

An Innovation in Urban Governance: Implementing Living Labs and City Labs through Transnational Knowledge and Experience Exchange

Thomas Höflehner, RCE Graz-Styria, University of Graz, Austria
Friedrich M. Zimmermann, RCE Graz-Styria, University of Graz, Austria

1 Introduction and Research Question

We live in a globalized world that is dynamically becoming more urban and interconnected. Cities are increasingly recognized as key players for sustainable development creating a new economic and political space opposing weakened and fragmented nation states and stronger global economic forces (Healey, 2007). Currently, more than half of the world population lives in cities. It is expected that urban areas will inhabit about 6.3 billion people in 2050, which will likely be the same size as the world's population in 2002 (United Nations, 2012). This projected population growth will increase the complex challenges cities are facing such as unemployment; food security; provision of essential public infrastructure (e.g. housing, water, sanitation, health and education services); managing urban wastes and wastewater; as well as planning and maintaining of green spaces (Dubbeling et al. 2009). These kinds of societal problems can be labelled as "wicked" because they are interconnected, include nearly all public policy issues, are very hard to fully formulate, and change over time (Rittel and Webber, 1973). This growing complexity and rapid change dynamics lead to the fact that urban planning agendas are increasingly difficult to manage which poses a serious challenge to the governance of urban areas (Hodson and Marvin, 2009; Bulkeley and Broto, 2012; Karvonen and van Heur, 2014; Evans and Karvonen, 2014).

However, the resilience of cities strongly depends on how urban stakeholders are able to deal with abrupt or chronic ecological, social and economic disturbances or threats over which they have little control (Seelinger and Turok, 2013). Therefore, the notion of resilience emphasizes the need of adapting and actively shaping new development paths through self-organization in contrast to hierarchical and ordered frameworks of analysis and intervention (Pugh, 2014). This calls for new forms of policy and spatial strategy-making which effectively link top-down and bottom-up initiatives, and promote the self-government of urban areas (Ostrom and Janssen, 2004). Multi-level governance structures are necessary because they allow cities to adapt to current challenges or to set impulses for transition processes toward sustainable development (Corfee-Morlot et al. 2009; Eraydin, 2013; Reimer, 2013). However, such reflexive forms of governance can only be successful if perspectives of different stakeholders are involved and implemented. Experimenting and learning-by-doing, as well as participation and collaboration of diverse actors can be seen as key aspects of such adaptive and transformative management approaches in urban development (Voß and Bornemann, 2011; Weichselgartner and Kelman, 2014; Höflehner, 2015). Therefore, soft infrastructure such as institutions, networks, relationships, as well as social and psychological processes that promote civic engagement in public life can be seen as key part of urban policy making that nurtures a resilient and sustainable society (Evans and O'Brien, 2015). Yet, in many European cities a common dissatisfaction with current and previous urban governance formats can be observed (Healey, 2007; Mattissek and Prosek, 2014).

Only recently, participatory spaces such as Living Labs and City Labs have gained much attention, reflecting efforts to explore such innovations in urban governance. They have rapidly developed and spread to cities around the world in order to tackle today's urban challenges (Kieboom, 2014). The concept of Living Labs originates from different disciplines and interest areas, including sustainability science, as well as private and public sectors (Mastelic et al. 2015). Although, there is no consensus on how to define a Living Lab, in general they can be described as institutional platforms for open innovation that support experimentation with real users in real contexts (Følstad, 2008; Hillgren, 2013). In this way, they create extended networks of participatory elaborating innovative approaches by emphasizing co-creation and joint learning in a multi-actor setting (Hillgren, 2013; Hellström et al. 2012). However, the implementation of such initiatives is confronted with various obstacles. For adequately addressing the challenges encountered with setting-up urban labs, it is necessary that cities learn from each other and exchange their experiences with establishing such new participatory platforms. Consequently, this paper deals with the question of how cities in cooperation with research institutions can establish and organize transnational partnerships, initiating mutual learning processes to investigate and implement Living Labs and City Labs as new form of urban governance.

The paper is organized as follows: Section 2 describes the methodology and theoretical-conceptual background of this study. Section 3 reflects some key aspects related to the processes of governing urban areas. Section 4 presents the concept of Living Labs and City Labs as new forms of urban governance and highlights some challenges related to implementing such initiatives. Section 5 deals with the role of multi-actor social learning processes for implementing governance innovation. Section 6 presents the preliminary results of the URB@Exp's transdisciplinary research and multi-actor learning approach, and section 7 concludes with summarizing remarks on urban labs and experiences from the transnational knowledge exchange.

2 Methodology and theoretical-conceptual background

This research paper is based on the integrative multi-method framework for action research within the scope of the Urban Europe project "URB@Exp - Towards new forms of urban governance and city development". The international consortium of this Joint Programming Initiative of the European Commission consists of five cities (Antwerp, Graz, Leoben, Maastricht, Malmö), four universities (Maastricht, Malmö, Lund, Graz), and a foresight and design studio (Pantopicon, Antwerp). The project partners are in direct contact with several urban lab experiments in the partner cities, bringing together policymakers and stakeholders from civil society committed to learning, and academics with relevant interdisciplinary knowledge. The research project facilitates joint learning processes that are fostered by the diversity represented in the URB@Exp project consortium in terms of actors, contexts and development stages of urban labs. Throughout the whole project progression, mutual learning processes are seen as key success factor. Therefore, urban stakeholders and policymakers of the partner cities are actively involved in concrete urban lab experiments. Moreover, an interurban mobility program for policymakers and lab practitioners was implemented in order to intensify the interregional and transnational exchange of knowledge, experiences and innovative practices in urban governance.

The transdisciplinary research approach of URB@Exp is based on the notion of transitioning of experiments, focusing on multi-actor involvement, value-based reflexive learning, evaluation, and dissemination as well as the embedding of lessons learned into urban governance structures. The concept of transition experiments originates from the literature on strategic niche management

(Hoogma et al. 2002) and transition management (Rotmans et al. 2001; Kemp and Loorbach, 2006). Transition experiments differ from typical innovation processes that aim at testing and demonstration, and seem to be more applicable in societal contexts addressed in urban labs because they consider complex interrelations, agonistic perspectives and displeasure about possible solutions. In this context, transitioning changes an innovation process into a transition experiment by fostering co-creation and strategic learning. This allows an open and objective process rather than achieving predetermined results. In this way, common pitfalls, such as lacking user integration, and overexposure of technical approaches can be prevented (Hoogma et al. 2002; Van den Bosch, 2010).

In the URB@Exp project, the concept of transition experiments is combined with agonistic participatory design, which aims at democratization of social innovation processes, by involving actors with diverging or even conflicting viewpoints. Thereby, the focus is not primarily on seeking consensus, but to create a common space where controversial perspectives, values, interests and concerns may be explored and discussed (Björgvinsson et al. 2012). Furthermore, URB@Exp makes use of the logical level approach and envisioning methods to frame urban lab experiments in the context of value-based visions for sustainable urban development and strengthen the focus on strategic learning goals. Visions and envisioning processes help to create inspirational images of the future of the city, which can stimulate stakeholders to design or upscale innovative actions and experiments for sustainable urban development (Janschitz and Zimmermann, 2010). In this manner, the URB@Exp consortium partners conduct transdisciplinary transition experiments in the partner cities by co-designing experiments with urban stakeholders concerned, applying agonistic participatory design and envisioning methods guided by the logical levels approach (see Figure 1). Thereby, the identification of important topics by the actors involved allows to define explicit learning goals. The participatory evaluation of processes and achievements helps to identify lessons learned, which can be disseminated to stakeholders concerned and embedded in urban governance structures.

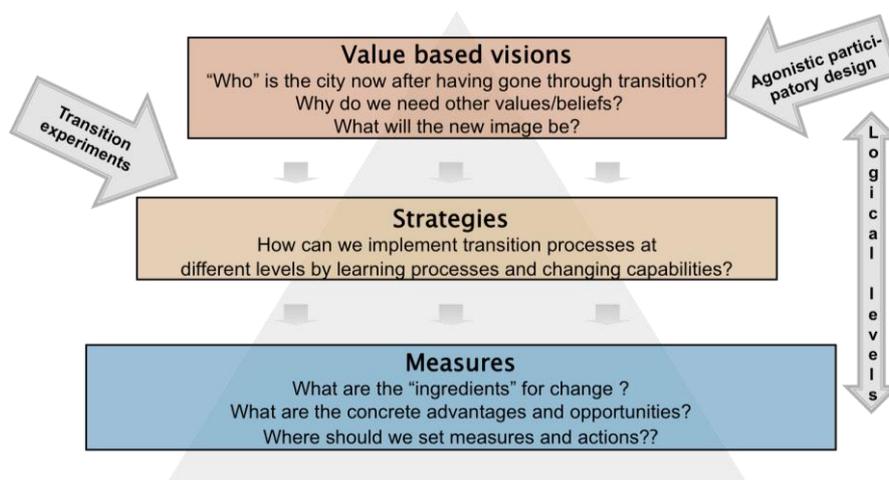


Figure 1: Integration of three theoretical-methodological approaches in URB@Exp

3 Urban Governance

In Europe, urban planning theory and practice have moved beyond a simplified technocratic understanding of cities, in which places and connectivities were grasped mainly through the physical form of built structures. Instead, the development of urban areas is described in socio-economic and

environmental processes that cannot be entirely controlled solely by governments (Healey, 2007, p.3). Therefore, cities need to reflect their governance strategies in order to find new ways for dealing with the great number of complex societal challenges (Bekkers et al. 2011, p.4). The concept of governance emphasizes the self-organization of inter-organizational relations through networks and partnerships (Amin and Hausner, 1997). The rise of governance to become a keyword in social science goes hand in hand with a shift in contemporary societies from hierarchical government to network and partner based governance processes. Thereby, government is commonly understood as a subset of governance, with governance including a broader set of actors from business and civil society. The main difference between government and governance is that the latter puts not so much emphasis on the state and its institutions but rather on social processes (Bevir, 2012).

During the last decades, the premise of neoliberalism led to a shift towards new entrepreneurial forms of urban governance that emphasize the cost efficiency of urban development projects (Harvey 1989, pp. 5-7). Thereby, the focus on profitability and rationality of public administrations often neglects social relations that are redistributing financial resources to the upper class “through a networked and decentred system of organized political-economic power” (Harvey, 2009, p. 71). In the search for a post-neoliberal model of governance, participation is a highly debated concept (see e.g. Eizaguirre et al. 2012; Huisman, 2014; Maloutas and Malouta, 2004; Swyngedouw 2005). Scholars argue that bringing together interdependent actors with various types of relevant information, perspectives and interests holds the potential to “destabilize sedimented world views, problematize routinized practices, and re-evaluate the functionality and relevance of traditional role perceptions and patterns of interaction. As such, collaboration fertilizes the ground for the development of new perspectives, ideas and practices” (Sorensen, 2012, p. 221). The key question is if an assumed change from urban entrepreneurialism to urban participation embodies a transition towards a more bottom-up democratic decision-making process, or if it is just another diversionary tactic that conceals the continuation of standard entrepreneurial governance practices (Garcia, 2006; Gerometta et al. 2005). The main challenge for participatory urban development approaches is the inherent conflict of different stakes and perspectives of the actors involved (Eizaguirre et al. 2012). A positive notion of participation is grounded on well-balanced interests and power relations, which is difficult to achieve under the primacy of unequal political-economic and socio-spatial relations (Huisman, 2014; Maloutas and Malouta, 2004; Swyngedouw, 2005; Garcia, 2006; Gerometta et al. 2005). It is widely accepted that unequal conditions between actors in terms of socio-economic power, authority, or influence lead to unequal levels of involvement, empowering a few while disempowering the majority (Huisman, 2014; Swyngedouw, 2005; Garcia, 2006).

To overcome this pitfall, urban planning experts propose more relational and reflexive forms of governance and planning. Relational forms of planning clearly refer to participatory governance approaches, while reflexivity can have different interpretations. Meadowcroft (2007) links reflexivity to the transformation of the governance system itself and the search for innovative solutions to societal challenges by moving beyond superficial conceptions to uncover systemic substructures. Healey (2007) emphasizes that participatory governance approaches have a discursive element because stakeholders create meaning to issues and possible intervention strategies, about the knowledge that is to consider in the form of framing and legitimizing a strategy. These scholars do not propose that traditional forms of governing are reduced to its essentials, but rather recommend more reflexive modes of decision-making processes in which each case is considered on its own qualities, to create public value in economic, social and ecological benefits through innovative solutions and policy strategies. Relational and reflexive forms of urban governance have drawn

considerable attention in planning theory and practice, emphasizing deliberative and participatory processes to strengthen and facilitate broad anchoring of the right to the city, which basically emphasizes the “collective power to reshape the process of urbanization” (Harvey, 2008, p. 23; Brown and Kristiansen 2009). Many administrators and politicians see the need for a different model of urban governance, but they experience difficulties with how to implement innovative approaches of participation and policy making.

Therefore, collective learning processes play a key role in implementing participatory governance structures. Organizations, political systems, representatives of authorities and groups that try to influence public policy have to learn, at least if they want to live on and make a difference in the dynamic setting of our modern cities (Gilard and Radaelli, 2012). In Governance processes, social learning turns the attention to the quality of decision-making rather than on specific states, which includes that learning among the involved stakeholders is an essential part of the outcome. Multi-actor participation is able to facilitate learning processes that go beyond individual and often predefined values and assumptions, and generate opportunities for a common understanding and joint steps toward sustainable development (Garmendia and Stagl, 2010). During the last decade, the concept of Living Labs and City Labs got increasingly attention because these participatory platforms allow different actors to work on innovative solutions (Karvonen and van Heur, 2014). This novel approach supports the initiation of reflexive processes in which involved actors have equal rights so that they can learn from each other, despite different social, economic and political backgrounds (Björgvinsson et al. 2010, 2012). But also urban lab practitioners face multiple challenges in their daily work routine in terms of “how to engage end-users in the work process, how to manage a good lab, how to assemble and contract a good team, how to scale out and/or up, how to develop effective methodologies, how to arrange funds and become financially independent, how to arrange a mandate from government bodies or how to position a lab: inside or outside a dominant system” (Kieboom, 2014, p.16).

4 Living Labs and City Labs

The Living Lab concept was primarily used in computer science in the 1980's for emphasizing participatory design in human-computer interaction (Bødker et al, 2000). In recent years this co-design approach was more and more applied to social, economic and political sciences as well as in regional studies for fostering new approaches to innovation that are more open, more inclusive, more democratic, and more creative than traditional ‘closed’ approaches (Mitchell, 2000; Sotarauta and Srinivas, 2006; Wallin, 2010). Thereby, consumers are engaged actively in innovation and development processes (e.g. idea generation, prototyping, testing and validation). End-users are seen as contributors to creative and evaluative processes rather than being passive addressees. This results in a creative collaboration between costumers, developers and other stakeholders (European Commission, 2009; Dutilleul et al. 2010).

Within the framework of current urban-planning developments, the Living Lab approach is increasingly used in smart city strategies, often referred to as City Labs. The interest in urban implementations can be traced back to the aim of adding public value, expressed in economic, social and ecological benefits, both in public and private spheres. In these real-live applications of ‘open’ social innovations in urban settings, local governments and other stakeholders jointly seek to learn about and are involved in new ways of dealing with urban challenges. What unites Living Labs and City Labs is an interest in experimentation involving users, co-design and learning. The Living

application of the Living Lab concept in urban planning contexts indicates interesting connections with the understanding of urban development as a participatory, transdisciplinary process, as a knowledge-intensive research activity, and as theoretical-methodological framework for place-specific trial-and-error interventions (Karvonen and van Heur, 2014).

What characterizes City Labs is that they have been started and are at least partly (financially) supported by departments of local governments (e.g. Barcelona city lab, Maastricht city lab and Antwerp citylab2050, the latter two are involved in the URB@Exp project). Municipalities increasingly integrate living approaches in their local work, mostly without using the terms and vocabulary of Living Labs or even City Labs. These participatory initiatives could be characterized as having lab-like structures and applying lab-like approaches, with various focuses and aims (e.g. Integral Urban Renewal' five-year local offices in various areas of Copenhagen; Five-year local 'Area programme' offices in Malmö, Sweden; Musicon' local repurposing office in Roskilde, Denmark). Generally, a characteristic attribute of these initiatives is that they (partly in opposition to the more formal departments) apply a local, citizen-centred perspective and have the mandate and room to experiment and explore new forms of collaboration, governance and commons. In addition, a core part of their practice is to support and enhance initiatives from locals as well as the establishment of new local relationships and networks as integral part of spatial development strategies, combined with social innovation and sustainability (e.g. Seravalli, 2014).

The Directorate-General for Regional Policy of the European Commission emphasizes, that such forms of "living social labs" appear to be a particularly promising, innovative approach of governance for addressing complex urban challenges and create public value (European Union, 2011, p.53). Nevertheless, policymakers and other urban stakeholders experience difficulties with the implementation of urban labs, because the concept is in its early stages of development and is still-evolving. The ontological, epistemological, and methodological framework for innovation using the broad concept of Living Labs is still being worked out. In the workshop proceedings "Towards a manifesto of Living Lab co-creation" it has been pointed out that research is needed to "identify contexts that are most promising to facilitate co-creation for certain innovation goals" and that we are "only now at the beginning of exploring suitable processes for involving Living Lab participants in innovative co-creation processes". Moreover, it is reported that "there exists no explicated set of processes and methods to support Living Lab co-creation" (Følstad et al. 2009, p.7).

These findings indicate a need for systematic analysis of the challenges of implementing Living Labs and to research those measures, processes, tools and methods that are being used or could be used to remove barriers related to establishing urban labs. Such challenges may be either across thematic areas (e.g. those of governance and of meeting supporting infrastructure requirements) or specific to particular implementation phases. As an example, a cross-cutting challenge common across implementations is to engage and retain commitment among users and stakeholders with heterogeneous backgrounds and needs in the context of asymmetries in the value distribution across different stages of development for developers and end users. It is suggested that reflective co-creation using methods explicitly addressing the different expectations, objectives, and meanings ascribed by the heterogeneous actors involved is needed to enable innovation benefits from the rich diversity found in Living Lab to be captured fully. Therefore, Living Lab facilitators can play an important role in perspective brokering enabling different stakeholders to develop a spirit of common interest and collaboratively bring the project forward (Budweg and Kristensen, 2009).

With the substantial increase in interest in the Living Lab concept, several hundred such initiatives have now been established across the EU, spread across a huge variety of application domains (see: ENOLL, 2016). This growth in implementations provides opportunity to experiment and learn more systematically about the Living Lab approach – including how the broad framework is translated into context-specific applications in actual implementations in specific domains – while simultaneously applying the Living Lab concept in real situations to address real and urgent innovation challenges. New Living Labs also allow to test and learn from these in real time, so implementations can be made more effective and efficient in the future.

Against this background, it is important to explore the reasons for implementing Living Labs; to describe and measure how – and how successfully – the Living Lab concept is being implemented and for which purposes in specific domains; to understand the challenges in implementing Living Labs in different contexts and domains and in relation to specific innovation goals; to describe successful implementation designs and practices; and to identify factors in successful implementations that deepen the understanding of the scope to transfer or customise the approach. Research is needed to investigate how scale-up and extension can be supported; for example, by defining, testing and validating Living Lab design principles, developing generic or customisable methods, supplying guidance notes on the use and combination of methods, and providing illustrative and inspiring case-studies of successful implementations and innovation outcomes. For adequately addressing these questions, it is necessary that cities and relevant research institutions initiate mutual learning processes to exchange their knowledge and experiences with establishing Living Labs and City Labs as new form of urban governance.

5 Multi-actor social learning for implementing governance innovations

The URB@Exp project explicitly embraces a learning approach and aims to foster social learning processes between policymakers, researchers and other stakeholders in the cities and initiatives under study in order to address the challenges of implementing and running urban labs. Thereby, learning occurs not only at the end where it concerns drawing lessons with regard to the specific project goals, but also during the execution of the project in the form of joint learning processes of stakeholders and policymakers in the urban lab experiments. To maximize learning, dissemination and integration of lessons learnt, an interurban mobility programme for policymakers and civil servants from the city partners who are responsible for the Living Lab and City Lab projects under study was implemented. The aim of this face-to-face programme is to foster knowledge exchange and innovative practices in urban governance by a rotating scheme of ‘internships and study visits’ to all city partners in the URB@Exp project.

The interurban exchange and mobility programme for city partners is the main public-to-public channel of URB@Exp’s Dissemination and Outreach Plan. The aim of this programme is that city partners visit urban labs in other cities to exchange knowledge, ideas and experiences, and to enhance mutual learning. In URB@Exp, learning is regarded as a key element for new forms of urban governance and development. Therefore, public and private actors should have the opportunity to exchange and integrate a diversity of viewpoints, needs, and types of knowledge and expertise in order to achieve innovative, and jointly supported solutions. In this way, social learning processes can help to better tackle the complex urban challenges cities are facing.

Recent research on multi-actor learning processes in sustainable urban development and natural resource management projects (Valkering et al., 2013; De Kraker et al. 2013; Oldenhuizing et al. 2013; Van der Wal et al. 2014) has fostered understanding of factors that determine the potential and occurrence of social learning processes, and how they can be supported and assessed. Accordingly, key factors influencing the potential of multi-actor learning networks are: diversity, autonomy, interactivity and openness (Downes, 2007). In practice, conflicts are likely to occur in a learning network, for example, between top-down and bottom-up control, and between hierarchical and emergent structuring (De Kraker et al. 2013). This calls for flexible and customized approaches in the support of learning networks, responding to the needs and perspectives of the actors involved and how these develop over time. Main factors supporting reflexive learning processes, as identified in a cross-border network for sustainable urban development (Valkering et al. 2013), are a strong focus on concrete actions and a broad, robust mix of learning-oriented actions and instruments. Further factors include applying an integrated and area-based approach and a minimum level of common ground between the diverse actors involved. Therefore, URB@Exp implements following mechanisms for stimulating the knowledge and experience exchange of the practitioners engaged in urban lab initiatives of the partner cities (Antwerp, Graz, Leoben, Maastricht, Malmö):

City exchange meetings:

During the half-yearly project meetings, URB@Exp organizes city exchange meetings for stimulating interaction between the involved urban lab practitioners. This includes visits of on-going experiments of local urban lab initiatives as well as discussion sessions on specific needs, questions and challenges the cities face with setting up their City Labs. A special focus is on a question/answer market and the co-creation of the inspiration kit for implementing urban labs, which is a main project goal of URB@Exp.

Bilateral city exchanges:

Next to the regularly scheduled city exchanges in the context of the project partner meetings, URB@Exp fosters bilateral learning exchanges between two partner cities. There have already been exchange meetings between Maastricht and Antwerp, where the practitioners discussed experiences with specific experiments and common challenges of their urban labs. Also the cities of Leoben and Graz already arranged informal and formal exchange meetings where they coordinated their project activities.

City exchange with external cities:

URB@Exp also tries to stimulate city exchanges with cities that are not officially part of the project. In this regard, Antwerp City Lab 2050 aims at involving other cities with urban labs to their events. In July 2015, practitioners from Leoben participated in a walking tour to lab-like initiatives in the city of Vienna (organized by the Austrian Association of Cities and Towns) for learning more about their inspiring participatory urban development projects. During the last years, administration employees from the city of Graz had several knowledge exchanges with Heidelberg concerning the implementation of principles for citizen participation (which are a main part of the current URB@Exp City Lab experiments). It is planned to continue this learning experience for further developing this approach of systemic civic involvement in urban planning.

Virtual city exchange:

Additionally, the foresight and design studio Pantopicon develops an interactive digital tool for the city partners to virtually reflect on questions and answers in relation to their urban lab initiatives.

This tool can be used online for the coming time so that the knowledge and experience exchange between partner cities can be stimulated effectively.

Final public project conference:

The city exchange of knowledge and experiences will be an integral component of the final public project conference in the city of Graz. In June 2017, this event will disseminate the project outcomes to policymakers, practitioners and researchers involved or interested in urban labs as new form of governance. The Conference will include sessions dedicated to basic as well as more applied aspects of the research. The organization team will focus at applying suitable formats to encourage the internal and external lab practitioners to exchange their experiences and documents the outcomes for linking them with the theoretical aspects of URB@Exp.

6 Results

The integrative multi-method approach in URB@Exp can be understood as value-based agonistic friendly hacking of urban transitions through experiments and mutual learning processes. The implementation of his theoretical-methodological background allows deriving following elements of urban labs that are in the focus of the specific action research initiatives in the different partner cities (see Table 1):

<i>Elements of urban labs</i>	Agenda Setting	Process Design and Experimenting	Learning and Embedding
<i>Approaches</i>	← Iteration →		
Logical Levels	<ul style="list-style-type: none"> • Vision • New image • Mission • Value orientation 	<ul style="list-style-type: none"> • Strengths, weaknesses, opportunities, threats • Strategies • Policy practices 	<ul style="list-style-type: none"> • Implementation of concrete projects & measures • Institutional change/innovation
Agonistic Participatory Design	<ul style="list-style-type: none"> • Alternative futures • Marginalized actors • Inclusion • Acknowledging Power relations • Shared ownership • Diverse perspectives 	<ul style="list-style-type: none"> • Iterative prototyping / making • Experimentation for Learning-by-doing • Emphasizing agonistic perspectives • Infrastructuring • Commoning/ Co-production 	<ul style="list-style-type: none"> • Mutual learning perspective • Friendly hacking • Questioning existing socio-material practices • Attempts at commons / Shared ownership
Transitioning	<ul style="list-style-type: none"> • Societal challenge (persistent problem) • Fundamental change in structure, culture, practice • Medium/long term perspectives 	<ul style="list-style-type: none"> • Problem structuring • Setting learning goals • Co-design 	<ul style="list-style-type: none"> • Deutero/reflexive learning • Scaling up • Broadening & deepening • Evaluation • Embedding lessons in Regimes & Niches

Table 1: Integrated multi-method approach of URB@Exp

Agenda Setting:

This element of urban labs focuses on the identification of the central actors of integrated urban development (involving change makers) with their needs for participatory development of long-term visions, common strategies and concrete agendas for transition experiments. The URB@Exp project applies the logical level approach and envisioning methods to frame urban lab experiments in the context of value-based visions for sustainable urban development and strengthen the focus

on strategic learning goals. Thereby, it is important to combine top-down and bottom-up approaches. In this way, top-down levels (e.g. a small urban lab task-force) can propose a few critical values as a basis for the discussion about urban transition. By using innovative communication methods, bottom-up involvement of a wider group of urban actors can complement the discussion. Common principles need to be set up at the interface of “top-down meets bottom-up” to create appropriate room for business and society orientation as well as a strong orientation towards individual values and preferences. This is probably the most crucial point in the process: the possible and sometimes inevitable clash between common and individual value systems. At this point mediation procedures play an important role to achieve the joint value set for the development, and to support its diffusion into the urban system. Visions and envisioning processes can also play important roles in urban lab settings. Potential images of the future that give direction are relevant in urban planning processes, for example as integrative frameworks for strategizing, or mobilizing concepts for stimulating actions. By creating inspirational images of the future of the city, visions, stakeholders can become inspired to design new and innovative actions and experiments for the city. Or the other way around, in case after some years several activities and experimentations for the city have been developed by means of a bottom-up process, the envisioning can take place by asking the question: in case these existing actions and experiments will be continued and scaled up, how will the city look like? Such an exercise can take place in the context of strategic learning processes.

Process Design and Experimenting:

According to the co-design approach or agonistic participatory design, urban labs should include stakeholders with different or even conflicting opinions. Thus, through optimal process design, a mutual understanding for the respective perspectives and needs can be created. In this way learning-oriented work on a specific topic can continue. Therefore, urban labs initiate participative experiments that are equipped with a "license to fail". These transition experiments are innovation projects that aim at learning important lessons for dealing with societal challenges for which there are no technical fixes. Societal challenges require institutional change and alignment of goals, interests and frames. Transition experiments are strategic experiments that foster learning-based change processes. In a transdisciplinary setting, researchers, lab practitioners and city administrators co-create open innovations. The term 'co-creation' encompasses a broad range of measures, with a specific focus on collaboration, dialogue, consensus-building and visible results. Co-creation refers to an exercise of collectively working on the creation of public value, based on some kind of (partial) ownership by both stakeholders and governments. This inherently involves a process of co-operation between different but interdependent actors, where changes in knowledge, attitudes and perceptions are brought about by communication, interaction and learning. How public and private actors can effectively contribute to processes of co-creation has been identified as a major gap in existing knowledge on (sustainable) urban governance. In the context of the URB@Exp project, this issue is addressed with the concept of 'infrastructuring', referring to the continual creation of essential communication structures and processes. Thereby, the goal is to foster long-germ relationships with different actors in order to build networks from which innovations can emerge (see Hillgren et al. 2011).

Learning and Embedding:

Transition Experiments are time-limited, innovative and have specific, pre-defined learning objectives, which are monitored and evaluated. The experiences are tested and included in further experiments by scaling up, broadening, and deepening. Deepening refers to deep learning, broadening to

repeating an experiment in another context and to link it up with other issues, and scaling-up to fostering institutional embedding. By reflexive learning, there is a societal, integrative development process. The greatest challenge for transition experiments is to disseminate lessons to city planners and embed them in urban governance structures. The active involvement of city planners in the choice, design and evaluation of local experiments for urban governance is one way of achieving this. Also an exchange and mobility programme for policy workers and lab practitioners who will spend time at partner organisations facilitates mutual social learning processes that can support the institutional embedding of governance innovations.

These proposed elements of urban labs are not necessarily following a specific order. Instead they can be regarded as different components of an iterative (co-design) process. Therefore, learning and embedding lead to new agenda setting, process design and experimenting (e.g. when a lab is being evaluated, closing down, starting a new round of funding etc.). According to the experiences from the action research in the different URB@Exp partner cities, the academic consortium is aiming to refine these characteristics, to accompany the elements with specific examples from the partner cities (story telling) and to include complementary methods and indicators to evaluate the experiments.

7 Conclusions

The preliminary results of the transdisciplinary research and learning processes established through the URB@Exp project indicate that the theoretical-conceptual approach of Living Labs and City Labs is able to contribute to improved governance of urban complexity. Urban labs can function as interface between the city councils, local governments and civil society and thus can be a suitable vehicle for developing new participatory working methods for managing urban development agendas. Thereby, the focus should be on building new coalitions, conducting transdisciplinary experiments with predefined learning goals, and developing new knowledge. Mutual social learning processes and exchange of knowledge should be seen as integral part of urban lab initiatives. Due to the variety of urban challenges it is essential that researchers, lab practitioners and policy makers learn from each other and from experiences made in other cities in terms of structure, processes of co-creation and engaging of participants in urban lab initiatives. The contrasting experiences with Living Labs and City Labs in different places, involving different types of urban projects being embedded differently in systems of governance, help to evaluate different processes of co-creation, identify critical conditions for success, and to further develop the concept of Living Labs and City Labs. By adopting this action research approach the consortium partners aim to guide urban lab initiatives towards positive outcomes.

The diverse competences and disciplinary backgrounds of the URB@Exp consortium partners are seen as key aspects that provide a comprehensive knowledge exchange for enhancing the successful creation of urban labs. One challenge that can occur in such mutual learning processes is linked to different expectations of partners, which especially holds true for the scientific analysis and policy support of the urban experiments. Expectations from researchers and urban administrators/policymakers can be different, and this is at the heart of 'action research'. Insights from co-creation and joint learning processes can help to foster understanding between the different perspectives of science, policy, and society. Thereby, cross-actor, cross-sectorial, and cross-scale interactions should be taken into account. This results in a transdisciplinary approach that allows analysing complex cause-effect relationships of urban development strategies with an integrated

perspective. In this way, established structures can be analysed critically. This re-evaluation of urban developments allows identifying rigidities, whereby necessary changes can be introduced selectively. Moreover, it is necessary to foster the adaptive capacity of urban areas through social learning processes and the introduction of radical transformative change processes, if adaption to dynamic circumstances is not possible due to internal or external causes.

The experiences from the transnational knowledge exchange indicate that one of the most difficult tasks of transition experiments conducted in urban labs is to embed the lessons learnt in urban governance structures. Therefore, the active involvement of urban policymakers in the choice, design and evaluation of the experiments is central for facilitating transition towards sustainable urban development. Also, the exchange and mobility program, allowing policymakers to spend time learning from and engaging with other city partners, seems to be a suitable tool to promote transition processes in urban governance structures. Moreover, the evaluation of transition experiments should not only focus on the outcomes, but also on the processes and conditions critical for achieving positive results. This makes the policymakers and stakeholders involved mindful of the coproduction element of outcomes of the experiments, thereby fostering the adaptation and/or transformation of urban governance structures. With this in mind, urban labs can be designed and implemented in a way that they do not continue a neoliberal path of urban governance, facing its ambiguities and discrepancies, but rather choose a participatory path, having to face and deal with its inherent challenges of diverging or even conflicting viewpoints of actors involved.

Acknowledgements

The authors wish to acknowledge the support of the European Union Joint Programme Initiative Urban Europe, the Austrian Ministry for Transport, Innovation and Technology and the Austrian Research Promotion Agency (FFG mbH) for funding the URB@Exp project. We would like to thank all scientific partners from the universities of Maastricht, Lund, Malmö and the foresight and design studio Pantopicon (Antwerp) as well as our city partners from Antwerp, Graz, Leoben, Maastricht and Malmö.

References

- Amin, A. and J. Hausner, (Eds.) (1997): *Beyond Market and Hierarchy: Interactive Governance and Social Complexity*. Cheltenham: Edward Elgar.
- Bekkers, V., Edelenbos, J., and B. Steijn (2011): *Linking Innovation to the Public Sector: Contexts, Concepts and Challenges*. In: Bekkers, V., Edelenbos, J. and B. Steinjn (Eds.): *Innovation in the Public Sector: Linking Capacity and Leadership*. IAS Series: Governance and Public Management. International Institute of Administrative Sciences. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan, p.3-32.
- Bevir, M. (2012): *Governance: A Very Short Introduction*. Oxford: Oxford University Press.
- Björgvinsson, E., Ehn, P. and Hillgren, P-A. (2010): *Participatory design and democratizing innovation*. In: *Proceedings of the Eleventh Participatory Design Conference, Sydney*.
- Björgvinsson, E., Ehn, P. and Hillgren, P-A. (2012): *Agonistic participatory design: working with marginalised social movements*. In: *CoDesign: International Journal of CoCreation in Design and the Arts*, vol. 8(2-3), p.127-144.
- Bødker, S., Ehn, P., Sjögren, D. and Y. Sundblad (2000): *Co-operative Design – perspectives on 20 years with the Scandinavian IT Design Model*, *Proceedings of the first Nordic conference on Human-computer interaction*, Association for Computing Machinery, Stockholm.
- Budweg, S. and K. Kristensen (2009): *Co-creation in Distributed ICT Living Labs: A reflection on communicative practices*. *Proceedings of the INTERACT 2009 Workshop, Report A12349, SINTEF, Oslo*, p.13-16.
- Bulkeley, H. and V.C. Broto (2012): *Government by experiment? Global cities and the governing of climate change*. *Transactions of the Institute of British Geographers*, vol.38 (3), p.361–75.
- Corfee-Morlot, J., Kamal-Chaoui, L., Donovan, M.G. Cochran, I., Robert A. and P.J. Teasdale (2009): *Cities, Climate Change and Multilevel Governance*. OECD Environmental Working Papers Nr. 14. OECD publishing.
- De Kraker, J., R. Cörvers, P. Valkering, M. Hermans, J. Rikers (2013): *Learning for sustainable regional development: towards learning networks 2.0?* In: *Journal of Cleaner Production, Special Issue: Learning for sustainable development in regional networks*, vol.49.p.114-122.
- Downes, S. (2007): *Learning networks in practice*. In: Ley, D. (Ed.): *Emerging technologies for learning*. BECTA, London, pp. 19–27.
- Dubbeling, M., Campbell, M.C., Hoekstra, F., and R. van Veenhuizen (2009): *Building Resilient Cities*. In: *Urban Agriculture Magazine*, vol.22, p.3-11.
- Dutilleul, B., Birrer, F.A.J., and W. Mensink (2010): *Unpacking European Living Labs: Analysing Innovation's Social Dimensions*, In: *Central European Journal of Public Policy*, vol.4 (1), p. 60-85.
- Eizaguirre, S., Pradel, M., Terrones, A., Martinez-Celorrío, X. and García, M. (2012): *Multilevel governance and social cohesion: Bringing back conflict in citizenship practices*. In: *Urban Studies*, vol.49, 1999-2016.

ENOLL (2016): European Network of Living Labs. <http://www.openlivinglabs.eu>

Eraydin, A. (2013): „Resilience Thinking“ for Planning. In: Eraydin, A. and T. Tasan-Kok (Eds.): Resilience Thinking in Urban Planning. In: GeoJournal Library, vol.106, p. 17-37.

European Commission (2009): Living Labs for user-driven open innovation: An overview of the Living Labs methodology, activities and achievements. Office for Official Publications of the European Communities, Luxembourg.

Evans, J. and A. Karvonen (2014): Give me a laboratory and I will lower your carbon footprint!— Urban laboratories and the governance of low-carbon futures. In: International Journal of Urban and Regional Research, vol.38 (2), p. 413-430.

Evans, B. and M. O'Brien (2015): Local Governance and Soft Infrastructure for Sustainability and Resilience. In: Paleo U.F. (Ed.): Risk Governance: The Articulation of Hazard, Politics, and Ecology. Dordrecht, Heidelberg, New York, London: Springer, p.77-97.

Følstad, A. 2008. Living labs for innovation and development of information and communication technology: a literature review. In: Electronic Journal for Virtual Organizations and Networks, vol.10 (7), p.99–131.

Følstad, A., Brandtzaeg, P., Gulliksen, J., Näkki, P. and M. Børjeson, M. (2009), Towards a manifesto of Living Lab co-creation, Proceedings of the INTERACT 2009 Workshop, Report A12349, SINTEF, Oslo.

Garcia, M. (2006): Citizenship practices and urban governance in European cities. In: Urban Studies, vol.43, p.745-765.

Garmendia, E. and S. Stagl (2010): Public participation for sustainability and social learning: Concepts and lessons from three case studies in Europe. In: Ecological Economics, vol.69, p.1712-1722.

Gerometta, J., Haussermann, H. and G. Longo (2005): Social innovation and civil society in urban governance: strategies for an inclusive city. In: Urban Studies, vol.42, 2007-2021.

Gilardi, F. and C.M. Radaelli (2012): Governance and Learning. In: Levi-Faur, D. (Ed.): The Oxford Handbook of Governance. Oxford: Oxford University Press. p.155-168.

Harvey, D. (1989): From managerialism to entrepreneurialism: the transformation in urban governance in late capitalism. In: Geografiska Annaler Series B: Human Geography, p.71, 3-17.

Harvey, D. (2008) The right to the city. In: New Left Review, vol.53, p.23-40.

Harvey, D. (2009): Cosmopolitanism and the Geographies of Freedom. New York: Columbia University Press.

Healey, P. (2007) Urban Complexity and Spatial Strategies: Towards a Relational Planning for Our Times. London and New York: Routledge.

Hellström R., McCormick, K., Nilsson, E. and N. Arsenault (2012): Advancing sustainable urban transformation through living labs: Looking to the Öresund Region. In: Proceedings of The Third International Conference on Sustainable Transition, DTU, Denmark.

Hillgren, P-A, Seravalli, A, and A. Emilson. (2011): Prototyping and infrastructuring in design for social innovation. In: *CoDesign*, vol.7 (3-4), p.169-183.

Hillgren, P.A. (2013): Participatory design for social and public innovation: Living labs as spaces of agonistic experiments and friendly hacking. In: Manzini, E. and Staszowski, E. (Eds.): *Public and Collaborative – Exploring the Intersection of Design, Social Innovation and Public Policy*. DESIS Network, p.75-88.

Hodson, M. and S. Marvin (2009): Cities mediating technological transitions: understanding visions, intermediation and consequences. In: *Technology Analysis and Strategic Management*, vol.21 (4), p.515–34.

Höflehner, T. (2015): *Integrated Multilevel Analysis of Regional Resilience: A Transdisciplinary Case Study in the Southeast of Austria*. Department of Geography and Regional Science. University of Graz.

Hoogma, R., Kemp, R., Schot, J. and B. Truffer (2002): *Experimenting for Sustainable Transport. The Approach of Strategic Niche Management*, EF&N Spon, London.

Huisman, C. (2014) Displacement through participation. In: *Tijdschrift voor Economische en Sociale Geografie*, vol.105, p.161-174.

Janschitz, S. and F. Zimmermann (2010): Regional modeling and the logics of sustainability – a social theory approach for regional development and change. In: *Environmental Economics*, vol.1 (1), p.134-142.

Karvonen, A. and van Heur, B. (2014): *Urban Laboratories: Experiments in Reworking Cities*. *International Journal of Urban and Regional Research*, vol.38 (2), p. 379-392.

Kemp, R., and D. Loorbach (2006): *Transition management: A Reflexive Governance Approach*. In: Voss, J.P., Bauknecht, D. and R. Kemp (Eds.): *Reflexive Governance for Sustainable Development*. Edward Elgar, Cheltenham, pp. 103-130.

Kieboom, M. (2014): *Lab Matters: Challenging the practice of social innovation laboratories*. Amsterdam: Kennisland.

Mastelic, J., Sahakian, M. and R. Bonazzi (2015): How to keep a living lab alive? In: *info*, vol.17 (4) p.12-25.

Mattissek, A. and A. Prosser (2014): *Regieren und Planen*. In: Lossau, J. T. Freytag und R. Lippuner (Eds.): *Schlüsselbegriffe der Kultur- und Sozialgeographie*, Stuttgart: UTB, p.198-211.

Maloutas, T. and Malouta, M.P. (2004): The glass menagerie of urban governance and social cohesion: concepts and stakes/concepts as stakes. In: *International Journal of Urban and Regional Research*, vol.28, p.449-465.

Meadowcroft J. (2007): Who is in charge here? Governance for sustainable development in a complex world. In: *Journal of Environmental Policy and Planning*, vol.9, p.299–31.

Mitchell, W. (2000): *E-topia. Urban Life, Jim--But Not As We Know It*. MIT Press, Massachusetts.

- Oldenhuizing, J., de Kraker, J. and P. Valkering (2013): Design of a Quality-of-Life monitor to promote learning in a network for sustainable urban neighbourhood development. In: *Journal of Cleaner Production*, vol.49, p.74-84.
- Ostrom, E. and M.A. Janssen (2004): Multi-Level Governance and Resilience of social-ecological systems. In: Max Spoor (Ed.): *Globalisation, Poverty and Conflict*, New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, p.239–259.
- Pugh, J. (2014): Resilience, complexity and post-liberalism. In: *Area*, vol.46 (3), p.313-319.
- Reimer, M. (2013): Planning Cultures in Transition: Sustainability Management and Institutional Change in Spatial Planning. In: *Sustainability*, vol.5, p.4653-4673.
- Rittel, H.W. and M.M. Webber (1973): Dilemmas in a General Theory of Planning. In: *Policy Sciences*, vol.4, p. 155-169.
- Rotmans, J., Kemp, R., and Van Asselt, M. (2001): More evolution than revolution: transition management in public policy. In: *Foresight*, vol.3 (1), p.15-31.
- Seelinger, L. and I. Turok (2013): Towards Sustainable Cities: Extending Resilience with Insights from Vulnerability and Transition Theory. In: *Sustainability*, vol.5, p.2108-2128.
- Seravalli, A. (2014): *Making Commons (attempts at composing prospects in the opening of production)*. Malmö: Malmö University Press.
- Sorensen, E. (2012): Governance and Innovation in the Public Sector. In: Levi-Faur, D. (Ed.): *The Oxford Handbook of Governance*. Oxford: Oxford University Press. p.215-227.
- Sotarauta, M. and S. Srinivas (2006): Co-evolutionary Policy Processes: Understanding Innovative Economies and Future Resilience, In: *Futures*, vol. 38 (4), p. 312-336.
- Swyngedouw, E. (2005): Governance innovation and the citizen: the Janus face of governance-beyond-the-state. In: *Urban Studies*, vol. 42, 1991-2006.
- United Nations (2012): *World Urbanization Prospects: The 2011 Revision*. Department of Economic and Social Affairs of the United Nations Secretariat. New York: United Nations.
- Valkering, P., Beumer, C., de Kraker, J., and C. Ruelle (2013): An analysis of learning interactions in a cross-border network for sustainable urban neighbourhood development. In: *Journal of Cleaner Production*, vol.49, p.85-94.
- Van den Bosch, S. (2010): *Transition experiments. Exploring Societal Changes towards Sustainability*. Erasmus University, Rotterdam.
- Van der Wal, M.M., de Kraker, J., Offermans, A., Kroeze, C., van Ittersum, M. and P. Kirschner (2014): Measuring social learning in participatory approaches to natural resource management. In: *Environmental Policy & Governance*, vol.24, p.1-15.
- Voß, J., and B. Bornemann (2011): The politics of reflexive governance: challenges for designing adaptive management and transition management. In: *Ecology and Society*, vol.16 (2), p.9.

Wallin, S. (2010): The co-evolvement in local development - From the triple to the quadruple helix model. Conference Paper at Triple Helix VIII, Madrid.

Weichselgartner, J. and I. Kelman (2014): Challenges and opportunities for building urban resilience. In: ITU A|Z, vol. 11 (1), p.20-35.