

UCCRN_educ Climate-Resilient Urban Planning, Design and Governance Guidance – Synthesis Report for Dissemination

Project Results' Lead Partner:
Università degli Studi di Napoli Federico II

UCCRN_edu — Climate-Resilient Urban Planning, Design and Governance Guidance

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Introduction

This scientific publication represents one of UCCRN_edu’s major contributions to UCCRN’s global research activities. It is part of the Third Assessment Report on Climate Change and Cities (ARC3-3), published by Cambridge University Press within the Cambridge Elements series (see <https://www.cambridge.org/gb/academic/elements>). The aim of ARC3.3 is to provide up-to-date benchmarked knowledge for urban climate change researchers, city practitioners, and policymakers at all levels of governance to motivate rapid action. Cities have emerged as leaders in mitigation and adaptation to climate change, and their role has a burgeoning interest. However, there is a crucial need to synthesise recent research in key areas to scale up and speed up responses. Building on the First and Second Assessment Reports on Climate Change, the UCCRN Third Assessment will be produced as a series of Special Reports on key research gaps and critical topics. In particular, R2 contributed to the Element “Planning, Urban Design, and Architecture for Climate Action”.

The drafting, reviewing, and publication process involved several external contributors linked to UCCRN and UCCRN_edu, including representatives of local authorities and communities engaged during the Intensive Study Programmes, Multiplier Events, and other project activities.

Figure 1. ARC3.3 Honeycomb Figure on Themes and Element Cross-Cutting Themes



The publication tackles emerging issues related to the need to make science understandable to decision-makers and practitioners in the field of urban climate-resilient design, planning and governance, where evidence-based approaches leading to cost-effective strategies are required, addressing both avoided climate impacts and social and environmental and economic co-benefits of climate action.

Innovative cross-cutting topics emerging from UCCRN-EDU activities will be addressed, such as:

- research informing practice, practice informing research
- integrating mitigation and adaptation
- environmental justice as urban climate policy driver
- capacity-building linking technical-scientific experts and community experts

Assessment tools and design/planning approaches will highlight the findings from Urban Design Climate Workshops (UDCWs), focusing on:

- analytical tools and guidelines (metrics, performance indicators and modelling tools, design guidelines)
- interconnected spatial scales (architecture, urban design, planning issues related to jurisdictions, stakeholders and governance, silo-busting across sectors, multi-scale approaches and the role of emerging technologies)
- value proposition (cross-sectoral benefits on health, cost savings, jobs, etc., spatial scales synergies and impact of Public-Private-People-Partnerships)

The publication is expected to have a significant impact on scientific communities, also in light of the ongoing collaboration between UCCRN and significant networks in the field of climate change and urban resilience, such as IPCC, addressing the set of research gaps for urban climate change that emerged from the Cities and Climate Change Science Conference held in Edmonton in 2018 and providing input to the planned “Special Report on Climate Change and Cities”.

The publication has been presented at the UCCRN_edu Multiplier Event in Montreal, during the session on “Key Findings from UCCRN’s Third Assessment Report on Climate Change and Cities” at the Adaptation Futures 2023 Conference. A panel session shared critical research takeaways and policy recommendations from ARC3.3 activities, highlighting key findings and how they can be leveraged to achieve transformative urban adaptation across multiple scales and sectors.

Figure 2. A model to illustrate the phases of a MOOC, its various stakeholders, and costs and revenues. UCCRN_edu team at Adaptation Futures 2023 in Montreal



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1.

Planning, Urban Design, and Architecture for Climate Action

1.1 Overview

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Abstract: Integrating principles of climate-resilient development into planning, urban design, and architecture ensures that the transformation of the built environment supports carbon neutrality, effective adaptation, and the well-being of both people and nature. Professionals in these fields — planners, urban designers, and architects — are tasked with bridging the gap between research and practice. They must enhance their roles and capabilities by adopting innovative methods and tools that function across various spatial scales to align outcomes with local, regional, national, and global targets. Driving systemic and transformative change requires a forward-thinking, action-oriented framework that incorporates multi-scale urban climate analysis, as well as collaborative processes such as co-mapping, co-designing, and co-evaluating with stakeholders and communities. This publication examines how factors such as urban climate dynamics, system efficiency, spatial configuration, building materials, and green/blue infrastructure influence critical metrics, including greenhouse gas emissions, resilience to extreme weather, spatial and environmental equity, and human comfort.

Keywords: Built environment, urban planning, urban design, architecture, climate justice

1.2 Key Frameworks

The publication is divided into eight key content sections underpinning key concepts associated with the paradigm shift in planning, urban design, and architecture theory and practice required for city climate transformation.

1.2.1 Research Informing Practice, Practice Informing Research

Research Informing Practice, Practice Informing Research underscores the evolving relationship between climate action and research. Ongoing obstacles faced by local practitioners and stakeholders in addressing climate challenges help identify critical research needs. These challenges, in turn, inspire the development of a practical, solutions-focused research agenda that stakeholders and practitioners can implement and test to assess effective climate outcomes.

1.2.2 Urban Transformation Through an Expanded Climate and Innovation Agenda

Urban Transformation Through an Expanded Climate and Innovation Agenda emphasises the importance of engaging urban practitioners, innovators, communities, and decision-makers in fostering rapid climate-resilient development that prioritises human needs and societal well-being. Architects, urban designers, and planners are encouraged to drive transformative change by adopting disruptive, dynamic, non-linear, and systemic approaches that highlight the role of innovation.

1.2.3 Climate Resilient Urban Transformation

Climate Resilient Urban Transformation examines the returns on investments in urban transformation and explores how practical climate policies leverage synergies between social goals and urban systems. It highlights the cross-sectoral advantages of urban transformations, including improvements in public health, economic savings, and job creation, all framed within the context of climate justice and equity. Additionally, it considers the role of “carrot and stick” incentives employed by public, private, and institutional stakeholders to drive action.

1.2.4 Integrating Mitigation and Adaptation

Integrating Mitigation and Adaptation emphasises actions that integrate the dual objectives of climate intervention, viewed through the framework of applied research. Rather than perpetuating the traditional divide between mitigation and adaptation — which can result in fragmented efforts or unintended consequences — it examines harmonized strategies tailored to urban settings that optimise the use of limited resources. These strategies include climate management initiatives aimed at reducing greenhouse gas emissions while simultaneously delivering co-benefits such as mitigating heat stress, improving flood management, and enhancing infrastructure resilience.

1.2.5 Embedding Environmental Justice in Planning and Design

Embedding Environmental Justice in Planning and Design incorporates this critical societal challenge into climate-focused planning and urban design by prioritising community engagement in setting priorities, shaping resilience strategies, informing decision-making, and planning project phases. While climate action offers economic opportunities for cities, these benefits must account for equity in distribution, context, and processes. The discussion emphasises how climate-driven initiatives such as transitional justice, job training, and circular economy programs can create economic opportunities for marginalised communities. It also explores how urban design and planning can address disparities in vulnerabilities, including exposure to climate hazards and air quality issues.

1.2.6 Capacity Building for Urban Decision Makers and Practitioners

Capacity Building for Urban Decision Makers and Practitioners describes recent research on stakeholder processes and examines ways for community experts, policymakers, and practitioners to enhance practices in knowledge-sharing, co-design, and co-evaluation. Successful local climate action relies on shared principles, such as equitable funding, inter-agency cooperation, and alignment on common priorities. Engaging the full spectrum of stakeholders in climate-resilient urban transformation requires achieving a balance between top-down and bottom-up approaches.

1.2.7 Metrics, Performance Indicators, and Tools

Metrics, Performance Indicators, and Tools introduces evaluation techniques and advanced strategies for adaptation and mitigation, encompassing digital tools, modeling approaches, intuitive climate-focused design guidelines, and direct engagement with stakeholders. It addresses key questions such as how to measure performance, determine success, and apply climate research for broader implementation and scaling. The

analysis considers spatial scales, examining the necessary cross-sectoral expertise, tools, and methodologies required from the building level to neighborhoods and metropolitan areas.

1.2.8 Urban Design Climate Workshops (UDCW)

Urban Design Climate Workshops (UDCW) outlines a forward-thinking, action-oriented framework designed to address climate change challenges in urban environments and explore opportunities for cross-sectoral improvements (Raven, 2021). It features examples from various Urban Design Climate Workshops (UDCWs), where urban design professionals, researchers, policymakers, stakeholders, and graduate students collaborate closely. The UCCRN team has engaged with city officials, communities, and practitioners to develop localised climate action roadmaps, tackling specific urban challenges and utilising tools and methods to advance climate-resilient planning and design practices.

The full publication is available in open access at the following link:

<https://www.cambridge.org/core/publications/elements/elements-in-climate-change-and-cities>

References

¹UCCRN *Assessment Reports on Climate Change and Cities* (ARC3) authors are associated solely with their cities or metropolitan regions.

²ARC3 Element Scientists support the Coordinating Lead Authors in content development and research support.

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