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Co-creating sustainable urban planning and mobility interventions in the city of Trikala

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Abstract. In recent years, the European Union has been promoting social innovation and new business models to support the long-term transition towards low-emission, sustainable urban development. To this end, a demand-driven approach is seen as key to enhancing the wealth of sustainable urban planning and mobility solutions, increasing their relevance and responsiveness to real life challenges, saving public Research & Development investment resources and most importantly, nurturing the uptake of those solutions by their end users. In addition, cities are seen as ideal places of experimentation because they accumulate a wealth of activities and stakeholders, as well as the complex networks and transactions among those. This paper presents results from the Horizon2020 Research and Innovation Project “Cities-4-People”, financed under the ‘Smart, green and integrated transport’ part of the Horizon2020 Work Programme of 2016 - 2017, topic “New ways of supporting development and implementation of neighbourhood-level and urban-district-level transport innovations” (MG-4.5-2016). More particularly, in this paper we present the methodology, results and conclusions for the co-creation of sustainable urban planning and mobility solutions in the city of Trikala. This phase of the project took place during the period April 2018 – September 2018 and was administered by the Trikala project team of the Cities-4-People consortium (Q-Plan International and E-Trikala).

1. Introduction

In recent years, the European Union has been promoting social innovation and new business models to support the long-term transition towards sustainable development, including low-emission, sustainable urban development [1, 2]. To this end, a demand-driven approach is seen as key to enhancing the wealth of sustainable urban planning and mobility interventions, increasing their relevance and responsiveness to real life challenges, making public research and development investment more efficient and most importantly, nurturing the uptake of those solutions by their end users. In addition, cities are seen as ideal places of experimentation because they accumulate a wealth of activities and stakeholders, as well as the complex networks and transactions among those.

Under this light, this paper presents results from the Research and Innovation Action (RIA) “Cities-4-People” [3], financed under the ‘Smart, green and integrated transport’ part of the Horizon2020 Work Programme of 2016 - 2017, topic “New ways of supporting development



and implementation of neighbourhood-level and urban-district-level transport innovations” (MG-4.5-2016). More particularly, in this paper we present the methodology, results and conclusions for the co-creation of sustainable urban planning and mobility solutions in the city of Trikala. Throughout this process, the so-called ‘People-Oriented Transport and Mobility’ (POTM) framework was utilised, referring to a process whereby people actively participate in all stages of the co-creation process for sustainable interventions (analytical description in Section 3). This phase of the project took place during the period April 2018 – September 2018 and was administered by the Trikala project team of the Cities-4-People consortium, comprised by E-Trikala and Q-Plan International.

In terms of structure, the following section presents the theoretical foundations, concept and applications and benefits of co-creation; the third section presents the methodology adopted by the “Cities-4-People” project partners for the co-creation of sustainable urban planning and mobility interventions in the city of Trikala; the fourth section presents the results of the co-creative process and the fifth and last section presents the conclusions from the experiment undertaken.

2. Theoretical Framework

2.1. Co-creation: background, concept, benefits

In his broadly cited paper, Harvey [4] highlights the fundamental right and inherent drive of humans to shape the environment in which they live. Engaging in a ‘dialectical relation’ with their living environment, the author argues, they become informal architects and planners that imagine and pursue better living conditions and social justice in the city. This could not be truer in the current era of digital empowerment, networked urbanism and urban commons. Today’s urban citizens claim their right both to participate in decision making for urban policies, and - most importantly- to develop and implement their own solutions for the city. As a result, we are increasingly becoming witnesses of new forms of urbanism, and specifically ‘open source’ urbanism, driven by citizen empowerment and collective intelligence through digital and analogue means [5].

Co-creation holds real promise as a way to facilitate government innovation [6]. It is a powerful means for improving citizen-centric governance and creating more effective, inclusive and democratic urban development policies [7]. Good and democratic governance is advanced by getting to know urban stakeholders and their capabilities and mobilizing them into cooperation, by nurturing public-private alliances and knowledge exchange networks, decomposing complexity and becoming better organized, being more flexible by keeping options open, becoming more responsive by shortening decision making times, educating, training and supporting culture shift throughout society. As a result, co-creation can trigger the development of high quality and more responsive public services and solutions for common welfare, enabling government to migrate from process-centric operating models to citizen-centric ones. It is also beneficial in terms of cost savings, reduced investment risk, increased quality of products and services, and increased acceptance on the side of users [8].

To this end, in recent years several methods and concepts have been developed for sourcing citizen input and capitalizing on the collective intelligence capabilities of urban populations. Such methods include an array of open innovation mechanisms in cities, such as co-creation, crowdsourcing, urban labs, open data, etc. [9]. Co-creation, more particularly, is a process that is based on collective creativity and aims at the production of new, innovative ideas [10]. It is a user-centered, collaborative approach where multiple stakeholders with different skills and talents come together in the design process of a product or service, in order to jointly create value. Co-creation can be vastly improved by using modern Information and Communication Technology (ICT) [6] which enables a more inclusive and organized approach to the capitalization of tacit decentralized knowledge in urban environments [7].

The basic stages of co-creation in new service design are featured in Figure 1. Briefly, during the ‘Empathise’ stage, user input is sought in order to gain an -as much as possible- empathic understanding of the challenge that needs to be solved; in the ‘Define’ stage, the designer puts together all the collected information in order to reach an accurate definition of the problem; in the ‘Ideate’ stage, the objective is to develop as many as possible demand-driven ideas for solving the problem with the help of the users; in the ‘Prototype’ stage a number of physical, low cost, scaled-down of the solutions are developed; and in the ‘Test’ stage, the users are called to engage and experiment with the prototype solution in a way that helps the designer to re-define specific aspects of the problem more accurately and calibrate their approach accordingly. The entire process is iterative and some of the above stages may be skipped or merged [11].

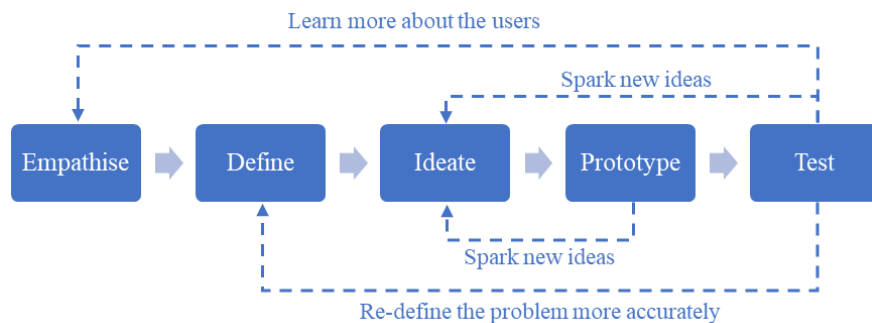


Figure 1. Basic stages of co-creation in new service design (adapted from Interaction Design Foundation [11]).

2.2. Co-creation for sustainable urban development

In urban environments, co-creation refers to the utilisation of collaborative efforts as drivers of sustainable urban development. It implies the supplement of sustainable urban development promotion through energy-efficient buildings and infrastructures, by efforts that seek to change lifestyles towards more sustainable behaviors and modes of living. These behaviors concern, in addition to citizens, planners, policy makers and other urban stakeholders and their institutions [12].

Co-creation for urban development holds a series of very important sustainability-related benefits. More particularly [12-15]:

- It promotes better and more efficient governance, by making government transparent, accountable, supportive to progressive urban change, and responsive to citizen needs. The citizens’ ‘ownership’ of the city and sense of co-responsibility for promoting sustainable urban development is nurtured.
- It promotes social sustainability and social inclusion, by giving access to marginalized societal groups in policy making and enforcing empathy and sense of community. On the broader level, it enables richer and more productive urban ecosystems, characterized by inclusiveness, resourcefulness, resilience, flexibility and responsiveness to unpredicted circumstances.
- It supports economic sustainability, by capitalizing on user input to achieve recourse savings and process streamlining. More significantly, it often leads to solutions for challenges that have not been addressed by the market and yield significant cost savings. In addition, it uncovers underlying sustainability-related trends and allows for the testing of the cost-effectiveness of new solutions.
- It supports environmental sustainability, through the development of solutions for cleaner environment, transport and waste management. In parallel, a bottom-up

approach builds on the resource-efficient conscience of its inhabitants, supporting a shift towards more sustainable lifestyles and behaviors.

During recent years, many forward-looking city governments have become aware of the benefits and opportunities that emerge from empowering their own citizens and rendering them central to the decision-making process. To this end, they encourage the development of innovation platforms, as places of intermediation between the city and its external stakeholders, enabling richer and more effective public sector decision making, with better chances for uptake and sustainability [16]. By providing the means for their citizens to drive the urban innovation process, cities hope to mitigate the daunting costs of making improvements in a top-down way, increase citizen buy-in and develop more effective solutions in an array of urban domains, such as governance, commerce, education, transportation, housing and tourism.

3. Methodology

The activities of Cities-4-People are governed by the project's developed 'People-Oriented Transport and Mobility' (POTM) framework [17]. POTM draws from the broader digital and social innovation domains to provide novel ways for delivering innovative, sustainable and needs-driven solutions. In the particular context of Cities-4-People those solutions address urban and transportation planning challenges. Social innovation, collaborative technology, citizen engagement in the co-design and co-creation of sustainable mobility solutions is seen as a key enabler of effective, demand driven solutions that respond to real life challenges [3].

The POTM approach of Cities-4-People enforces stakeholder engagement right from the outset of the co-creation process. Citizens and other urban stakeholders sit on the driving wheel of the innovation process and they are the ones who collectively and democratically define and upvote the challenges that call for a solution, and then co-develop and test solutions to address them. To this end, all of the basic stages of co-creation in new service design (empathise, define, ideate, prototype, test) are planned to be implemented in two iterations in the six pilot cities of Cities-4-People: Trikala (GR), Budapest (HU), Üsküdar (TU), Hamburg (GE) and Oxfordshire (UK). Moreover, the POTM approach enriches the basic format of the co-creation process with horizontal supportive activities, namely aimed at Community building and Citizen Mobility Communities' empowerment, as analytically described in the following sections. In this paper, we present the activities of the first three stages of the core co-creation process (empathise, define, ideate) and their supporting activities, as the remaining ones are ongoing and results are yet to be obtained (Figure 2).

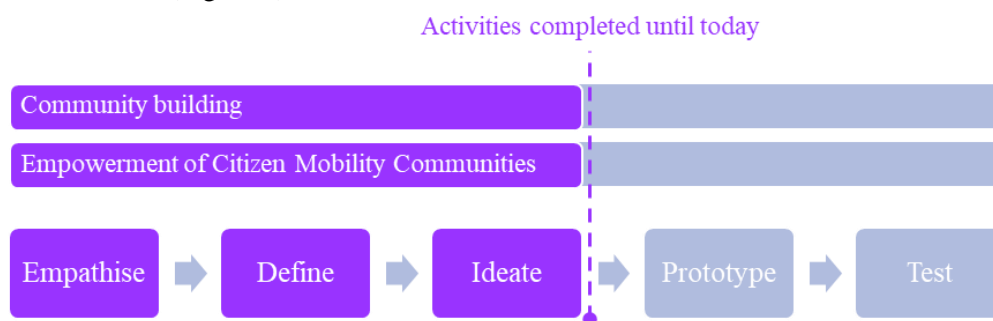


Figure 2. Co-creation activities completed until today in the Cities-4-People POTM framework (source: authors' development).

The following paragraphs present in brief the steps that were followed from the co-definition of the urban mobility challenges and the community engagement to the development of the final mobility concepts to be tested in the next phases of the project.

3.1. Community building

Cities-4-People put forth a mix of early community building activities to attract and maintain the interest of the local mobility ecosystem stakeholders and mobilize them towards addressing mobility challenges in their cities. Held at the early stages of the project, the community building activities aimed to create and sustain open communities of multiple actors that work together to co-define the city's urban and mobility challenges and collectively develop ideas to address them. A range of well-targeted "warm-up" events were organized and a set of methodological tools were used with a view to raise awareness around added-value of citizens' active engagement. Those tools also informed citizens about the concept of local communities as self-organised schemes to be involved in the development of sustainable urban and mobility solutions. The community building actions resulted to the development of open and self-organized "Citizen Mobility Communities" in the 5 targeted cities consisting of citizens, local mobility stakeholders and city authorities that work to tackle urban challenges and improve quality of life in each city. Later on, dedicated consultation workshops assisted these early communities to define their structure, vision and strategy. These communities are expected to be maintained beyond the end of the project as well as to serve as an efficient replicable structure with the aim to improve sustainable development in urban and peri-urban areas.

3.2. Empower Citizen Mobility Communities

To empower the formed "Citizen Mobility Communities" to interact, operate and collaborate with mobility experts, policy makers and other urban mobility stakeholders, two components were developed and deployed that combine physical, virtual, off-line and on-line collaborative approaches. In particular, a "Citizen Mobility Lab" was set in each pilot city of Cities-4-People. This lab provides a physical space for the information and interaction among the member of the local communities. It is an open, fertile and accessible space where the community's members meet to discuss, experiment, test technologies, kick off new ideas and conceptualize mobility projects. Moreover, the "Citizens Mobility Kit"¹, an online digital platform with several tools and applications, was employed in order to enable and facilitate information sharing among the mobility communities' participants as well as to enhance their engagement to the urban mobility innovation process.

3.3. Co-create mobility solutions

In this phase, the developed Citizen Mobility Communities leveraging the benefits of the Citizen Mobility Labs as well as the tools provided by the Citizen Mobility Kit, co-create mobility concepts to address the urged urban and mobility challenges in their cities. The member of the established communities use the provided tools to identify their needs and co-design innovative mobility concepts that could serve as solutions to their related problems.

The emerged concepts are communicated for endorsement by the local Quadruple Helix City Stakeholders. More specifically, e-participation and e-democracy tools are used to introduce the proposed concepts in the total population of the city so as to collect the public's opinions and preferences. The shortlisted concepts were presented to the community representatives and the key mobility ecosystem stakeholders (i.e. city authorities, transport providers, policy makers etc.) convened in order to conclude on the final set of concepts that could be translated in real-life interventions and tested.

4. Results

4.1. The City of Trikala in the Cities-4-People context

¹ <https://cities4people.eu/citizen-mobility-kit/>

The city of Trikala is a medium-size city in Central Greece which administratively belongs in the Prefecture of Thessaly, the central region of continental Greece. It is a modern city with a balanced and structured network of public spaces and spacious squares, while its plain topography has been boosting bicycling for many decades. Another main characteristic is the existence of the Litheos river, crossing the city center, dividing the city in two main sections. These sections do not stand isolated, however; they are interconnected by means of a number of bridges for vehicles and pedestrians, offering a deterministic mobility pattern struggling to fit in all types of mobility users.

Since the early 2000s', the city has been internationally recognised for its effort to promote urban innovation and experiment with innovative approaches in an array of domains, including responsive city hall services, smart public infrastructure management and sustainable mobility [18]. In addition, during recent years the city has implemented a series of forward-looking policies for urban and transport planning, including extensive pedestrianisations, extensions of its bicycling networks and the introduction of smart infrastructures and mobility applications. Along these lines, Trikala was nominated Greece's first smart city by the Ministry of Economics in 2004, followed by a series of international recognitions, such as the inclusion of the city among the Smart21 Communities of 2009, 2010 and 2011 by the Intelligent Community Forum [19] and the inclusion in the European Commission's Digital Cities Challenge [20].

Today Trikala hosts 81,000 inhabitants in its urban core, and a total of 130,000 inhabitants in its broader area of influence, which includes the surrounding suburbs and villages. Due to this decentralised settlement system, around 85,000 people commute daily to the city center by driving private vehicles, biking and walking. What is more, the daily accumulation of human and commercial activities in the historic city center results to extensive traffic congestion and unsustainable use of land in the area, especially during rush hours.

4.2. Co-definition of mobility challenges and intervention area

In order to identify the underlying mobility challenges in the city of Trikala, a combination of qualitative and quantitative methods were used. More particularly, at the beginning of the project, 17 semi-structured interviews were conducted with stakeholders of the local mobility ecosystem, including representatives from planning authorities, planning professionals, urban transport providers and users, people with disabilities, pedestrians, cyclists, etc. These interviews resulted to valuable insights regarding public transportation, car use and congestion, walking and cycling infrastructure, unsustainable land uses, as well as information concerning the available financial resources, the urban governance system and culture, the innovation level and capabilities, and the state-of-play of citizens' participation in decision-making. In addition, an online survey was carried out based on a structured questionnaire, aiming to complement the information collected through the interviews, as well as to provide quantitative data regarding the socio-economic context and the mobility challenges in the city of Trikala. The survey, targeted to the local citizens of Trikala, was launched on September 22nd 2017, via the web survey tool Maptionnaire [21], and lasted for 5 weeks. A total of 445 responses was collected, covering a wide range of age groups, socio-economic statuses and types of users.

In particular, both from the outcomes of the interviews and the online survey it seems that the main challenges that the city of Trikala could address or improve are the following:

- lack of a strategic approach about urban and transport development
- traffic congestion in the city centre
- unsatisfactory quality of public space / pedestrian infrastructure
- insufficient connectivity of cycling paths
- low social participation in decision making regarding mobility issues

The identified challenges were thoroughly discussed in a co-creation workshop held in Trikala with the "Citizens Mobility Community". During the workshop, a number of issues were

identified as the key points requiring attention towards improving the mobility and quality of urban environment status of the city centre.

4.3. Trikala's Citizen Mobility Community and Citizen Mobility Lab

Trikala's "Citizen Mobility Community" was developed from the early stages of the project through the organization of dedicated events and warm-up activities. During these activities, citizens and other urban stakeholders were informed about the benefits of creating and sustaining local mobility communities. The local community was empowered to actively participate in civic engagement while it was equipped with open channels to discuss and report their needs, and to discover and share ideas that could be turned into solutions. Trikala's Citizen Mobility Community engaged representatives from:

- Citizens, citizen unions and non-profit associations (mainly from civil organizations and non-governmental organizations). Among them there are representatives of the association of people with disabilities, the taxi drivers association, as well as many professional urban and transportation planners that were highly interested in the activities of the lab.
- city authorities, including heads of municipal departments, municipal employees, the mayor's advisors, the public transport provider and the police.
- industry and entrepreneurs, both from traditional and innovative business sectors.

The Citizen Mobility Lab was hosted at the Municipality's Info Point, located in the central square of the city, a place of high visibility and usage. Since the launch of the Lab many events were hosted, including brainstorming sessions, easy co-creation and ideas' sharing activities etc., giving the opportunity to the local citizens and stakeholders to discuss on the planning issues that their city faces and co-design innovative and sustainable solutions.



Figure 3. Physical space that hosts the citizens mobility lab [3].



Figure 4. Citizens Mobility Lab Co-creation activities [3].

4.4. Co-creation of innovative mobility concepts in Trikala

During the activities of the Citizen Mobility Lab, seven high level ideas were shared. These were translated in 23 urban and mobility concepts, all generated by the citizens and the local mobility stakeholders aiming to address the previously identified mobility challenges of the city. The results were refined to a long list of 11 co-created sustainable urban planning and mobility concepts. To reach a broader audience and to get feedback from people who were not able to attend the Mobility Lab events, the list of 11 co-created concepts was made available online for voting by using the e-democracy web application "Your priorities" [22]. Afterwards, a workshop was held with key local transport players and decision makers as regards the city's mobility planning and implementation, where each of the 11 concepts was presented and

discussed with the audience, highlighting the respective potential, risks and challenges. The presentation of the results of the online voting further contributed to the discussion. In the end, 6 concepts were shortlisted as the most feasible to be implemented and at the same time most beneficial to the local mobility situation:

1. Development of electric bicycle and scooter station for the transportation to and from the city center. This concept will address the problems of traffic congestion in the city centre, motivating more citizens to use a bicycle for their travels within the centre. Commuting in the area will become faster, environmentally friendlier and safer.
2. Installation of smart storage locker stations in central locations, where citizens can place their personal items for a while (e.g. their shopping bags, so as to move more easily around for other purposes, without the need of a car). This concept will facilitate the completion of multiple tasks/obligations in the center of the city. The result will be an increase in the share of sustainable transport users (public transport, walking, cycling), because the beneficiaries will be able to temporarily and safely store their purchases/documents/personal items and they will no longer be compelled to use their private vehicle as a storage medium or make multiple visits to complete a specific number of tasks.
3. Pedestrianisation of more streets around the central square. Development of a radial network of pedestrian walkways and streets that mix residential with commercial uses, usually paved, where cars drive slowly, and the pedestrian has priority.
4. Provision of free wheelchair scooters for people with disabilities. The intervention will include the supply of a number of wheelchair scooters that will be stored in public buildings (e.g. City Hall) and will be available to disabled people without charge. It will facilitate the social interaction and inclusion of people with disabilities.
5. Ban large vehicles from city center at specific time intervals. The problems of traffic congestion and road accidents will be addressed. Movements in the area will become faster and safer. Air pollution will become less. The motive to use more sustainable forms of transport will be enforced.
6. Reorganization of parking stops for Taxi around the central square and the introduction of a smart way to call for a taxi.

In the forthcoming months, three of the above ideas will be shortlisted for prototyping and testing. These upcoming phases of the project will also include intensive co-creative involvement of urban stakeholders.

5. Conclusions

The so far completed part of the co-creation process for sustainable urban planning and mobility interventions in the city of Trikala revealed several points that need to be taken into consideration when employing co-creation with users in urban and transport planning. Nevertheless, as the co-creation process is still underway, more conclusions are expected to be drawn in the future.

User engagement from the early stages of the definition and design of an intervention is of crucial importance for the development of impactful and sustainable solutions. Citizens and stakeholders have a deeper knowledge of their own area's particular needs and assets; they may have personal experience of those needs and they could be already well-positioned to suggest simple and practical interventions, as happened in the case of Trikala. What is more, their sense of feeling valued as facilitators of the problem-solving process enhances their commitment to participate further in the engagement process.

In this demanding process, moreover, solutions do not have to be delivered from scratch. A multitude of tested ideas are available and previous experience is not to be neglected. Our experience from Trikala confirmed that simple planning interventions and intelligent ideas that

have already been created -often in a bottom-up, needs driven way- in other parts of the world, may be suitable with minor adaptations to similar contexts. This is also the essence of co-creation: rather than developing radical and groundbreaking solutions, co-creation shifts attention to the essence of the procedure, which is substantial empowerment and community building. In this line of thinking, learning from other communities is very important, as by studying other approaches to co-creation can always provide useful inspiration and insights.

Despite the existence of previous solutions, however, it is important that the overall approach to co-creation is tailored to its organizational and functional context. Co-creation in Trikala, for example, benefitted through a thorough mapping of the city's already existing physical, social and economic assets, and a thorough accounting for existing policy making bodies and decision-making process. This process allowed us to timely identify opportunities and mitigate bottlenecks for the development of sustainable urban planning and mobility interventions, and tailor our approach proactively.

Finally, an accurate but also flexible identification and segmentation of stakeholder groups from the beginning of the co-creation process is also important. The identification needs to be accurate in order to ensure an inclusive process, identify relevant needs and challenges, and calibrate co-creation activities to the skills and capabilities of each stakeholder group. It also needs to be flexible, however, since there may be overlaps among stakeholder groups. In the case of Trikala, for example, through the co-creation process it was realized that caregivers of people with disabilities face both the challenges of non-disabled people and many of the challenges of the disabled, hence they fall within two stakeholder categories.

All in all, Cities-4-People puts forth an unprecedented experiment for large scale co-creation in urban environments. As such, and regardless of the successfulness of the interventions, it provided -and will continue to provide for the forthcoming years- a wealth of knowledge and experience regarding methods and tools for co-creation.

6. References

- [1] European Commission 2016 Social Innovation, Available from: http://ec.europa.eu/growth/industry/innovation/policy/social_en.
- [2] European Commission 2011 Cities of tomorrow. Challenges, visions, ways forward. *Publications Office of the European Union: Brussels*.
- [3] Cities-4-People project Towards People Priented Transport and Mobility 2019 Available from: <https://cities4people.eu>.
- [4] Harvey D 2003 The right to the city. *Int. Journal of Urban and Regional Research* **27**(4), p. 939-941.
- [5] Bradley K 2015 Open-source urbanism: Creating, multiplying and managing urban commons *Footprint*, p. 91-107.
- [6] Gouillart F and T Hallett 2015 Co-Creation in Government Stanford *Social Innovation Review*.
- [7] Janssen M and H van der Voort 2016 Adaptive governance: Towards a stable, accountable and responsive government *Government Information Quarterly* **33**, p. 1-5.
- [8] European Commission 2014 Design for Innovation: Co-creation design as a new way of value creation (Case study 14) *Business Innovation Observatory*.
- [9] Almirall E 2012 Talk at Commons4EU kickoff event (video) Waag Society City of Amsterdam ESADE Available from: <http://vimeo.com/41700139>.
- [10] Sanders E B N and Stappers P J 2008 Co-creation and the new landscapes of design **4**(1), p. 5-18.
- [11] Interaction Design Foundation 2019 *Design Thinking* Available from: <https://www.interaction-design.org/literature/topics/design-thinking>.

- [12] Nordregio 2016 Co-creating Attractive and Sustainable Urban Areas and Lifestyles: Exploring new forms of inclusive urban governance *Austrian Institute for Spatial Planning, and Delft University of Technology*.
- [13] Bakici T 2012 State of the Art – Open innovation in smart Cities *Open Innovation Mechanisms in Smart Cities Project co-funded by the European Commission within the ICT Policy Support Programme (Deliverable D1.1.1)*.
- [14] Markkula M 2012 Pioneering regions and societal innovations as enablers for the Europe 2020 strategy *Open Innovation, Directorate-General for the Information Society and Media European Commission*, p. 48-61.
- [15] Schuurman D et al 2012 Smart Ideas for Smart Cities: Investigating Crowdsourcing for Generating and Selecting Ideas for ICT Innovation in a City Context *Journal of Theoretical and Applied Electronic Commerce Research* **7**(3), p. 49-62.
- [16] Ojasalo J and L Tähtinen 2016 Integrating open innovation platforms in public sector decision making: empirical results from smart city research *Technology Innovation Management Review* **6**(12), p. 38-48.
- [17] Noring L et al 2018 Contextualising Mobility Variables *Sustainable Development and Planning X WIT Transactions on Ecology and the Environment* G. Passerini and N. Marchettini, p. 165 - 173.
- [18] The Guardian 2018 Inside Greece's first smart city: 'Now you don't need to know a politician to get something done' (by V. Rainey) Available from: <https://www.theguardian.com/cities/2018/sep/04/trikala-greece-first-smart-city-dont-need-to-know-a-politician-to-get-something-done>.
- [19] Intelligent Community Forum 2015 Trikala Available from: <https://www.intelligentcommunity.org/trikala>.
- [20] European Commission 2018 Digital Cities Challenge Available from: <https://www.digitallytransformyourregion.eu/>.
- [21] Maptionnaire 2019 Create map-based surveys to get ideas and insights from residents Available from: <https://maptionnaire.com/>.
- [22] Your Priorities 2019 eDemocracy web application designed by the non profit Citizens Foundation to help groups speak with one voice Available from: <https://www.yrpri.org/>.

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