and stakeholder engagement tools. To provide a clearer overview, it is noteworthy mentioning that UL planning is often characterized by time and budget constraints that, coupled with the fore-mentioned lack of data and knowledge, calls for new methodologies to be developed.

Interestingly, according to the recently shared outcomes, the LLL is considered among the opportunities of the SWOT analysis as a facilitator of the metro-SULP activities and approach adopted, together with the PNRR support and the EU De-carbonisation strategy. It also demonstrates the importance of governance aspects for the ability to manage wide-ranging strategies, both national and supranational (Città Metropolitana di Roma, 2022).

In order to collect and share data within the LLL, it has been developed the project "L-3D - a new dimension of participation", coordinated by TRElab, at the Department of Political Sciences of Roma Tre University. It uses new technologies and innovative communication tools to improve stakeholder engagement in the decision-making process for UL.

In more detail, the project develops and systematizes an innovative decision support system to facilitate stakeholder involvement and to assess the *ex-ante* acceptability of measures.

It delves on the application of this methodology in a real context as the participatory meetings in LLL of Rome by describing the different phases of L-3D case study, starting from the preliminary identification of shared measures to their final prioritization.

L-3D produced a purpose-built software is divided into two modules (Choose and Visualise), to complement the Living Lab approach.

The first one, L-3D choose, is based on Stated Preference (SP) and Discrete Choice Models (DCM), which constitute a valid instrument to estimate behaviourally consistent policies (Gatta et al., 2017). This is coherent to the idea of using a more structured, technical and scientific stakeholder engagement tools. By embedding this methodology within a software capable of eliciting and modelling data in real time within a participatory framework (e.g., a workshop, a LLL meeting) one can offset the gaps previously described.

The model is integrated with interactive audio-visual content. This will allow to represent, in real time, the preferences of stakeholders and to view the evolution of scenarios in an interactive way.

The software enables the acquisition and segmentation of stakeholders' preferences of the stakeholders consulted. At the end of the consultation process, the software can process the answers in real time, and store them so that it can represent the results, that are presented to the public through a graphic optimization, in the module "visualise".

Digital storytelling is used to make the result presentations more appealing and easy-to-grasp, thus reducing the risk of the so-called "survey fatigue".

Once the scenarios deemed most acceptable by most stakeholders are defined, they are reproduced in a video format, with the creation of movies reproducing in a realistic way how the new measures will impact the urban system.

This paper delves on the application of this methodology in a real context as the participatory meetings in LLL of Rome by describing the different phases of L-3D case study, starting from the preliminary identification of shared measures to their final prioritization

The analysis will also provide insights into the potential transferability to other existing Living Labs worldwide, and to other participatory planning processes, not only in a public policy context but also in the private sector realm.

As it allows identifying potential solutions and the role of the various actors, it can secure commitment to a strategy of improvements (Holguín-Veras et al., 2015); moreover, thanks to clearly identified stakeholders and their needs, it is then possible to preconize the acceptability of the proposal, thus reducing times and costs of the decision-making process and minimizing potential conflicts during its implementation. This increases the chance of success of the measure, at the same time increasing also the reliability of the decision maker (Marcucci *et al.*, 2019).

Keywords: Stakeholder engagement, storytelling, city logistics, SULP, Rome nserire le parole chiave separate da punto e virgola

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