



URBAN RESILIENCE AND CLIMATE CHANGE  
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# Urban Resilience and Climate Change: Innovative Solutions



CANBERRA,  
MELBOURNE  
AND SYDNEY



**Cities consume around 75% of the world's energy and produce more than 75% of all carbon emissions. Cities are also experiencing very substantial impacts to life and property from extreme weather events.**



**“Cities are hubs of innovation and human ingenuity—and potential centres for transformative action to implement the Sustainable Development Goals and build a zero-carbon, climate-resilient and socially just world.” United Nations Secretary General, World Cities Day 2021.**

**How cities can adapt to and enhance resilience to climate change, highlighting Australia.**

Cities and climate change is now a central theme in global discussions. The 28th meeting of the Conference of the Parties (COP) to the United Nations Climate Change Conference (COP 28) and the Intergovernmental Panel on Climate Change (IPCC) clearly recognise the huge importance of both reducing emissions from urban settlements and planning for the impact of climate change with appropriate adaptation measures. Cities consume around 75% of the world's energy and produce more than 75% of all carbon emissions. Cities are also experiencing very substantial

impact to life and property from extreme weather events (Norman et al. 2018, p. xv). The planning and design of cities and urban settlements has gained greater importance because this is where a substantial impact can be made in relation to climate change.

The recent 2023 IPCC report stresses the significance of climate resilient development through the integration of adaptation and mitigation, international cooperation, financial support for vulnerable regions, and inclusive governance. The IPCC announced

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in November 2023 a forthcoming special report, Climate Change and Cities, while COP 28 concluded the importance of "increasing the resilience of infrastructure and human settlements to climate change impacts to ensure basic and continuous essential services for all, and minimising climate-related impacts on infrastructure and human settlements" (UNFCCC 2023, s28 63e).

Across the globe, there is a groundswell of climate action at the local and regional level, often with national support in the form of a national urban policy including climate change. Global organisations including the UN's Environment Programme, the United Nations Framework Convention on Climate Change (UNFCCC), UN Habitat, and the Organisation for Economic Cooperation and Development have active programmes for supporting and implementing climate resilient development. These programmes range from sharing implementation frameworks that can be applied locally to direct funding for resilience projects.

### Challenges

While reducing greenhouse gas emissions is critical to minimise impact on current and future communities, adapting to the impact of climate change is of equal concern. We have seen several extreme weather events in the last few years, such as drought and extreme heat, coastal storms and flooding, and in some cases, a convergence of events has resulted in enormous costs to life and assets. The UN's SDGs continue to provide a clear framework for global to local implementation (for example, SDG 11 on sustainable cities and communities). Embedding climate change action into the framework at the urban level is a priority.

In my recent book, *Urban Planning for Climate Change* (Norman 2022), I outline these essential actions in response to the current challenges to change:

- Mapping of risks
- Community engagement
- A range of planning tools including scenario planning
- Mandatory consideration of climate change in all land use planning
- Nature-based solutions
- Collaboration
- Capacity building and training
- Climate-induced resettlement
- Indigenous knowledge
- Investing in forward strategic planning

It is critical that climate information is up to date and made public and accessible for communities to make informed decisions on building and development.

### Ways and Opportunities

There are many ways and opportunities to build resilience to climate change. These include:

1. Investing in strategic planning, to clearly identify through climate projections land that is suitable for development and land at risk from climate change, is essential to minimise risks to current and future urban communities. Including climate change considerations in planning legislation and infrastructure developments will ensure that mistakes are not made early on and can, as a result, save considerable costs in the future.
2. Developing climate-sensitive built environments is an excellent opportunity for innovation with multiple benefits for urban communities. Designing for the transition to a net zero or, preferably, a carbon positive built environment should be the goal. Possible innovations in this area include water-sensitive urban design to cool the urban environment, the use of recycled materials in construction, solar roof tops for renewable energy, rooftop gardens and recycling waste management.
3. A combination of the above is the creation and maintenance of healthy green and blue infrastructure for the spaces between buildings. Creating wetlands for storm-water management adds to urban amenities and the reduction of the impact of urban heat islands. Investments in landscape and quality open spaces are good for the climate, residents,
4. Space for renewable energy and active travel such as walking, the use of bikes, light rail, or electric charging, is essential in any new developments or when retrofitting existing urban developments. Redeveloping older suburbs with well-designed medium density to offer a greater diversity of housing choices provides the opportunity to implement more climate-sensitive sustainable urban development.

These are examples of ways in which opportunities can be created through good precinct planning at the block level, or at the level of the neighbourhood or suburb or regional centre.

and biodiversity, resulting in a healthier place to live and work (CLC 2019).

### A Look at Australia

The Australian Government is developing a new national urban policy to address urgent challenges facing our major cities. It is advised by a national Urban Policy Forum (of which I am Chairperson) comprising wide representation and supported by a dedicated Cities Unit focusing on climate change and contemporary urban challenges. Providing policy guidance with sub-national governments and industry to develop a more climate-resilient future is an important step, as is a funded grant programme for precinct planning.

Innovative solutions in Australia can be found at all levels of government, in industry and community groups—some examples of leading practice to illustrate what's possible with good planning, policy, partnerships and collaboration can be found below.

#### Decarbonised Precincts

At an industry level, the Green Buildings Council of Australia (GBCA) is leading the way with its roadmap for decarbonised precincts. The GBCA identifies key steps, including:

- Embedding climate positive pathways into all stages of planning
- Committing to fossil-fuel-free precincts and ensuring policy and planning processes support this ambition
- Removing barriers to low carbon precinct energy solutions





Low angle view of apartment buildings with vertical gardens and heliostat with motorised mirrors, Central Park residential building on Broadway, Sydney, Australia.  
Image: mamember / iStock

- Driving lower upfront carbon in materials and construction activity
- Committing to delivering low carbon buildings in all precincts (GBCA 2024)

To support the GBCA roadmap, considerable research is being undertaken to aid the implementation of low carbon precincts with detailed pathways and examples of leading practice (Curtin University 2023).

**Green and Blue Infrastructure**

The provision of green and blue infrastructure is critical to reduce the impact of the urban heat island. Australia has a solid history of

leading-edge practice in water-sensitive urban design. Integrating wetlands, restoring concrete waterways to natural landscape water courses all help to cool the environment and offer considerable benefits to the local communities through improved urban amenity and healthier urban environments.

The City of Sydney Urban Forest Strategy takes a comprehensive approach to landscaping the urban environment, bringing three key elements—growth, equity, and resilience—together with four key directions: an integrated forest, a growing forest, a forest for all and a resilient forest. This approach is supported by a species list and planting guide for city

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residents. The resilient forest direction focuses on planting and maintaining a more diverse urban forest of different species and ages to improve its sustainability and minimise overall risk from disease and the impact of climate change (City of Sydney 2023, p9). There are also excellent urban forestry plans for a number of major cities, notably Melbourne and Canberra (City of Sydney 2024; Australian Capital Territory [ACT] Government 2019).

**Active Living and Smart Infrastructure**

An important step towards more climate-resilient urban settlements is the provision of smart

infrastructure for public transport and active living. Integrating active living infrastructure into new urban construction and retrofitting existing suburbs is an essential step for climate-sensitive development, both help to reduce emissions and adapt to a changing climate.

There are excellent examples of active living in Australia, such as the active living strategy for Canberra, known as Active Travel Plan 2024-2030. This is supported by a Design Guide detailing the "best practices for intersections and other active travel infrastructure in the ACT" (ACT government 2024).



Jacaranda flowering in the gardens in Central Melbourne.  
Image: Zoya\_Avenirovna / iStock





Canberra, Australia, 4 May 2016. Autumn arrives in Canberra, trees become multicoloured around Lake Burley Griffin.  
Image: Daniitec / iStock

There are five key priorities of the Plan:

1. Safe infrastructure for people walking and riding
2. A better connected and maintained walking and riding network
3. Support for new types of active travel
4. Making active travel and bicycle parking easy
5. Supporting behaviour change and working with communities

An example of a non-government initiative is the Heart Foundation of Australia's Blueprint for an Active Australia (Heart Foundation 2019). The blueprint brings together active living, health, and climate-sensitive urban environments, with a key focus on the built environment. Key elements recommended for retrofitting neighbourhoods include mixed land use, medium higher densities, and "design neighbourhoods with high levels of street connectivity, diverse lot sizes and dwelling types, access to amenities and increased natural surveillance" (op cit. p18).

### Conclusion

Around the world are many examples of innovation to develop cities, towns and suburbs that are more resilient to climate change. With clear goals, targets, and collaboration, we can all work towards developing more liveable, prosperous, and healthy urban communities and environments. 📍



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