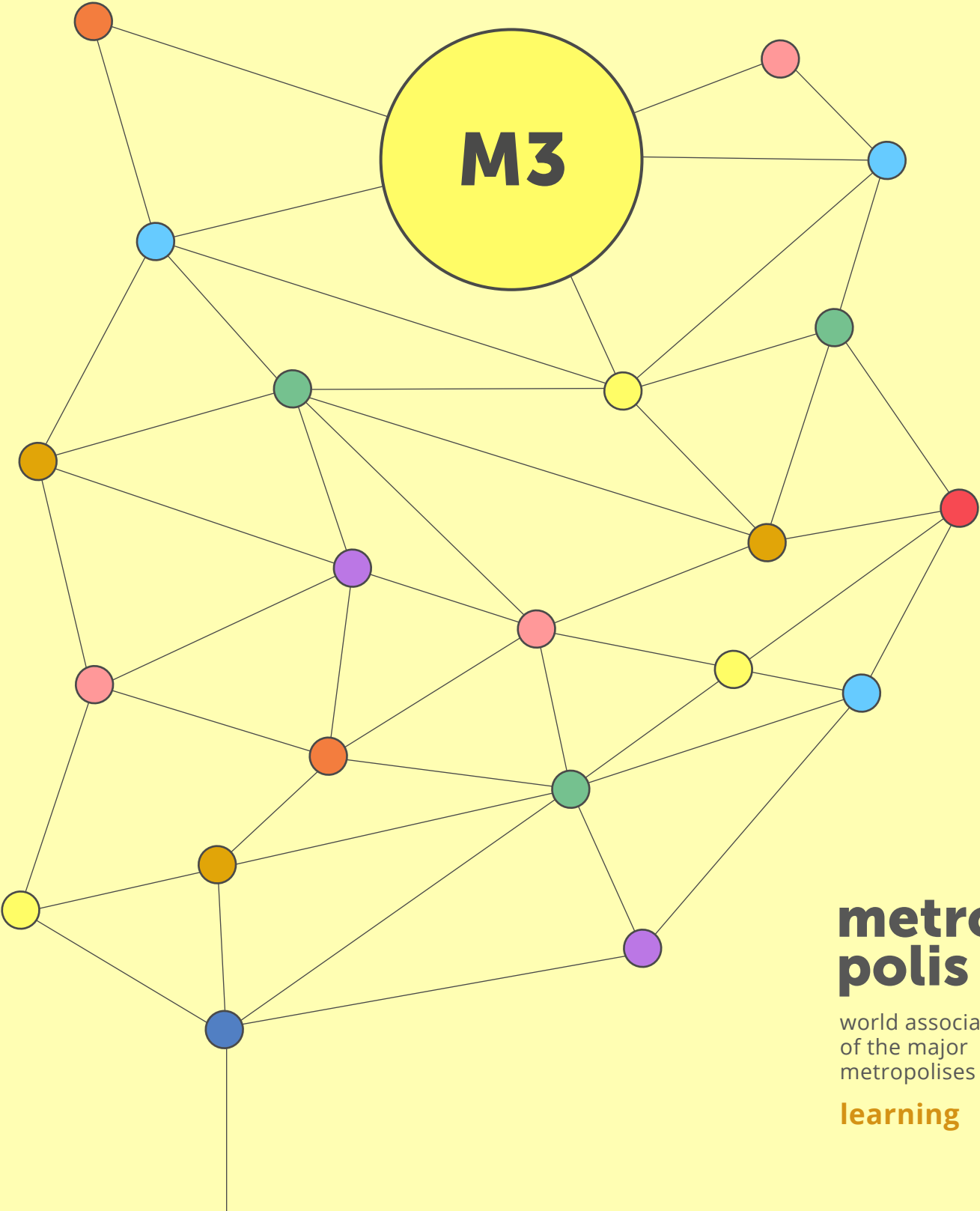


Metropolitan development practices and policies: a critical look



M3

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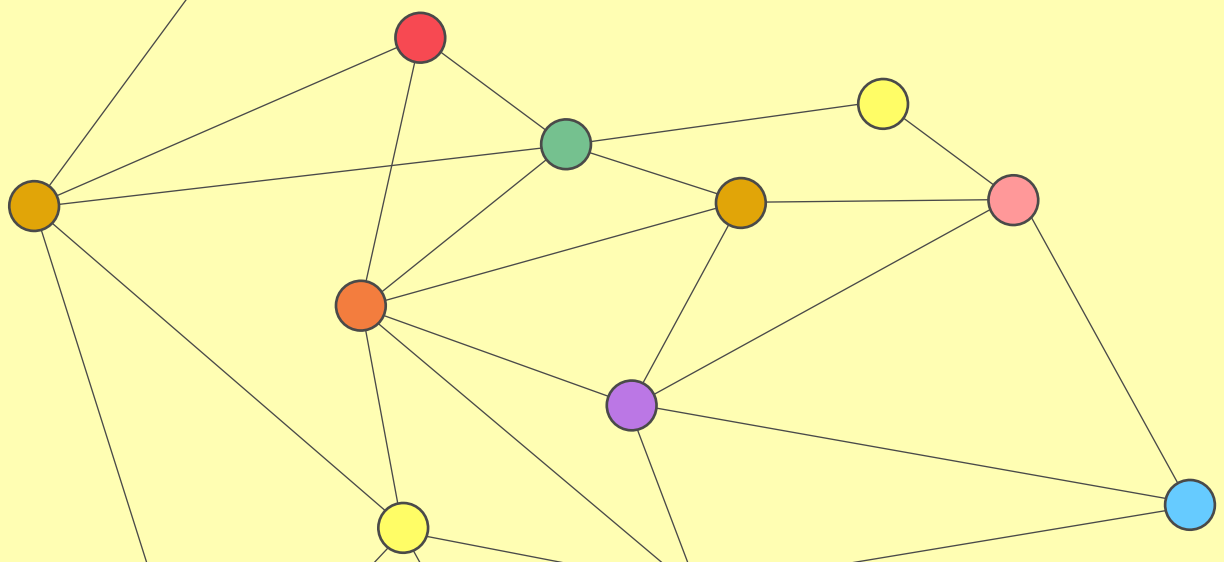
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1

Urban sustainability in the context of global agendas

The twenty-first century will turn on cities and their metropolitan areas since most of the world's population lives in them and they are the major economic drivers of the age. Their consumption and mobility patterns are determining factors in global environmental change and they are the scale in which the century's problems are most forcefully revealed. However, **it is in cities and metropolises where the answers and solutions to these challenges are being created.** It is therefore no coincidence that they are becoming more important in the battle against social inequality and climate change. Both issues are **central features of the New Urban Agenda** enacted in the framework of Habitat III. The 2030 Agenda for Sustainable Development also incorporates the idea of sustainable cities and communities and specifies it in development goal 11: *"Make cities and human settlements inclusive, safe, resilient and sustainable"*.

The urban sustainability is becoming essential to new city models under names like the 'eco-city', 'sustainable city' or 'green city'.

Issues around **urban sustainability** are becoming essential to new city models under names like the 'eco-city', 'sustainable city' or 'green city'. Among them, the concept of the 'smart city' has emerged as the most used today and encapsulates the notion of an inhabitable, low-carbon and sustainable city by leveraging information and community technologies (De Jong *et al.*, 2015).

In the following sections we analyse **how smart cities and urban resilience are embodied at the metropolitan scale.** The aim is to define these concepts and critically reflect on their implications in the reconfiguration of **urban socio-environmental governance** from a multi-scalar logic: municipal, metropolitan and/or regional.

2

Smart cities and urban resilience: a critical look

The smart city paradigm eschews twentieth-century urbanism and urban management and proposes new ways of managing the city in an 'integrated', 'inclusive', 'efficient' and 'profitable' way.

According to the smart city paradigm, “technologically improved” urban management would deliver a more efficient organisation of urban systems (Wig, 2016), an improvement in international city competition (Shelton et al., 2015) and a rise in the general public’s quality of life (Taylor Buck and While, 2017). The smart city comprises hard infrastructures, like sensors and platforms, and soft infrastructures, defined as forms of governance or new processes of social innovation. Through new infrastructures and hardware and software solutions, combined with real-time macro data availability (Kitchin, 2014), the smart city paradigm eschews twentieth-century urbanism and urban management and proposes new ways of managing the city in an ‘integrated’, ‘inclusive’, ‘efficient’ and ‘profitable’ way. The idea of the liberating role that the onboarding of information and communication technologies would have on people’s everyday lives and cities is therefore reinforced.

Similarly, although the **smart city concept appears in principle to focus on a strictly local scale**, metropolitan areas also harness it to create metropolitan socio-environmental frameworks of governance, as in the case of the **Barcelona metropolitan area**. Furthermore, particularly in Europe, the **smart city concept has permeated the regional scale** (smart regions) through the smart specialisation strategies promoted by the European Commission.¹ Another salient case is the Smart Nation² of Singapore, where the ‘smart’ strategy is coordinated through different territorial scales anchored in three core pillars: government, economy and digital society.

¹ European Commission. (2014) Smart Specialisation and Europe’s Growth Agenda. Brussels: European Commission.

² More information: [Digital Government, Smart Nation: Pursuing Singapore’s Tech Imperative](#).



Urban challenges require responses of a greater scope than technological solutions articulated within smart city discourses.

While most academic literature and political management celebrates the advent of **ICTs to resolve urban socio-environmental problems**, some critical currents analyse the implications of their implementation. From these perspectives, they address the need to understand why, how, for whom and with what consequences is this phenomenon emerging across different urban contexts (Holland, 2015, March 2016; Ribera-Fumaz and Fiori, 2016).

What, therefore, are the main criticisms around the smart city concept?

- 1 Technological determinism.** Prevailing views on the smart city are characterised by an ontological position “that frames all urban questions as essentially engineering problems to be analysed and solved using empirical, preferably quantitative, methods” (Bell, 2011). The **transformative power of technology is often overestimated**, while the nontech sides of urban problems are underestimated or ignored. As White (2016) says, **urban challenges require responses of a greater scope than technological solutions** articulated within smart city discourses. Thus, the question arises of how the smart city can address structural problems like poverty, inequality and discrimination.

One imaginary of “smart cities without (or with invisible) citizens” and another of “dystopic and totalitarian intelligence” persist in the twenty-first century.

2 **Non-geographic perspective.** Rolling out the smart city entails interventions performed in ways that are neither geographic, nor aspatial and decontextualized (Glasmeier and Christopherson, 2015). This can double down on urban splintering processes (Graham and Marvin, 2001) with the subsequent exclusion of women and some groups (the elderly, migrants, etc.) from the digital resources and private infrastructures produced (Angelidou, 2014). In other words, **urban technologies shore up existing unequal power relations** (Viitanen and Kingston, 2014).

3 **Depoliticising, disciplining and delimiting the notion of citizenship.** The idea of the political neutrality of technology has influenced the smart city paradigm. As the upshot of technological determinism and a win-win rhetoric, it **avoids the politicisation of urban issues**, which are transferred from the political sphere of consensus and dissent towards one that is technical and commercial (March and Ribera-Fumaz, 2016). From a critical perspective, the **smart city paradigm can be understood as an attempt to “discipline the city”** and facilitate its coupling “with political-technological assemblages designed to naturalise and justify new assets for the circulation of capital and its rationalities within cities” (Vanolo, 2014). One imaginary of “smart cities without (or with invisible) citizens” and another of “dystopic and totalitarian intelligence” persist in the twenty-first century.



Abidjan - Eva Blue, Unsplash

4

Privatisation of urban management and technological dependence. Smart city strategies seek to enhance city competitiveness and the impetus of advanced tech sectors. In this context, tech firms, large international consultancies and private providers of public services are positioned as central stakeholders in the design, testing, rollout and management of smart-city tech strategies. There is therefore the risk that the **city increasingly expresses the desires, images and values of the private sector instead of public values.** It can also be a barrier to the emergence and development of alternative urban socio-technological trajectories (Luque-Ayala and Marvin, 2015; Hollands, 2015).



Rio de Janeiro - Sergio-souza, unsplash

5

Private appropriation of urban data. The mass installation of urban sensors, smart counters and smart transport cards, combined with the proliferation of mobile applications, generates a continuous and mass production of data integrated on urban platforms for analysis. In many cases, the **data is not owned by the public authorities but by private corporations** that can profit handsomely from exploiting this information. This is a data extractivism process generated within the framework of digital capitalism (Schiller, 2014).

The implementation of smart city strategies is generally justified by a supposed improvement in urban sustainability and environmental quality.

6 **Environmental impacts of smart city technologies.** The implementation of smart city strategies is generally justified by a supposed improvement in urban sustainability and environmental quality. But the mass rollout of advanced technologies can have a significant ecological footprint. The critical metals and rare earths used in manufacturing their parts can be hard to recycle once used, and an enormous amount of energy is required to maintain the data archiving infrastructure generated by urban sensors. Similarly, the supposed enhanced efficiency in urban service provision and reduction of certain resource consumption or pollution emission parameters can have a rebound effect (the Jevons paradox).

7 **New risks in urban management.** The implementation of ICTs, macro data and urban sensorisation could prevent a multiplicity of human errors in urban infrastructure management, but they could also entail new risks. Third-party hacking of urban data platforms and a dependency on experts with highly specialised knowledge of technology and public information could result in nondemocratic and unequal endpoints.

Lifestyle of rural people in Thailand - Visoot Uthairam, Flickr



3

Urban resilience: why, how and for whom?

Resilience theories have been applied to socio-ecological systems, risk and natural disaster management, critical infrastructures, international development and climate change adaptation. The concept of urban resilience has been developed more recently.

In tandem with the 'smart city' concept, the use and implementation of the **'urban resilience' concept has also been consolidated** in recent years. As it has been leveraged across different academic and professional fields and areas such as psychology, biology, urbanism and engineering, its definition has varied in line with context and time.

One of the best-known definitions is that used by ecologist C. S. Holling in the 1970s regarding the resilience of ecological systems. This perspective was posited on such **a system's ability to continue to function and retain its core attributes** following a disturbance. Unlike more engineering-based perspectives, under this perspective the system does not necessarily return to its initial state - it is what we would call the resilience of nonequilibrium. In-deed, as Walker et al. (2004) said, resilience is "the capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks, and therefore identity". Resilience theories have been applied to socio-ecological systems, risk and natural disaster management, critical infrastructures, international development and climate change adaptation. The **concept of urban resilience has been developed more recently.**

There is currently **no consensus on the definition of urban resilience**, and this has implications for its implementation at the urban level. In researching the use of the concept across academic literature, Sara Meerow, Joshua P. Newell and Melissa Stults (2016) reached the conclusion that it was inconsistent in its definitions and set out the most cited ones (Table 1).

Table 1. **Definitions of urban resilience**

Author, year, page	Subject area	Definition
Alberti <i>et al.</i> , 2003, p. 1170	Agricultural and biological sciences; environmental sciences	<i>“the degree to which cities tolerate alteration before reorganising around a new set of structures and processes”</i>
Godschalk, 2003, p. 137	Engineering	<i>“a sustainable network of physical systems and human communities”</i>
Pickett <i>et al.</i> , 2004, p. 373C	Agricultural and biological sciences; environmental sciences	<i>“the ability of a system to adjust in the face of changing conditions”</i>
Ernstson <i>et al.</i> , 2010, p. 533	Environmental science; social sciences	<i>“To sustain a certain dynamic regime, urban governance also needs to build transformative capacity to face uncertainty and change”</i>
Campanella, 2006, p. 141	Social sciences	<i>“the capacity of a city to rebound destruction”</i>

Source: Meerow *et al.* (2016:41)

They identify **six conceptual tensions** around urban resilience (Table 2) that make it harder to have a shared view of the concept, and state their position on each:

Table 2. **Conceptual tensions around the concept of urban resilience**

Conceptual tensions	Authors' position
Characterisation of 'urban': most definitions on urban resilience are ambiguous about what a city or urban area is; many talk of the complexity of urban systems and operation in a network	The urban as a complex and multi-scalar system comprising socio-technical and socio-ecological networks.
Notion of equilibrium: there is a clear tension between two conflicting notions of equilibrium. On the one hand, the more engineering-type approaches, as well as those of psychology and disaster management, which spring from a single-state equilibrium perspective. On the other, perspectives influenced by ecological resilience anchored in a multiple-state equilibrium or even dynamic non-equilibrium.	Notion based on nonequilibrium with the capacity to retain desired system functions.
Resilience as a positive concept: most definitions of resilience understand it as a concept that is desirable to reach. However, the majority do not include a reflection on the social construction of the concept and its dispute.	Normative vision of resilience as a positive concept cities want to reach. It is necessary to acknowledge that it is a controversial concept.
Pathway to resilience: the definitions use different pathways to resilience: persistence, transition and transformation. They mostly focus on persistence without mentioning changes to the system (incremental, transitional or transformational).	Different pathways are required, from persistence to transformation.
Understanding of adaptation: there is a tension between specified resilience and general resilience leading to tension between short-term and specific adaptation and longer-term, general adaptation.	Adaptation to present conditions does not have to be at the expense of the system's general adaptive capacity.
Timescale of action: many of the definitions do not mention the temporal perspective.	Speed of recovery or transformation following a disturbance is critical.

Source: Adapted from Meerow *et al.* (2016:45)

On the basis of their position regarding each of these tensions, the authors offer their own definition: “Urban resilience refers to the **ability of an urban system** -and all its constituent socio-ecological and socio-technical networks across temporal and spatial scales- to **maintain or rapidly return to desired functions** in the face of a disturbance, to adapt to change, and to **quickly transform systems** that limit current or future adaptive capacity”. On this issue, they produce a series of critical questions on the concept of urban resilience (Table 3).

Table 3. **Critical questions on the concept of urban resilience**

Who?	Who determines what is desirable for an urban system?	Whose resilience is prioritised?	Who is included (and excluded) from the urban system?
What?	What perturbations should the urban system be resilient to?	What networks and sectors are included in the urban system?	Is the focus on generic or specific resilience?
When?	Rapid-onset disturbances or slow-onset changes?	Short- or long-term resilience?	Resilience of present or future generations?
Where?	Where are the spatial boundaries of the urban system?	Is the resilience of some prioritised over others?	Does building resilience in some areas affect resilience elsewhere?
Why?	What is the purpose of constructing urban resilience?	What are the underlying motivations in the construction of urban resilience?	Is the focus on process or outcome?

Source: Meerow et al., (2016:45)

They propose using these questions to reflect on whether the search for **resilience could end up reinforcing pre-existing situations of inequality**. That is why it is necessary to seek alternative forms of environmental transformation.

4

Critical application of the resilience paradigm and urban intelligence

Increasingly more urban areas are redirecting their technological urban strategies towards **citizen-focused models** where technology attempts to contribute to **'bottom-up' urban transformation**. This transition has come not just from cities at the forefront of the smart city paradigm like Barcelona and Amsterdam and grassroots movements but is also being acknowledged by international organisations such as UN-Habitat, the World Bank and the European Union. It can be understood as a second generation of projects that attempts to walk back from technological determinism and the monopoly of major tech firms, democratising the opportunities of the digital urban revolution by harnessing more cooperative and participatory ICTs. Two factors have been important in this change:

- The rollout of new tech architectures and infrastructures that make it possible to put the public at the heart of urban governance and
- The emergence of new forms of urban governance models.

Many of the new flagship smart-city projects have moved from costly endeavours entailing the deployment of centralised monitoring and software networks in favour of small-scale, bottom-up initiatives. These approaches embrace a perspective of the **urban as a laboratory of social innovations wherein citizens are not just part of the experiments but also generators of innovation**. However, it is important to keep the critical perspective active to avoid reinforcing the logic of first-generation smart cities.

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Cape Town Water Map

A digital mapping system was launched in 2018 encouraging the population to abide by water restrictions during a severe drought. Online mapping was used to acknowledge and compensate households that complied with the saving objectives, with colour symbols displayed on the outside of homes. The campaign enjoyed widespread engagement and its impact contributed to reducing domestic water use in the city.



More information: [City of Cape Town's Water Map](#)



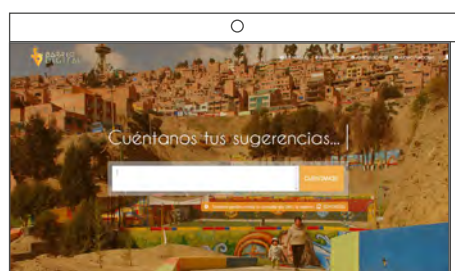
Another high-impact work area involves opening initiatives up to public scrutiny to leverage the feedback generated between authorities and citizens. One good example is the Barrio Digital in [La Paz](#), where the use of technology makes it possible to launch new channels that adapt to people's connectivity possibilities.

Barrio Digital. [La Paz](#)

Barrio Digital is a web platform enabling transactions with the public and also the collection of information on their requirements to coordinate responses with neighbourhood improvement programmes, engagement and planning and infrastructure areas. The platform can be provided online or offline (via intranet), thus adapting to the city's different realities. Its main medium of interaction is via text messages, which most mobile phones have.



More information: [Barrio Digital](#)



Mainstreaming the **gender perspective can also be reinforced by harnessing technologies** that facilitate the incorporation of the perspective and experience of women and girls regarding cities. Examples in Latin America include the construction of gender indicator systems and GovLab in Santiago de Chile,³ which leverages collaborative data **to map women’s different travel patterns** and reconfigure planning and decision-making accordingly.

Gender indicators system. Buenos Aires

The construction, outreach and improvement of gender indicator systems in different planning and statistics areas in Buenos Aires is framed in Sustainable Development Goal 5: “Gender Equality” since they make it possible to monitor the 2030 Agenda on the basis of information distributed by sex. They therefore promote the production of gender-responsive statistical information for decision-making. The data is regularly updated and new indicators onboarded.



More information: [Sistema de indicadores de género](#)



In the case of Barcelona, the rhetoric of the smart city strategy began in the late 2000s and was effective from 2011 to 2015. Through **public-private partnerships** with urban service sector firms and ICTs, most projects were aimed at developing smart infrastructure, operating systems and sensorisation. However, projects that responded to a new form of smart city were incorporated, targeted at **getting citizens and local communities⁴ involved**. Examples include the promotion of digital manufacturing athenaeums in neighbourhoods,⁵ the **Vincles BCN project and the Decidim Barcelona digital platform**.

³ More information: [The GovLab | Gender and Urban Mobility in Chile](#)

⁴ More information: [Barcelona Ciudad Digital](#)

⁵ More information: [Fab Labs | Barcelona Digital City](#)

Decidim Barcelona

Decidim Barcelona is a digital participation platform that originated in the exploration of open source tools for direct democracy in Barcelona, Madrid, Helsinki and Reykjavik through the D-CENT (Decentralised Citizen Participation Technologies) project funded by the European Union (2013-2016). Its core feature is that it can be improved on and reused by any person or entity, and other cities and social movements have now incorporated it. Several participatory processes are currently being implemented through the platform, such as the Plan Clima and Participatory Budgeting which guides the city's Municipal Action Programme.



More information: [Decidim.barcelona](https://decidim.barcelona) | [Democratic Innovation](#)



Vincles BCN

Vincles BCN is a social innovation project designed to strengthen the social bonds of elderly people who feel lonely and to improve their wellbeing with the aid of new technologies. The platform harnesses an app for tablets to help people aged over 65 living alone to shore up their social bonds. The programme thus recognises the importance of the relational and care dimension as factors of wellbeing. The city's demographic structure also makes it a programme that particularly benefits women who live alone.



More information: [VinclesBCN](https://vinclesbcn.cat)



5

Towards metropolitan strategies of urban resilience and the smart city

Although the concepts of a smart and resilient city are generally associated with the local notion of city, they are **paradigms that span the metropolitan reality**. Social and environmental problems for which answers are sought require coordination and cooperation in the **metropolitan territory** to push past the power boundaries and administrative frontiers of the municipal scale.

It is also essential to **share experiences and generate networks** that enable the joint exploration of learning and improvement opportunities. In this regard it is important to reach back to the recommendations made by the Metropolis Observatory and 100 Resilient Cities (2017) to develop urban resilience goals from a metropolitan strategy:

It is essential to share experiences and generate networks that enable the joint exploration of learning and improvement opportunities.

- Identify city systems and challenges requiring a metropolitan approach and encourage changes to models of governance on questions of an intermunicipal scope.
- Onboard regional and metropolitan stakeholders in the process of rolling out the resilience strategy and in the structures generated from it.
- Establish reliable funding mechanisms.
- Partner and share experiences with other cities with similar metropolitan challenges.

Global Resilient Cities Network (GRCN)⁶

The new Global Resilient Cities Network (GRCN) emerged in September 2019 from the 100 Resilient Cities Program with a unique reach, strength and legacy to understand and support the challenges of the ever-growing urban society. With a common lens for holistic resilience and thousands of projects in implementation, the new Global Resilient Cities Network is comprised of the members of the former 100 Resilient Cities Program and supports a thriving community of urban resilience practitioners in 98 cities and 40 countries. The main initiative of GRCN, Cities for a Resilient Recovery (C2R) is a coalition of cities and resilience practitioners committed to taking leadership, to embedding resilience in recovery as Chief Resilience Officers are taking an active role in their cities' efforts to fight Covid-19 and are particularly involved in the recovery phase. Of note is that of the 100 cities selected for the programme, 20 are Metropolis members: Accra, Addis Ababa, Bangkok, Buenos Aires, Dakar, Durban, Guadalajara, Jakarta, Lisbon, Medellín, Mexico City, Montevideo, Montreal, Porto Alegre, Quito, Ramallah, Rio de Janeiro, Santiago de Chile, Seoul and Toronto.

The metropolitan governments are tasked with balancing business innovation and entrepreneurship against public safety, privacy, universal access, gender mainstreaming and the common good.

Furthermore, digital technologies offer essential new components for the coordination and integration of efforts in urban areas. Given the novelty of this paradigm in the metropolitan sphere, we have still to see what the socio-environmental, political and economic repercussions will be. It will soon also become important to carefully analyse whether these initiatives reproduce a techno-determinist, hierarchical and depoliticised smart city model or are reconfigured towards a citizen-facing one with new possibilities for inclusive metropolitan governance. In any case, the **opportunities afforded by technologies**, with the mainstreaming of a critical perspective, could have a **major impact on urban area planning and governance**.

On the one hand, they facilitate information and **planning coordination strategies between diverse areas and levels of government**. At the metropolitan level, this can lead to improvements in transport management, land use, housing availability and production, safety, water basin management, air control systems, etc. On the other hand, it establishes **ways to open an innovation space** and expansion of the Right to the city. In this regard, metropolitan governments are tasked with balancing business innovation and entrepreneurship against public safety, privacy, universal access, gender mainstreaming and the common

⁶ More information: [Global Resilient Cities Network](#)

“The challenges for the digitalization of the metropolises are related to capacity-building, multi-stakeholder cooperation and welcoming public input and analysis.”

good. These strategies are in keeping with the 2030 Agenda for Sustainable Development. As Bettencourt (2019) says, “the challenges for the digitalization of the metropolises are related to capacity-building, multi-stakeholder cooperation and welcoming public input and analysis.” Some of his recommendations can be salvaged to embody this **metropolitan approach towards digitalisation**:

- Incorporate and use data for internal government operations and ensure they are effective, transparent and capable of providing answers.
- Make data an instrument for better collaborative policy. Data that is close to the human experience can lead to more meaningful, diverse and helpful planning and policy.
- Use data as a strategic tool for goal setting and monitoring of progress in more complex issues.
- Use disaggregated data to showcase gender inequalities and local solutions between neighbourhoods as a coordination mechanism among the public, civil organisations, businesses and other stakeholders.
- Generate data as a common good. Governments should promote information and public goods that support communities of innovators who can create economic value and human development.
- Close the gender digital divide by promoting the technological literacy of women and girls, incorporating their insights on innovation and data and creating safe digital environments.
- Compile aggregated and anonymised data by means of secure channels and encryption. Continuously assess the status of these protections.
- Set data collection standards with developers, operators and city agencies.

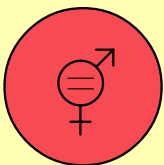
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**PEACE, JUSTICE
AND STRONG INSTITUTIONS**
SDG 16

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