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## **Planning in a complex, changing and uncertain urban reality: the emergence of a resilience planning paradigm in the city of Barcelona**

Maria Evangelina Filippi

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Graphics and layout: Luz Navarro, Giovanna Astolfo and Paola Fuentes



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# Planning in a complex, changing and uncertain urban reality: the emergence of a resilience planning paradigm in the city of Barcelona

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March 2018

Based on dissertation written in 2014

ISSN 1474-3280

**Abstract.** Resilience has been criticized for its fuzziness, inconsistency and lack of clear indicators. However, it can be a useful analytical tool to orient the re-design of urban planning approaches in a context of increasing complexity, uncertainty and change. The incorporation of resilience principles into planning pro-

cesses might contribute to transcend the barriers of traditional planning approaches to accommodate to the realities of the 21st century. Institutional reforms and innovations crafted by the Barcelona City Council since 2009 shed light on the path towards a resilience planning paradigm.



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## List of acronyms

CRPP	City Resilience Profiling Programme
CIU	Convergència i Unió (Convergence and Union)
ICTs	Information and Communication Technologies
IDP	Integrated Development Planning
NBC	Nuclear, biological and chemical threats
PGM	Pla General Metropolità d'Ordenació Urbana (General Metropolitan Plan)
PSC	Partit dels Socialistes de Catalunya (Party of Socialists of Catalonia)
TISU	Tablas de Infraestructura y Servicios Urbanos (Infrastructure and Urban Services Boards)
UN-HABITAT	United Nations Human Settlements Programme
UNISDR	United Nations Office for Disaster Risk Reduction



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# 1. Introduction

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## 1.1 Relevance of the topic and case study

Resilience has been criticized for its fuzziness, inconsistency and lack of clear indicators. However, the fact it has been adopted by different disciplines and realms can be argued to be indicative of its usefulness as an analytical tool. In urban studies, resilience lenses are more and more applied to assess the extent to which urban centres are resilient vis-à-vis disturbances. The attractiveness of the concept of resilience relies in the incorporation of the notion of disturbance to the urban metabolism of cities, and the suggestion of certain principles or attributes that would allow urban systems to resist and adapt. Acknowledging the key role urban planning plays – or should play – in the future of urban centres, it might be relevant to analyse the extent to which urban planning types have been able to understand cities as system of systems and to incorporate resilience attributes to deal with contemporary urban challenges.

The city of Barcelona has been widely renowned in the planning literature for being at the forefront of innovations. A ‘Barcelona Model’ has been even conceptualised in the ‘90s and exported to other local municipalities. More recently, and after a change of regime inaugurated in 2011, institutional reforms affecting the planning of the city have been introduced. In an era where traditional planning approaches have been discredited for not accommodating to the realities of the 21st century, this working paper aims to explore the extent to which the planning system of the Catalan capital city has managed to frame an alternative model able to adapt to a complex, changing, and uncertain urban reality. This exploratory research is conducted on the basis of the following hypothesis:

*The modernist technical approach of urban planning needs to be transcended towards more holistic and integrative urban planning alternatives in order to enhance urban resilience. In a context signed by complexity and uncertainty, and where there has been an increase in the number of disturbances – both endogenous pressures as well as external shocks – and therefore a recognition of contingency, flexibility and creativity are some of the key features for a rapid and effective response. A systemic and multi-stakeholder urban planning approach might offer an opportunity towards that objective. However, difficulties and challenges are equally important to address, since innovative urban planning strategies are not exempted to evolve into maladaptation.*

The paper is structured in three parts. The first part introduces the relevance of the topic and case study, together with the hypothesis, research questions and methodology that frame the field study. The second part reviews the existing literature around the concept of resilience, particularly in the field of urban studies, to highlight its ability to embrace the complexity of urban systems in a changing environment. Acknowledging the role of urban planning in the evolution of urban centres, new urban planning approaches are assessed against resilience attributes to suggest the possibility of an emerging resilience planning paradigm. Finally, the third section is devoted to the case of Barcelona. Starting with a description of recent institutional changes in the planning system, the case aims to unveil the extent to which those reforms are paving the way towards a real change of paradigm. In order to do so, relevant documents together with everyday practices and perceptions of local government officials are analysed.

## 1.2 Research questions

A main research question guides both the conceptual as well as empirical findings presented in this paper. The sub-questions are specific to the case of Barcelona, each of them underlying one of the four sections in which the case study is Organised.

### Main research question:

*How has urban planning been at the forefront of the process of resilience-building in the city of Barcelona? To what extent is this process truly contributing to transformative change?*

### Sub-questions:

1. What are the main disturbances (slow onset and acute events) the urban system is exposed to and expected to be exposed to?
2. To what extent have existing models of planning and governance been able to deal with those disturbances?
3. How far has the resilience concept been reflected in urban plans as well as everyday practices and perceptions of local government officials?
4. What role do the TISU/Resilience Boards play in the planning process of the city?

### 1.3 Methodology

The case study is structured around a discourse analysis methodology. Semi-structured interviews with policy officials from the Barcelona City Council together with local plans and projects that (implicit or explicitly) make reference to resilience have been analysed. In total, six interviews with officials from different departments of *Hàbitat Urbà* (Urban Habitat) were conducted. In addition, interviews were held with a member of the UN-HABITAT City Resilience Profiling Programme (CRPP) as well as with an expert in the field of urban resilience from the Autonomous University of Barcelona. All interviews were conducted during a two-week fieldwork in July 2014. Regarding docu-

ments, the main plans and projects respondents were working on and/or involved at the time of the field research were revised.

The unit of analysis of the case study is the Barcelona City Council that operates at a city-wide scale. This might appear contradictory in light with the more systemic and multi-stakeholder approach I am suggesting here. However, the local government has still a protagonist role in the planning of the city and most of the innovations in the planning system have come from within the government. In addition, space and time constrain reasons made it necessary to narrow down the approach. Regarding the scale, reference to broader jurisdictions will be made when appropriate.



## 2. Planning in a complex, changing and uncertain urban reality: the urban resilience planning paradigm

### 2.1 Urban metabolism: the city as a system of systems

There is an increasing recognition among scholars to understand cities as systems of interdependent subsystems (Moench, Tyler and Lage, 2011; da Silva, Kernaghan and Luque, 2012). In this regard, the idea of urban metabolism – underpinned by the (urban) ‘ecological footprint’ concept pioneered by William Rees and Mathis Wackernagel (Rees, 1992, 1997; Rees and Wackernagel, 1996) – has been advanced to portray this systemic approach that integrates ecosystem functions with socio-economic and spatial dynamics (Newman, 1999; Swyngedouw, 2006). Cities are considered ‘living’ systems undergoing dynamic exchanges – resource flows – at any time and constantly evolving and responding to internal and external shocks and stresses (Barnett and Bai, 2007; da Silva, Kernaghan and Luque, 2012). The system might take new shape, but “it remains living and evolving” (Innes and Booher, 2010, p.208).

The relevance of systemic thinking relies in its understanding of urban centres not as monolithic entities but rather as made up of multiple sub-systems that interact and influence each other in a non-linear manner. Furthermore, the conceptualisation of cities as systems emphasises that these cities do not exist in a vacuum but are rather part of a broader system that also influences them (Resilience Alliance, 2002; Barnett and Bai, 2007). Urban reality has not only been depicted as complex but also uncertain (Innes and Booher, 2010). There is uncertainty not only in terms of how the different sub-systems interact and mutually influence each other but more importantly in the way these interconnected systems might be affected by and respond to endogenous and exogenous disturbances. The influence of endogenous and exogenous forces is crucial at a time when “there has been an increase in the number of disturbances that put significant pressure on urban systems” (Eraydin and Taşan-Kok, 2013, p.18).

Finally, a third element of uncertainty is related to the type of disturbance itself. The UN-HABITAT report states that “the forces impacting upon the growth and change of cities have changed dramatically” (UN-HABITAT, 2009, p.3). Although most of the uncertainties and related disturbances have been framed under the realm of anthropogenic climate change, there might also be non-climatic disturbances equally relevant to consider. Regardless of the type of disturbance, the basic idea is that these challenges are inevitable and changes will take place (Innes and Booher, 2010; Eraydin and Taşan-Kok, 2013).

### 2.2 Resilience thinking to govern the metabolic rhythm

Whereas resilience science is still an emerging field (Turner II, 2010; da Silva, Kernaghan and Luque, 2012) and the understanding of urban resilience still remains in a formative stage (Moench, Tyler and Lage, 2011), signed by multiple definitions of the concept<sup>1</sup> and a lack of robust and concise indicators to benchmark cities against to (Cutter et al., 2008; Cutter, Burton and Emrich, 2010; Leichenko, 2011), more recent conceptualisations of resilience have proven to be useful to capture the complex, dynamic, and simultaneous relations that underlay the coupled human-environment systems that define urban spaces, and to understand how these urban systems are exposed to and respond to foreseen and unforeseen changes (Resilience Alliance, 2010; Turner II, 2010; Eraydin and Taşan-Kok, 2013). Table 2.1 summarises some of the definitions of resilience that to some extent reflect these two characteristics.

From the definitions two elements stand out. In first place, they all share a system approach that, in the case of urban resilience, is translated into the recognition that cities are made up of multiple systems and that resilience should be built up for each and all of them – ecological, infrastructure, social, economic, institutional and spatial resilience of urban systems. Moreover, since each of these systems evolves and develops according to different logics, different analytical lenses are required to understand them as well as specific measures should be implemented for increasing their resilience.

Secondly, the recognition that each of these systems is exposed to co-evolutionary changes at different levels: slow transformations and major events; “slow and incremental processes of growth and accumulation”, on the one hand, and “the rapid and sudden processes of destruction and reorganisation shaped under a disturbance”, on the other hand (Eraydin and Taşan-Kok, 2013, p.6). Consequently, some scholars suggest the importance of conceptually distinguishing between pre-event ‘inherent resilience’ conditions and post-event ‘adaptive resilience’ processes (Cutter et al., 2008), or between ‘cumulative’ and ‘disaster’ resilience (UNISDR, 2012; Johnson and Blackburn, 2014; Johnson and Brown, 2014).

The definition of resilience is still an ongoing concern within the research community (Cutter, Burton and Emrich, 2010). This is tightly related to the lack of clear and standardised

**Table 2.1:** Conceptual characterisation of (urban) resilience. Source: Author's elaboration

Author/s	Definition of Resilience	System	Disturbance
The Rockefeller Foundation (2014)	The capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.	<ul style="list-style-type: none"> <li>• Society</li> <li>• Businesses</li> <li>• Institutions</li> </ul>	Chronic stresses and acute shocks
UNISDR (2012, p.5)	Building resilience is a forward looking, target driven approach to urban development that uses a wide range of measures addressing all elements of urban systems (...) to ensure the safety of all people and protect the economic, social, environmental, and cultural assets and attributes which define the unique character of each city.	<ul style="list-style-type: none"> <li>• Environmental system</li> <li>• Social system</li> <li>• Economic system</li> <li>• Cultural system</li> </ul>	Natural and human-induced hazards
da Silva, Kernaghan and Luque (2012, p.125)	The ability of the city to maintain the functions that support the well-being of its citizens.	<p>Socio-technical networks that make up city systems include:</p> <ul style="list-style-type: none"> <li>• Ecosystems</li> <li>• Social system</li> <li>• Infrastructure</li> <li>• Institutions</li> <li>• Knowledge</li> </ul>	Wide range of shocks and stresses
Moench, Tyler and Lage (2011, p.21)	Resilience is defined as high where system characteristics, agent capacities, and enabling institutions combine in ways that enable all groups to access systems and ensure that those systems continue to function as climate conditions evolve.	<ul style="list-style-type: none"> <li>• Urban system (ecosystem and infrastructure)</li> <li>• Social agents (government agencies, individuals, households, and businesses)</li> <li>• Institutions</li> </ul>	Impacts of climate change
Cutter et al. (2008, p.599)	Resilience is the ability of a social system to respond and recover from disasters and includes those inherent conditions that allow the system to absorb impacts and cope with an event, as well as post-event, adaptive processes that facilitate the ability of the social system to re-organize, change, and learn in response to a threat.	<ul style="list-style-type: none"> <li>• Natural system</li> <li>• Built environment system</li> <li>• Social system</li> <li>• within a defined geographic space</li> </ul>	Natural disasters
Barnett and Bai (2007, p.8)	Urban resilience is the degree to which cities are able to tolerate alteration before reorganizing around a new set of structures and processes. Urban resilience can be measured by how well a city can simultaneously balance ecosystem and human functions.	<ul style="list-style-type: none"> <li>• Ecosystem</li> <li>• Human functions</li> </ul>	Disturbance
Resilience Alliance (2002)	Resilience is the ability to absorb disturbances, to be changed and then to re-organize and still have the same identity (retain the same basic structure and ways of functioning). It includes the ability to learn from the disturbance. A resilient system is forgiving of external shocks. As resilience declines, the magnitude of a shock from which it cannot recover gets smaller and smaller.	<ul style="list-style-type: none"> <li>• Ecological system</li> <li>• Social system</li> </ul>	Disturbance

indicators of the concept – something which has recently been worrying practitioners and policy makers who want to assess the performance of their districts in terms of resilience (UNISDR, 2012, p.67) as well as international organisations trying to develop universal resilience standards to evaluate indistinctively any urban context (The Rockefeller Foundation, 2014; UN-HABITAT, 2014).

The critiques of ambiguity and fuzziness of the concept of resilience and the lack of clear indicators to measure it might be explained in relation to the complex reality that resilience is trying to understand and account for. As Cutter et al. (2008, p.603) point out, “the conditions defining resilience are dynamic and ultimately change with differences in

spatial, social, and temporal scales”. Therefore, instead of looking for narrow and measurable concepts, it might be more interesting and useful to define principles of urban resilience that can accommodate better to the particular context of each urban centre (Gleeson, 2008; UNISDR, 2012).

Table 2.2 synthesises the main attributes of resilient urban systems found across the literature and the subsystem each attribute is principally aimed to tackle. Whereas there are differences among certain qualities, there is a common recognition of some basic key features, namely: resistant/responsiveness; integration/coordination; flexibility; redundancy and diversity; safe failure; ecosystem services; capacity to learn; resourcefulness.

**Table 2.2:** Main attributes of resilient urban systems. Source: Author’s elaboration

The Rockefeller Foundation (2014)	UNISDR - Ten Essentials (2012)	da Silva, Kernaghan and Luque (2012)	Moench, Tyler and Lage (2011)	Resilience Alliance (2010)	Walker and Salt (2006)	Godschalk (2003)	Subsystem
Rapid rebound	Early warning systems and emergency management	Responsiveness	Responsiveness	Recovery			All subsystems
Integrated	Organisation and coordination				Social capital	Collaboration	All subsystems
Adaptability						Adaptability	All subsystems
Flexibility		Flexibility	Flexibility	Flexibility			All subsystems
Self-regulation / Limited or safe failure	- Critical infrastructure that reduces risk - Safety of all schools and health facilities	Safe failure	Safe failure			Autonomy	Infrastructure
Redundancy / Spare capacity		Redundancy	Redundancy		Overlap in governance	Redundancy	All subsystems
Diversity		Diversity	Diversity	Diversity	Diversity	Diversity	All subsystems
Awareness / constant learning	Education programmes and training	Capacity to learn	Capacity to learn	Learning	Innovation		All subsystems
	Protect ecosystem and natural buffers	Dependency on local ecosystems			Ecosystem services		Ecosystem
	Assign budget	Resourcefulness	Resourcefulness			Efficiency	All subsystems

Finally, some have gone further and proposed resilience as a way of thinking in the planning and management of cities (Barnett and Bai, 2007; Eraydin and Taşan-Kok, 2013). Eraydin and Taşan-Kok (2013) propose resilience as a guiding principle or rationality for planning in a changing world – rather than an optimal end state or blueprint. There are at least two advantages behind this idea. In first place, it allows certain flexibility in terms of the policy realm resilience should target. Resilience has been assimilated to resistance and adaptation almost exclusively to natural disasters – an approach that both the hazards research group and the global environmental change research community have pushed forward under the umbrella of disaster resilience and climate change resilience, respectively (Cutter et al., 2008; Cutter, Burton and Emrich, 2010). This observation is particularly relevant for the case of Barcelona, where the concept of resilience was originally introduced to deal with technological/infrastructural crisis. Secondly, considering resilience as a set of guiding principles might allow moving beyond the constant preoccupation of searching for universal (quantitative) indicators. Instead, incorporating the logic of responding and adapting to changes into plans, policies and practices according to the vulnerabilities and institutional characteristics of each city might be more useful.

### 2.3 Resilience thinking into practice: from traditional to new urban planning paradigms

There are several approaches to urban planning, from the most technical physical planning to the more strategic and integrative planning approaches that transcend just physical factors. However, all of them share a common component: a concern with space (UN-HABITAT, 2009, p.19). In this regard, urban planning could be a useful entry point to integrate the different sub-systems of urban centres on the basis of space. And, in this sense, it might also offer a good realm for mainstreaming urban resilience. In line with this argument, for instance, Cutter et al. (2008, p.599) propose a place-based model of resilience “focusing on the place and the spatial interactions among the social system, built environment, and natural processes”. Similarly, in reflecting upon disaster resilience, UNISDR (2012, p.73) acknowledges the importance of urban planning in building resilience: “urban planning allows towns and cities to be analysed and planned as a system comprised of various sectors and institutions”.

However, this holistic and integrative urban planning approach has not been the dominant one across most urban centres in the world. Contrary, it is a relatively recent paradigm that has started to be framed under new innovative urban planning alternatives tested by specific cities (UN-HABITAT, 2009). The assumption behind this trend is the realisation that existing planning perspectives

are not able to adequately deal with contemporary problems such as the impacts of disasters, climate change and urbanisation (Johnson and Brown, 2014) or, more broadly, prepare to withstand both foreseen and unforeseen changes (Eraydin and Taşan-Kok, 2013).

#### Traditional urban planning paradigms

Modernist planning has been the dominant urban planning paradigm of the 20th century. Originated in Western Europe in response to the negative effects of the industrial revolution, it has been widely exported to the rest of the world as a result of colonialism, imperialism and the widespread influence of development modernisation theories (UN-HABITAT, 2009).

The modernist planning approach is based on three premises. Firstly, it entails a top-down expert-led process as an exclusive mandate of the government. Planning tends to operate in isolation from other line-function departments, as a reflection of the technical, value-free and non-politicised exercise planners are responsible for. Secondly, the outcome of the planning process is the production of a master plan, and the associated land-use and building regulations which are the legal instruments to implement that plan. Modernist planning is based on the premise of compliance with a strong regulatory component and, in this regard, it can be considered a conservative, pro-status quo approach. Finally, the master plan and land-use planning promote a particular urban form – mono-functional use areas, low-built densities, and movement systems based on the private car (UN-HABITAT, 2009, p.47).

The main critiques to the modernist planning approach are framed, precisely, in reaction to the above three premises<sup>2</sup>. Planning is not just about land-use planning but spatial planning (Jha, Bloch and Lamond, 2012); it is not just a technical but a political process (Johnson and Brown, 2014). The recognition that the space it is not just a physical but a relational entity (Healey, 2007), made up not just of land but also people, infrastructure, ecosystems and the relations established among them through institutions, justifies the argument that planning should be able to deal with competing claims over land, infrastructure and ecosystems. And, in order to do so, a wide range of mechanisms and tools are required to manage the planning process – not just land-use zoning. Furthermore, acknowledging that multiple actors – not just one – are driving urban development implies a change in the understanding of the distribution of power: from government to governance (Treib, Ba and Falkner, 2007; Innes and Booher, 2010); from the technical activity of planning to the planning system. An additional critique to the modernist planning approach is its lack of flexibility; the regulatory aspects of planning are aimed at containing and controlling change, rather than adapting to changing circumstances. This rigidity might not be able to accommodate to the changing and complex realities to which many urban contexts are exposed to nowadays (Eraydin and Taşan-Kok, 2013).

### New planning perspectives

The critiques to the reductionist modernist planning approach have triggered new definitions of urban planning. Watson (2002, p.28) defines planning as “(...) those intentional public actions which impact on the built and natural environment, and which are frequently accompanied by political processes of some kind. Planning is also (and not infrequently) initiated by groups other than formal governments, such as non-governmental and community-based organisations, and sometimes business”. According to Eraydin and Taşan-Kok (2013, pp.32-33) “planning involves making choices in contexts characterised by complexity and uncertainty”, and this choices are about “the way urban land and urban services, including ecosystem services, are used or provided”.

Along with these new ideas, innovative urban planning forms have emerged. UN-HABITAT (2009, p.60) outlines seven types of innovation in relation to processes, results and urban form. Four<sup>3</sup> of these innovations are relevant to the case study of Barcelona, namely:

1. Strategic spatial planning
2. New ways of using spatial planning to integrate government
3. Participatory and partnership processes
4. Planning aimed at producing new urban forms

The first three categories focus more on the process, while the last one prioritises the end-result of the planning process. However, in reality, the planning system is usually a combination of some of the distinctive features of different perspectives rather than a pure form of one of them. Strategic spatial planning is based on the premise that a long-range, directive plan needs to guide the development and growth of the city – in contrast to the short- or medium-term, project-led nature of planning in the neoliberal era. In order to transcend the fragmented and piecemeal character of contemporary urban planning (Eraydin and Taşan-Kok, 2013), this plan should be the result of a participatory process where different layers of government and relevant stakeholders agree – and maintain an enduring commitment beyond political cycles – on those aspects or areas of the city relevant to the overall plan objectives – planning is considered a strategic rather than a comprehensive exercise. In the case of Barcelona, the ‘Barcelona Model’ approach is a slightly different version of strategic planning related to a particular urban form: the compact city, Organised around large, well-designed urban projects. The promotion of the compact form at city level – new urbanism does the same but at neighbourhood level – has been justified on principles of sustainability and, more recently, on the contribution that particular spatial patterns might have on climate change mitigation and adaptation (Dodman, Kibona and Kilu-

ma, 2011; Hoornweg, Sugar and Trejos Gomez, 2011; Romero-Lankao and Dodman, 2011; Eraydin and Taşan-Kok, 2013).

Integrated Development Planning (IDP) and the new British planning system have been conceived under the premise that traditional hierarchical governments with agencies separated into silos might not be the most accurate form of governance when sector policy and decisions have all an impact on the space. Hence, planning offers the realm for the coordination and integration of different government sectors. Finally, participatory planning and partnerships incorporate non-governmental actors into the planning system.

Although quite different in nature, these innovations share certain attributes in common (UN-HABITAT, 2009, p.70):

- Systemic approach – rather than sectoral
- Strategic – rather than comprehensive
- Flexibility – rather than end-state oriented and fixed
- Action and implementation oriented through links to budgets
- Stakeholder driven – rather than only expert driven
- Awareness – by incorporating objectives related to emerging urban concerns (e.g. sustainability, environmental protection, social inclusion)
- Attention to the urban form and its implications on contemporary urban concerns

It is interesting to observe that many of these attributes resemble quite a lot those of the resilience concept. Consciously or unconsciously, many of the principles of urban resilience are already embedded – in different degrees and at least at the conceptual level – in the new urban planning perspectives. In this regard, it might be wise to recall the idea of an emerging resilience planning paradigm suggested by Eraydin and Taşan-Kok (2013). Whether a shift of paradigm (Eraydin and Taşan-Kok, 2013) or transformation (Innes and Booher, 2010; Pelling, 2011; Pelling, Manuel-Navarrete and Redcliff, 2012), this is a process that presupposes a change of mindset and values of those participating in the planning system.

Last but not least, a note to emphasise that in most cases the new forms of urban planning previously described have been tried out and actually implemented in cities in high-income countries<sup>4</sup>. This might suggest that there are certain pre-conditions, particularly at the institutional and political levels, that prove to be necessary for these planning perspectives to successfully evolve. A strong,

professional and well-resourced (e.g. with a strong tax base) local government, in the context of a stable social democracy, and together with a relatively well-off civil society are among the key features (UN-HABITAT, 2009).

A change of mindset and minimal conditions are certainly important to avoid maladaptation. Increasing the number of actors that participate in the planning of the city without

changing their values might result in stalemate situations that reduce the flexibility and responsiveness of the system. Similarly, a resourceful municipality usually relies on a consolidated and functioning regulatory system. Assuming that communicative or collaborative rationalities would automatically emerge by bringing people together or would be enough to develop and implement plans might result in inaction, and ultimately resistance to change.

## NOTES TO CHAPTER 2

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1. For a conceptual overview of the concept of resilience since its inception in Ecology and Social Sciences to its later integration in planning literature, see Eraydin and Taşan-Kok (2013, pp.39-51).

2. It is important to note these are the main critiques relevant to the Barcelona case study – a city of a high-income nation. There are further critiques to the modernist planning approach in the context of urban centres in middle- and low-income countries.

3. There are three other categories, namely: approaches to land regularisation and management; approaches promoted by international agencies and addressing sectoral urban concerns; new forms of master planning (UN-HABITAT, 2009, p.60).

4. Some of the new forms of urban planning have been also implemented in certain cities in middle-income nations in Latin America.



## 3. Case Study: Barcelona

### 3.1 A compact, complex Mediterranean city

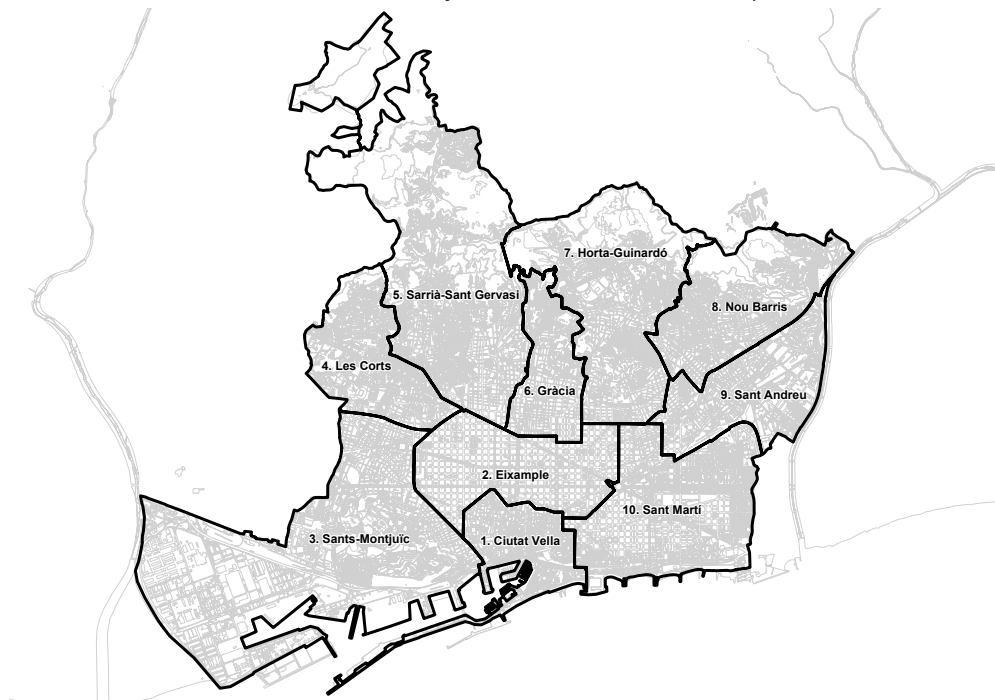
Capital city of the Autonomous Community of Catalonia, the city of Barcelona is composed of ten municipal districts (see Figure 3.1) and 73 wards, agglutinated under the Barcelona City Council, the politico-administrative body that governs the entire city (Departament d'Estadística, 2014). With a population of over 1.6 million inhabitants (2012) distributed in an area of 102.2 km<sup>2</sup> (Ajuntament de Barcelona, 2014c), it is a dense – over 15,000 inhabitants per km<sup>2</sup> –, compact – with multi-family housing and a large network of underground infrastructures – and complex – with an increasing mixture of urban uses and functions – city (Ajuntament de Barcelona, 2012a, p.12).

Whereas the compact and mix-used city has been promoted as the strategic urban form by the Local Agenda 21 Commitments (Ajuntament de Barcelona, 2002, 2012a) and ratified by the Barcelona City Council in several documents, policentricity has been encouraged at the metropolitan scale (Borja and Castells, 1997; Rueda Palenzuela, 2007). The city of Barcelona is part of the

broader Barcelona Metropolitan Area, an administrative entity that embraces 36 districts, comprises a total population of 3,239,337 inhabitants (2012), and extends along an area of 636 km<sup>2</sup> (Àrea Metropolitana de Barcelona, 2014). The creation of this administrative entity is quite recent (2011) and replaces the three metropolitan organisations<sup>1</sup> in force until then.

The population of Barcelona grew consistently since the beginning of the 20th century until the mid-70s, reaching a maximum peak of 1.9 million in 1979, mainly due to a strong migratory influx. Since then, the city has been losing inhabitants and the population is aging. Two factors can explain this reversal: the slowdown of immigration due to the crisis; the urban decentralisation process of both productive and residential activities. Consequently, while the city has been losing population, the metropolitan area has kept growing<sup>2</sup> (Marshall, 2000, 2004). The negative trend in the population growth of the city, however, has started to be gradually reversed in the last decade as a result of foreign immigration (see Figure 3.2) (Rueda Palenzuela, 2007; Ajuntament de Barcelona, 2011).

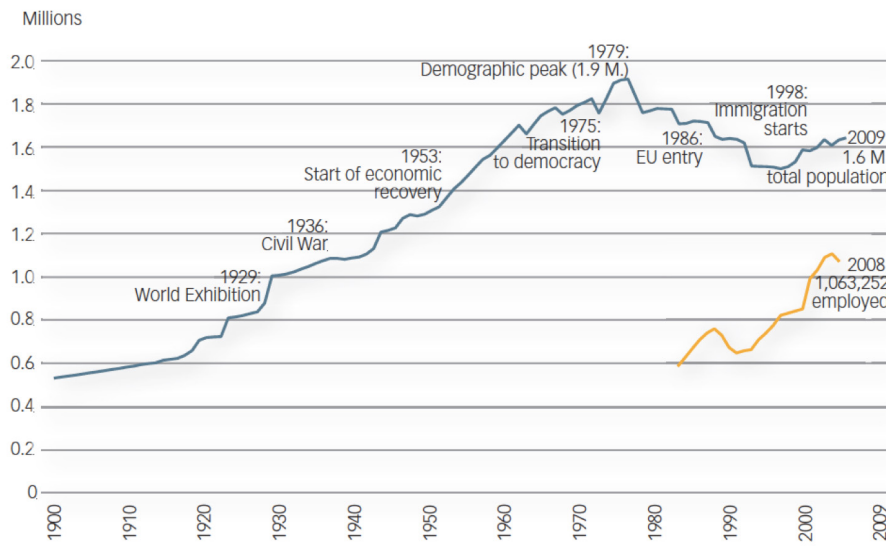
**Figure 3.1.** Politico-administrative division of the city of Barcelona. Source: Departament d'Estadística (2014, p.7)



Barcelona is a coastal city, situated by the Mediterranean Sea. It extends across a flat area with small hills and it is surrounded by the deltas of two rivers – the Llobregat in the South and the Besòs in the North. The Serralada de Collserola mountains bind the city to the West (see Figure 3.3). Barcelona has a typical Mediterranean climate; summers are hot and humid, winters mild, and most of the rainfall is in spring and autumn. According to the Fabra Observatory in Barcelona, the annual mean temperature has increased significantly from 1950 to today, and the same

increased has been registered for the annual maximum and minimum temperatures. As for annual precipitation, there is no statistically significant trend given the high seasonal variability, although a slight increase in intensity can be observed. Regarding predictions, one of the intermediate scenarios of the Fourth Report of the IPCC for the Mediterranean region indicates average temperature is expected to increase between 3.0 – 4.0 C° and mean annual precipitation to reduce by 12% by the end of the century (2080-2099) (Ajuntament de Barcelona, 2011, pp. 30-36).

**Figure 3.2:** Population growth in the city of Barcelona (1900-2009). Source: Ajuntament de Barcelona (2011, p.54)



**Figure 3.3:** Main ecosystems in the city of Barcelona and proposed green corridors. Source: Ajuntament de Barcelona (2013b, p.66)





Apart from the climate-related risks Barcelona is and might be exposed to (drought, epidemic and pandemic, pluvial and coastal flood, heat wave, tornado and wind storm, and sea storm), other phenomena complete the multi-hazard profile of the city, namely: earthquake, insect infestation, NBC (nuclear, biological and chemical threats), technical disaster, and wildfire. Therefore, the city is and might be exposed to climate-related risks, other natural risks, technological and human-induced risks. Furthermore, there might be non-linear cascading effects triggered by some of them (Ventayol, 2014). Technological and man-made hazards are relevant in a historic city characterised by a dense and compact urban grid, and where the steady provision of infrastructure and services as well as the safety of buildings are critical (UNISDR, 2014). In 2007, a series of critical events took place: severe drought in the region threatened water supply in the city, problems with the high-speed rail line and, above all, a three-day electric blackout that directly affected 323,337 users (Ajuntament de Barcelona, 2013a, p.7).

Considering the complexities and changes unfolding in the city, the subsequent question is how a city of these characteristics has been planned and managed to be internationally recognised (Borja and Castells, 1997; Marshall, 2004). The next section describes the main trends and innovations in the planning system in recent years.

### 3.2 *Hàbitat Urbà*: planning and managing the city as a system of systems

The origins of the ‘Barcelona model’ can be traced back to the General Metropolitan Plan of 1976 – currently in force, despite having passed several amendments over the years – and the generation of architects from the ‘80s, having its maximum expression in the 1992 Olympic Games and urban projects in the years to follow (Ajuntament de Barcelona, 2012b, p.205). This form of strategic planning has

been depicted as a metropolitan framework aimed to give coherence and articulate several large-scale individual projects at lower scales, in order to link the urban-regional space as a whole. The coherent whole is claimed to be the result of a collaborative planning process where key public and private actors are brought together across all its phases (Borja and Castells, 1997). Barcelona Social and Economic Strategic Plans I (1990), II (1994) and III (1999) synthesise this type of planning, around a core of economic development goals aimed to put Barcelona at the forefront of European and global competitiveness.

Marshall (2000), however, is more critical of the advocated integrative and collaborative nature of this planning model and argues that rather than one ‘Barcelona model’, what has emerged is a handful of models with limited coherence between themselves (see Table 3.1 for a summary of the planning types). Furthermore, at the city-scale level, he suggests that a ‘normal’ planning – expert-led land-use planning concerned with creating good urban form and securing implementable projects – has been prevalent particularly during the ‘90s. According to him, coordination between projects has been guaranteed by key politicians (e.g. Maragall, mayor of Barcelona during 1982-1997) and, rather than open participation, he prefers to talk about ‘citizen complicity’.

Finally, Marshall (2000) also poses the question about the extent to which this type of planning has been ecologically urban. This concern is shared among some from the current government who, for instance, argue that architects of the last thirty years are responsible for an extraordinary public space in the city but where the presence of green areas and biodiversity is limited (Interview with Coordinator of Green Areas and Biodiversity office, July 2014). Similarly, the Chief Architect of the new administration recognises the contributions of the Barcelona model but asserts that a new one is necessary – a model based on the links between urban planning, ecology and ICTs (La Vanguardia, 2011).

**Table 3.1:** Planning types and main plans at city, metropolitan and regional scale (1990-2000). Source: Adapted from Marshall (2000, p.304)

	Land-use planning	Strategic planning	Infrastructure planning	Regional & metropolitan planning
<b>Plans</b>	- General Metropolitan Plan (PGM-1976) - Modifications to PGM	Barcelona Social and Economic Strategic Plans I (1990-1994), II (1994-1998) and III (1999-2005)	- Llobregat delta agreement (1993) - Besos delta area agreement (1999) - Others (transport, underground services, etc.)	- General Territorial Plan of Catalonia (1995) - General Plan of the Metropolitan Region (draft 1998)
<b>Key actor leading planning</b>	Architects (City Council)	Economists (Councillors, City Council)	BR (public enterprise)	Generalitat
<b>Scale</b>	City	Metropolitan area (36 districts) and metropolitan region (163 districts)	Metropolitan area (36 districts) and metropolitan region (163 districts)	Catalonia

Whether there is a Barcelona model, what is important to note is the protagonist role of the local government in this process (Borja and Castells, 1997; Marshall, 2004). In Spain, urban planning competences are exclusive of regional governments (Autonomous Communities) who set up the guidelines and principles (e.g. Urban Planning Law of Catalonia) for municipal governments to plan and manage their territories. The prime plan-making and control powers rely on local municipalities (Interview with urban planner, Planning department, July 2014). Furthermore, the new Municipal Charter of 2006 accentuated the power of the Barcelona City Council and its metropolitan leadership and control of metropolitan bodies<sup>3</sup>.

Since 1977, the City Council and the metropolitan entities have been under the control of the Socialists, with the *Partit dels Socialistes de Catalunya* (PSC) being the dominant political party. In 2011, for the first time since the return of the democracy in 1979, the Socialists lost the elections in the city. The new government led by mayor Xavier Trias from *Convergència i Unió* (CiU), a right-wing party, has introduced some changes in the administration of the city:

*“In the last elections, there was a change of government in the City Council. The previous team had a very established way of working, according to certain parameters... And with the new government came Vicente Guallart [Chief Architect of Barcelona City Council], who is involved in issues related with resilience at the international level and he, from above, has been advancing projects. (...) If we are all now under the same umbrella of *Hàbitat Urbà* is because of this new team. There is a Chief Manager, Vicente Guallart, who has brought together all the departments that were previously disconnected”* (Interview with urban planner, Urban Management office, July 2014, *my translation*).

The creation of *Hàbitat Urbà* (Urban Habitat) has integrated all those units in charge of planning and managing the different sub-systems of the city under the same line-department (see Figure 3.4). Indeed, the main responsibility of the area has been defined as:

*“To ensure a cross-cutting articulation between urban planning, infrastructure and housing, as well as with environment, urban services and information and telecommunication systems, embedding the concept of urban habitat as the backbone of this approach”* (Ajuntament de Barcelona, 2014b, *my translation*)

This is defined as a turnaround – a change of paradigm – in the way of conceiving the city in an era signed by new changes<sup>4</sup>. Urban habitat is conceptualised as the ‘supporting structure’, the ‘body’ of the urban system. Under this new paradigm, urban planning should go beyond its traditional regulatory nature, incorporating a transversal and multidisciplinary vision in the making of the city (Ajuntament de Barcelona, 2012b, pp.205-206). A respondent from the

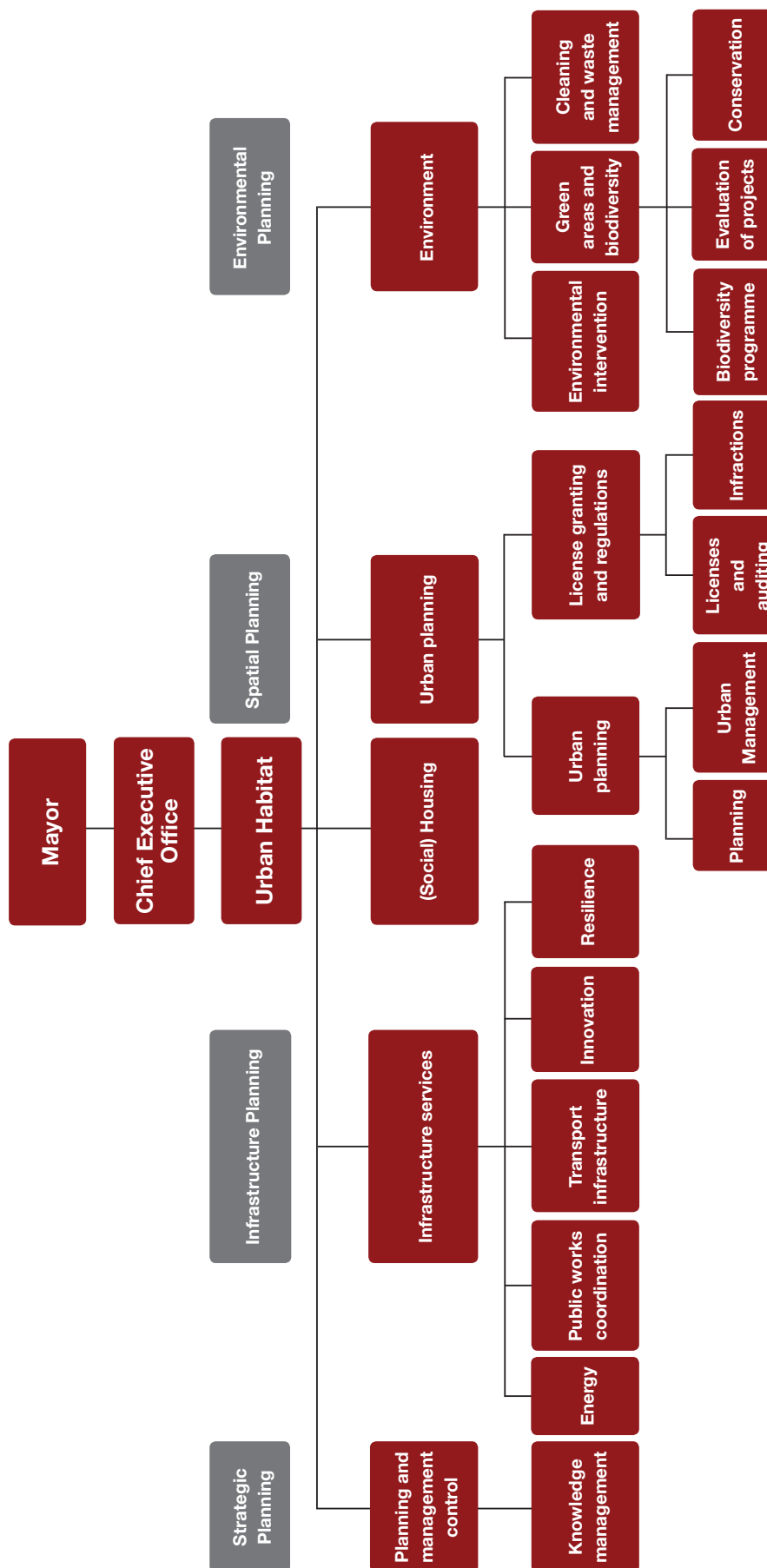
Green Areas and Biodiversity office, under the Department of Environment, explains this transition as follows:

*“Political circumstances explained that during many years we [the Urban Planning department, on the one hand, and the Green Areas office, on the other hand] worked separately. There was a wall between us, certain political dynamics made it difficult to approximate to each other. (...) Until the ‘80s, the Department of Parks and Gardens oversaw the planning, building and maintenance of green areas. Since the ‘80s, the planning, design and construction of new green areas was a responsibility of Urban Planning, but delinked from those in charge of their maintenance. More and more, the need to work more closely became evident. Now, under *Hàbitat Urbà*, everything is done under the same umbrella: Urban Planning makes the project and we [Green Areas office] do the maintenance. (...) Another thing we are doing is explaining the architect, the planner, that there are different types of green areas and that each of them has a function – from the most ecological to the more social ones. A well-planned green infrastructure functions better and it is easier to maintain”* (Interview with Coordinator of Green Areas and Biodiversity office, July 2014, *my translation*).

The Infrastructure Department has pioneered this more integrative way of working. The impacts of the successive hazardous events of 2007 put in evidence the vulnerability of infrastructure and urban services and the pressing need of increasing their resilience. A working methodology has been tested since 2009 and proved to be successful in dealing with critical infrastructural problems in the city, namely: TISU (Infrastructure and Urban Services Boards). Key stakeholders – from local administration, private operators and other administrations – have been clustered together around critical sectors – municipal services, urban tunnels, electricity, water cycle, energy, mobility and public transport, telecommunications, and underground works – in order to develop and implement projects that reduce the vulnerability to detected risks in those sectors (Ajuntament de Barcelona, 2013a). Five years later, a specific Resilience office has been created and its main challenge is to expand the scope of the TISU – now labelled Resilience Boards – to a wider range of resilience related projects (Interview with Head of Resilience office, July 2014).

A redesign of Barcelona’s planning system seems to be unfolding, led by a new administration which is determined to make changes in the institutional and organisational frameworks. Following the argument of Innes and Booher (2010, p.211), elected officials and leaders of public agencies can craft organisational structures and financial means that foster cooperation and learning. Moreover, they can also articulate visions of the future, for instance through the advance of strategic plans. Cooperation, learning and forward-looking thinking are all attributes of resilience that seem to be slowly permeating the planning system of Barcelona. But, to what extent is it valid to talk about a new resilience planning paradigm?

Figure 3.4: *Hàbitat Urbà* and planning types. Source: Author's elaboration



The TISU/Resilience Boards have been claimed to be a success. However, to what extent have they been able to go beyond just sustaining the existing functions of the city to incorporate the logic of adapting to expected and unexpected conditions? Furthermore, organisational reforms do not produce changes automatically. Organisations are made of and by people so a change of mindset is required for a change of paradigm to take place. The next section focuses on the practices and perceptions of government officials from Urban Habitat as well as the main plans and projects they are currently working on. The aim is to understand how far resilience thinking has been embraced by the organisation and its members.

### 3.3 Building the resilience of different systems: plans, practices and perceptions

Government officials from different departments of Urban Habitat were interviewed. They were asked to reflect about the characterisation of resilience and to identify the main plans they considered relevant in relation to that concept. Table 3.2 analyses these plans following the same criteria used in the literature review, namely: definition of resilience they explicit or implicitly advance, system understanding, characterisation of disturbance, and resilience attributes.

**Table 3.2:** Understanding of resilience in key documents and plans of Barcelona City Council. Source: Author's elaboration

Document	Definition of Resilience	System	Disturbance	Attributes of Resilience
Energy, Climate Change and Air Quality Plan of Barcelona 2011-2020	<b>Tacit definition:</b> resilience and adaptation to the effects of climate change; reduce or mitigate the effects of climate change	People, infrastructure, economy, ecosystem. Urban metabolism.	<ul style="list-style-type: none"> <li>- Changing international energy scenario</li> <li>- Changing socio-environmental scenario</li> <li>- Climate change impacts in the Mediterranean</li> <li>- Global factors are difficult to control</li> </ul>	<ul style="list-style-type: none"> <li>• Resource (energy) efficiency</li> <li>• Self-sufficiency</li> <li>• Diversity</li> <li>• Sustainability</li> <li>• Adaptability</li> <li>• Co-responsibility</li> <li>• Flexibility</li> </ul>
Citizen Commitment to Sustainability 2012-2022	<b>Tacit definition:</b> ability of proactive and preventive action to reduce vulnerability. Resilience is closely related to adaptation, mitigation and resource efficiency/sustainability.	Urban metabolism	<ul style="list-style-type: none"> <li>- Climate change risks</li> <li>- Health risks</li> <li>- CO2 emissions</li> <li>- Ecological footprint</li> </ul>	<ul style="list-style-type: none"> <li>• Self-sufficiency</li> <li>• Diversity</li> <li>• Sustainability</li> <li>• Cooperation</li> </ul>
Barcelona Green Infrastructure and Biodiversity Plan 2020 (2013)	<b>Tacit definition:</b> resilience is closely related to adaptation, ecological footprint and resource efficiency/sustainability	The city as part of a broader territory. Urban metabolism Green infrastructure and biodiversity.	Potential effects of climate change on biodiversity and vegetation	<ul style="list-style-type: none"> <li>• Long-term approach</li> <li>• Strategic</li> <li>• Environmental services</li> <li>• Adaptation of species</li> <li>• Diversity of species</li> <li>• Ecological connectivity</li> <li>• Resource efficiency</li> <li>• Sustainability</li> <li>• Responsiveness</li> <li>• Awareness</li> </ul>
Resilience and Climate Change Adaptation Plan of Barcelona 2015-2050 (Draft, 2014)	[A resilient city is] able to face upcoming challenges in a proactive way, and overcome them while learning and becoming stronger, adding value to the city and guaranteeing the quality of life of people living and/or working in it.	The city as a system of interdependent systems that operate in an interrelated manner.	<ul style="list-style-type: none"> <li>- Shocks and stresses</li> <li>- Increased frequency and intensity of climate-related hazards</li> </ul>	<ul style="list-style-type: none"> <li>• Proactive approach</li> <li>• Holistic approach</li> <li>• Sustainability</li> <li>• Security</li> <li>• Proximity</li> <li>• Flexibility</li> <li>• Co-responsibility</li> <li>• Co-beneficiary</li> <li>• Learning</li> <li>• Creativity</li> </ul>

All documents analysed are relatively recent. The earliest plans do mention the concept of resilience but without providing an explicit definition. Resilience appears tightly connected with anthropogenic climate change and the need to mitigate its impacts through resource efficiency, self-sufficiency and sustainability. A resilient city is able to reduce its ecological footprint while securing the metabolic flows. More recent plans – some still in draft version – have started to transcend the sustainability discourse to focus more on the idea of change – being climate change one but not the only type of change. Furthermore, they concede the possibility that disturbance might not be necessarily bad and that the system can learn and become stronger after shocks and stresses.

It is interesting to note that all the aforementioned documents are strategic – rather than regulatory – plans. They are meant to be a roadmap that defines strategic lines of action that are then translated into specific projects. The Energy, Climate Change and Air Quality Plan states the core idea is to help overcoming uncertainties by establishing priorities for projects. As a result, plan's managers can “put special emphasis on policies that are structural ‘building blocks’ and make a decisive contribution to achieving target trends and strategic lines of action” (Ajuntament de Barcelona, 2011, p.388). The underlying assumption is to bring flexibility to the planning and management of the city in the face of uncertainties.

Another example is given by the Green Infrastructure and Biodiversity Plan and the implementation of green corridors – one of the strategic lines of action of the plan. As one of the authors of the plan explains, it is easier to amend the existing General Metropolitan Plan (PGM) for specific urban projects than expecting the sanction of a new urban plan<sup>5</sup>:

*“The intention is not so much to include green corridors in the plan... At the beginning, we thought: ‘we have to include them in the planning’. But now we see it is more important to work hand-in-hand with the experts [urban planners]. In the end, it is the work of the expert what helps to progress day by day... Our urban plan is from the ‘76; hence, trying to change a plan from 1976 in an integral manner is impossible. It is much better to work in the way the Urban Planning department has been working thus far: special projects that amend the urban plan for a specific place. This is what we are going to do for the green corridors project: making changes in the planning and land-use qualifications strictly for the area where the corridors are to be placed. This is more feasible than a municipal urban plan that recognises green corridors by law. You can amend the urban plan at project level, what it has had been done for years. A change for a specific place and consequent approval... If you want to make it in the big way it is very hard. We have learnt it is better to work in concrete projects...”* (Interview with Coordinator of Green Areas and Biodiversity office, July 2014, my translation).

Same reasoning identifies the urban planners interviewed. They are not only sceptical about the possibility of a new master plan for the city in the short term<sup>6</sup>, but more broadly they distrust the relevance of stand-alone normative changes to incorporate sustainability or resilience elements in the spatial planning of the city. Instead, they find it more useful to focus on everyday practices and training for planners that, later on, might influence a bigger change in the normative system. Shortly, improving internal processes and creating the conditions for these improvements to materialise (Interview with urban planner, Planning department, July 2014). Two urban planners are currently working in the incorporation of sustainability, climate change adaptation/mitigation, and resilience – there is no clear differentiation between these concepts at the discourse level – in the spatial planning process. Box 3.1 highlights the main points of their proposal which implementation will take advantage of the TISU methodology, starting in September 2014.

The logic of defining strategic plans to give coherence to individual projects can be considered a legacy of the ‘Barcelona model’. The difference, however, seems to rely in the design and implementation process of the projects. A more integrative and multi-disciplinary approach has been advanced, recognising the relevance of diversity – particularly of information and knowledge – to deal with complexity and uncertainties. This new planning approach has been facilitated, at least, by two organisational changes described in the previous section: (1) the broader integration of different departments under *Hàbitat Urbà*, and (2) the development of a specific methodology (TISU) to deal with critical issues that required the involvement of multiple actors. While *Hàbitat Urbà* might be helping to improve existing policies, plans and programmes by identifying limitations or shortfalls through the input of multiple knowledge and actors, the TISU methodology has a key role to play in the identification of critical issues in the urban system and the definition of areas to act upon. In this sense, it can be argued that the new planning system is contributing to enhance both cumulative/inherent as well as disaster/adaptive resilience.

In the case of cumulative resilience, for instance, when asked about what resilience is, urban planners answered that it is about “doing things better” to “improve the functioning of the city and make it more liveable”. As an example, they explained that after being in contact with the Green Areas and Biodiversity office they are now better informed about the underground conditions they must respect for planting trees in the city – e.g. leaving enough space for tree roots to grow (Interview with urban planner, Urban Management office, July 2014). In the case of disaster or adaptive resilience, the Resilience office explained that in the aftermath of an acute problem they bring it to the corresponding board – according to the affected sector – or create a new board if necessary. In the latter case, for instance, they created the Social Services group after an energy crisis affecting the



most vulnerable users (low-income residents who are not able to pay the bills during winter) (Interview with Coordinator of TISU/Resilience Boards, July 2014).

All in all, there are signs that suggest the planning system of the city of Barcelona might be evolving towards a resilience planning paradigm, characterised by an integrative rationality that, according to Eraydin and Taşan-Kok (2013, p.30), is the result of the combination of an instrumental and communicative rationality. There are strategic plans that are already incorporating the idea of dealing with changes and uncertainties, particularly in the field of climate change. Since these plans require the collaboration of multiple levels and layers of government for implementation, they have also the potential to be implemented given the integration of the multiple departments involved, and the existence of a methodology to translate plans into implementable projects.

Figure 3.5 synthesises the main plans, practices and departments involved in this new planning system. It is

worth noting that this is a static representation of ideas, practices and projects that are constructed through dynamic and dialectic processes, mutually influencing and reinforcing each other. The formal organisational restructuring facilitates a more subtle and intangible change in the way of thinking: by bringing people from different areas together, by encouraging more informal networks and links among them, and by generating a multidisciplinary, multi-dimensional and deliberative culture. This is not to say traditional government and planning practices will be completely discouraged, but rather that they will coexist with new forms of governance and innovative practices. As urban planners reiterated in various occasions: “we are not changing but improving the planning process” (Interview with urban planner, Planning department, July 2014). The extent to which this will restrain a truly transformation process remains an open question. A closer look at the TISU/Resilience Boards might anticipate some of the challenges and opportunities in this process of building a resilience planning paradigm.

**Box 3.1:** Resilience in spatial planning. Source: Interview with urban planner, Planning department, July 2014

Spatial planning is a process of multiple phases – from the plan itself to the construction of roads and buildings – which is reflected in the different areas within the Urban Planning department of the Barcelona City Council. This process has functioned relatively well, although in a very linear manner and fairly isolated from other departments. Therefore, it is crucial for resilience building to

- consider the whole process and all its phases;
- incorporate feedback loops between these phases to generate a more circular process;
- increase the network relations between Urban Planning and other departments.

#### *How it works?*

The idea is to incorporate elements ('keys') of resilience in each phase of the process. If all 'keys' are activated at the right time, the end result is a resilient city. Innovation relies in knowing where to activate what.

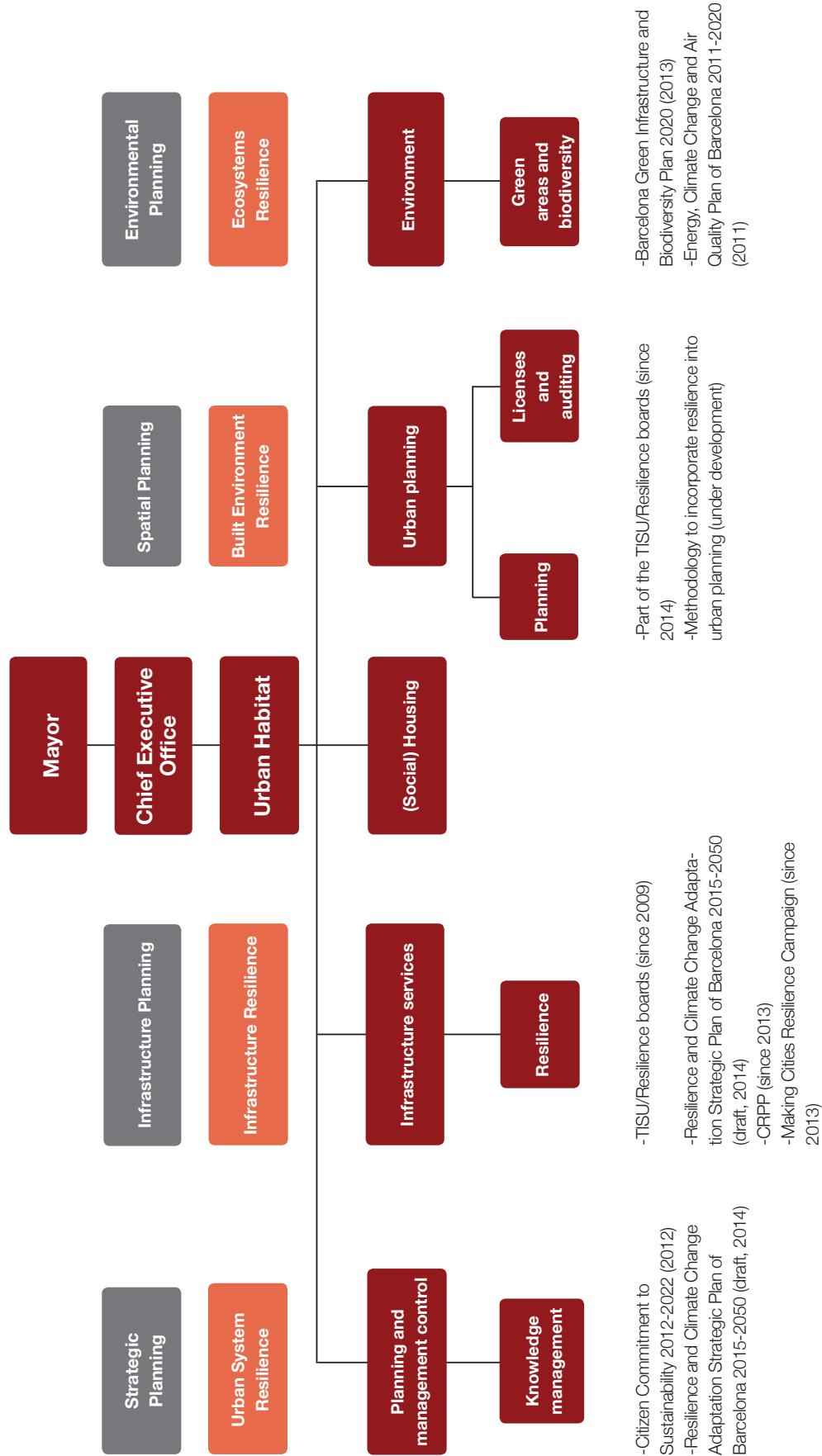
In the first phase – planning – it is possible to introduce normative changes at project level – e.g. in relation to permeable paving, green building or sustainable storm drainage to reduce flood risk. But, if no other keys are activated along the process, it is unlikely that norms will have any effect in the final stage of the chain. Introducing cartographic risk information, fiscal incentives or inspectors in the corresponding phases, can help in the implementation of norms.

#### *Methodology*

There is a macro project defined – improvement of the spatial planning process for incorporating climate change and sustainability issues – which is going to be broken down in small implementable projects.

A new Urban Planning board has been created within the TISU/Resilience Boards as the space to define priorities and elaborate projects. Participating actors in the board will be selected according to each project. First project: customised, in-company training on specific issues of climate change/sustainability for each area of the Urban Planning department. The core idea is to generate the change from inside.

Figure 3.5: Planning and resilience in *Hàbitat Urbà*. Source: Author's elaboration



### 3.4 Integrative, flexible and multi-stakeholder resilience planning approach: from TISU to a resilience strategy

The Infrastructure and Urban Services Boards (TISU) have offered both a formal institutional space as well as a working methodology for the implementation of projects which complexity urges for a systemic and multi-stakeholder approach. Organised by sector, the TISU are coordinated by a team that assures integration not only within each board but also among the different sectoral divisions (see Figure 3.6). Representatives from the local administration, other administrations and private operators form part of each group, accounting for approximately 72 professionals from 37 entities. Forty improvement projects were defined in 2009, which development and implementation have followed the same working methodology: 1. risk detection; 2. risk evaluation; 3. resilience evaluation; 4. resilience building (Ajuntament de Barcelona, 2013a, p.21).

Created in response to a crisis of infrastructure and service provision, the initial scope of the TISU was building the resilience of grey infrastructure. The focus was on the implementation of projects to respond to or reduce the impacts of predominantly technological risks at city level. This represented a very narrow understanding of resilience from an Engineering perspective and centred mostly on the attributes of robustness, redundancy and safe-failure (Interview with Head of Resilience office, July 2014).

The increasing participation in international events (Resilient Cities 2012) and network of cities (C40, ICLEI, City Protocol) would start expanding the understanding of the resilience concept. A Resilience office would be created in 2014 and a resilience strategy developed. As a member of the Resilience office acknowledges herself: "It is interesting because we started with the implementation of projects and then we defined a strategy. But, in the end, the strategy does not have any sense if it is not translated into real value for the city" (Interview with Head of Resilience office, July 2014, *my translation*). In this new context, the implementation of projects is part of a broader resilience building process where diagnosis and performance evaluation are equally relevant (see Figure 3.7).

An information management platform (Situation Room) is under design to consolidate all relevant information – including geo-referenced information – from more than 700 public and private information management systems active in the city. When an incident is reported to the Control Room (already in operation), it would pass to the Situation Room to assess its potential impacts on the whole system and evaluate the required actions to undertake by the now so-called Resilience Boards.

The new resilience strategy recognises the relevance of bringing all key actors together not just for the implementation of projects but also for consolidating all their infor-

mation and knowledge to be better prepared to respond and adapt to disturbance. A more holistic understanding of resilience has been embraced, recognising that other systems of the city – not just grey infrastructure – might be affected by different types of disturbance – not only technological risks – and might also need to respond and adapt. In this sense, and acknowledging that risks are constantly evolving, two new boards have been recently incorporated into the scheme, namely: Social Services and Urban Planning. This suggests a transition towards a more strategic approach focused not so much on avoiding critical situations but rather generating the conditions for adaptation.

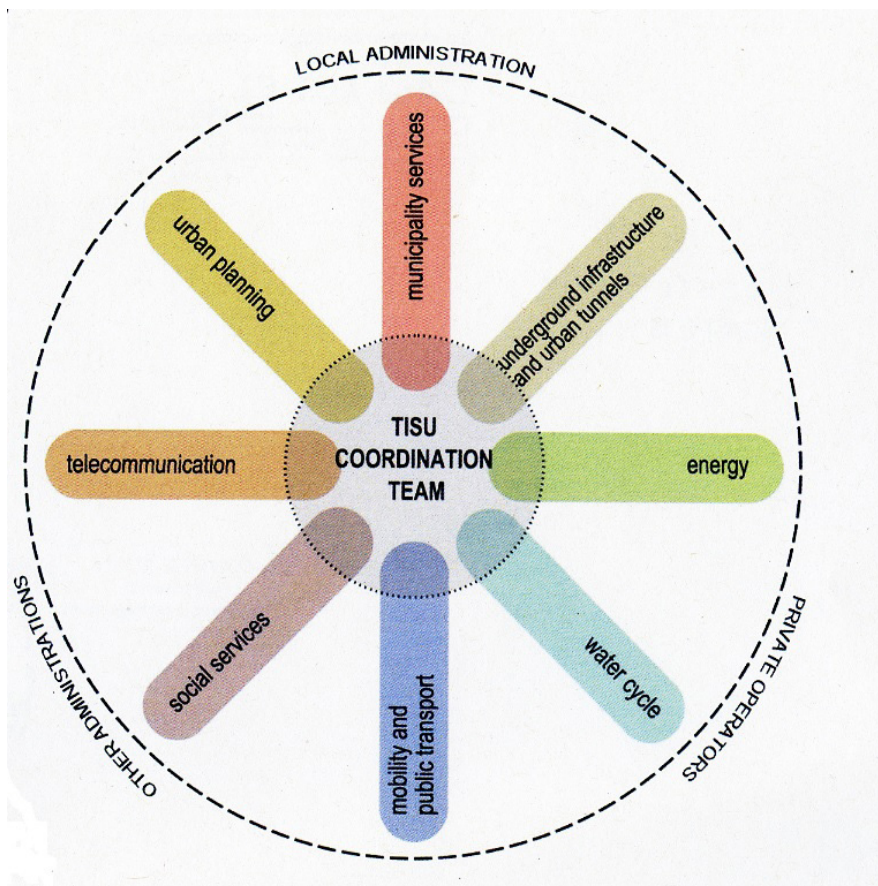
The joint work of the Resilience and Knowledge Management offices for elaborating the Resilience and Climate Change Adaptation Plan is also in line with this forward-looking and strategic approach. Furthermore, the draft version of the Plan stipulates that climate change related projects should be incorporated into the TISU/Resilience Boards scheme. Under this new conceptualisation of resilience other attributes are also considered; it is not just those related to resilient infrastructure but ten principles – those defined in the Resilience and Climate Change Adaptation Plan – that should be simultaneously assessed during the definition and implementation of projects. Finally, the new resilience approach is starting to transcend the city scale and look at the metropolitan level for certain projects (Interview with Head of Resilience office, July 2014).

In the opinion of those leading the Resilience office, the main challenge for the resilience strategy is the coordination of many different actors – some with seemingly opposing interests – in order to avoid stalemate situations that curve down participants' motivation to take part in the boards. That is, offering a space where multiple actors participate and, at the same time, are able to implement projects with tangible benefits to all of them. A second challenge is the reluctance of some actors to share information, especially when the benefits of doing so might not be immediate or might be related to unforeseen circumstances. There is a third challenge concerning the tension between politico-administrative divisions and the geography of risk, since the jurisdiction of the Resilience office is restricted to the city level.

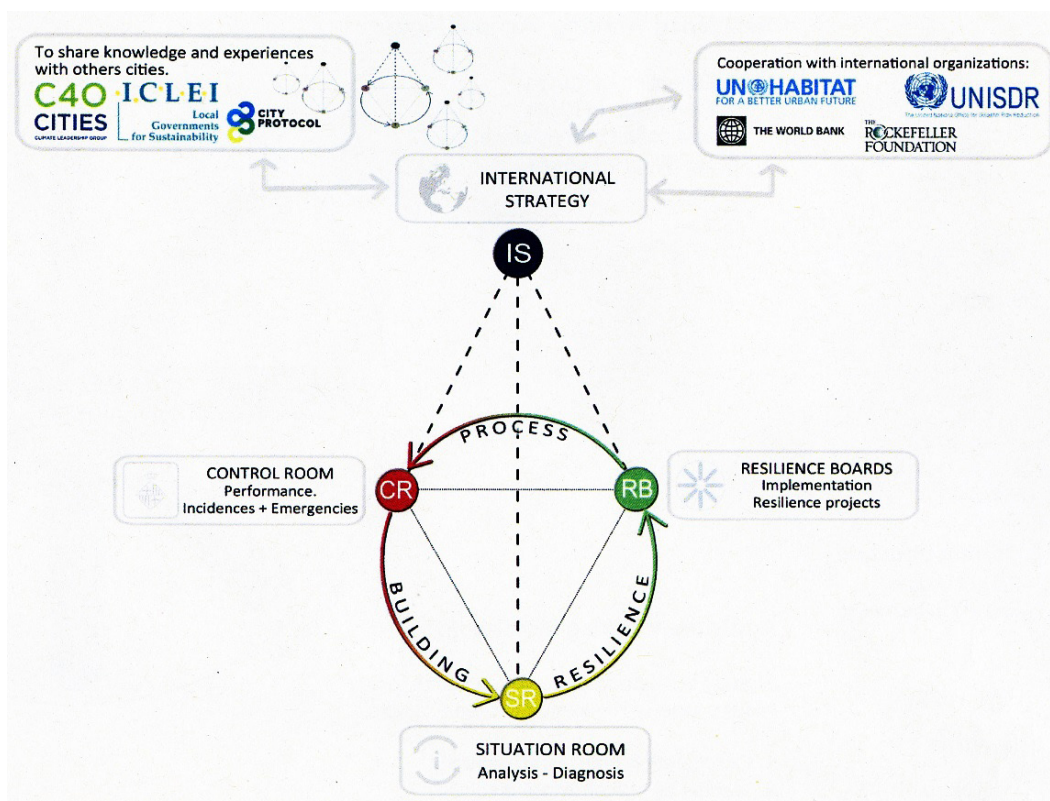
There is overall consensus, at least within *Hàbitat Urbà*, that the TISU methodology proved to be successful for the implementation of projects targeted at solving a crisis. This is more difficult when the perception of a disturbance is not so tangible – e.g. climate change. Here, a cultural change is needed, and this might require a mid- or long-term perspective. The Resilience and Climate Change Adaptation Plan currently under development could be an important roadmap to guide this change. As for the territorial scale, the Resilience Boards can provide an alternative by bringing to the table relevant supra-municipal entities with competence to implement projects at metropolitan or regional scale.



**Figure 3.6:** Structure of TISU / Resilience Boards (July 2014). Source: Departament de Resiliència Urbana (2014)



**Figure 3.7:** Barcelona's resilience building strategy as a continuous process. Source: Departament de Resiliència Urbana (2014)



The evolution since the inception of the TISU until the recent development of a resilience strategy shows an interesting path. In first place, it is quite unusual because the trigger point was an infrastructure crisis, while in most cases resilience strategies and measures within local governments respond to natural disasters or climate change forecasted impacts. It is also unusual as it started with the implementation of projects rather than an overarching strategy. The emphasis on infrastructure and implementable projects could be seen as an obstacle for the

incorporation of other systems – e.g. ecosystem and built environment – which resilience building benefits are less tangible in the short term. On the other hand, however, it has offered an opportunity to bring different stakeholders together, convince them of the benefits of joint action, and initiating a learning process for a more collaborative way of planning the city. It remains to be seen the extent to which the Social Services and the Urban Planning groups would be able to successfully implement projects that incorporate other dimensions of resilience.

### NOTES TO CHAPTER 3

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1. Association of Municipalities of the Metropolitan Area of Barcelona, Environmental Agency and Metropolitan Transportation.
2. During the 1980s and 1990s, many people moved to the second metropolitan ring where they could find a greater supply of housing at more affordable prices (Marshall, 2004, p.227).
3. The new Municipal Charter not only reinforced the executive power of the Mayor, but also gave the City Council greater presence in administrative and planning bodies responsible for infrastructure networks and public transport at the national level, including the port, airport, suburban railways and coastal zone management (Ajuntament de Barcelona, 2014a). Since 2011, the mayor of Barcelona is also the president of the Metropolitan Area of Barcelona and its maximum political representative (Àrea Metropolitana de Barcelona, 2014).
4. The new challenges include: regeneration of the consolidated urban grid; promotion of large-scale infrastructure; incorporation

- of self-metabolism in buildings and city; re-naturalization of the city; incorporation of ICTs in the construction and management of the city; incorporation of non-polluted mobility systems; metropolitan and transnational planning; new environmental agenda that promotes the economies characteristic of the 21st century and encourages the excellence in urban design (Ajuntament de Barcelona, 2012b, p.205).
5. According to legal requirements, the first step is to amend the General Metropolitan Plan (PGM) to legitimise a specific urban project. Once the amendment is approved, the urban project can be written up and approved.
  6. *“In spatial planning is also more complicated because a plan is a law. I consider more feasible making changes in urban projects than changing an urban plan; it is quicker. For the urban plan, you need much more consensus”* (Interview with urban planner, Planning department, July 2014, *my translation*).

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## 4. Conclusion

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The changes in the planning system of the city of Barcelona briefly presented here are quite recent and still in a transition phase. *Hàbitat Urbà* was created just three years ago, initiating an organisational reform at the level of the main departments that still needs to be assimilated at the lower levels of the organisation. In accomplishing this task, several other processes are contributing to the development of an integrative rationality that seems to be at the core of the new resilience planning paradigm: more informal relations between members of different departments, training programmes that stimulate a more holistic approach in everyday practices, and the increasing use of a multi-stakeholder methodology for consolidating information and implementing projects to anticipate and respond to critical issues.

Many processes are unfolding simultaneously and at different levels of government, suggesting that the incorporation of resilience attributes in the planning process might not necessarily follow a neat, structured and unidirectional pathway. Flexibility, innovation and redundancy seem to be guiding this process instead. Some voices – especially from the opposition parties – are already discrediting the ongoing changes on the premise of inefficiency and inaction (El País, 2012; La Vanguardia, 2012).

These critiques could be taken as a sign of maladaptation, but in my opinion it is too early to effectively assess the impact of the changes introduced in a big organisation as the City Council of Barcelona.

At least three main challenges can be identified in the transition towards a new planning paradigm. There is a cultural challenge, represented by the need to incorporate a more collaborative rationality to complement a long-standing tradition of technical urban planning. Changing values and well-established practices it is not an easy task; even less when they should permeate ideas and ‘ways of doing’ that have received credit and recognition for many years. Secondly, a legal challenge, which is the development and approval of a new metropolitan plan that mirrors the new values and practices and accommodates to the realities of the 21st century. Finally, there is a political challenge, which is the continuity of the planning model regardless of the results of the municipal elections in 2015. Integrative rationality, effective regulatory frameworks, and political commitment are all and equally important for the consolidation of a resilience planning paradigm.

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