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## Drawing Futures Together. Diagrams for the Design of Scenarios of Future Liveable Cities

Pollastri, Serena

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# Drawing Futures Together. Diagrams for the Design of Scenarios of Liveable Cities

Serena Pollastri

## Abstract

This work introduces an ongoing research project that seeks to develop appropriate visual techniques for the design of future visions of cities. These design methods are being explored as part of a wider research on the future of cities and sustainable urban living.

This paper examines different ways in which the future of cities has been visualised, and highlights the need for visions that encourage participation and engagement. There is a need to develop “means for drawing things together” (Latour, 2008), a common language to describe complexity and allow hidden interdependencies to emerge.

The paper will describe a series of “Future Visioning” workshops and visualisations developed as a research activity for the Liveable Cities programme. The Future Visioning workshops involve participants from different sectors in developing radical visions for the future of cities. These visions are then collected in a series of visualisations that are used to generate discussions and inform research directions.

While methods that are being designed for the Liveable Cities program might not be directly applicable to different projects, radical design actions in complex systems require the development of specific methodologies to develop articulated visions. These visions, generated in a trans-disciplinary context, provide involved actors with a common direction for their design actions (Jegou and Manzini, 2004).

## Introduction

This working paper describes an ongoing research that seeks to explore how visual tools can be used to talk about the future of cities.

The issue of cities as complex systems has been explored by a considerable amount of literature, across different disciplines (for example, Simmel, 1971; Lynch, 1960; Jacobs, 1992; Abrams and Hall, 2004). Cities are not only defined by buildings and infrastructure, but also by the material and immaterial flows generated by the activities that take place in the urban environment, as well as the personal experience of its inhabitants.

Because of its multidimensionality, images of the city often describe more than its topography. Several artists and social scientists in the past century challenged the authority of the map-maker, and experimented with activities in which citizens were invited to map their personal city (see for example Bruno, 2007; George Simmel, 1971; Lynch, 1960). These subjective representations, in

which emotions and territory are woven together, put citizens' experience of the city in the foreground. They are often used to highlight stories from communities, valorise hidden meaningful places, and generate discussions that might drive design and decision-making processes at the city level. In the last decade, digital tools and online platforms have further encouraged this collaborative approach to map-making and city storytelling.

In consideration of the large number of case studies that highlight the role of maps and images in including citizens and communities in open discussion about the city, and because of the continuous process of transformation that cities are undergoing, this study seeks to understand how a similar participatory approach can be applied to explore alternative visions of future.

The active role of citizens in speculative conversations and in drawing visions about the future of the city is also coherent to a vision of sustainability in which participation is key. Environmental, social, and economic challenges call for actions of radical interventions in modern urban areas. In order to be truly sustainable these actions must be collaboratively developed in trans-disciplinary sessions. Here, people from various backgrounds and with different interests explore alternative solutions, find a common ground and plan concrete actions towards a desirable future (Holman et al., 2007).

## A complex future to imagine

Thinking about the future means dealing with great uncertainty because we live and act as part of complex systems, whose behaviour is not linear and therefore cannot be forecasted.

One of the ways in which companies and institutions have dealt with this uncertainty in the past sixty years is through the development of techniques of scenario planning as a way to think about alternative futures and test the resilience of solutions (Hunt et al., 2012). This methodology substitutes the traditional "predict and control" approach to planning, with "qualitative causal thinking" (Heijden, 2005). This approach rejects the idea that the future can be predicted through the probabilistic analysis of trends. It seeks instead to map out different alternative ways in which the future can unfold, by including non-predictable factors and human behaviour as the driving forces (Heijden, 2005; Schwartz, 1996).

In the Foresight Future of City working paper, "Living in the City" (Urry et al., 2014), we adopted a similar methodology to Heijden (2005), establishing four possible scenarios that describe how UK cities might look like 50 years from now: the "high-tech city", the "digital city", the "liveable city", and the "fortress city" (Figure 1). They highlight how different "cities" are defined by a multitude of interrelated factors that belong to seemingly incomparable fields, but that are strongly interrelated through connections, networks and flows of people, information, and objects (Bridge and Watson, 2011; Urry et al., 2014). What this paper highlights is that we ought to think of cities in terms of dynamic networks that connect different layers of the system, and acknowledge that small decisions that are made in the present might have a significant impact in the future on different parts of the system.

This approach highlights the complex nature of cities as well as the difficulty in defining the boundaries of research in this context. However, by using this approach, there is a risk of alienating readers from their own future, by describing the future as a series of possibilities that will be determined by a very complex set of factors of which we are not in control. As a result, we might feel

locked into a system that happens around us, and it is hard to understand our role and how we can influence it. Moreover, future scenarios are often presented as snapshots of a moment in the future, and, in the format in which they are presented to the public, rarely capture the transition phase.

If participation is indispensable for the achievement of sustainable scenarios, the role of actors involved in the discussion must change: from external observers of future diorama, to active participants to the process of shaping of the city.

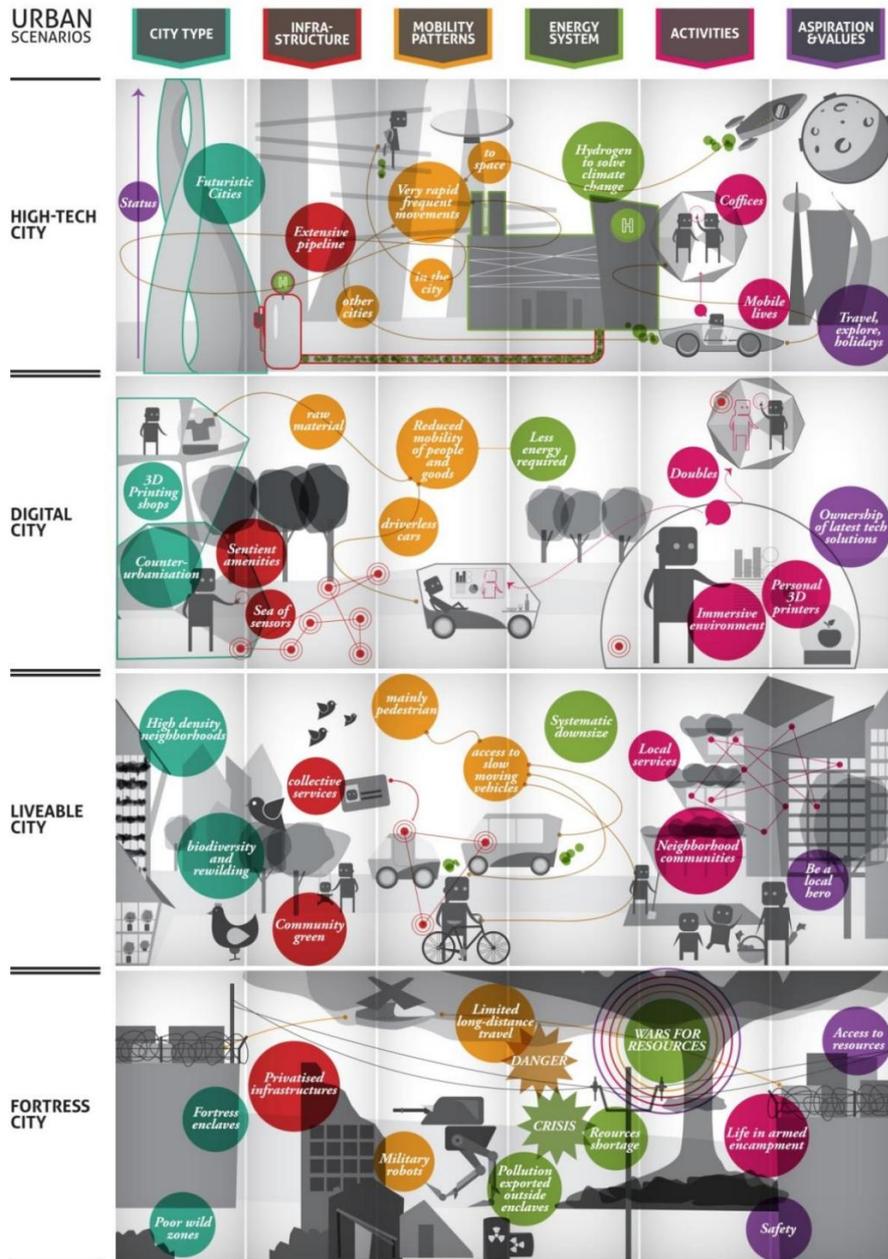


Figure 1 The city futures scenarios

## Visions of future and cities

The scenario-planning methodology described in the previous paragraph is a popular approach to think about different possible futures. It is able to include uncertainty, and provide a deep

understanding of the driving forces. However, this is hardly the only way in which the future of cities has been described.

Visualisations of future are deeply embedded in their social and cultural contexts. These images also have agency in influencing the discourse on the future of cities, and ultimately, in shaping cities themselves. In some cases – produced as part of decision-making or design processes – the shaping of the future is at the core of the purpose of the visualisation. Imaginative, not design-oriented visions of future – for example from films or videogames - have great influence on the way we think about the future, as they make it possible to the general public, to imagine unexpected worlds (Bassett et al., 2013)

Because the information included in the visualisations go beyond the subject represented in itself, it is worth asking questions regarding the purpose, the contexts, the actors involved, and the power relations among these actors. These questions could help us understand whether there is a space for shared activities of envisioning future cities, and what are the tools and processes that are necessary to enable them.

Figure 2 is the taxonomy that accompanied the Foresight Future of Cities report “A Visual History of the Future” (Dunn et al., 2014). The report is a collection and an analysis of different ways in which the future of cities have been visualised in the last 100 years. The paper sought to identify dominant paradigms and main narratives, while providing an account of the purpose and the individual characteristics of each of the 108 images included.

Although the examples collected in the paper show a great diversity, both in terms of content and techniques, there is very little space for participation in the process of making these visualisations. The social structure of the communication process normally includes a group of actors producing a visual message as part of a communication process that includes a final user. This user can be either a passive reader of the image, or asked to participate by reacting to the message. This can be done by either comment (such as in the “Scenario Games” by Chora, 2009) or take action in the implementation of the vision (see, for example Fuller, 2008). In the majority of cases the reader is not an active participant in shaping the vision itself.



used across disciplines and contexts to describe complexity, visualise how individual solutions relate to each other and with the broader system.

## Visualisations and participation in thinking about the future

The role of communication design as a discipline that facilitates the understanding of complex information through the mean of visualisations has been understood and explored in the last decade by a number of researchers, practitioners, and institutions. Part of the potential of this approach is in the development of tools and processes that facilitate the participation of diverse groups of stakeholders in design and decision making processes (Ciuccarelli et al., 2008).

In the context of design for complexity, methods from communication design can be used to:

- *Capture the complexity of the system.*  
Map the actors and flows that characterize a system to create a structured and detailed representation of complexity that can be used to generate ideas for system interventions at different scales. Giga-Maps are an example of tools used for this purpose (Sevaldson, 2013).
- *Think and talk visually about the future*  
Overcome the difficulty of thinking about alternative futures that are radically different from what we know. Designers can invent new languages to reimagine different ways of living. This approach is central to the Metadesign framework, which refers to the collaborative design of the design tools to be implemented to generate a systemic change. (Wood, 2008).

These two ways of designing for complexity -- one that focuses on the understanding of the system, the other one on design as a “seeding process” -- are different but complementary. In both cases, collaboration is essential in creating a common understanding and in shaping visions of future. The case study presented below mainly focuses on the second approach, looking at visualisation processes and methods that allow us to talk about the future beyond the boundaries of trends and probability.

## The use of diagrams for the collaborative mapping of the city of the future

Finally, we identified the language of diagrams to be particularly suitable to map abstract ideas and unfinished thoughts. Diagrammatic visualisations, in fact, focus on connections and flows, rather than on the iconic representation of the future. This particular type of visualisations can be applied to develop multi-faceted visions of future.

Drawing on Deleuze philosophical interpretation, Scagnetti (2007) describes diagrams as “operating devices able to reveal weak links among the elements of the system, and to show the driving forces that can facilitate (or hinder) a design intervention.” In this context diagrams are processes rather than finished products: they are working tools for design and decision-making.

Diagrams are a type of visualisation that are particularly suitable for creating shared understanding and finding a common ground in multi-actor contexts (Ciuccarelli et al., 2008). Because they focus on connections and relations more than on figurative descriptions, diagrams can be adopted to describe abstract concepts and ideas. Moreover, they can be used in design research to reveal weak links and driving forces in a system, and clarify the impact that these can have in design interventions (Scagnetti et al., 2007)

Different fields such as Information Design, Data Journalism, and Data Visualisation have popularized the use of diagrams to describe complex systems in the last few years. Research in these disciplines

contributed to the development of excellent software and techniques, and to the improvement of visual literacy in the general public.

Some interesting insights can be drawn from research in this field and applied to the design of tools for the collaborative description of alternative futures. To do this, an additional effort should be made to prototype ways in which non-professionals are engaged with the whole process, rather than being only invited to interact with the final piece of work.

## Case study: Future VisionING workshops

This final section of the paper provides a description of some research conducted as part of the Liveable Cities programme, and concerned with mapping co-created visions of future for UK cities.

Liveable Cities is a UK Engineering and Physical Sciences Research Council-funded 5-year interdisciplinary research program. The main objective of Liveable Cities is to investigate and develop recommendations, guidelines and solutions to deliver societal and planetary wellbeing within the context of low-carbon living and resource security in UK cities. The programme is divided into five Research Challenges (RC), conducted by research teams from Lancaster University, University of Birmingham, University of Southampton, and University College London.

One of the ways in which the research team is trying to achieve its main objective is through Future Visioning workshops. This series of workshops is part of the Radical Visioning Research Challenge (RC4), conducted by a team from Lancaster University and University College London.

Each Future Visioning Workshop brings together experts from a specific sector to explore visions of sustainable, liveable future cities through a combination of hands-on activities and open discussion. The sectors involved at the moment of writing are:

- Retail
- Architects and Urbanists
- Archaeologists and Historians
- Transport and utilities
- Environmental and Physical science

Additional workshops are being organized.

Mapping the conversations and visions emerging from these workshops enables the team to create multi-faceted visions for cities in the future.

## Future Visioning research activities aim

The aim of the Future Visioning workshops and visualisations is to broaden the scope of academic research by involving a diverse group of leading experts in various sectors to imagine desirable urban scenarios. These visions will be used to inform design and engineering recommendations developed in the Liveable Cities programme.

This research activity is not about people's expectations for the near future. Rather, the Future Visioning workshops help people to explore "unthinkable" futures, in which cities might be radically different from what we know now.

## DEVELOPING THE FUTURE VISIONING Workshops

The first critical issue we encountered was to find a way to manage effectively the short time available during the workshops. Each workshop is only 2 hours long. This duration was chosen to allow a number of activities and structured conversations to take place, while making it possible for busy professionals to participate.

Encouraging blue-sky thinking and the generation of radical ideas in such a short time was problematic. We wanted to push the conversation beyond the familiar and expected, and encourage participants to be as imaginative as possible. For this reason, three different methodologies had been designed, prototyped, and evaluated, before finding an engaging way to involve participants.

In prototyping the different versions of the methodology, it became clear that there was a fine balance to be found between structure and openness: structured activities, materials, and facilitation are necessary to frame the discussions and push its depth towards radical ideas; a degree of openness is necessary to put people at ease, eliminate judgement, and extend the breadth of the conversation.

### Future Visioning workshop structure

The following structure describes the Future Visioning Workshops:

- **Introduction:** A brief introduction of Liveable Cities describes the research framework and the purpose of the workshop.
- **Activity 1 - Warm up:** The participants are asked to think about things that have significantly changed in their sector in the last 50 years. Each participant provides a unique response, as there is a rule: no answer can be repeated.
- **Activity 2 - Time-limited negative Scenarios:** This exercise is done in pairs, with each pair asked to respond to the following question: What is the worst thing that could happen to your professional sector in the next 50 years? The groups write down their responses on sticky notes, read them out, and then deposit the sticky notes in The Box of Negative Scenarios.
- **Activity 3 - The future liveable city:** This exercise is designed to stretch the participants' imaginations and push their time horizon. Like the previous one, it is also done in pairs, with each pair given two "Thinking cards" to help them imagine what a future liveable city could be in terms of what that city would look like and where people would live 50 years from now. After several minutes, the pairs are given another "Thinking card", followed by a fourth card a few minutes after that. Silly ideas are encouraged and pairs could use different materials to visualise or explain their ideas (e.g., sticky notes, marker pens). There are four groups of "Thinking Cards", and each card presents an issue that might become relevant in the future. These issues are part of future low-carbon scenarios being developed as part of Liveable Cities, and based on data, research activities, and reviews of literature. This helps to contextualize the future imagined by participants within the Liveable Cities research framework. However, participants are free to question or reject the cards.
- **Activity 4 - The future city building:** All activities lead to this part of the workshop, in which we focus on the future of the sector in the city, 50 years from now. Participants are split into two groups, provided with an array of materials (e.g., coloured blocks to represent buildings, small plastic people, tissue paper) and asked to design a future city from their own professional perspective, bearing in mind the scenarios that they created and heard about in the previous activity. Specifically, the groups need to consider consumption and production practices—how, where and when people would consume, produce and live—what infrastructures would need to be in-place and what the general vision of the city would be.



The conversations that took place in each workshop were transcribed and organized, together with pictures, in summary reports that are available for download from the Liveable Cities website.

## Visualisations

Readers might find in the summary reports some interesting insight on participants' aspirations and worries for the far future. However, the linearity of the written text, does not allow for patterns to emerge. There is some richness in the diversity of issues that emerge in different ways in the different workshops that gets lost when the conversations are reduced to a report. Translating this information in visual diagrams can help highlight these patterns, and allows the reading of multiple conversations at once.

### An example of a visualisation process

At the moment of writing, a series of visualisations have been created for one of the activities in the workshop (Activity 3). This activity consisted of a facilitated discussion around the the following question: "What will a liveable city of the future be like?" with participants divided into small groups.

The following steps describe the process of mapping of this activity.

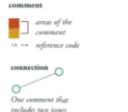
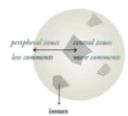
- **Prepare the material:** In order to work with long text in every workshop, each comment has been given an identification code.
- **Identify areas of discussion:** The seven areas of discussion that emerged are:
  - o *Living*
  - o *City structure*
  - o *Communities*
  - o *Mobility*
  - o *Production and consumption*
  - o *Environment*
  - o *Governance*
- **Recognize recurring, emerging issues:** Emerging issues are topics that we found to be addressed (in slightly different ways) by different groups and in different workshops. These topics might be addressed in different areas of discussion. For example, we might talk about "Food" in terms of living, mobility, production and consumption, and so forth.
- **Organize the material according to areas and issues:** all the information collected in the previous passages have been organized in a small database to make it easy to retrieve information in the visualisation phase.

- **Design of the working diagrams:** all the comments have been mapped according to the issue they represent and the areas of discussion they touch. The circles in the images below frame the space of discussion for each workshop. Those issues that include higher numbers of comments are mapped in the middle (as “central” issues). Issues that are mentioned less frequently are located more towards the periphery of the circle. Although this poses some issues in terms of readability, we included the codes of the comments that belong to each issue as well as the areas of discussion to which each comment refers. Connections are marked for comments that belong to more than one issue.

**WHAT DO WE TALK ABOUT WHEN WE TALK ABOUT CITIES OF THE FUTURE**

Liveable scenarios in sustainable cities  
MAP 2

HOW TO READ THIS DIAGRAMS



THE FUTURE VISIONING WORKSHOP SERIES

Each Future Visioning Workshop bring together leading experts in a specific sector to explore visions of sustainable, liveable future cities. Through a combination of hands-on activities and open discussions, these 2-hour workshops enable deep, creative thinking in a short time.

ABOUT THIS VISUALISATION

This diagram maps, for each sector, the main issues emerging from the discussion generated in one of the activities of the workshops (Activity 3). This activity, facilitated through the use of prompts ("Issue Cards"), is aimed to stimulate a creative discussion around the general question: "what will the future look like?"

Have a look at the booklet with the transcriptions if you are interested in reading the comments.  
Feel free to leave your comments on a sticky note.

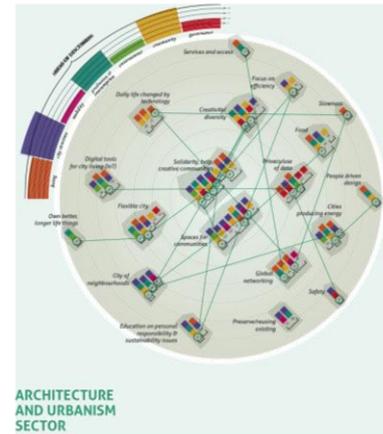
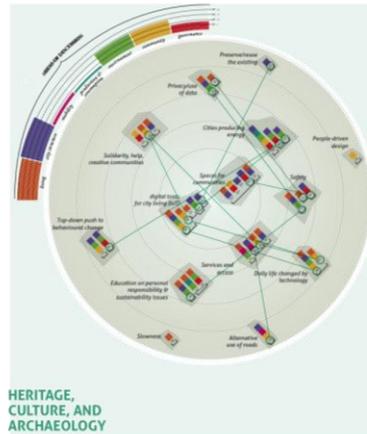
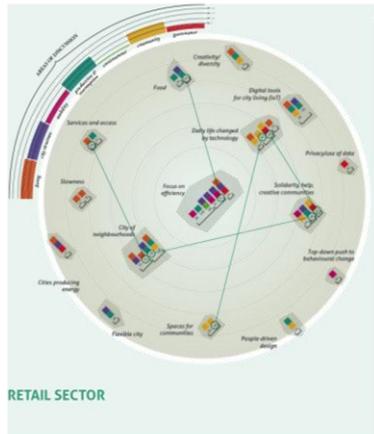
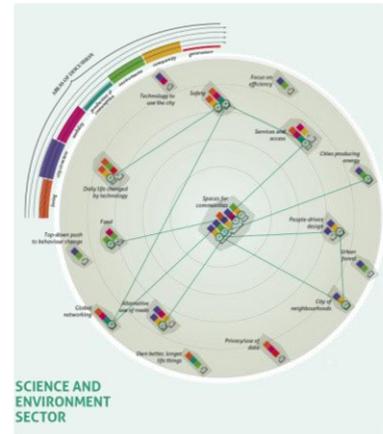
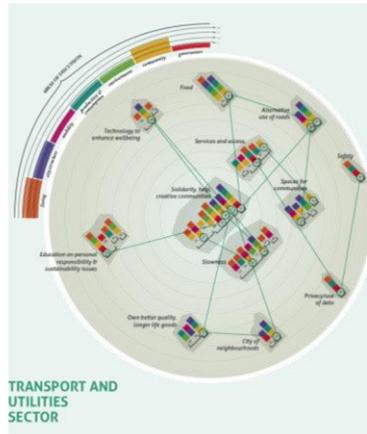


Figure 3 "What do we talk about when we talk about liveable cities": Working Diagrams for activity 3 of the Future Visioning Workshops

**The danger of bias and other critical issues**

The process of visualisation is a process of interpretation and translation of a message. This means that bias is inevitable. As designers, we are used to working with ambiguous material for which we give meaning through the design process. As researchers, on the other hand, we are asked, as much as possible, for objectivity.

One way in which we dealt with issues of subjective interpretation, is through transparency. In the working diagrams shown in Figure 3, the connection with the original source of data is maintained, through the inclusion of the identification code for each comment mapped.

It is worth at this point to mention that the diagrams produced at this stage are used for internal research purposes, and will have to be refined to improve their readability in order to be presented to a broader audience. This will happen once the series of Future Visioning workshops will be completed.

## Preliminary findings

Initially, the purpose of the series of Future Visioning workshops was to explore radical ideas for a preferable future in different sectors through the help of lead experts. As it turned out, it was pretty difficult to generate truly radical ideas in the short time available. The main contribution that this research activity brings to the Liveable Cities programme, instead, is a complex picture of the meaning that people give to the concept of city, and a network of interrelated issues that emerge from this picture. Ultimately, it is possible to read messages in the visualisations about what is important, the priorities, and the risks of the future, according to participants representing themselves both as citizens and experts in their professional sector.

Figure 3 and Figure 4 highlight how issues that are central for one or more sectors are not considered relevant in the discussion between participants from other sectors. Experts from the transport sector, for example, talked a lot about “slowness”, in terms of daily life, services and transport. In the workshop with the retail sector, issues of slowness were only mentioned once, and the focus of the discussions was primarily on efficiency. By looking at the different diagrams in details, it is possible to spot further significant differences in the conversation.

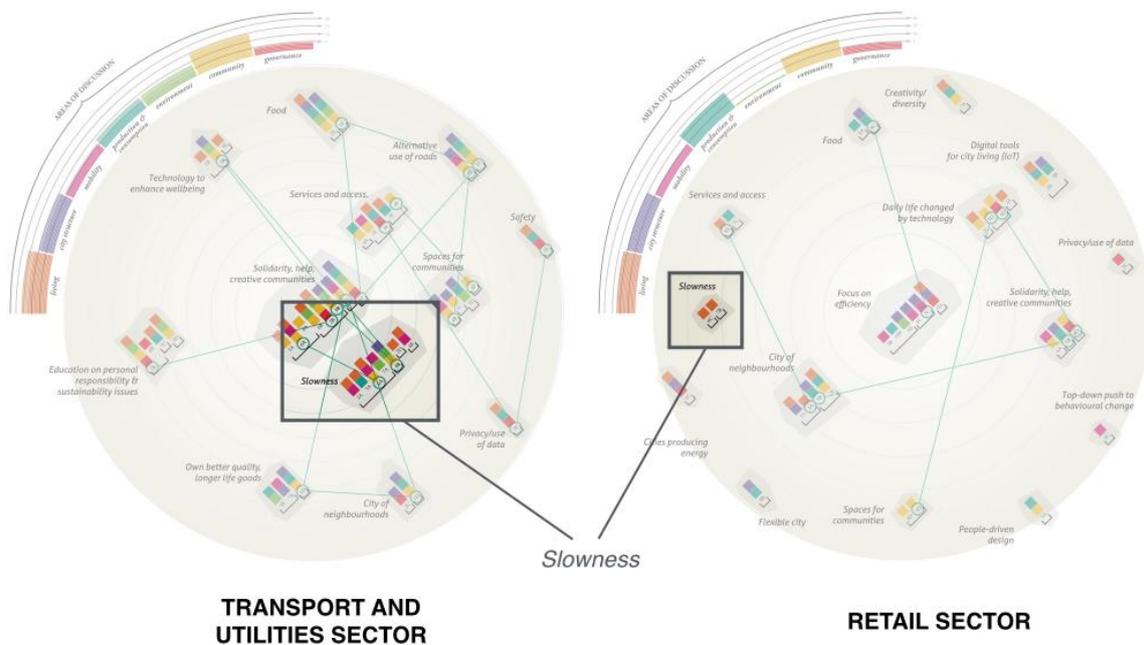


Figure 4 "Slowness" in the workshops with the Transport and Utilities Sector, and with the Retail Sector

Another way to analyse the workshops was to examine them as a single database to understand whether some issues are significantly more relevant than other. The diagram in Figure 5 provides a summary of the areas of discussion and the ten most relevant issues from the five workshops analysed so far.

What this diagram highlights is that, when asked to talk about the city of the future, people tended to focus on their interaction as individual and communities with the city. The three most prominent areas of discussion are “living”, “community”, and “city structure”. Although experts in most sectors are now asked to deal with issues related to climate change and carbon emissions, these topics are only marginally mentioned in the discussion. Governance is often associated with risks of over-controlling and privacy (mostly related to the way data is used), but also with the role of the public

sector in enabling communities to reclaim a more prominent role in shaping city. Mobility often refers to public transport, immobility, and alternative uses for roads, made possible by the disappearance of cars.

The central role of communities in the city is also highlighted in the issues that are most commonly raised in the discussions (and listed on the right side of the diagram). In terms of space, the ownership and the right of use of shared spaces in the city is often a central topic in the discussion; the central role of public space in the life of citizens will be a core issue of the city of the future, according to different groups. Groups and individuals who will live in smaller houses will use shared spaces in the city for a wide range of activities. In terms of economy, bottom-up, informal models of service provisions with a neighbourhood scale will support the needs of communities.

While this discussion does not indicate a naïve attitude of participants, they are certainly not in denial of the risks of climate change and overuse of resources. Rather, it reflects a general desire for a more prominent role of people in shaping their common future in the city, possibly in contrast with the stereotypical way future cities are often depicted – as “smart cities” in which data will be used to manage optimize resources.

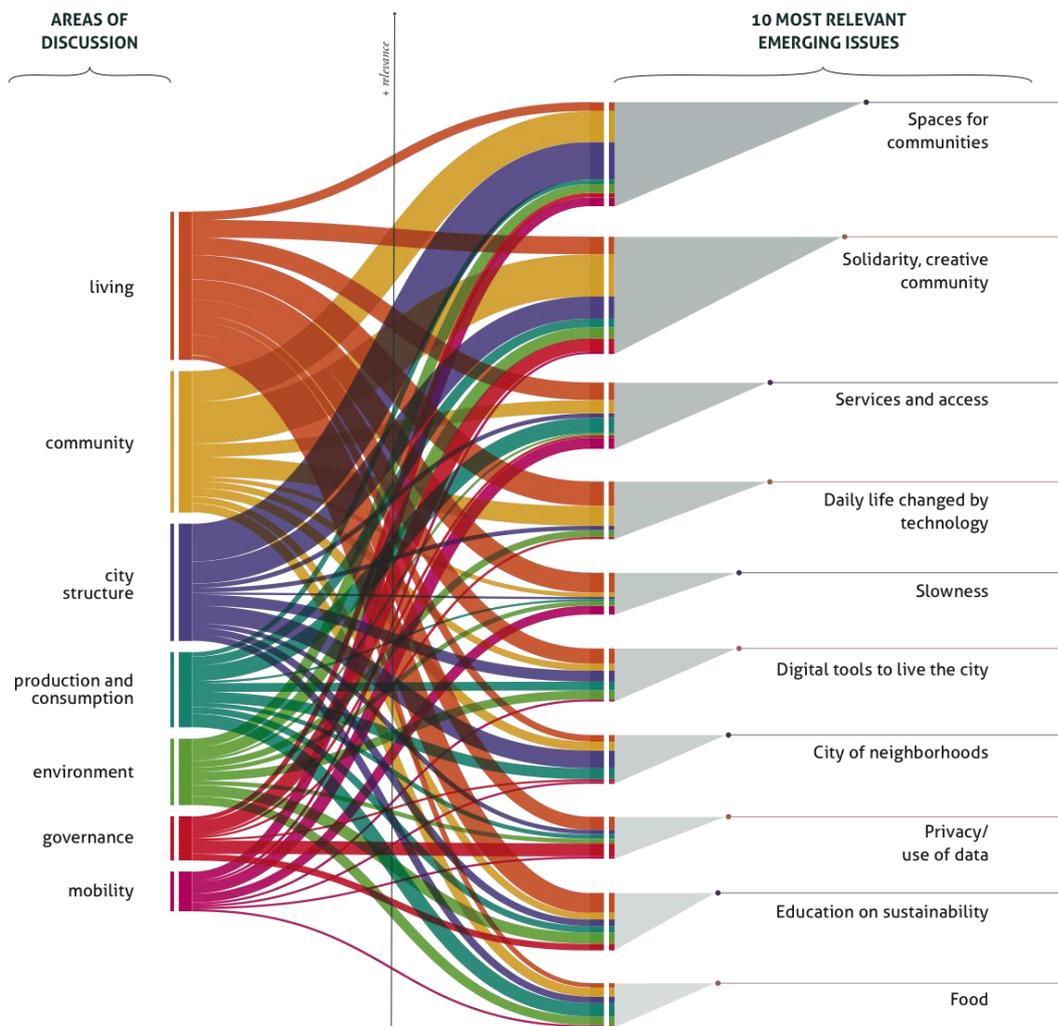


Figure 5 "What do we talk about when we talk about cities of the future": Summary diagram with areas of discussion (left) and the ten most relevant issues (right) emerging from the workshops

## Conclusions

This paper has discussed the need of tools and methods to promote participatory structured discussions on the future of cities. This can be done through the collaborative, bottom-up development of future visions that can be used to drive strategic interventions or inspire the design of sets of radical solutions.

The case study presented in Paragraph 0 described one way in which a combination of activities and visualisations have been used to develop alternative visions of the future. In this case, though, the diagrammatic visualisations of the workshops have not been developed together with the participants, but by the research team. Although these visualisations have direct links to the conversations and the activities, the evaluation and dissemination phase of this activity will be essential to understand the potential and the limits of this approach. We intend to invite the participants to the workshops to comment, interact and integrate the visualisations produced in this research activity.

We also recognise the early stage of this research; further work needs to be done to explore different processes of visualisations of future cities.

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