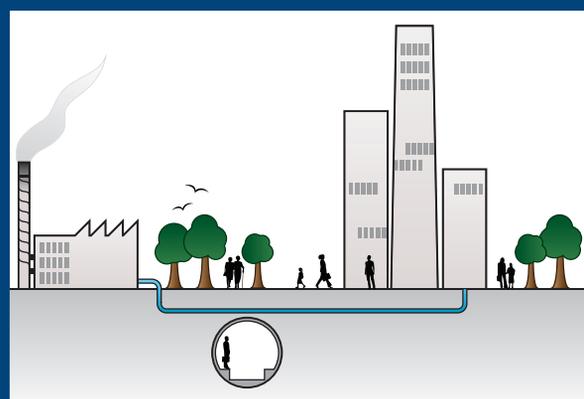


# DESIGNING RESILIENT CITIES

## A guide to good practice

DR Lombardi, JM Leach, CDF Rogers and The Urban Futures Team



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and the Urban Futures Team

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Rosie Phenix-Walker

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**The Urban Futures Method has been developed with input from a wide range of urban development and regeneration specialists, and is based on the current state of knowledge at the time of writing. It is intended as a guide to help professionals understand the resilience of their decisions. The Method and the Interactive Tool must be used responsibly to arrive at considered judgements. They do not provide definite 'yes' or 'no' answers, but rather help the user to make the best decisions.**

# ABBREVIATIONS AND GLOSSARY

<b>BREEAM</b>	BRE Environmental Assessment Method. A rating system for buildings. <a href="http://www.breeam.org">www.breeam.org</a>	<b>Indicator</b>	Measures of change, herein used to refer to those dimensions of the scenarios further characterised
<b>CO<sub>2</sub></b>	Carbon dioxide	<b>Intended benefit</b>	The benefit derived from implementing a sustainability solution, such as reducing car usage and thus air pollution (the benefit) by incorporating cycle and pedestrian lanes (the sustainability solution)
<b>CSH</b>	Code for Sustainable Homes. The national standard for the sustainable design and construction of new homes. <a href="http://www.planningportal.gov.uk">www.planningportal.gov.uk</a>	<b>LEED</b>	Leadership in Energy and Environmental Design. A rating system for sustainable design, construction and operation. <a href="http://www.usgbc.org/LEED">www.usgbc.org/LEED</a>
<b>EPSRC</b>	Engineering and Physical Sciences Research Council. EPSRC is the main UK government agency for funding research and training in engineering and the physical sciences	<b>Market Forces scenario (MF)</b>	Market Forces relies on the self-correcting logic of competitive markets. Current demographic, economic, environmental, and technological trends unfold without major surprise. Competitive, open, and integrated markets drive world development. Social and environmental concerns are secondary
<b>Fortress World scenario (FW)</b>	In Fortress World powerful individuals, groups and organisations develop an authoritarian response to the threats of resource scarcity and social breakdown by forming alliances to protect their own interests. Security and defensibility of resources are paramount for these privileged rich elite. An impoverished majority exists outside the fortress. Policy and regulation exist but enforcement may be limited. Armed forces act to impose order, protect the environment and prevent a societal collapse	<b>Necessary conditions</b>	Those conditions necessary for the future success of a given sustainability solution
<b>Future scenarios</b>	The use of future scenarios has become widely accepted as a means of provoking 'what if' questions (for more on scenarios see 'Using scenarios to explore urban UK futures: a review of futures literature 1997–2011' available on the CD). Consideration of the potential consequences of future changes broadens our thinking about the risks that today's developments might face in the future. Four UK-based scenarios have been developed for use with the Urban Futures Method: New Sustainability Paradigm, Policy Reform, Market Forces and Fortress World	<b>New Sustainability Paradigm scenario (NSP)</b>	In New Sustainability Paradigm an ethos of 'one planet living' facilitates a shared vision for more sustainable living and a much improved quality of life. New socio-economic arrangements result in changes to the character of urban industrial civilisation. Local is valued but global links also play a role. A sustainable and more equitable future is emerging from new values, a revised model of development and the active engagement of civil society
<b>Global Scenarios Group (GSG)</b>	The four future scenarios developed alongside the Urban Futures Method are based on a substantial body of work produced over 20 years by the GSG, a collaboration between the Tellus Institute and the Stockholm Environmental Institute. <a href="http://www.gsg.org">www.gsg.org</a>	<b>NO<sub>2</sub></b>	Nitrogen dioxide
<b>GW</b>	Greywater	<b>OECD</b>	Organisation for Economic Co-operation and Development, formed of 34 countries to stimulate economic progress and trade
		<b>Policy Reform scenario (PR)</b>	Policy Reform depends on comprehensive and coordinated government action for poverty reduction and environmental sustainability, negating trends toward high inequity. The values of consumerism and individualism persist, creating a tension with policies that prioritise sustainability
		<b>Potable water</b>	Drinking water
		<b>QoL</b>	Quality of Life

<b>Resilience</b>	The ability to withstand shocks and disturbances and to continue to operate in recognisable form	<b>Sustainability solutions</b>	Actions taken today in the name of sustainability. Examples of such solutions might be installing a green wall or designing for mixed use
<b>RWH</b>	Rainwater harvesting	<b>Urban</b>	In the UK, any settlement greater than 10,000 people qualifies as urban. Town and village refer to settlements of less than 10,000 people
<b>Scenarios</b>	See 'Future scenarios'	<b>Urban Futures Method</b>	The Urban Futures Method (the subject of this Guide) aims to broaden the way we think about the form and function of urban development and regeneration by focussing on the likely long-term performance of today's urban design solutions, and their associated risks
<b>Solution–benefit pair</b>	A sustainability solution and one of its intended benefits	<b>VOCs</b>	Volatile organic compounds
<b>STEEP</b>	Drivers of change commonly used in scenario analysis (Social, Technological, Economic, Environmental and Political)	<b>WEA</b>	Water-efficient appliances
<b>SUDS</b>	Sustainable drainage systems		
<b>Sustainability</b>	Meeting the needs of the present without compromising the ability of future generations to meet their own needs (as defined by the Brundtland Commission of the United Nations on March 20, 1987)		

## EXECUTIVE SUMMARY

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Global urbanisation is increasing dramatically and most of the world's population now lives in cities. The environmental impact of cities has received much attention in the global debate, making urban sustainability a top priority – for local and national governments, and for the people who live, work and recreate in urban areas.

Sustainability is about putting in place solutions that will yield a positive legacy. Resilience is about putting in place solutions that are resistant to future uncertainties. Large investments are being made today to make our cities more sustainable; the success of these investments depends on their resilience and how the future develops. However, predicting the future is complex – perhaps the only certainties are that there will be change, and that we must learn to live within the resource limitations of our planet. Those involved in urban development and regeneration will influence the resilience and sustainability of our cities through their responses to influencing factors such as climate change, population growth, the global economy, and planning regulation. The Urban Futures Method aims to broaden the way we think about the form, function, and context of urban development and regeneration by focussing on the likely long-term performance of today's urban design solutions, and their associated vulnerabilities.

In this Guide, we present the Urban Futures Method to test the likely future performance of actions taken today in the name of sustainability, in a series of possible future scenarios in the year 2050. Examples of such solutions might be installing a green wall or designing for mixed use. If the proposed solutions work across a range of alternative futures, the investment is likely to prove robust; where there are very different outcomes depending on the future, the solution can either be adapted to create a more resilient outcome (ie it will continue to function in the face of change should the future turn out to be very different) regardless of the future, or implemented with some insight into its potential vulnerabilities.

Incorporating a scenarios analysis based upon four distinct and plausible futures, the Urban Futures Method guides the user through the complexities of thinking about the impacts of future changes in key drivers. Scenario analysis cannot predict the changes, but can help decision-makers to plan for

resilience and adaptation as a key part of project management, for both current activities and future strategies. People are able to think more broadly about the future and about the sustainability of today's actions by considering 'what-if' questions for changes in society, technology, economy, environment and policy (STEEP). While the Urban Futures Method is independent of the chosen future scenarios, the method is illustrated using four scenarios specific to the UK urban context for the year 2050.

It is important to note that the Urban Futures Method focuses on process – broadening the scoping of future risk. The usefulness of the result depends on asking the right questions. The methodology helps to raise questions that would not normally be asked, and provides a structure for exploring them with a view to enhancing the solution that is put into place. The Urban Futures Method is designed to assist in making strategic or detail-level decisions about investing in plans or projects related to urban development and regeneration. The results can be useful to a wide variety of public- and private- sector decision-makers, including community stakeholders, urban designers, planners, developers, architects, and engineers. It is applicable to sustainability solutions at all scales: from the planting of an individual street tree, to building systems such as appliances or water systems, to a mixed use policy implemented at a regional or national scale.

How can we make robust decisions to achieve the lofty goals of sustainability and resilience when we truly do not know what the future will bring? The process of assessing the performance of a sustainability solution in a variety of futures aids practitioners in identifying those conditions necessary for its success and in assessing the likelihood that those conditions will be met in the future. By assessing the necessary conditions in various scenarios, the Urban Futures Method helps identify the causes and effects of a solution's resilience in a methodical way such that risks are evident and the options for adapting the solution are made clearer. Note that it does not assess the current viability of the solution to deliver sustainability benefits today, as its performance is strongly context dependent. Nor does it define the local sustainability priorities, which form part of the local context.

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