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## Constructing a Vision for an ‘Ideal’ Future City: a conceptual model for Transformative Urban Planning

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### Abstract

Nearly 54% of the world’s population lives in urban areas and this is set to grow over 2.5 billion people by 2050 (United Nations, 2014). In this context, the question is how to make cities contribute positively to the wellbeing of all their inhabitants and with economic, social and environmental sustainability. Due to increased complexity of their functionality and limitations imposed by the existing uncoordinated frameworks for designing and managing urban systems, cities are already facing great challenges such as resource scarcity, institutional barriers, narrow accounting frameworks, lock-in due to infrastructure, inequality, congestion, crime and diseases, which will only worsen with increased urbanization. As such, innovative tools for planning and engineering coordinated solutions to transform cities’ systems are at the heart of sustainable living in the future.

As part of the EPSRC programme grant Transforming the Engineering of Cities we are conducting research to understand precisely how to radically transform the way in which cities are engineered to move towards future cities that address current challenges and promote long-term well-being for society and the planet. After reviewing evidence of urban transformations, we identified that, in most cases, their starting point was a high level vision, usually defined by political leadership based on strong participatory processes, which constructed imaginaries that defined the main urban functions to be provided by the city and that underpinned all projects and policies in the short and long term. Because of the importance of setting such a vision our research aims to define a way of developing a vision of a future ideal city. Our approach identifies a methodology for defining the future city vision that is able to move beyond the all-too-common ‘political wish list’ and that enabled the vision to be defined as a result of a rigorous process. To develop this process we divided the work into two phases. The first phase included empirical work in Latin America, the UK and China and literature review of exemplary urban transformations. As a result, an initial preferable future vision, conceptualized as the 5-cities model was defined. The second phase included a series of 8 sectoral visioning workshops conducted over a period of 2 years in London and other UK cities. Each workshop is analysed to identify the high level principles for the preferable future city. This research findings underscore that transformative planning only can take place when social norms, people’s behaviors and people’s attitudes change. Urban life is created by everyone in cities, the municipality, citizens, owners, businesses, experts, individuals, communities; therefore, urban life can only be transformed

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through the right tools to engage and involve them, and it is precisely what the process of defining a high level principles vision and the vision itself should do.

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## 1. Introduction

As part of the EPSRC programme grant Transforming the Engineering of Cities we are conducting research to understand precisely how to radically transform the way in which cities are engineered to move towards future cities that address current challenges and promote long-term well-being for society and the planet. After reviewing evidence of urban transformations, we identified that, in most cases, the starting point for transformations was a high level vision, usually defined by political leadership based on strong participatory processes, which constructed imaginaries that defined the main urban functions to be provided by the city and that underpinned all projects and policies in the short and long term. Because of the importance of setting such a vision for achieving transformations our research aims to define a way of developing a vision of a future sustainable city. Our approach was to identify a methodology for defining the future city vision that was able to move beyond the all-too-common ‘political wish list’ and that enabled the vision to be defined as a result of a rigorous process. To develop this process we divided the work into two phases. The first phase included a series of work sessions held with transport sector authorities in Latin America, the UK and China and was informed by literature review of exemplary urban transformation cases. As a result, an initial preferable future vision, conceptualized as the 5-cities model (Tyler, 2015) (Tyler, et al., 2013) was defined. The 5-cities model constructs the future city vision as a set of principles which are independent of the usual sectoral divisions that characterize city policy, design and operation. The second phase included a series of 8 sectoral visioning workshops conducted over a period of 2 years in London and other UK cities in collaboration with researchers from Lancaster University. Through the workshops we aimed to complement the initial vision with a grounded basis. Each workshop is analyzed to identify the high level principles for the future city. The terms and phrases emerging from the sectoral workshops are combined to create a unified future vision and identify potential pressure points barriers and triggers for change.

The structure of this paper is the following: after this introduction, section 2 presents in more detail the 5-cities model and some of the relevant findings from the case study of the transformation processes of Curitiba and Copenhagen. Section 3 presents the methodological approach for the envisioning exercise, details on the characteristic of the workshops and the data analysis and initial findings on the emerging visions. Section 4 concludes with discussion, further elements of transformative process and future research topics.

## 2. A Conceptual Model for A Preferable Future City Vision: The 5-Cities Model

Our objective is to understand how we can radically transform the engineering approaches for developing cities in order to deliver future cities that address upcoming challenges and enhance the well-being of society and the planet. Hence, the starting point for achieving our objective is to re-envision the engineering of cities from the root, acting upon what is essential and fundamental. This meant focusing on the identification of the purpose of cities understood as the needs that society has and that should be addressed by cities as part of their functionality.

Hence, our visioning approach, the process of creating a vision, aims to define a representation of a desirable future state in terms of fundamental urban principles. The value for transformative urban planning of this desirable or preferable future vision is that it is conceived to serve the purpose of a *concrete Utopia*, as defined by Bloch, which simultaneously anticipates and influences the future (Ganjavie 2013). An example of this is the sustainability discourse, in which positive visions about societies’ future are influential, if not indispensable, stimulus for change as they provide direction for actions and behavior and create identity, consensus and community (Wiek & Iwaniec 2013).

The 5-cities model conceptualizes a city's objectives, so that these are not seen as singular areas of concern, but as cross-cutting fundamental principles for making the city closer to an ideal in which people's aspirations are met and societal well-being is reached. The initial preferable future vision defined as the 5-cities model (Tyler, et al., 2013), encompasses the principles set out as five characteristics for a city. 1) A *Courteous city* that stimulates positive social interactions and promotes behaviors that facilitate the functionality of the city. 2) An *Active and inclusive city* that ensures people's fair access to opportunities to meet their needs and aspirations. 3) A *City as public space* in which all public spaces are designed as open and accessible to provide protection, safety and security and create a sense of belonging and ownership. 4) A *Healthy city* that is conceived to ensure the good health of people and the environment today and for future generations. 5) An *Evolving City* designed to be adaptable, flexible, innovative and responsive especially for its soft infrastructures (i.e. governance, policies, financing, economy, among others), and which learns and adapts dynamically accordingly to people's behaviours.

This initial model aims to be complete and comprehensive, but overall it aims to be clear and easy to communicate. This emphasizes the fact that from our approach, a future city vision is not a fixed perfect state but one that should evolve as the needs of the people living in the city evolve and as all the different systems of the city change. In consequence the process of creating the vision and the vision itself are dynamic. In other words, a vision does not end with the definition of the urban principles, it begins there, with the initial message to start a dialogue between the people and the city's agents in order to engage, commit and promote transformative action.

### 2.1. Urban Transformation Case Studies: Curitiba and Copenhagen

The two case studies briefly presented here, Curitiba and Copenhagen were selected based on the environmental and social goals achieved in each city through their urban transformations which has made them recurrent examples of good urban planning practices. These two cities are also important references because they are by definition evolving cities that started their transformation processes around the 1940s and have continued evolving ever since with Copenhagen having achieved a 20% CO<sup>2</sup> emissions reduction over the last decade and having set the goal to be carbon neutral by 2025 (full compensation of use of fossil fuels by renewable energy) (Hall, 2013) and Curitiba being the city with the highest levels of rubbish separation in the world (Lerner, 2008) and having CO<sup>2</sup> estimated at 70 kg of CO<sub>2</sub> per person which is considerable less than 292 kg which is the largest average of 17 of the major urban areas in Latin America (EIU, 2010):

For the purpose of our research, studying the transformation processes of these two cities is important because they have managed to translate their visions into initiatives across almost all the different city systems such as public spaces and streets, transport, water and sewage, energy and waste systems, but also housing, businesses, culture and education, policy and governance and economy. These examples of taking the conceptual vision to practice, holistically, are of high relevance because they are part of the evidence base that contributed to the genesis of the 5-cities model. Moreover, these two cases present evidence regarding the possibilities of achieving simultaneously economic sustainability objectives and environmental and social sustainability. On that regard, Copenhagen's 20 per cent cut in emissions occurred at a time when GDP rose by 66 per cent. This good economic performance of the city and the country is related to the fact that Denmark pioneered commercial wind power in the 1970s and managed to produce almost 50 per cent of the wind turbine power in the entire world and after years of investing in research and development on wind energy technologies, almost half of the wind turbines placed around the world are produced by Danish manufacturers (Danish energy agency, 2012). Such initiative allowed Copenhagen and Denmark to make the environmental sustainability vision a viable commercial proposition which led to favourable outcomes on both spheres (OECD, 2012). On the other hand, Curitiba is the city with the fourth highest GDP in Brazil with US\$10,800 (after the megacities of Rio de Janeiro and Sao Paulo, and the capital Brasilia) (Lerner, 2008). The city's economy is driven primarily by commerce and services, but industry makes up about a third of its GDP. The city is the largest car manufacturer in the country and also home of numerous well-known national and international companies (EIU, 2010). In fact, Curitiba's economic performance is also a result of its urban planning process. Together with the development of land use and transport policies, the city implemented economic policies aimed at developing the industry and creating economic growth. Curitiba's experience has been defined as a project to build a city within a project to build an industrial city which is in effect a share commitment and a convergence point between economic, political and societal agents (Ardila, 2003).

The common characteristics of the urban transformations of Curitiba and Copenhagen are the following:

- Visioning process and the consequent strategic actions partly catalysed by a sense of urgency created by context and high perceived cost of ‘do nothing option’. (1970’s oil crises for Denmark and exponential population growth paired with income decrease within the dictatorship of Brazil in the 1970s)
- Aligned interests between public sector and private sector, individuals and industries, and strong links with research institutions (e.g. universities or NGO’s) to foster innovation and increase financial capacity.
- Development of physical interventions both large and small. Large projects including Transport Oriented Development projects like 1947’s 5 finger plan for the development of the rail systems and the location of housing and job areas in Copenhagen or the rapid, bus-based Integrated Transport Network in Curitiba which started with a single corridor in 1974 and now covers the whole city with more than 80 km of corridors, 395 services, 100 stations and a daily demand of 500.000 passengers (SIBRT, 2015). Physical interventions, as small, ‘urban acupuncture’ projects, which Lerner (2014) define as ‘quickly’ implemented interventions that trigger healthy responses within the city, improvements and positive chain reactions, such as the pedestrianizing the first street in 1962 in Copenhagen city center (1.8 km) (Gehl, 2006) or the pedestrianizing of the first street segment, in 72 hours, in the center of Curitiba in 1972 (Lerner, 2014).
- Leadership from knowledgeable urban planners, such as Jan Gehl and Jaime Lerner, supported in good planning systems, with effective planning tools and capable institutions that have given continuity to the vision over the years, overcoming generational trends and political cycles.
- A vision that takes the environmental and social objectives beyond specific targets and transform them into essential principles that define the city’s culture, social norms and mind-set of the people as individuals and of all the organizations, businesses and institutions of the city. A commitment to use different types of education and communication to teach these principles to every citizen, especially the new generations.
- Economic and policy frameworks structured to support the delivery of the city vision

Finally it is important to highlight that these two case study cities are medium or small, in terms of population, and relative population within their respective city systems. This might be regarded as a constrain but actually is part of the value that this research aims to construct. The high complexity of cities as a system of systems is affected by many factors, including population size or geographical area. A common approach to deal with the issues arising in cities is to break the whole into smaller, more manageable, parts, such as in the case of land use zoning regulations. However, Copenhagen and Curitiba adopted urban forms that addressed the city vision for the complete spatial and functional expansion of the city. Within that city vision, smaller areas (in terms of physical space or population) such as neighborhoods or ‘villages’ have been planned but not as isolated elements, but as elements of the wider city system that contribute with the achievement of the city vision and which are smaller in scale but not in complexity.

### **3. A Dialogue for the Vision of the Future City: Sectorial Visioning Workshops**

In order to define a future city vision, we need to envision the future undistorted by assumptions about what we think that future would be like. This is why we adopted the approach of constructing a dialogue about the future city. This is not just an imagined city though. We construct this from a grounded basis for examining the possibilities. In this case, we generate a set of extrapolated views of a future city, based on experts’ views of the future in their own domain. We collect these views in a set of facilitated visioning workshops, in each of which we bring together a group of experts in a particular sector and obtain from them their view of a preferable future city from their perspective of and in relation to their sector. The preferable future vision addresses the question what is desirable to happen? This yields a set of ‘future cities’ which are essentially independent, but which will also have some sense of coherence given by the context under which the visioning exercise is taking place. Furthermore, this preferable future vision is also conceptually consistent with the initial vision defined in the 5-cities model.

As presented in Figure 1, the visions resulting from this exercise will be preferable future visions which are expected to have some elements of probable (what is likely to happen based on trends), some elements of plausible (what could happen based on existing knowledge) and some elements of possible (what might happen based on assumption of construction of new knowledge) (Voros 2003).

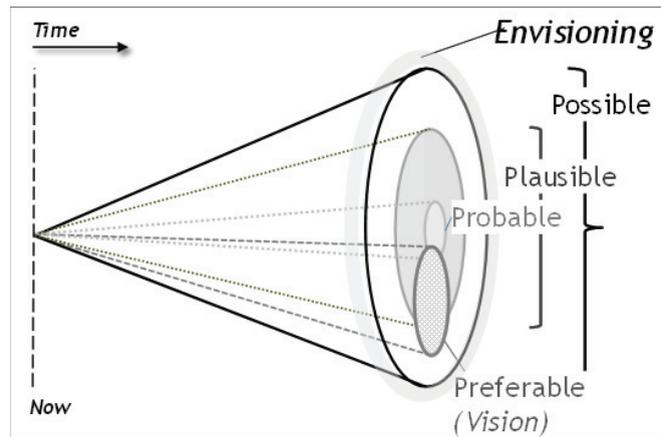


Fig. 1. The Futures Cone. Source: Authors based on (Voros 2003)

The visioning exercise is presented as a participatory dialogue about a preferable future city between 97 people from 77 different organizations of 8 sectors. Each of the visioning workshops lasted for around 115 minutes and was structured in 4 phases: i)describing changes in the sector over the last 50 years, ii)describing the worst case scenario for the city of the future, iii) defining the future Liveable city, iv) designing the future Liveable city. For this dialogue the exercise was left deliberately open to prevent constraining the thinking by the existing city. However, given the difficulty of imagining a future completely disconnected from the reality, the visioning exercises are tacitly contextualized in London and UK cities, where the workshops were conducted. Nonetheless, because of the transversal analysis created to construct the dialogue between sectors, the results are indeed an exercise removed from reality as they represent a conversation that did not take place. Table 1 presents the summary of the workshops’ participants.

Table 1. Sector, people and organizations that participated on the visioning workshops.

Participants\Workshop	Education (EDU)	Architecture (ARC)	Environment (ENV)	Heritage (HER)	Retail (RET)	Utilities (UTI)	Transport & Utilities (T&U)	IT (IT)
Number of Organizations	13	11	11	8	6	16	8	4
Number of Participants	13	16	13	11	9	17	12	6

### 3.1. Word Frequency Analysis

Following the conceptual approach of the 5-cities model presented on section 1, the vision will be constructed by identifying the high level urban principles that were mentioned explicitly or implicitly within the discussions.

Our first approach for getting a complete overview of the topics discussed during the workshops is a word frequency analysis. For the analysis we normalized the data to prevent sampling bias due to larger sample size for certain groups (more words due to larger group of people or longer duration time). To remove commonly used words a list of the top 5000 most frequent words on the English language, obtained at <http://www.wordfrequency.info> was used. Based on the classification of words according to Part of Sentence, only nouns and adjectives were selected for the analysis. The word frequency analysis also excluded other high frequency words that were used during the workshop which were identified as common idiomatic expressions not highly relevant from a content perspective. The total number of words per workshops and the total number of words analyzed are presented on Table 2. The total word count for the workshops is 90290, out of which only 17139 word counts which represent 19% of the total will be analyzed.

Table 2. Visioning Workshops word count

Part of Sentence/Workshop	Education (EDU)	Architecture (ARC)	Environ (ENV)	Heritage (HER)	Retail (RET)	Utilities (UTI)	Transport & Utilities (T&U)	IT (IT)
Noun	1341	1615	1706	1630	1166	1860	1722	990
Adjective	498	701	760	737	446	761	688	516
Total	9464	11633	13116	13703	8733	12804	12961	7815

The word count analysis shown in Figure 2 presents the top 20 most frequent words. The word *people*, followed by other words consistent with the context of the activity, such as *city* and *future* are the highest frequency words. This is a very important finding because although *people* is a frequent used word, in general (ranked 54 in the top 5000 word list) when looking at the data more in detail, specifically at compounds including the word *people*, it is evident that the people is indeed a central part of the conversation about the future city as all the elements of the city are described in terms of their effect or interaction with people.

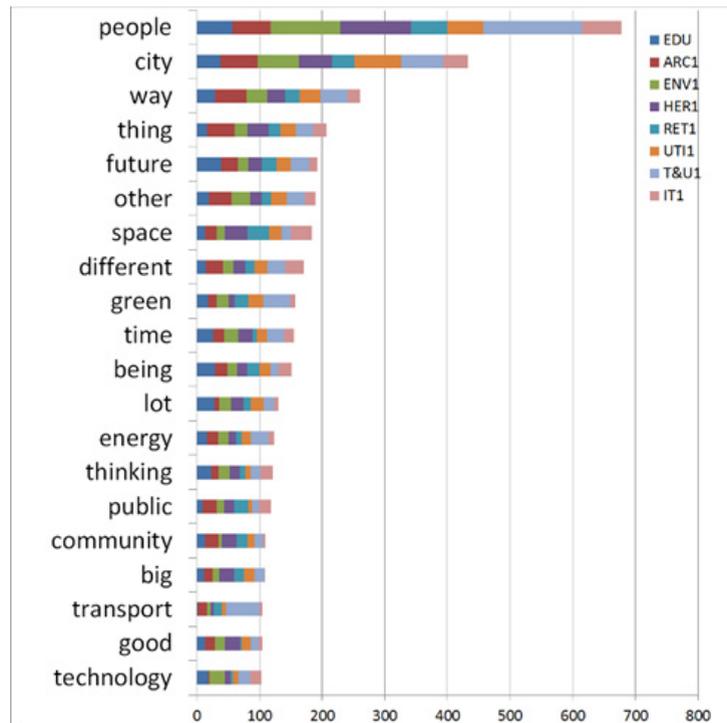


Fig. 2. Word count - 20 most frequent words. Source: Authors

Figure 3 presents the top 60 most frequent words divided in seven categories: 'general', 'processes' or each of the cities of the 5-cities model. Within the group categorized as 'general' the word *being* has the highest frequency after *people* and *city*. This suggests that the dialogue about the city's components is expressed in terms of their effect on people *being* in a certain way or place. The most frequent words categorized as 'process' are *design*, *different*, *other*, *new*, *way*, *thing*, which suggest the topic of change. Words with relative frequency of more than 80% are: *space*, *time*, *public*, *green*, *energy*, *thinking* and *community*; and with more than 70%: are *data*, *local*, *technology*, *food*, *good*, *infrastructure*, *building*, *stuff*, *transport*, *working*, *school*, *social* and *water*. This shows the relevance within the dialogue about the future city of common sustainability topics related with resources, the natural environment or public services but also the appearance of more current topics such as technology and data and an important representation of social related aspects like community, space, local, schools and social.

Category	Word	Relative frequency (in relation to most common word)	Category	Word	Relative frequency (in relation to most common word)
EVOLVING CITY	data	0.76	PROCESS	big	0.80
	digital	0.62		design	0.77
	government	0.69		different	0.87
	local	0.76		example	0.63
	multiple	0.62		future	0.91
	planning	0.63		high	0.65
	problem	0.62		idea	0.73
	technology	0.78		little	0.64
ACTIVE & INCLUSIVE CITY	building	0.72		lot	0.84
	centre	0.66		new	0.78
	food	0.63	other	0.90	
	good	0.79	part	0.64	
	infrastructure	0.74	point	0.73	
	stuff	0.72	small	0.63	
	transport	0.80	thing	0.92	
	working	0.74	thought	0.71	
	world	0.70	way	0.94	
	access	0.71	GENERAL	being	0.85
able	0.65	city		0.96	
community	0.81	people		1.00	
education	0.64	system		0.67	
information	0.69	urban		0.68	
life	0.65	used		0.66	
living	0.67				
school	0.70				
COURTEOUS CITY	sense	0.68			
	social	0.70			
	thinking	0.82			
	place	0.75			
	energy	0.83			
	HEALTHY CITY	environment	0.67		
		green	0.87		
		water	0.77		
	CITY AS A PUBLIC SPACE	area	0.68		
		public	0.82		
space		0.89			
TEMPORAL CITY	time	0.86			

Fig. 3. Top 60 most frequent words (Source: Authors estimations)

### 3.2. Emerging Topics

The second part of the analysis presents the results of the qualitative analysis of the data for conceptualizing it and identifying emerging urban principles. This analysis is divided into two sections. The first section, presented in Figure 3, is a summary of the comments that were explicitly expressed by participants as characteristics of a vision of a future city. The second section presents the results of a qualitative analysis conceptualization process. In both cases the emerging concepts are mapped to the existing categories of the 5-cities model.

The main objective of this analysis is to capture the topics discussed during the cross-sectorial hypothetical conversation synthesizing the vision but keeping as much as possible the specific details of the topics discussed.

Based on the data presented in Figure 4 the general vision of a future city describes a city in which life is better,

the pace is slow, easier, relaxed, where things flow smoothly, and there is a better work-life balance with more time and more freedom. The city has contrasts, is beautiful but messy, formal and informal, centralized and decentralized, local and global. With chaos in the skyline that brings surprise and creative qualities. The city is like a Swedish city or a Mayan city in the Jungle, a sustainable, living organism. In this city the energy issues are solved (in 200 years) moving away from dystopian scenarios. The city has evolved planning mind-sets, co-produced and mixed bottom-up and top-down spaces, places and policies. This is a collective and civic city, affordable and accessible to all and with digital technologies that create value for all; with multiple dimensions and multiple new geographies based on new data.

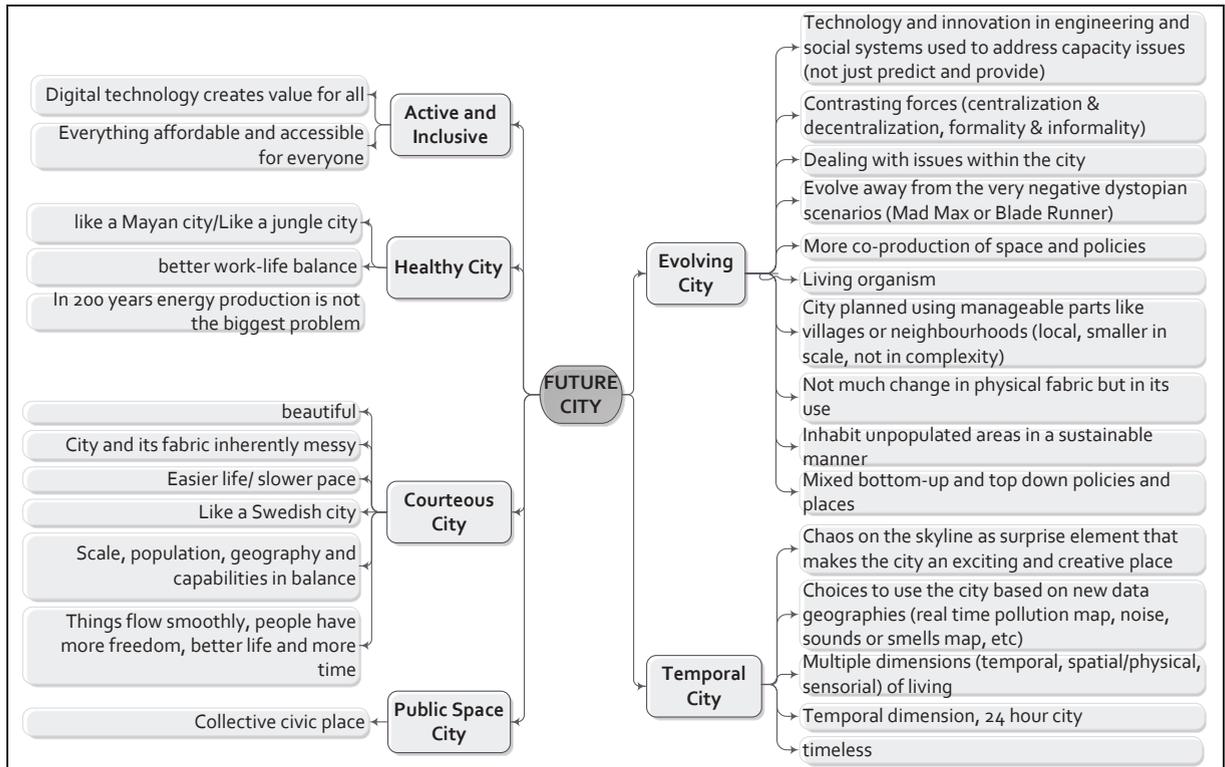


Fig. 4. Emerging description of a Future Preferable city. Source: Authors

For the second part of the analysis of emerging urban principles, the following tables highlight the importance of the concepts of the Evolving city, the Courteous city and the City as Public space. This might be related to the fact that these categories cover more innovative concepts not directly related with more traditional sustainability concepts associated with environmental or economic sustainability. The most relevant urban principles based on the mentions within the workshop and cross-impact in the 5-cities model are:

- Provide systems that function at the local level and connected to the wider network
- Cater for a multiplicity of needs and desires
- Address people's needs using appropriate technology of the time (adapting and resilient)
- Address people's basic needs (physical needs) and other psychological needs (happiness, fulfilment, sense of place and community)
- Prevent people feeling set aside
- Ensure public spaces are evenly distributed and available for all, including virtual spaces (e.g. Wifi)
- Prevent social breakdown
- Have mechanisms to provide agents with meaningful information, not just data
- Provide public spaces for the enjoyment of green and blue infrastructure

The colours of the marks on Table 3 show how much the topics were repeated within the different workshops, quarter-black circles correspond to 1 mention, half-black circles correspond to between 2 and 3 mentions and full-black circles to 4 or more mentions.

Table 3. Emerging Urban Principles mapped to 5-cities model

EMERGING URBAN PRINCIPLE		A	I	C	C	E	H	T
		C	C	PS	C	C	C	C
ACTIVE & INCLUSIVE CITY	allow people to feel fundamentally equal	●	●					
	connect the productive city with the leisure city	●	●					
	ensure accessibility and multiple possibilities for moving around the city	●						
	make everything accessible to everyone	●						
	make the built environment better to live, work and grow and thrive as a city	●	●					
	prevent the negative conditions that lead to fragmentation, ghettoisation and impoverished areas	●				●		
	provide access to services reliably and in a safe, pleasant environment allowing people to feel they belong to the city	●	●	●				
	provide connectivity	●						
	provide equal opportunities	●						
COURTEOUS CITY	address people's basic needs (Maslows' hierarchy) and other psychological needs (happiness, fulfilment, sense of place and community)	●	●				●	
	allow people to express themselves and their individuality	●	●					
	allow spontaneity and freedom of choice	●						
	create stronger communities	●						
	engineer the city around human issues, fun, leisure, attractiveness and as pleasant place to live in	●						
	ensure free flow information and the related benefits	●						
	ensure that all hard infrastructure and functional systems promote or do not affect social and natural capital	●				●	●	
	give people more freedom	●	●					
	guarantee equality of treatment for people	●	●	●				
	help people make better use of time	●						
	make everyone feel valued and empowered	●	●					
	prevent people feeling set aside	●	●					●
	prevent social breakdown	●	●					
	promote empathy, compassion and sense of community	●	●					
provide public areas for leisure and relax	●							
use traditional education channels to educate on civic and sustainability culture	●	●						
well designed tall buildings planned consistently with their context	●						●	
CITY AS A PUBLIC SPACE	cater for a multiplicity of needs and desires	●	●					
	create strong sense of community within globalization	●	●					
	ensure equity of access to political processes					●	●	
	ensure public spaces are evenly distributed and available for all, including virtual spaces (e.g. wifi)					●	●	
	have a democratic process to define a shared future vision for all					●	●	
	have mechanisms to provide agents with meaningful information not just data					●	●	
	provide public spaces for the enjoyment of green and blue infrastructure	●						●

EMERGING URBAN PRINCIPLE		A	I	C	C	E	H	T
		C	C	PS	C	C	C	C
EVOLVING CITY	address desire for new by having products reconfigurable by technology and which consume less resources					●	●	
	address people needs using appropriate technology at the time (adapting and resilient)	●				●		
	allow organic growth and build the city's systems to respond						●	
	always move towards diversity and creativity	●	●			●		
	centrifugally planned (not the bird-eye view, centralized form)						●	
	chaotic growth spread over centuries						●	
	contrasting forces (centralization & decentralization, formality & informality)							●
	co-production of space and policies					●	●	
	define mechanisms for coping with technology failure							●
	ensure people's involvement in digital technology regulation (security, privacy, physical infrastructure laws)					●	●	
	flexible							●
	functional systems integrated, coordinated and multipurpose							●
	have a mindset for solving current problems but thinking about future sustainability and protecting heritage							●
	have mechanisms for aligning interests and incentivise agents to undertake actions that contribute with the overall city objectives					●	●	
	have mechanisms to value the benefit that public places create for social or cultural capital to justify the allocation of resources	●				●	●	
	mechanisms for capacity building and skills development at the government level to cope with challenges							●
	no one size fits all solutions, massive small, little solutions, best suited approach							●
	not homogeneous, multiple options							●
	promote dialogue and knowledge interchange between universities, industry and public sector to understand and address social needs							●
	provide systems that function at the local level and connected to the wider network							●
to materialize high level vision at basic level							●	
use information to understand user's needs and adapt							●	
HEALTHY CITY	develop city systems to prevent risks of natural hazards							●
	ensure designs consider trade-offs and cross-impacts	●					●	●
	ensure fulfilment of basic needs	●						●
	ensure that the design of city elements contributes holistically with people's wellbeing					●	●	●
	give people a better life					●	●	●
	harmonize man-made infrastructures and functions with those of nature and environment							●
	prevent health crises							●
provide health							●	
TEMPORAL	cater for temporal dimension, 24 hour city							●
	cater for multiple dimensions (temporal, spatial/physical, sensorial) of living, working and retail							●
	ensure surprise elements that makes it an exciting and creative place							●
	provide choices to use the city based on new data geographies (real time pollution map, noise or sounds map, smells map, etc)							●

### 3.3. Retrofitting the 5-cities model: Emerging topics analysis

The discussions held during the visioning workshops have emphasized that the biggest changes observed in the last decades are not necessarily related to changes in urban form or hard infrastructures, they have been more about soft infrastructures, the intangibles and how people 'do stuff' and engage with the city and with each other. Consistently, the word frequency analysis showed that the most frequent words are people, use, being and the emerging urban principles are described as well from a people centric perspective, with various needs related principles within the list of most mentioned.

The data presents some complementary ideas that could be added to the initial 5-cities model to adjust it to reflect in greater detail the emerging principles. The main ideas are:

- The preferable future city is a city engineered and designed for people being well
- The model requires a temporal and multisensorial dimension. It might not require to be a new category, but perhaps an overarching quality for the future city
- The City as a Public Space category encompasses the full dimension of THE PUBLIC space, as the Agora in ancient Greece, a collective gathering place" or "assembly". A centre of athletic, artistic, spiritual and political life of the city, with aesthetic qualities and appeal but also with political and democratic connotations.

The 5-cities model, as any model, is an abstraction of reality, and therefore it might seem less complex and less chaotic than how it should be to better represent cities. Nonetheless, it is important to remember, that the future city, like the cities in the past, will face heterogeneity, multiplicity, diversity, contrasting forces, chaos and uncertainty.

The findings from the workshops and the mapping exercise validate the initial 5-cities model urban principles. Moreover, the data confirms the soundness of the model in the sense that the fundamental principles are precise enough to be clear but wide enough to encapsulate various specificities. The simplicity of the 5-cities model has a great practical value because, as defined by Kotter, a useful rule of thumb for a vision is: If you can't communicate the vision to someone in five minutes or less and get a reaction that signifies both understanding and interest, you are not yet done with this phase of the transformation process (Harvard Business Review, 2007).

## 4. Discussion and Concluding Remarks

This research highlights that the value of constructing the vision for a future city is twofold, one at the process level and one at the outcome level. At the process level the research presents the visioning exercise - and the resulting vision- as a participatory dialogue about the future city that will contribute to the planet and people being well. The engineering of the vision is a cooperative process that should allow multiple voices to be heard to identify needs, align different interests and foster engagement and leadership from one person or groups of individuals at the public sector organization level and at the community, civil society level.

At the outcome level, our research identifies that for a future city vision to be transformative, it should not be defined in terms of projects, budgets or foresighted trends or indicators but as a conceptual characterization of a city where its people can live and be well. This conceptualization should be done in terms of high level urban principles that underpin the functioning and design of all city systems at all scales. These urban principles are not objectives for siloed sectors, or singular concerns, but cross-cutting fundamental principles for making the city closer to an ideal in which people's aspirations are met and societal well-being is reached. Therefore, the definition of the high level principles must not be constrained by existing conditions, science, technology or likely trends, but needs to have an aspirational or desirable quality assuming the construction of new knowledge. The 5-cities model presented on this paper exemplifies this outcome-based vision which aims to be comprehensive and clear so that, in general terms, it can be a starting point for thinking and having the dialogue about the ideal future city vision of any city in the world.

Moreover, in the dynamic context of the visioning process the vision should be regarded as the starting point of the transformation. The vision defines that preferable future towards which the city should move and allows the identification of the pathways to go from the present to the preferable future.

Such a process will require continuous innovation in a context of rapid change and high uncertainty. Given these great challenges, transformative urban planning for the cities of the future needs to bring practices from other areas

which have successfully developed models and tools for transformation, innovation and management of complex systems. Our future research interests focus precisely on analysing how transformative urban planning benefits from the application of principles from agile and lean management. How principles of hypothesis testing, innovation accounting and validated learning for user centric design of city's systems should be applied to allow cities to identify value creating processes and strategies for successfully delivering the vision (Ries, 2011).

Through the analyses of urban transformation case studies and the emerging themes of future city visioning workshops this research underscores that transformative planning only can take place when social norms, people's behaviors and people's attitudes change. Urban life is created by everyone in cities, the municipality, citizens, owners, businesses, experts, individuals, communities; therefore, urban life can only be transformed through the right tools to engage and involve them, and it is precisely what the process of defining a high level principles vision and the vision itself should do.

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