

Urban resilience implementation: A policy challenge and research agenda for the 21st century

1 | INTRODUCTION

Resilience has risen rapidly over the last decade to become one of the key terms in international policy and academic discussions associated with civil contingencies and crisis management. As governments and institutions confront threats such as environmental hazards, technological accidents, climate change, and terrorist attacks, they recognise that resilience can serve as a key policy response. Many organisations including the United Nations, the European Union, the World Bank, International Monetary Fund, government agencies and departments, international non-governmental organisations and community groups promote resilience. However, with the rapid rise of resilience has come uncertainty as to how it should be built and how different practices and approaches should come together to operationalise it (Chandler & Coaffee, 2016). Whilst there is a variety of different interpretations given to resilience from practitioners and an open debate about resilience principles and characteristics in academia, we adopt the crisis and disaster management definition of “the capacity of a social system to proactively adapt to and recover from disturbances that are perceived within the system to fall outside the range of normal and expected disturbances” (Boin, Comfort, & Demchak, 2010; p. 9). By developing resilience, a system becomes capable of reducing the impact of shocks and resuming normal functioning more quickly following a disaster and better equipped to meet population needs and minimise economic losses caused by crises (Lagadec, 2009; Meerow, Newell, & Stults, 2016). However, it should be noted that this definition fails to capture preexisting socio-economic inequities within society and that in many countries “negotiated resilience” may be desirable (Ziervogel et al., 2017).

Moreover, in the rapidly emerging policy discourse of resilience, cities and urban areas have become a key focus of action where rapid urbanisation and greater global connectedness present unprecedented challenges. Such increased urbanisation also concentrates risk in cities making them increasingly vulnerable to an array of shocks and stresses. Under such circumstances, city managers are increasingly seeking to enhance *urban resilience* by addressing underlying risk factors, and by reducing the exposure and vulnerability of people and assets to a range of current and future threats. In this sense urban resilience provides different frameworks for reducing the multiple risks faced by cities and communities, ensuring there are appropriate levels of resources and capacities to mitigate, prepare for, respond to, and recover from a range of shocks and stresses (Coaffee & Lee, 2016). Many initiatives organised through global governance networks promote the importance of city-based resilience whilst a range of private

sector and philanthropic organisations have advanced programmes of work and frameworks by which cities might develop the capacities to become more resilient. Most notably, major cities throughout the world have joined the *100 Resilient Cities* programme (<http://www.100resilientcities.org/>) (Rockefeller Foundation & Arup, 2015), pioneered by the Rockefeller Foundation, to develop resilience strategies to face disruptive events and address vulnerabilities that amplify crises and erode coping abilities (e.g., inequality, ageing infrastructure, environmental degradation) (100 Resilient Cities, 2016). Organisations of the United Nations are also urging the development of operational frameworks for dealing with integrated risks management, as the UN Habitat City Resilience Profiling Programme, enhancing resilient communities building in relation to *Sustainable Development Goals* and the *Sendai Framework on Disaster Risk Reduction 2015-2030* (UN, 2015) that followed the *Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters* (ISDR, 2005).

However, empirical studies show that despite the popularity of resilience, its implementation sometimes lead to business as usual approaches neglecting social justice (Anguelovski et al., 2016; Ziervogel et al., 2017), or lock-in the development path through unsustainable trajectories, and thus resulting in a complex and underestimated set of trade-offs across spatial and temporal scales (Chelleri, Waters, Olazabal, & Minucci, 2015). This implementation gap (Coaffee & Clarke, 2015) remains between resilience as ambitious objective and the “demonstrated capacity to govern resilience in practice” at the urban level (Wagenaar & Wilkinson, 2015; p. 1265). The implementation of resilience challenges the normal functioning of public administrations (Bourgon, 2009; Duit, 2016) by highlighting the need to replace silos with horizontal management (Matyas & Pelling, 2015), take interdependence with external partners into account (Henstra, 2012; McConnell & Drennan, 2006; Valiquette L'Heureux & Therrien, 2013), and encourage flexible and adaptive processes rather than regular routines that maintain the status quo (Pelling & Manuel-Navarrete, 2011; Stark, 2014).

Whilst from a governance perspective we can readily acknowledge that “the building of urban resilience will be most effective when it involves a mutual and accountable network of civic institutions, agencies and individual citizens working in partnership towards common goals within a common strategy” (Coaffee, Murakami-Wood, & Rogers, 2008), municipal authorities are undoubtedly struggling to do so. In seeking to identify the different knowledge gaps and future research questions regarding the implementation of urban resilience we ran a 3-day intensive knowledge-brokering workshop on Co-constructing Knowledge for Urban Resilience Implementation at the *École nationale*

d'administration publique in Montreal in October 2017. The event brought researchers and city practitioners together to share advances in academic knowledge and innovative operational experiences in order to co-construct possible solutions and future research questions around topics based on challenges raised in the literature and from the experiences of city practitioners in their endeavour to implement resilience strategies. We found that these discussions helped us in setting the stage for a research agenda, which identifies the key barriers and facilitators in resilience implementation.

We propose them here as an opening to an ongoing dialogue for potential contributors to a new editorial line nested in the *Journal of Contingencies and Crisis Management*. We want to encourage and stimulate the conversation between practitioners, resilience managers, and researchers around the issues of resilience. Even if our discussions were built more specifically on an urban forefront, we think that the policy and organisational issues we raise here could be transferred to other sectors of resilience such as health, terrorism, or territorial governance. We present here our own questions and issues for future research questions, and encourage future papers to be submitted to this new editorial line. We think that by accepting this new path, JCCM is participating at being at the forefront of a new perspective. Resilience is fast catching as a new response to the complexities of governance arrangements and needs to be co-constructed with strong empirical and theoretical tools.

2 | JOINING IT UP LOCALLY AND BUILDING CAPACITY

Resilience is a complex solution to a complex set of problems, including risks such as climate change, critical infrastructure failures, terrorist attacks, technological accidents, pandemics, and so on. These risks exhibit features of “wicked problems” (Rittel & Webber, 1973) as they involve interrelated issues, lack definitive formulation and are subject to different interpretations based on values and rationalities (Ibid). Implementing urban resilience creates a significant challenge, because it requires coordinating the efforts of numerous government departments, adopting flexible, and adaptive processes to accommodate changing circumstances, and allocating resources to preventative measures in anticipation of uncertain future threats (Bahadur and Tanner 2014; Boin and Lodge 2016). How best to restructure the activities of municipal authorities to break down the silos that protect fields of expertise in traditional bureaucratic settings and move towards horizontal integration and long-term planning is perhaps the key task in developing overall city resilience. Practitioners identify this as a difficult area, especially when it involves groups not traditionally included in risk management who are less aware of the importance of resilience. Important parts of a policy change need to be clarified and operationalised by the meso-level managers (Hupe, 2011; May, Sapotichne, & Workman, 2006). The implementation of resilience therefore requires a thorough examination of governance models with emphasis on anticipatory and proactive approaches (Perelman, 2007).

According to different scholars (Bourgon, 2009; Duit, 2016; Stark, 2014), the implementation of resilience challenges traditional public administration values and processes as municipal authorities seek to transform processes to enable the development of adaptive capacities. Key to this process of seeking more integrated and holistic working is seeking to connect a greater array of individuals and organisations working in different sectors and siloes within strategic resilience efforts (Coaffee & Clarke, 2015). The ultimate focus here is to mainstream a resilience approach in all the city-level decision making. However, municipal level governance is often trapped in formalised ways of working and it is proving a difficult task to institutionalise such new “resilience” arrangements and shift away from technical, bureaucratic and short-term ways of working in policy silos towards systems that are agile, mobile and diverse. Cities recognise that they must collaborate across boundaries, but problems arise when different groups are trying to protect their identity. Scholarship on collaborative governance reveals three disconnects that impede the implementation of urban resilience objectives: (a) collaboration across silos is enabled by incentives but is impeded by institutional logics; (b) the creation of joint capacity is enabled through procedural arrangements, but is impeded by bureaucratic routines; and (c) shared motivation and values are enabled by a common definition of resilience, but are impeded by institutional practices (Therrien and Normandin, 2017). Furthermore, resilience professionals lack comparative information on effective implementation strategies, do not have longitudinal evidence to understand implementation challenges over time, and need criteria to assess potential trade-offs associated with the adoption and prioritisation of different resilience actions (Therrien et al., 2017; Chelleri, Schuetze, & Salvati, 2015; Chelleri, Waters, et al., 2015).

Recognising the central importance of working across siloes and joining it up locally, the Rockefeller Foundation's 100 Resilient Cities programme has funded, in every city, a Chief Resilience Officer (CRO) whose key task is to work across government departments, to help a city improve internal communications, understand and address its own complexities, and develop new collaborative relationships. CRO's are tasked with being an institutional “boundary spanner”; the oil that lubricates the resilience engine in a given city. Whilst anecdotally there are many accounts of how resilience is slowly permeating into the governance infrastructure of cities with “innovative” new arenas generating pressures on “mainstream” practices to enable new relationships and new visions of the future, many barriers still impede the creation of new and more integrated work practices. Notably, all too often resilience processes that have been set in motion are “captured” by existing processes, constrained by traditions of “clientelistic” politics and siloed practices and do not progress towards holistic working. Such institutional inertia is seen to stem largely from difficulties of organisational change and especially in ceding power and control to new stakeholders and governance configurations. Resilience policy implementation has therefore, largely remained in silos with weak cross-sectoral coordination (Therrien, 2010). Yet, coordination strategies are ever more crucial in the face of global threats such as climate change, and as the current organisational structures increase in complexity (Normandin and

Therrien, 2016). However, the CRO's and their coordinating units (or offices) are becoming dealers in trading zones. They look to develop "soft intelligence" linked to soft power to create negotiated agreements. These require a strong distributed leadership to maintain the network (Therrien and Normandin, 2017).

To better understand why the implementation of holistic approaches to urban resilience has proved problematic in many areas it is imperative to support capacity building and organisational behaviour change across municipal authorities. Organisations require new capacities for adaptation (Pelling & Manuel-Navarrete, 2011) and to better face crises (Boin et al., 2005), including sense making, collaborative management, and strategic thinking. Whilst it is crucial to advance virtuous circles between capacity building and organisational change to sustain the implementation of resilience, this assumption should be tempered with the acknowledgement of much existing institutional obduracy and inertia.

The implementation of urban resilience requires a thorough examination of pre-existing governance models with an emphasis placed upon anticipatory approaches (Perelman, 2007). In this sense, resiliency is seen as proactive, rather than reactive, and traditional methodologies for assessing risk within the urban context are being replaced by increased consideration of unpredictable, high consequence "what if" events as new models for anticipating an uncertain future are developed. Resilience therefore foregrounds risk prevalence, where risk must be extensively planned for and where pre-emptive risk management activities are undertaken to map urban vulnerabilities (often with an emphasis on the worst-case scenarios), to plan and test for high-impact "shock" events, and to develop and enhance practical and technical expertise across a range of built environment and urban management professionals to aid both mitigation and recovery from disruptive challenges (Coaffee, 2013).

This shift in tradition governance approaches has proved challenging because resilience implementation in public administrations is, in most cases, in conflict with bureaucratic values such as efficiency and procedural rationality, which are difficult to balance with adaptability, redundancy, and innovation (Stark, 2014). The problems identified above lie at the heart of the urban resilience implementation gap and complicate attempts to advance more adaptive governance models involving co-productive efforts and collaborative decision-making with different networks of formal and informal institutions. Key research questions include:

What capacities are required to translate innovations into transformational change in day-to-day practices, in the light of the various power relations embedded in them? What capacities need to be enhanced and for whom?

3 | MOBILISATION OF MULTIPLE STAKEHOLDERS AND BUILDING THE EVIDENCE BASE FOR URBAN RESILIENCE

A key question at the heart of urban resilience implementation is whose resilience is enhanced by these efforts, and who should be

involved; in other words, resilience for whom by whom? (Meerow et al., 2016). In more partial terms, how might we mobilise the urban ecosystem of public, private and non-profit organisations, as well as the broader public, including those most vulnerable, to support reform for urban resilience?

The development of resilience requires managing both short-term responsive capacities and longer-term transformational ones (Chelleri, Schuetze et al., 2015; Chelleri, Waters, et al., 2015), represented by the interdependence between organisations in responding to crises (Redlener & Reilly, 2012; Therrien, 2010) and future risks adaptations (Matyas & Pelling, 2015). Practitioners report that this is difficult to achieve, especially when it involves groups not traditionally included in planning for crises and who are less aware of resilience as an objective. Whereas traditional approaches to urban risk have relied upon a narrow range of stakeholders, contemporary and future urban resilience schemes aim to draw a full range of professional and community groups into decision-making at a range of spatial scales, from locally coordinated systems to centralised and sub-national organisations (Coaffee, 2013). This will require developing trust ties for lasting relationships with organisational partners, engaging the public and adopting best practices from other research domains harness the power of social networking to advance local resilience to cope with crisis situations.

Whilst past approaches to resilience have centred on physical infrastructure, such as building dams, levees, embedding sensors in roadways, constructing waterproof facilities, and so forth, new research has instead highlighted the role of social infrastructure. The ties between individuals—also called social capital—has proven to be a way to mitigate shocks and reduce deaths during extreme weather events (Aldrich, 2012a,b; Aldrich & Sawada, 2015). Further, as strong social ties allow for easier sharing of information, the overcoming of barriers to collective action, and informal insurance, better-connected communities show better recoveries after major crises (Iwasaki, Sawada, & Aldrich, 2017). Because social capital, like other forms of capital, can be strengthened and deepened, local communities and organisers can invest in programmes which build resilience to future shocks (Aldrich & Kiyota, 2017; Aldrich & Meyer, 2014).

To better consider social capital within any resilience implementation policy, the community capacities (and threats) need to be considered in an integrated way within assessment tools. Whilst there is no universally accepted approach to which is most useful tool, or framework for implementing and measuring city resilience, there is broad agreement on *why* we need to measure it (Prior & Hagmann, 2013):

1. to *characterise resilience* in context and to articulate its key constituents;
2. to *raise awareness* and assist managers to identify entities whose resilience is lower than some predetermined threshold;
3. relatedly, to *allocate resources for resilience* in a transparent manner;
4. to *build resilience* in order to better manage disruptive challenges and to gauge the impact of mitigation measures; and,

5. to monitor policy performance and to assess the effectiveness of resilience-building policy through comparison of policy goals and targets against outcomes.

Those reasons relate to the imperative to build resilience through integrated approaches, but also to foster the linkages between its framing and support from evidence-based practices. Several indices and frameworks have been developed to measure resilience based on a system's ability to cope with an event, and vulnerabilities that undermine this capability (Bene et al., 2018). Scholars have also proposed frameworks and tools to enable decision-makers and practitioners to better grasp complex aspects of resilience such as social capital (Aldrich, 2012a,b; Aldrich & Meyer, 2015) and the interdependence of critical infrastructures (Hémond & Robert, 2012). Despite the availability of these tools, practitioners emphasise the difficulty in using them strategically and regularly in their organisation to concretely develop resilience.

There is an ongoing need for urban resilience evidence gathering processes to ideally be both multi-scalar and multi-dimensional, advancing a "fit for purpose" assessment framework and mobilising a wide range of related stakeholders into a collective and collaborative effort where technical elements of resiliency are fused with social and organisational requirements. Capturing key resilience performance indicators in an ongoing, holistic way to address current and future urban challenges is a critical task but is by no means an easy one, especially given the lack of an agreed international measurement approach.

The ability to respond to shock events and to improve contingency and crisis management is emphasised in a number of resilience indices and frameworks, which often focus upon the reduction of underlying risk factors. An ethic of prevention is anticipated to motivate institutional capacity-building to ensure risk identification, assessment and monitoring are core components and that the building of a culture of safety through understanding and awareness, knowledge transfer, innovation, and education is emphasised. Having a clear understanding of the risks a city faces is key to assessing their resilience.

But such "scorecard" approaches are inherently formalised and prescriptive, assessing municipal authorities' preparedness for disaster against a large set of criteria. This has not only proved time and resources intensive but is necessitating systematic adoption of resilience codes of governance practice to provide such level of detail. The development of such approaches implicates considerable commitment and resources for initial completion, notwithstanding that this will become a periodic exercise as urban resilience is seen as something to work towards with the scorecard expected to highlight improvements through a new public management framing and indicates the high degree of professionalisation and information management required (Coaffee & Lee, 2016).

Many of the existing indices exhibit significant shortcomings in terms of robustness and a number of criticisms and problems also emerge in relation to the aggregation of data to different scales. As Prior and Hagmann (2013) have highlighted, existing

assessment frameworks serve to simplify an inherently complex resilience process, often as a result of time and resource pressures, and thus often only "measure" relative urban resilience (for example one neighbourhood vs. another) rather than the risks faced and capacity to cope in any one area (absolute resilience). Moreover, the current assessment processes, given their bias towards quantitative indicators and to parameterisation, often use arbitrary indicators and associated weighing to create an amalgam of several core indicators (Therrien, Tanguay, & Beauregard-Guerin, 2015). They also assume appropriate data is readily available and consistent across a defined geographical area.

The challenges in constructing techniques of measurement for resilience lie in its multifaceted nature, and beg the question of *resilience of what* and *resilience to what*, or *resilience for whom* (Vale, 2013). Whilst existing assessment "tools" provide a broad and scalable baseline measure of resilience that might be of interest to policy makers, they are currently developed at a level of abstraction that does not fully account for context.

One of the challenges of resilience is to design routines and develop capacities in normal conditions to promote, in extreme conditions, the emergence of a polycentric network (Aligica & Tarko, 2011; Ostrom & Ostrom, 1965; Polanyi, 1951) of stakeholders cooperating for responding to and overcoming crisis. Contributing to this challenge implies the promotion of multi-stakeholder decision-making and raises the question of the interactions between plural cultures (Trice & Bayer, 1992), subcultures, strong cultures and counter cultures (Hatch & Cunliffe, 2013) in a network composed of professionals, administrative, elected representative, industrialists, citizens, NGOs, etc. Such polycentric resilience networks can also be transnational, especially in borderlands, raising specific challenges (Adrot et al., 2018) such as the management of the impacts of national culture on individual and collective decision-making and actions. The variability of national culture factors (Hofstede, Hofstede, & Minkov, 2010; Meyer, 2015; Trompenaars & Hampden-Turner, 2010) such as power distance, uncertainty avoidance, long-term vs. short-term orientation, neutral vs. emotional, sequential time vs. synchronous time, scheduling mode, or disagreeing management can further impact on the performance of individual and collective "resilience" behaviours.

It is therefore an issue of the combinational, dynamic and evolutionary nature of urban resilience that requires measurement—a task perhaps better undertaken through a mixed method approach involving quantitative and qualitative measures to study the impacts of disruption in situ—and to combine this with a generalised framework or index of resilience that provides a relative aggregated picture of exposure to shock and stressful events (Coaffee & Lee, 2016). Existing resilience assessment approaches and evidence gathering techniques therefore need modifying to enable recognition of capacities and capabilities within city administrations and communities. They need to avoid silo thinking, capture perspectives of a range of stakeholders, better represent interrelationships between different aspects of resilience and capture the multiple scales at which resilience can be encapsulated.

4 | DESIGNING A “NEW” RESILIENCE GOVERNANCE APPROACH

The previous sections of this paper have illuminated some of the practical changes faced by municipal authorities in adopting resilience policies and practices that is necessitating a rethinking and adoption of new governance approaches. There is no one-size-fits-all model for doing this, which poses the question of how to best design policy to develop urban resilience: rethinking the role of regulation, organisation, resources, and information to deliver results?

Public authorities employ various policy instruments to implement transformation, including regulation, organisation, resources, information, network building, best practices and others (Hood & Margetts, 2007; Howlett & Rayner, 2007; Lascoumes & Le Galès, 2007). The selection and arrangement of these instruments are complex activities that bring into play different assumptions and ideologies (Lascoumes & Le Galès, 2007), have different attributes in terms of “resource intensiveness, targeting precision, political risk, and ideological and financial constraints” (Henstra, 2016), and may see limited implementation if they do not gain acceptance in the community concerned.

Key properties that contribute to new resilience governance approach are strong institutions characterised by diversity and redundancy, the presence of multiple smaller systems that are relatively independent, collaboration and responsive regulatory feedbacks (Walker, Salt, & Reid, 2006). A comprehensive and sustainable urban policy, and in particular the alignment of regulatory, fiscal and financial instruments, is critical. Here, an important driver in the implementation process is the diversity and the strength of the partnerships created between public, private and non-profit institutions with high level of commitment to mobilisation of resources to achieve operational efficiency, whilst managing risks (Tsenkova, 2014).

The responsibility of governments is to create an enabling policy environment to ensure that institutional structures are not subject to “stop and go” government programming, red tape, and regulatory constraints.

Therefore, key to advancing new governance approaches to urban resilience is to acknowledge the challenge of prioritisation among a set of different (and sometimes conflicting) resilience perspectives, and related operational strategies. Indeed, recent literature has highlighted the shortcomings of some city resilience implementation strategies, questioning how sometimes short-term risk reduction actions could reinforce robustness whilst reducing the opportunities for the city to embrace change, sustainability transitions and structural transformations (Chelleri, 2012; Elmqvist, 2014; Pelling, 2011). However, in developing transformative governance approaches to implementing resilience importance should be placed upon issues of social capital, identity and justice where who builds resilience, and how (through centralised or decentralise approaches, for examples) is key in determining sustainable and socially responsible governance and policies (Chelleri, Schuetze et al., 2015). Much recent evidence from case studies worldwide, illuminate the need to addressing resilience trade-offs, emerging through temporal and spatial scales when resilience is

operationalised (Chelleri, Waters, et al., 2015). A resilient trade-off occurs when an effort to build resilience by increasing adaptive capacity and/or reducing risks exposure leads to a reduction in adaptive capacity and/or an increase in others risks exposure, and this could happen at another spatial or temporal scale, for other individual(s), or to another threat (Chelleri et al., forthcoming). This introduces the recent understanding that resilience could be not always a positive nor a desirable feature (Chelleri & Olazabal, 2012) and invites us to have a more open-ended approach to the relationship between resilience and vulnerability (Bennett, Blythe, Tyler, & Ban, 2015; Lauer et al., 2013). Viewed in this way urban resilience decision makers and communities “must inevitably deal with the management of multiple and interacting exposures to different threats through a set of capacities and adaptive responses” (Chelleri, Minucci, & Skrimizea, 2016), making explicit that resilience is a feature that *needs to be managed*, rather than simply enhanced or built. During the workshop, we discussed in depth the policy implications of managing prioritisations respect different resilience approaches, highlighting the importance of understanding and assessing resilience trade-offs in order to better informing policy-making processes. A framework for assessing these potential trade-offs would benefit policy design, avoiding lock-ins, unsustainable outcomes, patterns dependent, or unjust and socially exclusive adaptive and risk reduction strategies.

5 | CONCLUSION

Based on the workshop discussions and burgeoning scholarship in this field, we identify four research priorities to better understand and inform the implementation of urban resilience. First, lines of responsibility for resilience implementation must be analysed and documented in order to clarify expectations about how specific actors behave and the context in which their decisions play out. In-depth cases studies that document the evolution of resilience from idea to action to results are one means to elucidate the complex processes involved in resilience implementation. Second, analysis of how resilience objectives are operationalised through implementation is necessary to diagnose whether these efforts transcend traditional practices to achieve better outcomes (i.e., future-oriented and adaptive) or merely reinforce the status quo (i.e., past-oriented and reactive).

A third research priority is to identify the conditions that enable innovative and transformative approaches to addressing acute shocks and chronic stresses, such as a “safe-to-fail” environment, which embraces bold new ideas and encourages critical reflection and learning for continuous improvement. Understanding whether and how such approaches are institutionalised, and the benefits and costs of their use in practice, is essential to draw lessons about alternative governance arrangements to implement resilience. Lastly, the durability of resilience as a policy objective must be considered, due to the difficulty of demonstrating its value in the absence of an imminent or actual threat. Political and budgetary cycles are short, whereas evidence of the benefits of enhancing resilience accrue over a longer time period. Through comparative

research, analysts can document different techniques by which practitioners both achieve short-term goals, but also entrench an enduring ethos of “resilience thinking” to overcome periodic challenges such as a change of political leadership or budget contraction.

The intention of this paper is to open up a new dialogue and a research line in JCCM whereby academics practitioners and policymakers can learn from the experiences of others and can collectively advance resilience implementation, in all its forms, at the city scale. We are thereby issuing a call for papers that are connected to the issues raised in this paper or other resilience challenges that impact the embedding of resilience in crisis and contingences management.

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