

# A HARMONISE'd approach to building security-driven urban resilience: a call to arms

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HARMONISE'd  
approach

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## Abstract

**Purpose** – Resilience is a topical concept in many academic disciplines world-wide and also among practitioners. In Europe, however, the current conceptualisations of urban resilience are highly specific to institutional contexts, national cultures and traditions and emergent risks faced in particular countries and their urban areas. The differences in how urban resilience is understood and applied are important, and yet such differences are only scarcely addressed in current resilience literature. This paper draws from the EU's Seventh Framework Programme for research, technological development and demonstration security project HARMONISE – A Holistic Approach to Resilience and Systematic Actions to Make Large Scale Built Infrastructure Secure.

**Design/methodology/approach** – The project develops a comprehensive, multifaceted, yet mutually reinforcing concept for the enhanced security, resilience and sustainability of urban infrastructure and development. As part of the project, 61 experts were interviewed in six European countries (UK, Ireland, Germany, Italy, Spain and Finland) to establish a comprehensive understanding of the current role and position of resilience in urban-built infrastructure. These interviews elicit the current views of professionals from a number of contributory and competing disciplines.

**Findings** – Results indicate that there is no shared holistic understanding of urban resilience in Europe. The definitions of the concept vary across disciplines. The research identifies that there are a number of existing theoretical and practice gaps that require to be addressed.

**Originality/value** – This paper presents a number of research and practice “gaps” which are being addressed in the HARMONISE project and which require to be addressed by the wider academic and practice communities.

**Keywords** Holistic approach, Sustainable design, Urban resilience

**Paper type** Conceptual paper

## Introduction

The urban environment is becoming more and more complex. This is particularly so with regard to security aspects following continued and expanding threats to existing and planned large-scale urban-built infrastructure. Such infrastructure (public buildings, commercial centres, transport nodes and entertainment centres) are critical within the intertwined networks of urban areas and include not only physical components, but also integrated hardware and software aspects. Resilience priorities have been increasingly focused on cities because of the particular vulnerability of densely populated political, economic and cultural centres; the interdependencies of



these networked infrastructures; and as a result of continued and rapid urbanisation (Coaffee and Clarke, 2015). These trends amplify the pressure upon cities to keep citizens safe, healthy, prosperous, well-informed and supplied with essential services. However, a comprehensive and holistic (systematic) approach to improve the resilience and security of large-scale urban development against attacks and disruptions has yet to be thoroughly developed.

The general aim of the HARMONISE – an European Union (EU)-funded security project[1]– is to develop a comprehensive, multi-faceted, yet mutually reinforcing concept for the enhanced security, resilience and sustainability of urban infrastructure and development. Its main output will comprise an Interactive Semantic Intelligence Platform that will host a range of tools that will assist built-environment professionals to achieve this goal of enhancing urban resilience. This platform and suite of tools will provide access to methods that are designed to assist in the enhancement of the resilience of large-scale urban-built infrastructure. Underpinning this is the development of a thematic framework to aid decision-making in relation to the security and resilience of urban infrastructure. This will encompass the design and planning phases of development projects (thereby leading to robust built infrastructure invulnerable to natural/man-made disasters). HARMONISE will ultimately improve the planning and design of urban areas, thereby increasing their security and resilience to the existing and emergent risk and threats.

This brief paper provides an insight into the theme of urban resilience. It identifies emerging findings from the HARMONISE project and outlines a practice-driven research agenda to highlight the need for the built-environment professionals and practitioners and to work in tandem with key urban stakeholders to create a more resilient urban future.

### **The urban resilience concept**

Since the early 2000s, the language of resilience, although contested (Brand and Jax, 2007), has permeated a range of disparate disciplinary areas, a range of policy narratives, multiple worlds of professional practice and the popular media. Whilst the broader resilience literature has focused on, for example, climate change adaption, disaster risk recovery, economic recovery, migratory trends, individual and group psychology, child education or, more broadly, a general sense of uncertainty about the future; it is in the field of security that the emergence of resilience concepts and practices have most notably developed. A number of sources also identify a shift away from a public policy focus on sustainability, towards resilience, a shift attributed to the implicit assumption of equilibrium within sustainable approaches, in contrast to resilience (Davoudi, 2012; Wilkinson, 2011). For example, Edwards in the acclaimed Resilient Nation report (2009) contended that an understanding of resilience based upon “bouncing back” is restrictive, whilst Shaw (2012) suggested that we need to consider a more proactive approach to viewing urban resilience as “leaping forward”. In essence, where sustainability often assumes a present and future of equilibrium, resilience is based upon a change paradigm, which makes it particularly helpful for managing a complex and uncertain future: “where sustainability aims to put the world back into balance, resilience looks for ways to manage in an imbalanced world” (Zolli, 2012).

Resilience is a concept incorporating a vast range of contemporary risks and stresses. It has become increasingly important to our understanding of contemporary urban

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policy and practice, offering a new and increasingly relevant set of ideas, tools and approaches to help understand the complexities of an increasingly urbanised world (Coaffee *et al.*, 2008; Davoudi *et al.*, 2013; Scott, 2013; Stumpp, 2013). Within the urban context, there has been a shift in recent years to an increasingly transdisciplinary concept of resilience that integrates its physical and socio-political aspects and emphasises “joined-up” approaches to decision-making. The growing importance of urban resilience has been underpinned by the political prioritisation of the safety and security of communities against an array of perceived hazards and threats. These range from terrorism, disease pandemic and global-warming-related flooding to stresses which serve to weaken the fabric of everyday life, such as fiscal retrenchment and high rates of unemployment. Particularly, after ‘9/11’ 2001, urban resilience has become an increasingly central organising metaphor within the policy-making process and in the expanding institutional framework of national security and emergency preparedness, across all aspects of the “resilience cycle” of mitigation, preparedness, response and recovery (Edwards, 2009).

However, tensions exist regarding the extent to which the principles underpinning urban resilience can become enmeshed within the formal planning processes for vulnerable urban areas. There exists an urgent need to identify key stakeholders, understand their roles and requirements and to investigate how existing risk assessment processes can be utilised or amended to increase the adaptive capacity and resilience of urban areas through planning policy and practice (Coaffee and Clarke, 2015). This so-called “resilience turn” in urban policy (Coaffee, 2013; Coaffee and Lee, 2016) has seen ideas associated with resilience embedded within an array of urban policy and practice, driven by an overarching requirement to secure the future from an array of disruptive challenges, threats and events (Coaffee, 2010; Walker and Cooper, 2011; Cote and Nightingale, 2012; Davoudi, 2012; White and O’Hare, 2014).

As it has evolved, the idea of urban resilience has begun to infiltrate a host of additional social and economic priorities, including planning policies. As such, the use of resilience and the scope of its application have expanded beyond the traditional considerations of security and are increasingly used to understand how different agendas can be practiced and conceptualised. These include disaster risk reduction, climate change adaption, water management, economic development and even community relations (Coaffee *et al.*, 2008; Shaw, 2012; Martin, 2012; Coaffee and O’Hare, 2008; Wilkinson, 2011; Davoudi, 2012; Raco and Street, 2012).

From the perspective of built-environment professionals (planners, architects, surveyors, civil engineers, etc.), attaining resilience often requires an enhancement of urban planning and design techniques to make cities and associated critical infrastructure more resistant to exogenous shocks. Moreover, urban resilience is seen as a collective responsibility which ‘is 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 *et al.*, 2008). Urban resilience, therefore, both shapes the way we perceive the challenges cities face and provides a framework by which to respond. Within this urban focus, the built environment is of critical importance. As Valdes *et al.* (2013) note that achieving a resilient built environment is of paramount importance in the functioning of human society, thereby underlining the importance of achieving resilient cities.

### **Urban resilience policy**

Urban resilience policy has emerged as a means to secure the future from disruptive challenges, security threats and hazardous events. The successful integration of urban resilience policies involves a range of stakeholders operating at multiple scales, dealing holistically with different issues and providing integrated governance or response. However, in practice, policies that promote urban resilience do not always arise from a specific or explicit resilience objective *per se*, and where they do, the synergies often emerge *ad hoc* through a combination of other initiatives which aim to secure against future adversity.

National policies and associated responsibilities for dealing with disruptive challenges (which in effect build urban resilience) differ between nations and are influenced by historic policy developments, national governance structures (Handmer and Dovers, 2011) and the emergence of a range of city resilience toolkits and assessment indexes from a host of local, national and trans-national organisations and networks (notably Rockefeller 100 Resilient Cities, ARUP's City resilience index, UNISDR's Making Cities Resilient campaign and Siemens Resilient Cities toolkit) (UNISDR, 2012). At the same time, those organisational and governance structures that are in place to implement policy also vary from and within EU states. Therefore, an understanding of the contexts in which these activities take place is critical in developing a more holistic solution to urban resilience across the EU and internationally. For example, regarding how different stakeholders are integrated in the development and implementation of policy, how policy is adapted and operated at different spatial scales and how such policies are co-ordinated across different spatial scales to ensure holistic governance.

The HARMONISE project is being carried out among six European countries: Ireland, Italy, Finland, Spain, Germany and the UK. Each country has a different approach to resilience set within its own governance structures, but there are common threats and hazards faced by all nations. An initial overview of the European context identified five broad policy areas which address aspects of urban resilience and, at present, are not aligned. These are emergency planning, national security, urban planning, sustainability and climate change and crime and community safety.

### **Urban resilience challenges, emerging gaps and trends**

In the HARMONISE project, a stakeholder-engagement exercise was undertaken, followed up by a series of risk-screening workshops in each of the case study countries. The results highlighted the challenges that are commonly encountered by the array of stakeholders tasked with delivering urban resilience. Sometimes these challenges present themselves as gaps in knowledge that need to be filled, or, alternatively, as trends that are emerging as important factors in thinking about the future scope of security-driven urban resilience.

These include:

- *The need to pay attention to long-term adaptation as part of a broader and more strategic approach to resilience thinking:* At present, short-term fixes are generally favoured over longer term solutions. There is a pressing need to undertake a detailed Europe-wide analysis to determine the range of future challenges (and opportunities) and the possible technological pathways faced by cities in attempting to develop long-term resilience strategies.

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- *Limited strategic thinking*: There is often a lack of horizontal and vertical integration between actors and agencies responsible for urban resilience. For urban resilience to be successful, it is essential that better relationships are formed between those that design, those that build, those that manage and those that use urban spaces.
  - *A lack of leadership and political support*: The leadership of resilience practices tends to be fragmented and divided between a number of stakeholders with implications for the ease at which urban resilience responses can be delivered. Short-term political cycles often dominate spending decisions. Increasingly, there is a trend emerging of responsibility for urban resilience being passed down to the local level.
  - *The need to consider multiple viewpoints in a transparent and participatory process*: Often the command and control management of urban resilience decision-making has meant processes have lacked transparency. If urban resilience is to be seen as a collective responsibility, then appropriate governance mechanisms need to be found so that appropriate stakeholders are involved at the right stages in the design and planning cycle.
  - *The development of bespoke guidance/frameworks*: In many EU member states, there is little guidance informing stakeholders of possible choices available to them regarding implementing urban resilience. Evidence supports the notion that regulation is required to “force” built-environment professionals to consider (costly) resiliency measures.
  - *Better training and education*: There is a fundamental lack of training, especially within the built environment professions, in urban resilience issues. Training the next generation of young professionals to work in an interdisciplinary way and equip them with the skills and knowledge to think and practice in a resilient way is now a pressing priority throughout Europe.
  - *Better measurement of vulnerability including role of spatial data*: Whilst there are a multitude of risk assessment tools and methodologies available for use by built-environment professionals, many of these are not fit for current purpose and take a simplistic probabilistic view of risk (insurance premium setting being an obvious example). To put into practice urban resilience requirements calls for increasingly nuanced tools that utilise all available data. Also, are the traditional indicators used to assess resilience still valid?
  - *The enhanced use of digital technologies and big data*: Big data emanating from an array of sensors and new technologies, curated data sets, open-source material and social media provide opportunities to utilise a greater amount of information more quickly (to aid resilience practices and to better understand the changing nature of city life). This is increasingly encompassed within the smarter cities concept.
  - *Better financial modelling (including consideration of dual-use technologies)*: Making the business case for enhancements in urban resilience is often hard in pressing financial times. Increasingly, there is scope to consider alternative financial models of how this might be achieved in practice to enable the current built environment to be future-proofed in the most efficient and cost-effective way. What is clear, however, is that early consideration of resilience at the earliest possible stage in the building cycle will lead to better and more economic solutions.

## Conclusions

There is a pressing need to address the shortcomings of traditional “siloed” thinking and more “traditional” views of resilience that seek recovery or bounce-back to a pre-defined equilibrium state.

The “state-of-the-art” in security-driven urban resilience of large urban buildings and related infrastructures encompasses a multi-faceted but inter-related range of dynamics, comprising design, planning, socio-technologies, financing, and advancement and innovation in material composition. Individually these components have a well-established and evidence-based foundation in respect of resilience. However, it is essential that the continued advancement of the security and resilience of large-scale urban-built infrastructure be undertaken, to ensure the ongoing development application of best practice.

Integration of these elements is therefore critical in developing an approach which moves beyond the state-of-the-art and addresses the “implementation gap” (Coaffee and Clarke, 2015) in the operationalisation of urban resilience in practice. In doing so, urban resilience has to take advantage of co-benefits and complementarities, and realise synergies in the broader context of sustainable urban development. This is the space into which the HARMONISE project has moved and represents a rich and important field for both theoretical and applied research in the future. This is also an approach recently represented in the UN Sustainable Development Goals (SDGs) released in September 2015, replacing the former Millennium goals, and that set targets in relation to future international development up until 2030. Within the SDGs, the discourse of resilience is utilised to highlight how we should respond proactively to a range of shocks and stresses and how we might collectively operationalise a “joined-up” response. Notably the so-called “urban SDG” – Goal 11- is dedicated to make(ing) cities and human settlements inclusive, safe, resilient and sustainable, whilst target 9.1 focuses upon critical infrastructure resilience and the need to “develop quality, reliable, sustainable and resilient infrastructure [...]”. This is a vision for sustainable development that chimes with the emerging discourse of urban resilience that is slowly but surely extending the ways in which built-environment professionals think about future sustainability issues and which is changing the nature of professional practice (Coaffee and Lee, 2016).

The challenge for all built-environment professionals – including the construction and real estate sectors – is clear: Interdisciplinary research is needed, alongside a greater willingness to view challenges facing urban society in a holistic fashion. Educational and training programmes need to take cognizance of the multifaceted nature of future threats to society and the economy and consider a process of integration and cross-fertilisation, to increasingly train built-environment professionals to face these challenges in a holistic fashion. This is about both knowing more about other disciplines and having greater respect for what these disciplines can offer.

There is also a need for the industry and urban policymakers to strive harder to identify the optimal practical, physical and financial options to face and fund methods and approaches which can address the challenges facing urban areas now and in the future.

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**Note**

1. HARMONISE (A Holistic Approach to Resilience and Systematic Actions to Make Large Scale Built Infrastructure Secure) is a project which has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 312013; For full details of the Project and the Partners involved visit [www.harmonise.eu](http://www.harmonise.eu)

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