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Constraints on upscaling and social inclusion in smart city living lab experiments and ways to anticipate them: lessons from four “smarter” labs

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Abstract

The ‘Smart City Living Lab’ is an emerging approach in European cities, referred to projects devised to design, test and learn from innovative socio-technical practices (i.e. ‘new ways of doing something’) in real-time and in urban contexts, with a diversity of stakeholders. However, successful implementation of new practices in the reality of LLs does not guarantee the large-scale adoption required to reach their full effect in resource efficiency. Also, there is a risk of exclusion of social groups not matching the required ‘smart citizen’ profile. Acknowledging such drawbacks, we focused on how to foster upscaling and avoid social exclusion, developing a novel approach that anticipates such problems, and testing it through ‘smarter’ LL experiments addressing mobility-related topics in four European cities. In this paper we summarize the key constraints we have identified and comment on the strategies we implemented in our Living Lab activities in order to cope with them.

Keywords: *living lab; inclusion; upscaling; smart city; mobility.*

1 Introduction

The ‘Smart City Living Lab’ is an emerging approach in European cities, referred to projects devised to design, test and learn from innovative socio-technical practices (i.e. ‘new ways of doing something’) in urban contexts, with a diversity of stakeholders. A Living Lab (LL) was defined as an institutional environment for open innovation that supports experimentation with real users in real contexts (Folstad 2008; Hillgren 2013). It may be organized in a variety of ways (long-term or short-term, independent from or embedded in the municipal organization (Kemp and Scholl 2016), provider-driven or user-driven (Leminen 2013)), but commonly characterized by situated experimentation, diversity and participation, learning, and evaluation.

The interaction of the social and technical dimensions often makes urban infrastructure quite resistant to change and requires specific attention when new practices are to be introduced (Hommels 2005, 2010). The current approach to LLs focuses on small-scale performance tests and technology-user interactions, mostly neglecting the larger social-institutional context (Karvonen & van Heur, 2014; Karvonen et al., 2013). Therefore, successful implementation of new practices in the reality of LLs is not a warrant for the large-scale adoption required to reach their full effect in resource efficiency. Another limitation of the current LL approach to smart urban technologies is its focus on ‘smart citizens’ as users and partners, namely citizens with both the cognitive and material resources to consume and co-produce the smart services of the smart city. Citizens lacking these resources will normally not be included as users and co-creators in LLs, nor are they likely to be able to use the smart services once these are implemented on a larger-scale (Dutilleul et al., 2010). The consequence is not only limited adoption and use of these smart technologies but also social inequality and exclusion (Evans & Karvonen, 2014).

In the ‘SmarterLabs’ project we focused our attention on how to foster upscaling and avoid social exclusion, developed a novel approach that anticipates such problems and tested it through ‘smarter’ LL experiments addressing mobility-related topics in four cities: Bellinzona (CH), Brussels (BE), Graz (AT), and Maastricht (NL). Action research activity in such LLs is still going on and we are now performing final evaluations of effectiveness. However, the elements collected so far allow us to identify a set of recurrent constraints on inclusion and upscaling and to comment on the strategies we implemented in order to cope with them. After a brief introduction to our ‘smarter’ pilots (Section 2), in this paper we present the constraints we identified and the lessons we gathered (Sections 3 – 14), concluding with considerations on future work (Section 15).

2 Main constraints on social inclusion and upscaling

In the framework of the SmarterLabs project we performed a literature research, developed a retrospective analysis on mobility and land planning processes and directly engaged in action research activity by designing, managing and evaluating four ‘smarter’ LL processes. In Bellinzona citizens were involved in co-designing a smartphone app aimed at promoting individual behaviour change and rewarding those who reduce car use. In Brussels citizens were involved in participatory measurements of air quality, with the aims of increasing awareness on the impact of urban traffic flows on local air pollution and co-designing more sustainable mobility scenarios. In Graz citizens and local stakeholders were engaged in the ‘smart’ redesign of Griesplatz, a large square in the centre of the City, especially important as a traffic hub. Similarly, in Maastricht a series of focus group meetings exploiting a web-based design tool were held to engage stakeholders in co-designing the renovation of the central station area.

Table 1 summarizes the constraints we identified in our LL pilots. We refer to *upscaling* as the emergence and expansion of an innovative practice (i.e. a new way of doing something) in the particular urban area and to *social exclusion* as a multidimensional, multi-layered and dynamic deprivation that people may suffer because of new urban practices. Note that we understand social exclusion as a key constraint affecting upscaling itself: addressing constraints on social inclusion is a pre-condition to effective upscaling.

Table 1 Constraints precluding social inclusion and upscaling.

Constraints on social inclusion		Constraints on upscaling	
Exclusion <i>from the LL</i>	Exclusion <i>in the LL</i>	Related to <i>LL design</i>	Related to <i>context</i>
Citizen’s lack of financial, intellectual and human resources	Reproducing existing power structures inside the Lab	Limited learning	Low stakeholder receptiveness
Mismatching goals between the citizens and the Lab		Poor timing	Low institutional receptiveness
Overlooking people outside lab context		Wait-and-see attitude	High institutional fragmentation Sticky urban assemblage Neglecting effects outside project locality

3 Citizen's lack of financial, intellectual and human resources

Living Labs can be complex and long lasting. To participate meaningfully, citizens need to have time and energy, a certain level of understanding of the discussion and sometimes also specific economic and intellectual resources. People with no, low or very discontinuous revenues might be excluded from the Lab, since earning their living can leave little space to other activities. Also, people with precarious employment or residential conditions might lack the possibility to plan for long term and therefore commit to participate in a Lab. People responsible for taking care of elderly or children, as well as people working during non-office shifts might lack the material time to join the Lab. Foreigners and new-comers can be excluded because of their limited proficiency in the language. In addition, people lacking a minimum understanding of the issue at stake or acquaintance with the technology used in the Lab (e.g. because of low education level or age) are also at risk of exclusion. Socially marginalized groups may tend not to participate in community initiatives due to a lack of self-determination, of financial or educational resources, or both.

While it is virtually impossible for LLS to be inclusive of all relevant groups, it is desirable to minimise exclusion. It is important to reflect on desired outcomes and apply stakeholder and requirement analysis tools to identify potential types of exclusion and adequate coping strategies. This exercise is essential in the design phase, though it requires ongoing reflections at different stages of the Lab. Also, involving all Lab participants (not only the 'institutional' initiators) in explicit reflections concerning causes and outcomes of exclusion and seeking for solutions would be beneficial.

For example, efforts to minimise exclusion were at the core of the Brussels Lab since the beginning. Different adjustments were also made in progress, to cope with unexpected circumstances. At very early stages, the organizers (one of the local universities, and a network of neighbourhood committees) identified potential barriers to inclusion and opted for establishing different sub-groups, precisely to include the broadest variety of population. Throughout the process, regular outreach efforts were made towards groups at potential risk of exclusion, also relying on a 'focal person' identified in each group. For instance, venues and schedules for each group were strategically selected: for EU officers, meetings were convened in EU premises at lunch time, for groups of parents and shopkeepers, small meetings were organised in the early morning (just after leaving the children in school/before opening the shop), for young professionals, meetings were organised at early evening in a central neighbourhood. Several smartphones were purchased to ensure everybody could still take part in the Lab, as well as tablets, used for demonstrative purposes. Less acquainted people with smart technologies were dedicated more training time. In

some cases, however, these efforts were not enough to bridge the gap, resulting in participants not using the technology.

Similarly, the City of Graz aimed to act in a district with challenging circumstances: high proportion of migrants, various cultures and ethnics, education levels and incomes below average. The strategy to reach out to marginalized groups such as migrants, elderly people and children was to offer different formats of LL activities: workshops, social safaris, online questionnaires, mental maps, etc. Lab organizers did not wait for people to show up, but actively approached them on the street, literally bringing the Lab to the people. By repeatedly offering possibilities for stakeholders to participate and actively approaching them, over a long period of time also marginalized groups were included.

4 Mismatching goals between citizens and the Lab

Due to their experimental character, LLs often struggle to define concrete goals, especially in initial stages. Trial-and-error and learning-by-doing approaches can be a challenge when it comes to communication. On the one hand, it is important to be transparent and inform stakeholders and potential participants about LL objectives in advance. On the other hand, participatory processes are more beneficial when a common vision for the Lab is created together with participants. What happens in practice is that stakeholders often feel information is lacking (due to little or wrong communication) or – even worse – disagree with Lab objectives (due to not being sufficiently involved in their creation). The latter strongly depends on the facilitators. Aiming to involve a variety of people, special attention needs to be paid to their individual demands and desires. Communication, including awareness raising campaigns to inform people and establish a connection between them and the LL facilitators, is the key to success throughout a Lab's lifetime. Through a constant exchange, expectations can be kept realistic and results are better accepted.

For example, the LL in Graz was initiated by the city government which aimed to improve the quality of life in the traffic-dominated area of Griesplatz. Although changes in traffic infrastructure were not supposed to be part of the participation process, the residents around Griesplatz attributed the LL ambitious desires in that aspect too. The divergent goals between citizens and the LL could be partly attributed to legal circumstances that prevented rapid changes in infrastructure (i.e. concession for bus operators). However, also communication turned out to be misleading, as external policy-makers interfered with the information provided by the facilitators of the LL. Whether they were justified or not, it was the task of the organizers to address high expectations among the residents and clarify certain issues: they clearly pointed out that the Lab itself was an approach to a solution of existing problems and not

another initiative to fight against – the Lab would facilitate dialogue between city decision makers and stakeholders. To this purpose, various communication channels were used, including newspapers, Facebook, public events and direct interaction with people via the Lab's district office.

5 Overlooking people outside Lab context

Living Labs are experiments situated in a specific geographic context, ranging from a building block to a neighbourhood, a municipality or a whole urban area. While there is a certain flexibility in choosing the scale within which to operate, any choice implies the definition of boundaries excluding people living beyond them. Often, people living outside or faraway the project context self-exclude themselves, relinquishing to join the Lab either because of the effort to reach Lab meetings or because they do not feel immediately concerned - though they might be impacted by the project.

When setting a LL, therefore, thorough reflections on the multiple scales relevant to the LL, and on the actors that at any scales might be included/excluded, are needed. Adequate logistic arrangements can help minimise exclusion. This includes communicating LL purposes, adapting them and adjusting the frame. Overall, constantly discussing with (potential) participants about the objectives and the frame of the Labs can be particularly helpful in defining a shared vision, thereby increasing motivations and obtaining a broader audience.

For example, in Brussels the place of residence was one of the most solid barriers to broad inclusion. As indicated above, to minimise exclusion based on participants' residence, different LL ateliers were held in different locations, depending on the participants' home and daily schedules. However, despite the outreaching efforts, the Lab was eventually not successful in including participants from all neighbourhoods, nor participants living outside the regional borders, many of whom are commuters towards Brussels – thus largely contributing to, and being impacted by, air pollution in the city. Main reasons for failing in engaging them were the lack of time and resources to identify suitable locations at the urban periphery and their relatively lower concern for the issue at stake (i.e. widespread perception that suburban living is less impacted by air pollution). To complement for this shortcoming, constant efforts of networking and coordination with other organisations were made, to share good practices and lessons from the Lab: by experience-sharing with organisations in nearby cities, the conditions were created for replication in other contexts.

6 Reproducing existing power structures inside the Lab

One fundamental aim of LLs is to establish a democratic structure that guarantees that every voice is heard and considered. However, in practice, instead of achieving

real participation, various circumstances can lead to mere reproductions of the power structures already existing in real life. This could be the result of deliberate management in the LL, if run as an alibi activity. Or, LL organizers might not be aware of the heterogeneity of stakeholders and precautions needed to provide any group with equal opportunities.

To avoid reproducing existing power structures, first these need to be assessed by carrying out a stakeholder analysis. Then LL organizers have to design a communication strategy to address all identified target groups, applying tailor-made methods for each of them. Flexibility in the use of methods is a key requirement (e.g. not only conversation or only ICT tools). Also inviting people at various levels and occasions and building trust and social cohesion plays an important role. Organizers should facilitate development of activities along different tracks and allow each group to adapt to their speed. Next to the methodology, also the locations should be neutral and unbiased, providing access to everybody. If that is not possible, meetings should change locations over time.

For example, the Lab in Graz involved residents, shop owners, bus operators, city entities and politicians. All of them filled out certain roles that contained different levels of power. Moreover, a couple of persons repeatedly 'sabotaged' events by excessively raising their voices and acting as opinion leaders. Lab organizers aimed to blur the borders between them, enabling each person to participate equally. This was achieved by offering different formats of LL activities (social safaris, questionnaires, mental maps, etc.) and carefully selecting locations: the city district office next to Griesplatz remained a neutral place for diverse activities throughout the whole project, complemented by outdoor activities in the district. These measures created awareness and social cohesion among the people involved.

7 Limited learning

Living Lab processes are frequently run by actors already engaged with other compelling duties, being them civil servants, for city-owned LLs, or voluntary citizens, for civil society-owned LLs. Therefore, they often lack time or resources to perform explicit monitoring of the lessons learnt throughout the process. Even when single actors draw their assessments and conclusions, they often lack a comprehensive view of the process, and therefore a comprehensive knowledge. If no single actor has an overview of all options, mechanisms and impacts emerged during Lab activities, limited transfer of learning is possible to future users, precluding upscaling.

Explicit learning strategies are needed, capable of capturing and monitoring knowledge creation and transferring it to all actors. To this purpose, first goals and ambitions of the actors need to be understood. Then, knowledge exchange can be

favoured through *people-to-people* real-life interactions (i.e. physical meetings), which make learning more rewarding and comprehensive to all and also ensure *tacit* knowledge to emerge.

For example, the Lab in Bellinzona was a pilot project, run on a voluntary, politically non-binding base. On one hand, this favoured acceptance of the LL approach by the City, but on the other hand it made also responsibilities and commitment by the City to contribute to the participatory knowledge-sharing process less pressing. This made the process of capitalizing on the ‘lessons-learnt’ from the Lab and integrating them into the City’s policies more difficult.

Therefore, a learning strategy was explicitly designed, with the aim of monitoring knowledge creation. The strategy included analysing the project’s impacts, assessing the level of engagement and satisfaction by Lab participants, and reporting and communication of results, both internally to all actors involved, as well as externally, through local media. In parallel, it was avoided external experts driving a one-way learning process, by defining ‘their problem’, providing ‘their knowledge and technology’, and preparing ‘their solutions’. This would have meant limiting lab participants as *testers* of the app functionalities, not assimilating the knowledge developed during the LL, nor transferring it to future users. To avoid this, a user-centered approach was adopted and the app was directly co-designed within the Lab meetings. This helped increasing intrinsic motivation, enduring participation and learning and knowledge-sharing between participants.

8 Wait-and-see attitude

It is not infrequent that Living Labs are managed as routine projects, with no special attention to diffusion of knowledge and learning, during and after the pilot: either upscaling effects are expected to occur by themselves or strategies are put into place after the pilot ended.

At the beginning of Lab activities, what can reasonably be up-scaled should be identified, and an upscaling strategy should be designed, together with the relevant communication and dissemination measures – keeping it flexible and open to the evolution of activities in the Lab, which, for their open and participatory nature, might impose adjustments respect to initial plans. Such a strategy might be developed with the actors engaged in the Lab, who might get engaged also for its practical implementation. Also, the identified dissemination and communication activities need to be tailored to the specific context where Lab results are up-scaled, by choosing the right channels, time and language.

The Lab in Bellinzona is emblematic: initially, the process was approached as a sequence of closed and separate steps: first, the app is developed, then a plan is made to promote it to the population, finally it is assessed whether additional citizens need to be engaged. Namely, no specific upscaling strategy would have been devised by the City. Promoting app use to the population was initially expected to follow a rather traditional communication plan: press conference and distribution of information leaflets. No particular efforts would have thereafter been planned to actively advertise the initiative and promote app use.

However, the very choice of engaging citizens in app co-design triggered their intrinsic motivation and commitment, thus innately generating communication and dissemination possibilities versus the outside. Therefore, the ‘multiplier effect’ triggered during LL experiences thanks to committed participants was explicitly exploited: Lab participants were actively engaged in promoting app use among their circle of family and friends. Also, specific functionalities were explicitly included in app-design (‘collective challenges’), with the aim of periodically launching them and continuously attracting new citizens to join app use. The product of the Lab itself (the app), was therefore endowed with an inbuilt mechanism to favour its diffusion and counteract the ‘wait-and-see’ dominant approach.

9 Poor timing

‘Poor timing’ in the implementation of the LL precisely refers to a situation where broader dynamics, namely the particular social, economic, cultural and political conjuncture, are disregarded and the experiment is designed as if it takes place in a vacuum. No immediate replication of LL best practices is likely to be successful without adequate customisation and adaptation to local conjuncture. This includes accounting for broader socio-economic, cultural and political considerations, ensuring links with the existing public debate, with what communities consider their priorities and with what stakeholders consider feasible.

In practice, avoiding ‘poor timing’ involves maintaining flexibility throughout the Lab, to ensure that both its objectives and frame can be adjusted and continuously re-defined by all actors. An important precondition is to place citizens at the core of the process, as they are likely to have the most detailed understanding of the local context. Also, it also requires active coordination with other societal developments and initiatives regarding related contents. This can be done at different levels, from simple information sharing to building bridges and identifying possibilities of cooperation. Ensuring that Labs are well linked to the broader societal debate is also a way to ensure that participants feel recognised, thereby strengthening internal dynamics.

In Brussels, an effort was made to link the Living Lab with the broader public debate. To begin with, the original frame around 'smart mobility' was immediately adapted by LL initiators, so that air quality and people health were at the core. Soon after, the organizers also engaged in open dialogue with all stakeholders active on the topic, contributing to establishing a platform for discussion for all civic movements striving for better air and a network of researchers working on air quality and citizen science. Both efforts contributed to reaching a broad audience and ensuring the LL was part of a broader discussion.

10 Low stakeholder receptiveness

Even though results produced within the Lab are aligned with the original plans and expectations, the policy climate might no longer support adoption of the innovation pursued in the Lab. Alternatively, outcomes of the Lab might not find consensus beyond Lab participants. In both cases, Lab outcomes would lack support or agreement by the population, as well of the political majority needed to activate the envisioned upscaling measures.

To avoid this, Labs should open to participation as much and as early as possible, by activating participatory processes already from the development of visions, selection of methodologies and identification of actions to be performed. In doing so, 'the common' should always be emphasized and already existing networks and coalitions between groups of stakeholders should be exploited. Also, building relationships with successful initiatives already developed by other actors would be beneficial.

For example, when the City of Maastricht started re-designing the station area, a LL visioning workshop was organised around the vision for mobility in Maastricht in 2040. Around thirty people, stakeholders from different backgrounds and interests (residents, entrepreneurs, commuters, urban planners, mobility operators), came together to picture a vision of the transportation system in 2040, with attention for accessibility, affordability and quality of the living environment. Participants could experience their own design in a 3D visualization model (SketchUp), learn about the designs of other stakeholder groups, obtain feedback and then adjust their own vision. Involving actors since the visioning level favoured later consensus.

11 Low institutional receptiveness

Sometimes barriers might be due to the lack of open-mindedness and receptiveness by institutions and policy-makers. Decision-makers might in fact be unfamiliar with,

or not open to co-design approaches, believing that interaction with stakeholders adds unneeded complexity to policy development. Favouring expert-driven ways of thinking and agreement with powerful lobbies, policy-makers might not show (or indeed not have) real commitment: in the best-case Lab outcomes would not get full support from City government; in the worst case, the Lab itself would be an alibi activity.

To cope with such constraints, early inclusion of policy-makers should be sought for. Provided that activities in the Lab are adequately designed, namely that Lab organizers show genuine commitment and give voice, role and responsibility to diverse groups of citizens, civil society organizations and experts, policy-makers and institutions might start appreciating the approach and its benefits. Then, it would be a matter of repetition: once multiple successful pilot processes are carried out, institutions and policy-makers will embrace approaches and processes, supporting their outcome.

For example, the City of Bellinzona was formally owning the LL process; however, they were unaware of the potential of participatory LL projects in supporting policy development. Therefore, they lacked leadership and predominantly relied on advice and superintendence by the local university. They mainly perceived the Lab as a technology innovation testing ground: a single, small-scale, closed and controlled process, aimed at developing and evaluating the mobile app prior to its roll-out at city-level. In particular, City decision-makers tended to cling to authoritative governance styles, rather than opening up to more consultative, cooperative or even facilitative approaches (Ker Rault, 2008), mainly due to the fear of losing formal power and responsibility on the decision. Their main concern was to avoid possible financial and personal drawbacks and, inadvertently or not, the tendency was to keep the living Lab in the policy periphery.

However, leadership can only be learnt through experience: providing first-hand opportunities of experiencing public participation processes is a first start. Thus, researchers involved in Lab organization tried to promote a new political culture by ensuring the presence and active participation of representatives of the Municipality (civil servants, politicians) in LL meetings. This helped getting local authorities and decision-makers gradually acquainted with the concept that LLs may represent a valuable learning-by-doing tool and a constructive and enriching means for reflection on practices or policy.

Also, to favour Lab acceptance by decision-makers, the strategy was to focus at first on an app development: practical and technologically oriented, this was perceived as a low-conflict topic and therefore easily supported. Later on, capitalizing on the actor- and context-dependent knowledge created while Lab participants were testing the

app and concretely experiencing new mobility behaviors, discussion in the Lab was upscaled to policy-related topics regarding future mobility scenarios ('What would we need to make mobility more sustainable in Bellinzona?'). This way, also potentially scaring, far-reaching and conflicting discussions were spontaneously introduced in the Lab with the support of the institutions.

12 High institutional fragmentation

Even when policy-makers embrace the LL participatory approach, its outcomes might suffer from limited diffusion due to fragmented institutional arrangements, which hinder clear distribution of responsibility and effective cooperation between involved city departments. Fragmentation into units and departments ('silo compartments') within and between public administration institutions, in fact, makes both horizontal and vertical dissemination of results rather difficult.

Transparency and collaboration between administrative units and organizations must therefore be actively fostered. In Bellinzona, for example, administrative organization at the City level was the main obstacle preventing diffusion of the LL approach to other fields than mobility and institutionalization of new governance practices. The strategy to overcome 'silo compartments' barrier was to actively engage councillors and civil servants, instead of waiting for them to spontaneously express interest in process or results. Thus, it was planned to invite them to attend LL meetings, in order to personally experience how they work and the effort needed, and guess their potential in addressing complex or conflictual topics. In the end, the envisioned strategy was not put into practice, mainly due to 'low institutional receptiveness' mentioned above. However, this gap will at least partially be closed, by inviting councillors and civil servants to a workshop aimed at presenting the approach and discussing its opportunities and limitations, as emerged from final assessment of the whole LL process.

13 Sticky urban assemblage

Changes in urban contexts are sometimes tricky to achieve, due to technical, infrastructural, legal or financial aspects. There is an obduracy to urban assemblages that can result from persisting infrastructure, long-term contracts or legal 'lock-ins'. In such cases decisions need to be taken by multiple stakeholders or entities on a political level and cannot be attached to the outcome of a participatory process only. For example, the Living Lab in Graz aimed to improve the quality of life in the traffic-dominated area of Griesplatz. However, due to its purpose as traffic hub, not all

infrastructural elements could be replaced according to citizens' desires: long-term contracts with bus operators forced to wait or find alternative locations for bus stops which occupy a big part of the square.

If circumstances don't allow big changes, a LL should focus on what is actually possible. Communication strategy and methodology have to be designed accordingly, in order to avoid wrong expectations among LL participants. A focus on behavioural measures can be fruitful in order to trigger structural change over time. Also collecting ideas and concepts to apply in future, under different circumstances, can be a strategy.

In the case of Griesplatz, people started to complain that elaborated discussions ended up in little outcome. Thus, the organizers remained flexible and changed their strategy by focusing on small steps: in order to deliver visible outcomes of the participatory process, they provided small and quick improvements for the Griesplatz area, such as a bike lane, enlargement of a green area, benches, or painting temporary zebra crossings as awareness-raising measures. They released press articles ensuring that 'no idea was lost' and would be put into place at a later stage within a public architectural competition.

14 Neglecting effects outside project locality

Replicating pilot projects in the broader urban area can be prevented either because generated knowledge is very much related to the specific context of the Living Lab or because the whole Lab process only focused on the pilot project, neglecting or forgetting the effects on its boundaries. To avoid this, it is important to always consider projects' indirect and cross-scale effects, also outside the boundary of analysis, by actively engaging stakeholders of the broader urban context.

This aspect was not considered in Maastricht, when in 1971 the first parking garage was situated below the main square that until then had served as an open-air public parking. The preparation plan for the garage was developed in consultation with business representatives from the city centre, and intended to secure the economic attractiveness of the city as well as the spatial attractiveness of an open square. At first, parties involved were pleased with the results: parking capacity had increased and the square was cleared of cars. Along time, however, when parking tariffs strongly increased, urging people to park shortly to allow high circulation, negative effects started to become manifest. Not at the square, this remained clean, but the growing flows of in- and outbound traffic increased congestion, noise and air pollution at the inner-ring with its neighbouring residents.

To avoid replication of similar errors, when the City activated the redevelopment process for the station area and the related Living Lab visioning workshop, the project of the station area was explicitly put in the broader urban context of Maastricht, thus preventing that an improved train station area would go at the expense of other urban areas.

15 Conclusions

In this paper we have presented lessons learnt from action research in four ‘Smart City Living Labs’ in the field of mobility, held in Bellinzona (CH), Brussels (BE), Graz (AT), and Maastricht (NL). We were in particular interested in understanding which factors typically hinder effective social inclusion and upscaling possibilities, thus conditioning LL’s overall impacts. Once we identified such ‘constraints’, we developed ‘smarter’ methodologies aimed at anticipating them, in both design and management of Living Lab activities, and practically tested them. At the time of writing, final assessments are still being performed. However, insights obtained so far already allow us to identify simple coping strategies that, if implemented, could produce tangible improvements in the effort towards wider social inclusion and upscaling.

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