



# Resilience Planning

## From hazards to performance

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## 1

## The Focus Issue

- The concept of local resilience has evolved significantly over the last 15 years. Resilience efforts in the early 2000s focused on catastrophic hazards and on building local capacity to recover from extreme events. In recent years, however, the scope of resilience has been expanded to consider the ability of communities to thrive.
- As a result, there is now a significant gap between established risk planning practices, with their focus on specific hazard categories (e.g., most recently, on climate and extreme weather risks) and the evolving concept of resilience as a form of place and property performance.
- This paper introduces an approach for closing this practice gap.

“ There is a significant gap between established risk planning practices and the evolving concept of resilience as a form of place and property performance. ”

The proposed planning framework applies principles from enterprise risk management to the urban development arena, addressing risks in the context of performance planning and management. This contrasts with conventional risk management approaches, in which the management of potential downside disruption and losses is disconnected from the primary motivation behind urban investment: upside value creation, and the social impacts pursued through performance delivery.

The proposed planning framework addresses this disconnect in three ways:

- Concurrent consideration of both downside risks and risks to the achievement of upside opportunities and performance ambitions
- More systemic evaluation of risks as they interact in unique places with unique ambitions
- The design of performance enhancing solutions that double as risk reduction and mitigation measures

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# 2

## Policy Relevance

The traditional separation between downside and upside management has a direct impact upon resource allocation for risk management. Global financial losses from natural catastrophes—now averaging \$180 billion per year—are indicative of the poor economic incentives within established risk management frameworks.\* Even with the best risk planning—including local climate adaptation planning—preventative measures to address catastrophic exposures fail to draw needed budget share and investment. At the same time, the under performance of urban places and regions—even without catastrophic events—also bears very high societal costs, whether in terms of poverty, health care costs, traffic congestion, or pollution. If ‘resilience’ practices are to shape the nature of urban investment and development, then resilience planning needs to establish a more direct and positive relationship between preventative risk management and the financial and social performance returns sought by investors, owners, and residents.

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\* Average annual losses from natural catastrophes also overshadow annual flows of international development assistance (averaging \$130 billion per year, 2005 – 2015).

# 3 The Practice Challenge

Modern practices of urban risk management were rarely established preventatively. New risk management practices (e.g., building standards, zoning laws), organizational capacities (e.g., fire and public health departments), and investments (e.g., sewer and sewage treatment systems) were established as *ex post facto* responses to catastrophic events: to fires and earthquakes that destroyed whole cities; to epidemics that devastated city populations; and to industrial accidents.

“ Siloed management approaches fail to address the range of hazards and vulnerabilities that interact in unique communities, which are located in unique places, designed for unique functions—and now have unique new development ambitions. ”

This disaster-first/manage-later pattern remains evident today. For instance, standards for roofing in the hurricane prone southeastern United States were established in response to \$60 billion in losses (in 2016 dollars) from Hurricanes Hugo (1989) and Andrew (1992). Property development still is not restricted in highly exposed coastal and flood plain areas in many parts of the southeast and central United States, most recently evidenced by major flooding in low lying areas of Louisiana (August 2016). Sophisticated climate adaptation planning exercises, such as one completed for New York City in 2008-2010, have rarely instigated substantial preventative investment. Actual climate adaptation in New York City began in earnest after \$19 billion in financial losses from Superstorm Sandy in 2012.

In addition to their *ex post facto* character, legacy risk management practices exhibit the following other common patterns:

**Each form of catastrophic exposure has been addressed through the establishment of a new risk management domain or ‘silo,’ with its own distinct planning practices and management measures.**

This pattern is being repeated with climate adaptation planning. Siloed management approaches fail to address the range of hazards, vulnerabilities, and performance challenges that interact in unique communities, located in unique places, designed for unique functions—and now with unique new development ambitions.

**The starting point in each new risk planning practice has been hazard assessment—and not opportunity assessment.**

The risk planning process is generally separate and distinct from investment and performance planning. Risk management generally interfaces with investment planning through regulatory or development approvals processes, rather than as part of a front-end development strategy and project design process. Risk management measures are thus generally viewed as costs, if not impediments, imposed without direct or foreseeable returns for those seeking to make investment work.

**Each new, risk management ‘silo’ is then systematized and institutionalized into a risk management regime.**

Each regime involves a complementary mix of innovations in planning, policy, regulation, finance, technical/design elements, professional standards, organizational capacities, and public education. Each regime is thereby made systematic, but not *systemic* in approach. It locks in norms, standards, and requirements related to the specific silo of risk, often without consideration to systemic interactions within the unique context and performance ambitions of that place or community.

# 4 The Unique Requirements of a Resilience Planning Framework

Resilience therefore imposes three unique requirements that are distinct from legacy risk management approaches.

**Resilience puts heightened emphasis on the prevention of losses—not only from known exposures, but from unanticipated ones as well.** The scope of prevention is significantly broader than in conventional risk management, where historical experiences with specific exposures now enable relatively precise estimation of risks and evaluations of measures *for those specific exposures*. By contrast, resilience involves the development of a broader capacity *to anticipate uncertainties and new forms of exposure* as well as new preventative measures.

“ The planning process identifies and designs measures that can enhance investment and place performance while managing the full spectrum of risk. ”

This broader scope explains the close association of resilience with climate change adaptation planning. Climate change poses the challenge of systemic instability as a unique kind of exposure, involving numerous possible but hard-to-quantify scenarios. The potential for misdirected investment is therefore relatively higher. Continuous re-evaluation, the building of adaptive capacities in organizations and communities, flexible response options, adaptable assets, and multi-functional or redundant systems are key.

**Resilience focuses on systemic interactions between the broad range of risks that could impact upon function and performance in an urban area or infrastructure system.** Conventional urban risk management regimes each contribute in a self-limited way to function and performance in their specific risk category, but without reference to other determinants of performance.

As a simple example, fire risk management at the scale of a building or district gives limited consideration to overland flood risk—or even to wildfire risk (as seen in New South Wales and southern California), which can affect access by fire control services. Soil contamination and related health risk management in the context of brownfields redevelopment gives limited if any consideration to market risks, including the displacement of established communities through property appreciation and associated family health risks that can arise from loss of home, community, and livelihood.

Since resilience focuses on overall system stability and on the reduction of all possible forms of disruption, resilience planning has to consider a much broader range of apples-and-oranges exposures and vulnerabilities, and their possible interactions. Conventional approaches avoid this complexity through their organization into management silos.

**Resilience requires that risk management measures improve today's function, quality of life, and performance.** Risk reduction and mitigation in one area (e.g., the risk of home mortgage default following a flood event) often requires preventative improvements to community function (e.g., greater local economic development and small business support, and even improved healthcare and healthier lifestyles, reflecting the relationship between health and household economics). The management of systemic risk at the scale of an urban district often requires upside improvements to infrastructure, social equity, population health, economic vitality and livelihoods, and environmental quality—so as to reduce and mitigate tomorrow's potential downsides.

# 5 A Performance-focused Approach to Resilience Planning

Reflecting the above challenges, a performance risk management approach reduces and mitigates the probability and impact of exposures by improving current day performance. Such an approach needs to focus on two forms of risk:

- Risks that can result in downside losses, including new and emerging hazards, and business and market risks
- Risks that can result in failure to achieve upside performance ambitions, such as political (or mandate) risks, regulatory risk, or post-delivery risks associated with poor management of assets or places.

The planning process identifies and designs measures that can enhance investment and place performance while managing the full spectrum of risk. The result of such a process is a resilience plan or plan ‘element’ –the equivalent of an enterprise risk management strategy for a development project, community, precinct, or system.

## 5.1 Overview of the Basic Planning Framework

The process for preparing a resilience element is organized in familiar planning stages. These stages are summarized in **Figure 1**.

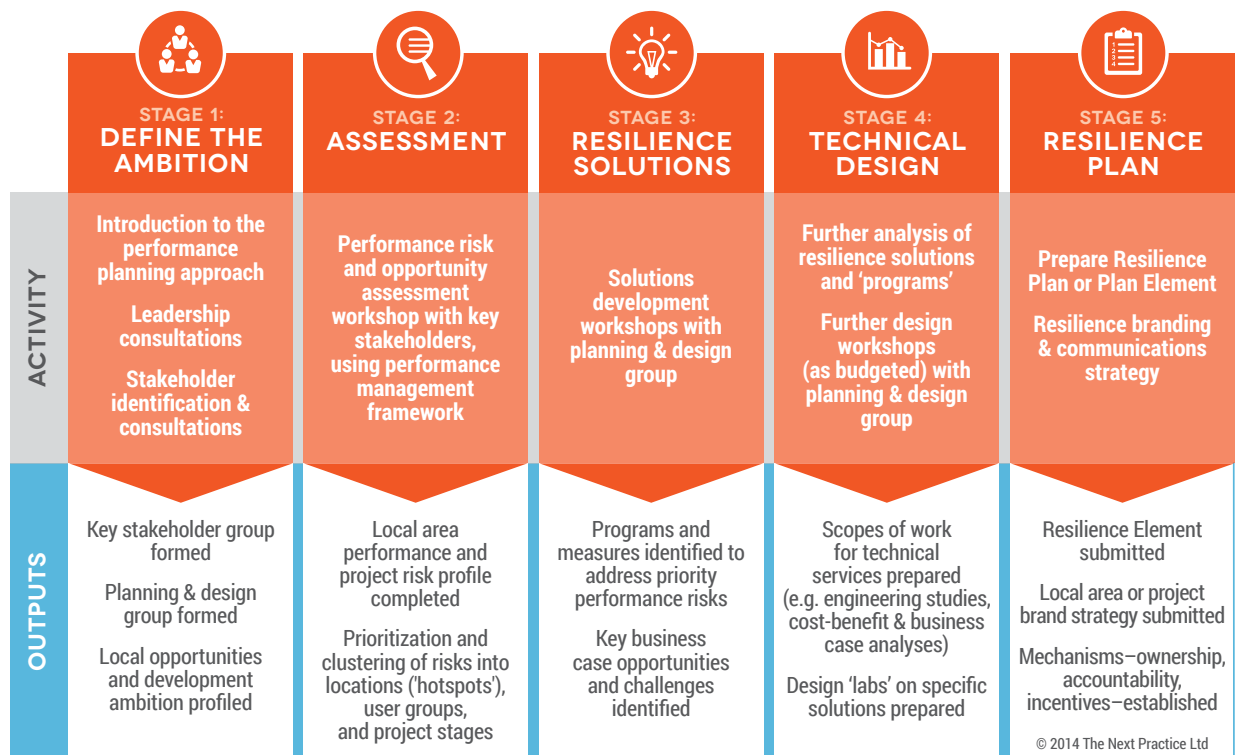


Figure 1. The Stages of Resilience Plan Preparation

The starting point for planning differs from traditional risk management in that initial focus is placed upon the opportunities and performance ambitions for the place or project (Set Up, stage 1).

“ Risks are clustered and further evaluated together at the scales at which an area actually performs...the aim is to identify ‘hotspots’ that could most compromise the performance of the entire area or strategy. ”

Working from a profile of opportunities and targeted performance, the stakeholders then identify i) risk to the upside (i.e., potential risk to the achievement of the defined performance ambition) and ii) downside risk (i.e., potential losses as in a traditional hazards-focused approach). A framework for identifying these risks is summarized in section 5.2 below. The variety of risks identified will be wide-ranging. However, each can be given a risk score using established scoring approaches (i.e., probability times impact).

To enable more systemic assessment of these apples-and-oranges risks, in addition to addressing broad hazard exposures to the whole city and region (e.g., seismic risk), the scored risks are also clustered and further evaluated together *at the scales at which an area actually performs*:

- in specific places within the area (e.g., an intersection, plaza, corridor),
- in particular assets or types of asset (e.g., an infrastructure, a park, or types of building units),
- in local enterprises or institutions (e.g., specific kinds of business risk), and
- among specific user groups or resident communities.

This clustering (see Assessment, stage 2) represents the second main distinguishing factor of a performance-focused approach to resilience.

Possible risk management measures associated with each of the main risk ‘hotspot’ clusters are then considered together to develop a resilience program for each hotspot (Resilience Solutions, stage 3). A resilience program involves a mix of measures to enhance performance, to manage risks to the achievement and maintenance of that performance, and to manage any downside risks to which the hotspot is exposed (Technical Design, stage 4). The programs developed for each hotspot are then incorporated into a resilience plan or plan element for the whole project or area (Resilience Plan, stage 5).

In essence, the resilience plan articulates a guarantee on the project’s or place’s performance. This performance promise provides the basis for project or place branding, and related communications strategy. Effective project brand management motivates communities and stakeholders to invest fully in their ambitions. It also supports market recognition of the comparatively greater and more reliable performance of the project or area.

## 5.2 Risk Identification, Assessment & Prioritization

The following framework (**Figure 2**) provides a logic for simultaneous identification of downside and upside performance risks, across the full cycle of a development project or local economic development strategy. As noted above, the starting point is the stakeholders’ ambition in terms of performance outcomes. Stakeholders address broad the question, *What conditions or events might impede the delivery and sustained achievement of those outcomes?*

“ In essence, the resilience plan articulates a guarantee on the project's or place's performance. ”

This general question is explored with regards to each stage of the project/strategy and its implementation, identifying:



Figure 2. Risk Identification in Resilience Planning

- Mandate risks, arising from political, public, and senior executive/board positions regarding the strategy
- Market and policy risks, arising from the mix of policies, regulations, and economic instruments that together establish the viability (or unviability) of an investment business case
- Business risks, associated with internal capacities and resources of enterprises (public or private) that are key to delivery and operations at desired levels of performance
- Risks to function and brand, associated with the ability of operators to maintain the promoted performance, and to limit downside losses, in the face of extreme events and other forms of change and disruption
- Risks to adaptability, associated with the ability of tenants and users, both individually and as communities, to recover and improve in the face of change and challenges.

Once identified, the risks are prioritized using familiar scoring approaches, as noted. However, to craft a resilience plan factoring such a wide array of risks, we recommend that the significant risks be mapped or otherwise clustered according to specific locations, assets/infrastructures, and user groups. As summarized in **Figure 3** (next page) and noted above, the aim is to identify the 'hotspots' that could most compromise the performance of the entire area or strategy. Such a hotspots approach focuses inquiry and stakeholder discussions upon areas of systemic weakness.



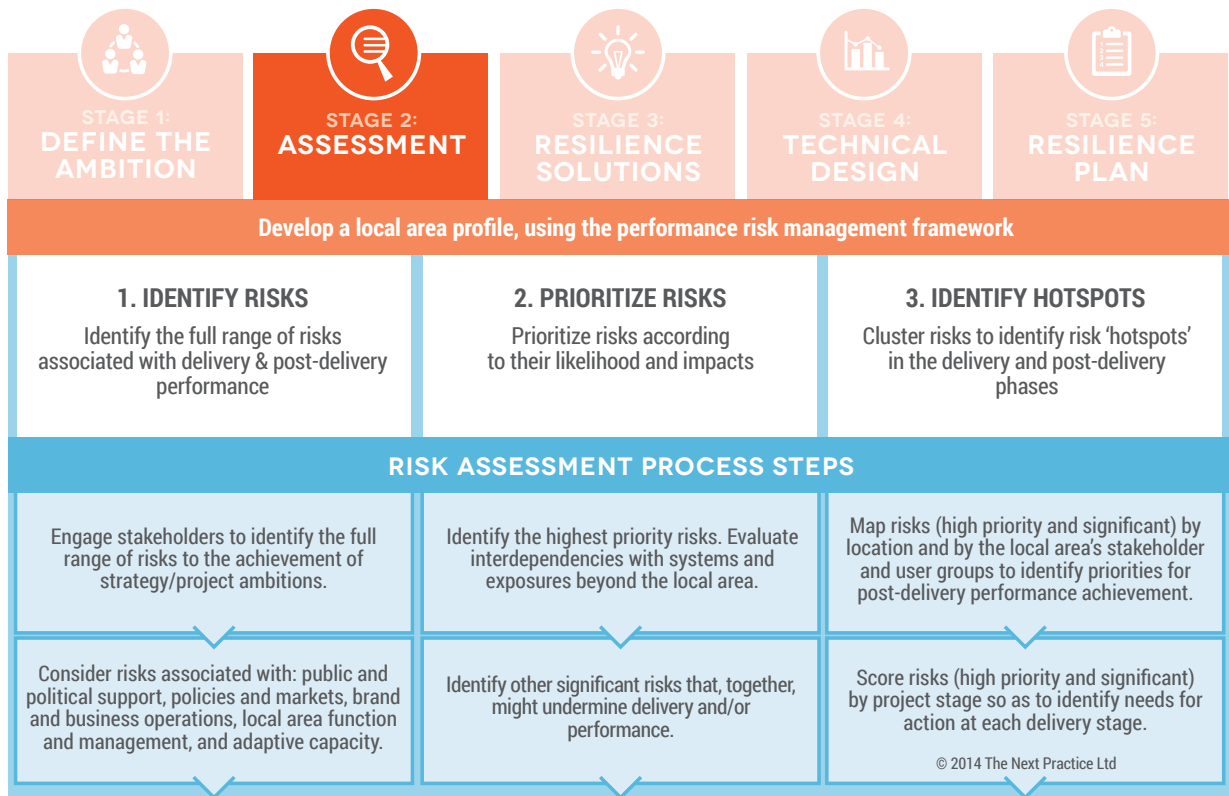


Figure 3. Performance Risk Prioritization in Urban Resilience Planning

### 5.3 Resilience Solutions: Developing a Performance 'Program'

Figure 4 summarizes the logic for designing a resilience 'program' for each hotspot – a mix of measures and solutions to maximize upside performance in ways that also minimize downside risk (and related management expenditures). Elaborated at length elsewhere<sup>1</sup>, the first step for each hotspot is to identify what each stakeholder can do individually to manage the hotspot risks within their own operations or household—and to do so in ways that can improve their own performance. The residual risks that cannot be managed individually are those that must be collectively managed through

additional solutions. Solutions for these collective risks are explored first from a resilience upgrading perspective, identifying how they could be reduced or mitigated through enhancements to the current design or performance of the hotspot area, system, or user community.

These enhancements or 'resilience upgrades' can then be communicated to prospective investors, operators, tenants, and users as part of the aforementioned brand strategy.

<sup>1</sup> Brugmann, J. (2013), *Building Resilient Cities: From Risk Assessment to Redevelopment*. Boston: Ceres, ClimateWise, Cambridge Institute for Sustainability Leadership

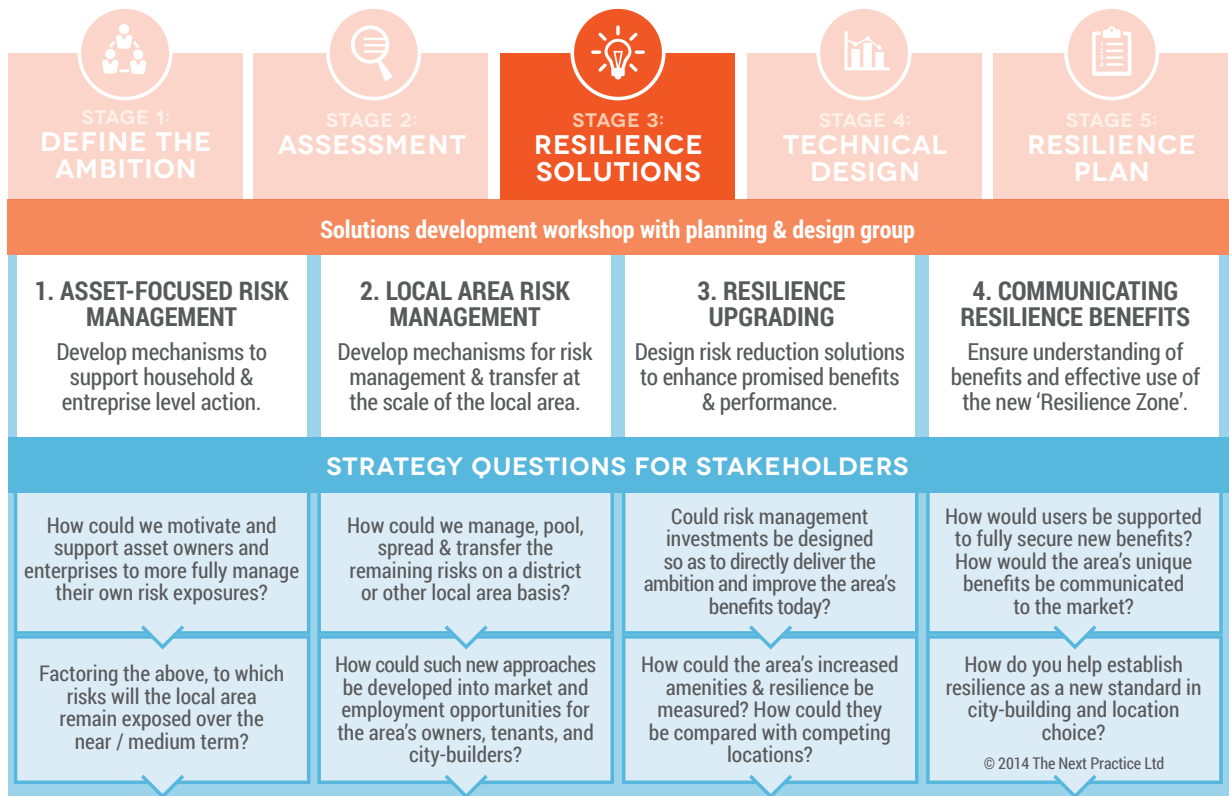


Figure 4. A Logic for Performance-Focused Design of Risk Management Measures

For further information or support to establish a performance-based approach to resilience planning, contact The Next Practice, or follow further posts on our website ([www.thenextpractice.com](http://www.thenextpractice.com)) and on Twitter (@jebbrugmann).

## About the Author/The Next Practice

Jeb Brugmann is Managing Partner of The Next Practice. During the course of his 30+ year career working with municipalities and companies in 28 countries, Jeb has been at the forefront of new, leading practices for local sustainability, poverty reduction, and social enterprise development. A Senior Associate with the University Cambridge Institute for Sustainability Leadership, Jeb is a regular advisor to international development programs, finance institutions, and municipal associations regarding their urban programs and strategies.

Established in 2004, The Next Practice Ltd. supports clients in the private, public, and charitable sectors to develop, pilot and enter the market with new business lines, products or programs for social impact. TNP has served major energy, communications, logistics, financial services, and property development companies; local governments in 15 countries; international development agencies, and national and subnational foundations and social enterprises. TNP either directly manages innovation projects for clients or it helps them design and establish their own innovation programs and processes.



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## About ICLEI

ICLEI-Local Governments for Sustainability, USA is the United States branch of ICLEI, the global network of cities, towns and regional governments committed to building a sustainable future. ICLEI USA is proud to endorse *Resilience Planning – From hazards to performance* and to partner with The Next Practice on its introduction to American cities and counties.

Established in 1990, ICLEI is a global network of more than 1,500 local and subnational governments in more than 86 countries, operating from 17 offices on all continents. ICLEI staff work with ICLEI municipal members to develop and disseminate leading methods, protocols, and software tools for local climate action planning, urban sustainability and resilience planning, eco-procurement, urban biodiversity management, eco-mobility, and other areas of sustainability action. The impacts of this work are measurable. For instance, the 1,000+ cities and counties participating in ICLEI's Cities for Climate Protection (CCP) Campaign collectively reduced annual greenhouse gas emissions reductions by more than 60 million tons CO<sub>2</sub>eq.

ICLEI's work in the field of resilience and climate adaptation planning began in 2002 with its involvement in the establishment of the Resilient Cities Campaign of the UN International Strategy for Disaster Reduction. ICLEI convenes the annual Resilient Cities Congress—The Global Forum on Urban Resilience and Adaptation, concurrently with the annual Bonn Climate Change Conference of the parties to the United Nations' climate convention.



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