

Greener urban environments

LSPS Priority 5

4.0 Greener urban environments

Open space and the connections between the urban and natural environment contribute to our standard of living. Our waterways, beaches, bushland, open spaces and parks are integral to the liveability and wellbeing of our community. It is necessary to maintain and enhance these connections by designing our communities around nature using the 'green and blue' grid to keep urban areas cooler and enhance biodiversity and ecological resilience.

The Towards 2040 principles for *Priority 5: Greener Urban Environments* will guide future planning decisions. The principles include:

- Create a resilient, healthy and interconnected urban tree canopy across the Northern Beaches.
- Protect, maintain and enhance the existing tree canopy, including mature trees.
- Provide a diverse range of species of varying families and genera, prioritising local native tree, shrub and ground cover species.
- Offset tree canopy loss by planting a minimum of two trees for any one tree removed from public and private land.
- Integrate the design of green, blue and grey infrastructure in support of the urban tree canopy.
- Reduce exposure to UV radiation and the urban heat island effect by increasing the urban tree canopy and green cover, incorporating water sensitive design and improving infrastructure and building design.

The urban tree canopy is a form of green infrastructure that helps to mitigate urban heat, manage temperature increases associated with climate change, heatwaves, urban heat island effect and protection from UV radiation. Shady streets also enhance visitor experience, reduce energy costs and add appeal for retail, business and office developments.

The Northern Beaches has one of the highest urban tree canopy coverages in Sydney, with overall coverage estimated at 39%. Tree-lined streets, urban bushland and tree cover on private land, are components of the urban tree canopy.

What is urban tree canopy?

Urban tree canopy refers to all trees on public and private land within urban areas. This comprises a variety of tree types such as exotics, natives, deciduous trees, and evergreens occupying a range of environments from busy city centres to regional main streets and suburbs.

On the Northern Beaches, our urban tree canopy refers to the tree canopy in urbanised environments outside of National Parks and rural and bushland areas.



Every 10% increase in tree canopy can reduce land surface temperatures by **1°C**



The tree canopy cover for street trees in the Northern Beaches is **39%**

4.1 Benefits of a Greener Urban Environment

The 'green and blue' grid across the urban environment is critical to the liveability and the environment of the Northern Beaches. They are just as important as roads, car parks, water and buildings.

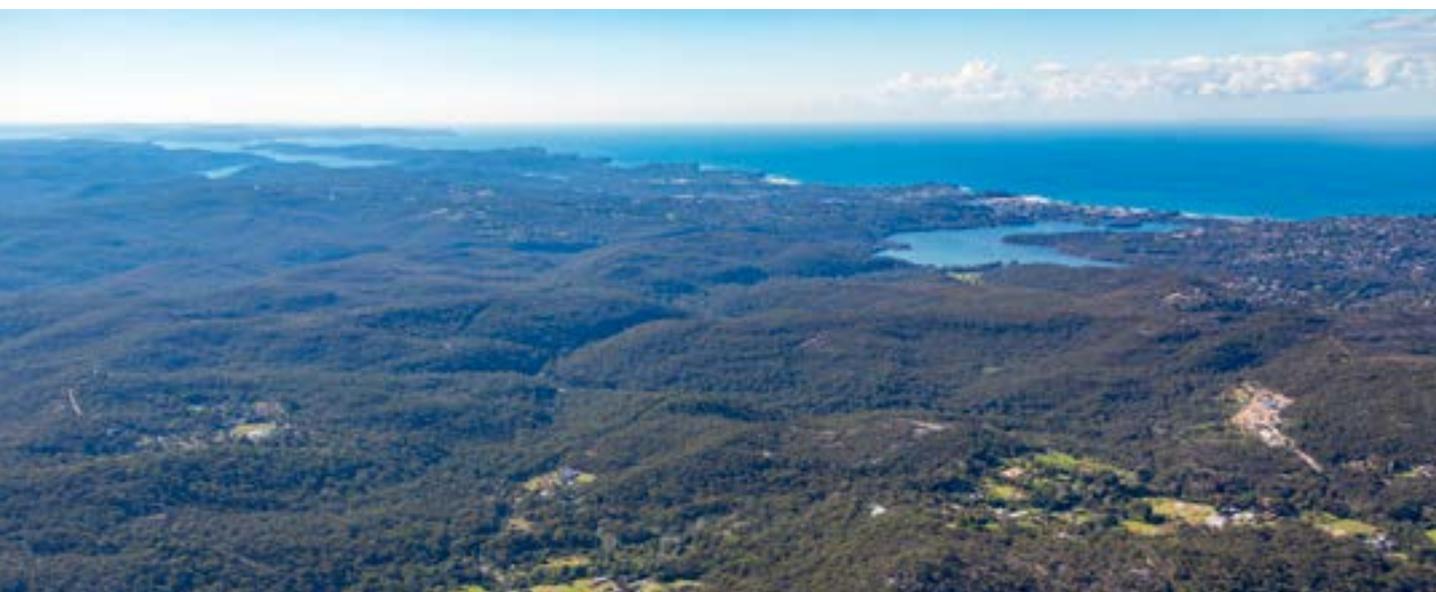
Connections across the natural environment, whether it be bushland, waterways, lagoons or coastal environments, are essential for biodiversity and ecological resilience. This includes backyard bushland connectivity which enables native fauna to migrate throughout the region.

The green and blue grid is also important for urban areas of higher density, where, over time, bushland has become fragmented and where the value of native species plantings can increase native fauna habitat.

The Northern Beaches coastal lagoons contribute to maintaining and enhancing the blue-green grid connections. Narrabeen, Manly, Curl Curl and Dee Why Lagoons provide important wildlife habitat and refuges. The lagoons and their riparian lands also support and provide recreational opportunities for the surrounding communities.

Connections to the green and blue grid is fundamental from a human health perspective, supporting active, physical lifestyles and mental health outcomes. The lifestyle benefits associated with natural environment connections is one of the hallmarks of life on the Northern Beaches. Protecting and enhancing these assets goes well beyond their intrinsic benefits.

The urban tree canopy also supports cleaner air and water, provides local habitat and reduces the urban heat island effect. Trees remove fine particles from the air and help insulate against urban noise pollution, particularly important along busy roads.



4.2 Heat

Extreme heat events have killed more Australians in the past 200 years than any other climate (i.e. natural) hazard (Coates 1996). With an increase in population, urbanisation, ageing and climate change, the health impacts of extreme heat are likely to increase, with those most affected likely to come from vulnerable groups in our communities (NSW OEH, 2016).

Heatwaves will become more frequent as the climate changes and a problem like urban heat cannot be eliminated. An overall increase in temperature means that current extreme heat events will become hotter, more frequent, with increased duration and therefore more severe.

The NSW OEH (2014) has presented a snapshot of the expected temperature changes in Sydney:

- In the period from 2020–2039, maximum temperatures are projected to increase by between 0.3–1.0 degrees C; and
- By 2070, the maximum temperatures are projected to increase by 1.6–2.5 degrees C.

In addition, it is expected that the Northern Beaches will experience an additional four hot days each year by 2030 and 11 additional hot days by 2070. Hot days are defined as days with a maximum temperature over 35 degrees C. The increase in hot days will be more pronounced in areas away from the coast.

Change in annual mean temperature (°C)
1990-2009 to 2020-2039



Change in annual mean temperature (°C)
1990-2009 to 2060-2079



4.3 Challenges and Opportunities

Communities should be sensitively designed within the natural environment to build resilience to heat and allow natural processes help to improve liveability of the urban environment. In addition, the shade is integral to creating welcoming places for people.

The Greater Sydney Green Grid concept is visionary and displays solid principles about the importance of open space, landscape character and natural processes that benefit cities and towns. The resulting advantages which emerge with striving for a greener urban environment include:

- combatting the urban heat island effect with natural shade and cooling;
- assisting storm water quality, drainage and absorption;
- contributing to improved air quality;
- increasing habitat and safe corridors for wildlife;
- increasing resilience to climate change; and
- enhancing opportunities for environmental awareness and social activity through bush care and community gardens.

4.3.1 Urbanisation

Urbanisation can disconnect people and the natural environment. It can also lead to a loss of tree canopy and increase localised temperatures that contribute to the urban heat island effect.

Urban consolidation will help avoid unnecessary land clearing, habitat loss and further fragmentation of ecologically valuable areas of bushland and corridors. However, this will likely also translate to an increase in the density of development of existing and emerging strategic centres such as Dee Why, Manly and Frenchs Forest.

Incorporating greener urban environment principles across these centres will help maintain the natural environmental character of the Northern Beaches, and the connectivity of corridors and environments throughout these areas.

The rehabilitation and revegetation of creeks and waterways is a key opportunity to re-establish network connectivity and enhance open space and water quality outcomes, at a regional scale. Supplementing these opportunities with urban backyard connections recognises the important environmental services these connected networks play in the function of cities.

4.3.2 Urban heat island effect

A key issue of urbanised environments is associated higher temperatures as materials and surfaces such as concrete and bitumen absorb heat. Treeless urban areas generally have higher temperatures than the surrounding vegetated urban areas which give them an island appearance in heat maps leading to the name urban heat island effect (UHI).

As noted, as a result of climate change, it is expected that there will be an increase in temperature in the area in both the near (2030) and far (2070) future.

Strategic centres and employment hubs of Mona Vale, Brookvale, Dee Why and Frenchs Forest and along major entry and transport routes of Pittwater Road, some parts of Barrenjoey Road and Condamine Street are particularly susceptible to the urban heat island effect. In these locations for example, the urban tree canopy coverage is about 11 per cent, with some areas as low as four per cent.

Increasing the urban tree canopy or other green infrastructure, such as green walls, green roofs or water sensitive urban design, across our urban areas will help to cool the urban environment.

Environmental Planning Actions

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The following environmental planning actions have been developed to deliver the LSPS planning priorities. These will also help to achieve the outcomes of the ECC Strategy.

LSPS Action	ECC Strategy	Environmental Planning Actions	Timeframe
Implement the Urban Tree Canopy Plan, including the protection of trees and tree-lined areas.	Implement relevant tree plans and strategies, including finalising and implementing the Draft Northern Beaches Council Urban Tree Canopy Plan 2019 to protect and enhance our urban trees. Key directions in the plan include protecting urban trees, maintaining tree canopy covers, improving tree health and diversity and inspiring the community to protect and enhance urban trees.	5.1 Review, develop and integrate planning controls into the new planning framework that includes green infrastructure that provides for water treatment and retention, water sensitive urban design, urban cooling, ecosystem services and amenity and integrate it into built, landscaped and natural environments in strategic centres, employment hubs and areas subject to urban intensification.	Short Term
Prepare design guidelines and develop LEP and DCP controls for urban tree canopy, urban heat and UV radiation. Tree canopy to be addressed by tree replacement ratio, deep soil requirements, landscaped area requirements and increased front of building setbacks in road corridors. Urban heat to be addressed by the requirements for roof colours, cool pavements, wind circulation, green roofs, green walls and water sensitive urban design. UV radiation to be addressed by well-designed built and natural shade.	Select tree canopy species that complement the local natural environment.	5.2 Ensure built form controls maximise landscape open space at ground level, and where appropriate at upper levels (through green roofs and green walls) with adequate soil volumes to enable landscaping and tree canopy planting.	Short Term
Investigate the feasibility of Greater Sydney Green Grid projects, identify a local green grid and protect and enhance these grids in the new planning framework.	Support, encourage and enable green infrastructure development, including vertical and roof gardens through our planning instruments and regulations.	5.3 Implement a best practice Urban Tree Canopy Plan for the LGA that includes tree canopy targets and prioritises local native tree species.	Ongoing
	Identify, design and deliver priority local green grid corridors, connections and shared uses. We will integrate this into our planning instruments.	5.4 Incorporate within the new planning framework requirements for landscape open space, tree protection and replacement requirements.	Short Term
		5.5 Develop and integrate planning controls into the new planning framework that require building materials that help to mitigate urban heat including requirements for lighter coloured roofs, cool pavements and wind circulation.	Short Term