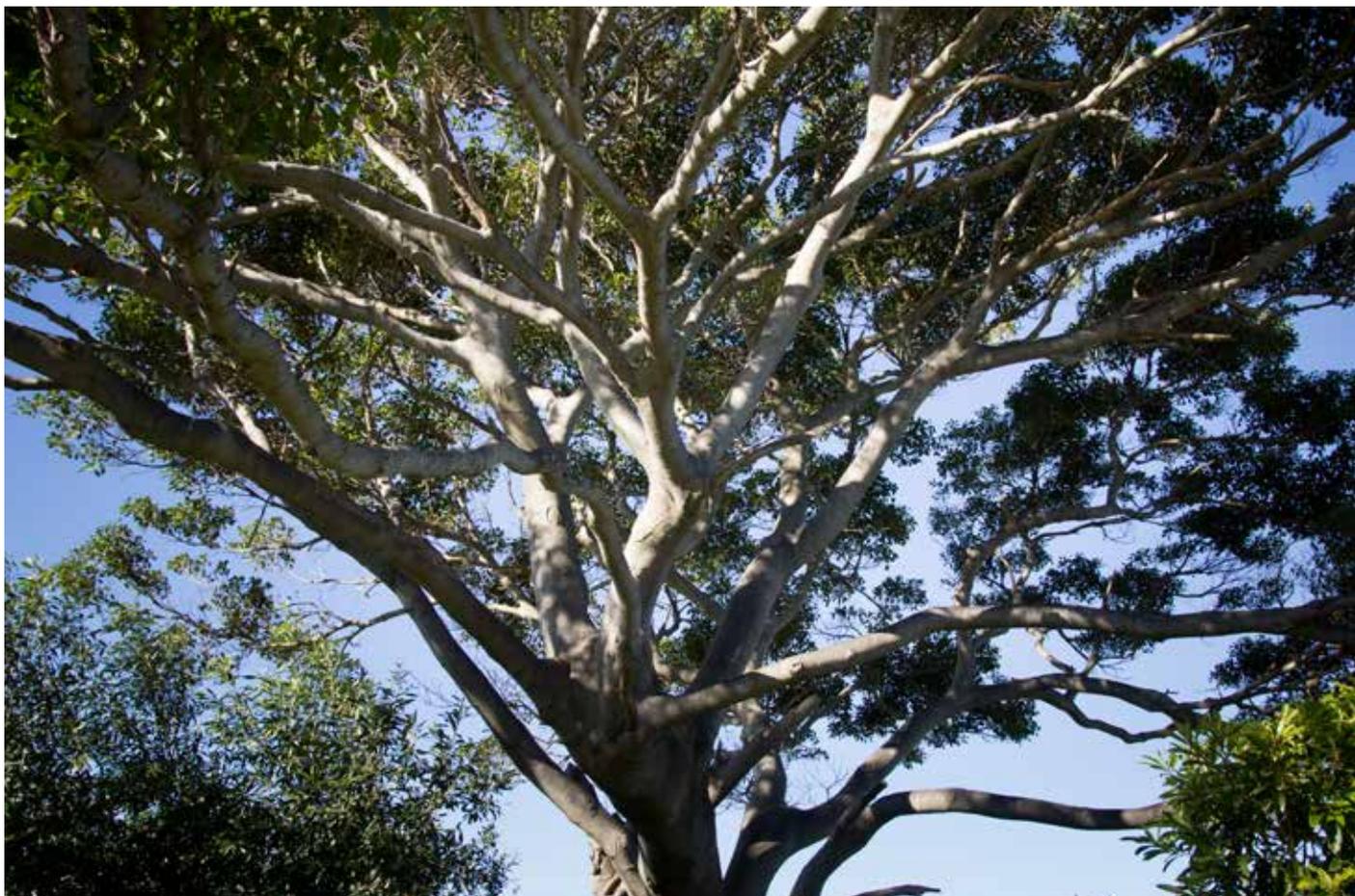


Urban Greening Strategy

2017 - 2037

Endorsed by Council 2017



Acknowledgements

Wollongong City Council would like to show its respect and acknowledge the Traditional Custodians of the Land to which this Strategy applies, of Elders past and present, and extend that respect to other Aboriginal and Torres Strait Islander people.

Wollongong City Council would like to thank members of the community who contributed to this plan by providing feedback in engagement activities throughout 2015-17.

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Introduction

The role of the Urban Greening Strategy

This is the City of Wollongong's first Urban Greening Strategy. It is written at a time of significant urban renewal and growth. Wollongong's attraction as a location for business and investment is underpinned by superb liveability and a world-class natural setting.

The Strategy's key drivers include the City's current and emerging challenges along with the overarching goals set by our community. These include improved amenity and recreation, liveability, biodiversity, quality urban development, economic renewal, climate change, asset management and tree replacement. To achieve a world-class urban landscape to match our goals, we require investment in quality urban infrastructure.

Urban greening will deliver the following benefits to help achieve these priorities:

- Shade and cooling
- Storing and sequestering carbon
- Reduced sun exposure
- Increased sense of local identity
- Encouraging outdoor activity
- Reconnecting people with nature
- Reduced infrastructure costs
- Increased property values
- Attracting investment

Urban greening is about strategically increasing the quality and quantity of all vegetation and open green space on all land types in an urban setting. A component of this is the 'urban forest', the sum of all of the trees, plants and green space across all land types.

Forward-thinking cities in Australia and around the world are measuring the health, diversity and extent of their urban forests, setting targets and realigning their operational programs to work towards improving greening cover.

Wollongong's average urban tree canopy cover is well below the national average of 39% (ISF Benchmarking report). Optimal urban canopy cover is estimated at 35-40%. There is ample immediate opportunity to improve tree canopy cover on our streets and in our public spaces.

Our City's liveability and amenity is a key factor driving business and investment, our unique natural setting provides opportunity for ecological enhancement, and our people will be more prosperous and healthy with enhanced urban greening.

The Urban Greening Strategy 2017-37 presents a vision for a coordinated approach to managing urban vegetation and outlines the steps required to implement a program of planning and targeted investment in public urban greening. It is a strategic document that will be used to shape the future of urban greening in Wollongong over the next 20 years.

Council has a leadership role in delivering quality streetscapes, improved public amenity and increased shade. Council also plays a significant role in protecting and enhancing urban vegetation on private land.

Our City's future quality, success and performance can be cost-effectively and efficiently enhanced by well managed trees and other vegetation.

As our City transforms and grows, Council recognises the importance of working in partnership with our community.

Together, we will plan, protect and grow a thriving, diverse and efficient urban forest which will underpin our City's future health and prosperity.

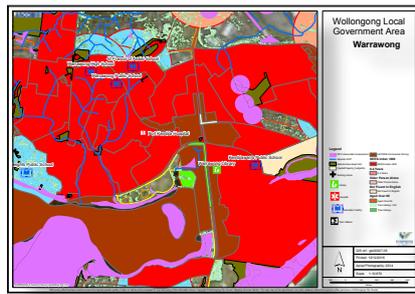
Vision and Principles

Wollongong will grow and nurture a healthy, diverse and well-managed urban forest to deliver a renewed and resilient place for people, enterprise, and the ecosystems that support us.

The following principles will inspire and inform Council's approach to Urban Greening in Wollongong



More strategic and targeted urban greening



Evidence-based decision making and programming



Enhanced amenity of public spaces



Maximisation of ecosystem services, waterway health and biodiversity connectivity



Stronger leadership and partnerships with the community



Greater diversity of greening

Background and Context

Scope

What is 'urban greening'?

Urban Greening is about strategically increasing the quality and quantity of all vegetation and open green space on all land types in an urban setting. A component of this is the 'urban forest', the sum of all of the trees, plants and green space across all land types.

Plants and trees cool our towns and cities, reduce pollution and attract investment. They also make us healthier, happier, and more productive. By recognising the value of the 'urban forest', we are able to plan to enhance and protect it in order to harness the benefits it provides for the whole City.

The urban forest is divided into the public and the private realm. Council manages the City's public spaces, street trees, parks, and natural areas. Privately owned and controlled property makes up the majority of the land area, and the majority of urban vegetation.

Council has an important influence on the whole urban forest, either through direct management, through planning controls and regulation, or providing opportunities for education and participation in greening initiatives.

Specific actions for natural areas and open space are outside of the scope of the Strategy, however those areas occurring within the study area do contribute to the analysis of tree canopy cover and opportunities for improved biodiversity connectivity and prioritisation of street tree planting.

Looking after and investing in our public trees and vegetation in a planned and coordinated way will maximise the benefits, reduce risks, and enable responsible and targeted long term financial investment for the whole community.

The Strategy will also discuss Council's ability to influence the protection of trees and enhancement of urban greening in the private realm and new developments.

The Strategy provides a snapshot analysis of the 'urban forest' as a whole.

It goes on to focus on the priority actions for greening our streets and public spaces.

202020 Vision Approach

202020 Vision is a network of organisations collaborating to create a 20% increase in urban green space by 2020.

The network shares expertise from industry, business, academia, government and NGOs in achieving best practice urban greening.

Council has followed the 202020 Vision approach in preparing the Strategy, and definition of the 'urban forest':

'An urban forest comprises all trees and other vegetation within the municipality and the soil and water that supports it. It incorporates vegetation in streets, parks, gardens, plazas, campuses, river and creek embankments, wetlands, railway corridors, community gardens, balconies and roofs.'

[202020 Vision](#)

There are some key differences from the status quo approach to tree management:

- The urban forest is considered a continuous resource, regardless of ownership
- Trees are valued as essential infrastructure, and afforded equal status
- Trees are valuable assets, and managed with financial rigor and commitment
- There is a focus on holistic, integrated design
- Diversity and context is important, yet there is a focus on large canopy trees
- Consistency and coordination across the whole 'urban forest'

Urban vegetation on public land

includes street trees, trees and vegetation in parks, natural areas, public spaces and town centres.



Urban vegetation on private land

includes trees and vegetation in residential backyards, residential subdivisions, shopping centre car parks, schools, university, and other privately controlled commercial and industrial places.



Drivers

Clear drivers for urban greening in Wollongong inform the priorities and opportunities outlined in the Strategy.

Why does Wollongong need an Urban Greening Strategy?

There is strong demand for a strategic approach to greening. Some common themes that emerged during consultation with Council staff, key external stakeholders and the community include:

“brings quality of life and social cohesion to our community, will add vibrancy in a City that is starting to look homogenous and sterile”

“Council needs an agreed and understood vision and a plan to achieve it”

“ Tree replacement is too ad hoc - we need a programmed approach to street tree planting”

“ Shift our attitudes from trees being a nuisance by increasing awareness of the benefits of trees ”

“ Place an economic value on trees, and manage them like other infrastructure or assets”

“ Look at the places that build their image around their trees like Grafton, Canberra, Newcastle...this has economic benefit and identifies the City”

“Like Gehl Architects showed us - A City for People should be a more comfortable and pleasant place to be”

The Strategy’s key drivers include the City’s current and emerging challenges along with the overarching goals set by our community.

Amenity, Recreation and Liveability

Our community values above all else ‘Wollongong’s natural beauty, access to our beaches and the coastline, the escarpment backdrop and the lifestyle and amenity this affords us’ (Wollongong 2022 Community Strategic Plan).

In 2014, Council partnered with internationally acclaimed Gehl Architects to undertake a Public Spaces Public Life study. This study echoes the community’s vision of creating a city for people, focusing on creating high quality city streets and spaces to encourage people to rediscover and reinvent the possibilities for living in our unique and beautiful place.

A liveable city is one that offers a variety of attractions and opportunities for people to work, live, play, learn, visit and invest. Public life is at the centre of planning for a liveable city. Achieving the liveliness, health, attractiveness, sustainability and safety of a City for People is not possible without quality urban greening.

‘A City for People’ (2016) sets a vision for the City Centre and the strategic direction to guide the delivery of Wollongong City Centre as a dynamic and vibrant regional city. Community feedback during the formulation of this plan consistently highlighted the importance of public space, and a desire to connect to our unique natural setting and foreshore.

Enhanced urban greening was identified as a key means of achieving a sense of place, liveability, and to increase shade and cooling.

Wollongong 2022 Community Strategic Plan (CSP) outlines high level goals relating to civic pride, meeting the needs of current and future communities, strengthening vulnerable communities, child-friendly and age-friendly design, and the creation of urban areas which provide a healthy living environment, which are all drivers for enhanced urban greening.

What does this mean for Urban Greening?

Trees and vegetation are critical to the amenity, recreation opportunities and liveability of our City - and the wellbeing of our residents. Without a planned and coordinated approach to urban greening, the quality of these attributes will decline. This will affect the success of Wollongong’s economic transformation. The impacts will be borne by those most vulnerable.



Climate Change

The NSW Office of Environment and Heritage has published a snapshot summarising key climate projections for the Illawarra (pictured right). These projections indicate the need to plan for significant changes in temperature, rainfall and fire risk in both the near and far future.

To imagine what these living conditions might be like, CSIRO has modelled future climate scenarios. This modelling suggests that the future climate of Wollongong will be more like the current climate of the Gold Coast by the end of this century (see below).

Council has a commitment to investigate and utilise methods to mitigate and adapt to the impacts of climate change (Climate Change Adaptation Strategy 2007).

Urban trees can help mitigate the impacts of projected changes. Well maintained trees live for many decades as part of our urban infrastructure. Trees we plant in the coming years will need to thrive in a very different future climate by the end of this century.

What does this mean for urban greening?

Care will need to be taken to select species that will continue to perform under changed climatic conditions. We must identify those species vulnerable to stress and decline in a changed climate, planning for renewal over time. Stormwater infiltration into soils must be prioritised in urban design to ensure water recharge.

Dangerous heatwaves will become more frequent. This prioritises the provision of shade to cool those areas where the most vulnerable - the very young and the elderly - gather.

Asset Management

Council is the custodian of a huge range of physical assets worth over 3 billion dollars. These include roads, land, buildings, playgrounds, natural areas, ocean pools, waste and recreational facilities, bridges - a myriad of assets which are used in the delivery of services to our community.

Significant effort over the past decade has been invested in establishing a policy framework and program of capital investment for the effective management of current and future assets to ensure that Council delivers safe, reliable and sustainable services to the community.

Projected temperature changes	
 <p>Maximum temperatures are projected to increase in the near future by 0.4 - 0.9 C</p>	<p>Maximum temperatures are projected to increase in the far future by 1.6 - 2.3 C</p>
 <p>Minimum temperatures are projected to increase in the near future by 0.4 - 0.7 C</p>	<p>Minimum temperatures are projected to increase in the far future by 1.5 - 2.4 C</p>
 <p>The number of hot days will increase</p>	<p>The number of cold nights will decrease</p>
Projected rainfall changes	
 <p>Rainfall is projected to decrease in winter</p>	<p>Rainfall is projected to increase in summer and autumn</p>
Projected Forest Fire Danger Index (FFDI) changes	
 <p>Average fire weather is projected to increase in spring</p>	<p>Severe fire weather is projected to increase in summer and spring in the far future</p>

'near future' average 2020-39 projections

'far future' average 2060-79 projections



The future climate of Wollongong will be more like the current climate of the Gold Coast (under mid-range emissions modelling) or Rockhampton (high-range) by the end of this century (CSIRO Climate Change in Australia Analogues Explorer 2015).

Trees and vegetation on public land form part of Council's physical assets portfolio. However, Council does not currently hold the necessary data to make informed decisions about the required service levels or resource allocation for this asset class.

The Asset Management Policy (2017) outlines the objectives and procedures for ensuring effective ongoing management of Council assets, and over time will guide the incorporation of trees into planning and information systems.

What does this mean for urban greening?

Trees are important, and valuable public assets as is the urban forest as a whole. It is necessary to undertake immediate work to assess the condition and risks associated with the current urban forest, understand service level requirements, monitor and predict future demand based on canopy targets, prioritise capital for renewal, and to incorporate this data into Council's Asset Management Plans and Information Systems.

Condition assessment of existing urban trees will inform maintenance schedules, ongoing financial implications and future community service level decisions.

West Dapto Urban Release Area

The Wollongong 2022 CSP includes the goal that: Urban density and expansion, such as West Dapto is carefully planned and balances economic, social and environmental considerations.

Planning for future streetscapes which deliver best practice amenity, environmental performance, and associated benefits is a major challenge for the future.



55,000+

19,000+ New homes proposed in West Dapto Urban Release Area

55,000+ Additional people living in West Dapto Urban Release Area

Tree Replacement

A business as usual approach will see the quality of the urban forest decline over time.

Trees on all land types are removed due to a range of reasons including poor health, to prevent hazards, or to accommodate infrastructure or development.

Compliance monitoring of the proper implementation of controls or conditions imposed on tree removal and replacement on private land needs improvement.

Currently, there is not a strategic approach to replacing trees on public land. Species selection, specifications and site-specific design for new or replacement plantings across all land types requires improvement.

Biodiversity

Wollongong has a unique natural environment, and Council has a clear commitment to protect and enhance local biodiversity. The CSP includes specific Goals to ensure that our urban environment minimises impacts on habitat and biodiversity and areas of high conservation value are protected; and that the community is actively involved in the expansion and improvement of our green corridors connecting the escarpment to the sea.

Council's extensive restoration works in natural areas can be supported by quality greening in the remainder of the public realm. Our community's commitment to enhancing biodiversity and habitat conservation through private effort and volunteer programs is another driver for urban greening in Wollongong.

Urban Development

Wollongong is experiencing significant urban renewal and growth. The City's attraction as a location for business and investment is underpinned by its liveability, and a world-class natural setting.

The CSP includes the goal that 'Development is functional, attractive and sympathetic with the environment, and avoids unnecessary use of energy, water or other resources'.

Urban development will deliver more positive social and economic outcomes through a proactive approach to greening.



Nature and green spaces increase workplace productivity.

Planning and Policy Context

Alignment with Wollongong 2022 Community Strategic Plan

The Strategy has been prepared to align with the community's vision:

'From the mountains to the sea, we value and protect our natural environment and we will be leaders in building an educated, creative and connected community.'

Implementation of the Strategy will specifically help to achieve a range of interconnected community goals and objectives. These include reducing Wollongong's ecological footprint (1.3), improving the sustainability of the urban environment (1.6), increasing the physical and mental wellbeing of residents (5.1), a high standard of public domain (5.3), and increasing participation in recreation and lifestyle (5.5).

The development of the Urban Greening Strategy was identified in the 2012-17 Delivery Program.

This diagram illustrates where the Strategy sits within Council's broader planning and policy context. The Strategy proposes as a priority the review and establishment of consistent tree and vegetation plans, policy and guidelines for both the public and private realm.

Those items listed in red* are proposed or new.



Legislation and Plans

Council is guided by the following legislation and plans relevant to the regulation and management of trees and vegetation in Wollongong:

- Illawarra-Shoalhaven Regional Plan (5.1.1 and 5.1.3)
- Roads Act 1993
- Electricity Supply Act 1995
- Relevant State Environmental Planning Policies (eg., Vegetation SEPP in Non-Rural Areas, SEPP Infrastructure, SEPP 14 Coastal Wetlands, SEPP 26 Littoral Rainforests, SEPP 71 Coastal Protection)
- Civil Liability Act 2002
- 10/50 Vegetation Clearing Code of Practice for New South Wales
- Wollongong Local Environmental Plan 2009
- Wollongong Development Control Plan 2009
- Local Government Act 1993
- Environment Planning and Assessment Act 1979
- Biodiversity Conservation Act 2016
- Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)
- Biosecurity Act 2015
- Fisheries Management Act 1994
- Crown Land Management Act 2016
- State Emergency and Rescue Management Act 1989
- National Parks and Wildlife Act 1974w
- Heritage Act 1977
- Rural Fires Act 1997

More green space nearby reduces the risk of having type 2 diabetes and promotes healthier durations of sleep

Benefits

Why is Urban Greening important for Wollongong?

Urban greening delivers a range of ongoing, long-term benefits to our City. Wollongong has the opportunity to establish an inspiring, innovative and more liveable City by harnessing the benefits of urban greening.

Research has quantified the dollar value of benefits delivered by urban greening. From reduced energy consumption and lower health costs to the boost to business, increased urban greening is a demonstrably good investment for our City. Environmental benefits include the relative efficiency of restoring natural ecosystem services, along with purifying air and water. Social benefits include a range of positive impacts on health and wellbeing. The following section cites interesting research demonstrating how proven benefits will deliver on Wollongong's identified drivers.



Amenity and Recreation

Trees and vegetation provide a sense of place and local identity

Trees and greenery play a key role in place making and defining the sense of place in a city (Arnold, 1980)

Well maintained urban green space has a positive effect on an area's image and the confidence of the community (Arnold, 1980)

Street trees are one of the most cost effective assets for improving quality and amenity of neighbourhood streets. (Jacobs, 1993)

Encourages outdoor activity

Environmental and lifestyle factors are major contributors to overweight and obesity. The Wollongong population has higher than NSW average rates of associated chronic health conditions, which have been steadily growing.

There is abundant evidence that community health and wellbeing improves with access to quality urban green spaces:

People walk and cycle more in greener, well-shaded places (Giles-Corti, et al., 2005; de Vries et al., 2003)

There are a lower levels of obesity in greener neighbourhoods (Bell et al. 2008)

There is increased likelihood of increased physical exercise in parks with trees and shade (Timperio et al., 2008)

Liveability

Provides shade and cooling

Urban greening can provide natural shade and shelter for people. Shade trees reduce daytime temperatures between 5 and 20 degrees Celsius (Akbari et al., 1997; Livesley, 2010)

Reduces people's exposure to the sun and harmful radiation

Through their provision of natural shade, dense canopy trees can reduce the exposure to UVA and UVB rays from the sun during summer. (Grant et al., 2002)

Improves mental wellbeing

Urban green spaces provide attachment to nature (Ulrich, 1986)

Green urban spaces promote recovery from stress in urban environments with their restorative effects: (Velarde et al., 2007)

Greater productivity at work when workers were able to view green spaces and nature from their window (Kaplan, et al. 1988)

Children have improved cognitive function in greener neighbourhoods (Wells, 2000)

Supports good health in children

More green space nearby reduces child asthma by protecting against traffic-related pollution (Feng and Astell-Burt, 2017)

More green space good for the health of all children, richer and poorer (Feng and Astell-Burt, 2017)

Urban Development

Reduces energy consumption, emissions and costs

By shading buildings in summer and allowing sunlight in during winter, trees can save energy use from heaters and airconditioners with buildings of up to 20% (Simpson and McPherson, 1996)

Achieves higher residential property values

Many studies show the link between the presence of and access to well maintained urban greenery and residential house prices. Studies in Australia and Perth recently suggest that the presence of street trees can add significant value to a residential property. (Pandit, 2013; Plant, 2016)

Markets the City

Investment in high quality urban greening can encourage and attract high value industry, entrepreneurs and skilled workers to a region through the creation of high quality, environmentally friendly living and working environments, adding value to local economies (ECOTEC, 2008).

The presence of high quality urban green spaces within retail and commercial precincts improves vitality and increases consumer spending (Wolf, 2005)

Improves asset longevity

Through their shading capacity from the sun's UV rays, trees can improve the life span of asphalt, concrete and even paint on houses.

Why is Urban Greening important for Wollongong?

Biodiversity

Urban greening can improve connectivity between natural areas of biodiverse value (European Commission, 2012).

Street trees can provide habitat for local animal species (Fernandez-Juricic, 2000).

Urban green space is an important investment local authorities can make on behalf of citizens and their well-being
World Health Organisation

Climate Change

Reduces stormwater flows and nutrient loads

Tree canopies and permeable urban green space intercept and store rainfall, reducing stormwater flows and reducing the impact on stormwater infrastructure (Xiao, 1998).

Urban vegetation improves stormwater infiltration into urban soils increasing groundwater recharge (Xiao, 2002).

Vegetation and associated soil volumes remove nutrients and heavy metals from stormwater runoff (Read, 2008).

Reduces the Urban Heat Island Effect

Trees and vegetation can modify local microclimatic temperatures and reduce the urban heat island effect (McPherson, 1994).

Research has shown that a 20% increase in urban forest canopy cover can reduce ambient temperatures by 3-4 degrees Celsius (McPherson, 1993).

Shade, evapotranspiration and healthy urban green space directly reduces temperatures during heatwaves, helping to reduce heat related illness (Luber, 2008).

Reduces air-borne particulates and air pollution, including carbon

Trees and vegetation absorb and intercept polluting gases and particulate matter through their leaves including ozone, carbon and nitrous oxide (McPherson, 2010; Nowak, 2006).

The role of public green space

We often think about the environmental benefits of trees, or how they provide habitat for birds and animals. However, there is now a growing awareness of the role that trees play in taking pollution from our air and water, or storing carbon from the atmosphere.

One of the important services Councils deliver is to provide safe and healthy environments for our people, regardless of their circumstances.

Access to quality public green space is critical to a person's wellbeing and health. Streets, town centres and parks are places where people can gather to connect with each other, and nature. They are places for celebration, for recreation, for activity and respite.

Ensuring that these shared spaces have great landscape attributes, are efficient and inspiring, is critical to achieving our City's vision. It's also good for business.

The Strategy will use spatial analysis of demographic and other attributes to prioritise urban greening in areas where it is most needed.

"Evidence suggests that green spaces help to restore our abilities, such as improving our mental alertness and enhancing recovery from stressful experiences. They can provide attractive settings for us to build capacities through physical and social recreation. Some types of greenery in our neighbourhoods may also help to mitigate the effects of wider environmental exposures, such as tree canopy providing shelter from heat island effects and road-side vegetation protecting us from traffic-related air pollution. All of these benefits accumulate and work in synergy to support child development and longer, healthier lives."

A/Prof Thomas Astell-Burt and Dr Xiaoqi Feng Population Wellbeing and Environment Research Lab (PowerLab), University of Wollongong

New York's street trees return \$5.60 for every \$1 invested in their street tree program.

Motorists drive slower down tree-lined streets



Analysis

Overview

Good data is required to understand the context, challenges and opportunities for urban greening in Wollongong.

Evidence-based decision making is challenging without appropriate data. Council does not hold qualitative or quantitative data for individual trees or vegetation in streets, public spaces and parks.

Recognising this, Council has invested in creating a series of broad scale datasets to inform the Strategy.

Datasets created to inform this Strategy include:

1. An assessment of tree canopy cover across the urban area of Wollongong
2. Canopy cover distribution and land use categories across the City
3. Temporal land use analysis looking at vegetation cover changes in three sites
4. Desktop analysis of vacant tree sites on urban streets
5. Mapping of attributes including census-derived social vulnerability to determine areas of priority for tree planting and urban greening

Council holds data on biodiversity, transport, community facilities, water infrastructure and other key attributes.

These datasets feed into the Strategy's over-arching goals, and assist in communicating an appropriate and relevant business case for future urban forest management.

They also provide a benchmark against which implementation can be monitored and evaluated.

Some ways in which this data can be used are illustrated on pages 23 - 25.



The Study Area

Wollongong's stunning natural setting is defined by the Illawarra Escarpment, which rises sharply above a coastal plain fringed by iconic long sandy beaches and prominent headlands.

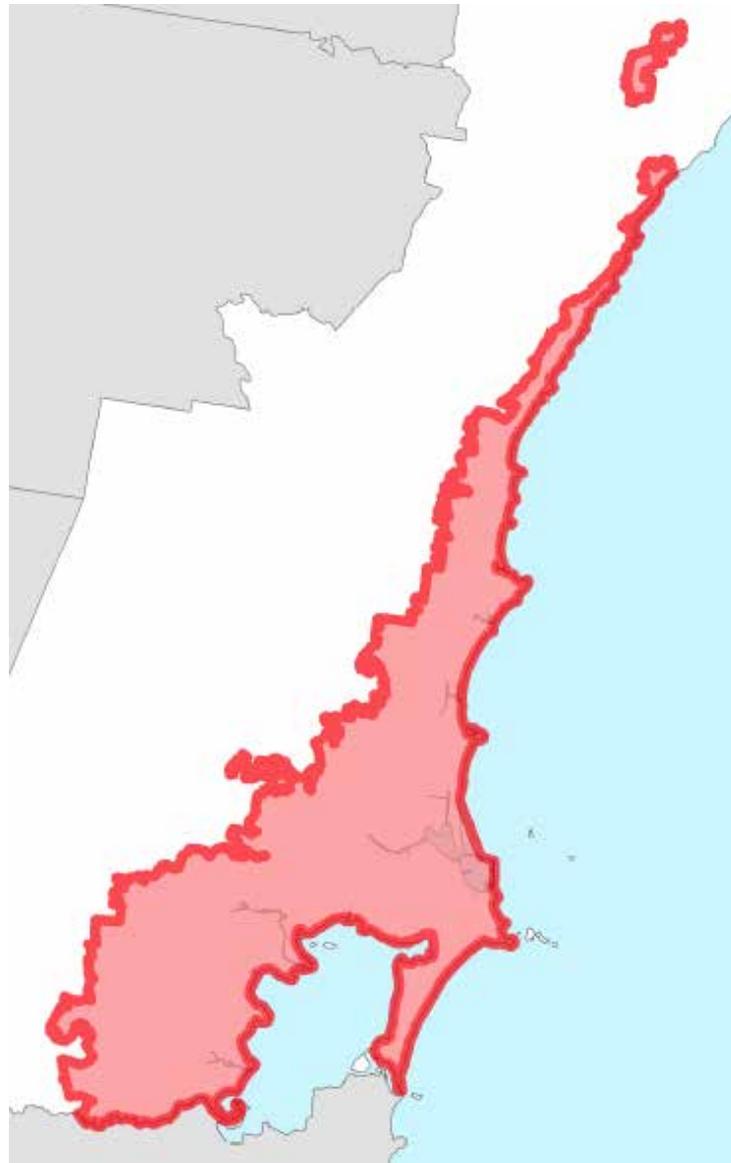
The variety of naturally occurring soils give rise to unique vegetation types across the City's coastal dunes, coastal plain and Escarpment foothills.

The Strategy has defined a study area which focuses broadly on trees and vegetation on all land types within the 'urban' setting. It excludes the rainforests and tall eucalypt forests occurring along the Illawarra Escarpment boundary.

The study area includes land across a range of zonings, public and private land. It comprises a total of around 178 km² including 59 separate suburbs.

Parks and Natural Areas comprise 10% of the study area and 3% of total canopy cover. These areas are vital to understanding the urban forest as a whole and contribute to the analysis of opportunities for improved biodiversity connectivity and prioritisation of street tree planting. The Strategy focuses on actions in the built or urban realm as a priority.

A Natural Areas Asset Management Plan is being prepared as a separate project to prioritise investment in restoration projects and monitor improvement in vegetation condition and quality.



- UGS Study Area
- LGA Area
- Bordering LGA's

Wollongong's Urban Greening Strategy provides a focus on delivering increased access to a network of green spaces for active living and relaxation, supporting ecological health and habitat, and helping to create resilient and adaptive built environments to provide cooling and shade into the future.

Historic Context

Wollongong's current urban landscape has a rich Aboriginal, cultural, farming and industrial history

For at least 30,000 years before white settlement, the Illawarra Aboriginal people, the Wodi Wodi, lived around Wollongong, making use of natural resources from the variety of habitats that stretch from the beaches, along the coastal plain, to the sharp slopes of the escarpment and the Hawkesbury Sandstone plateau.

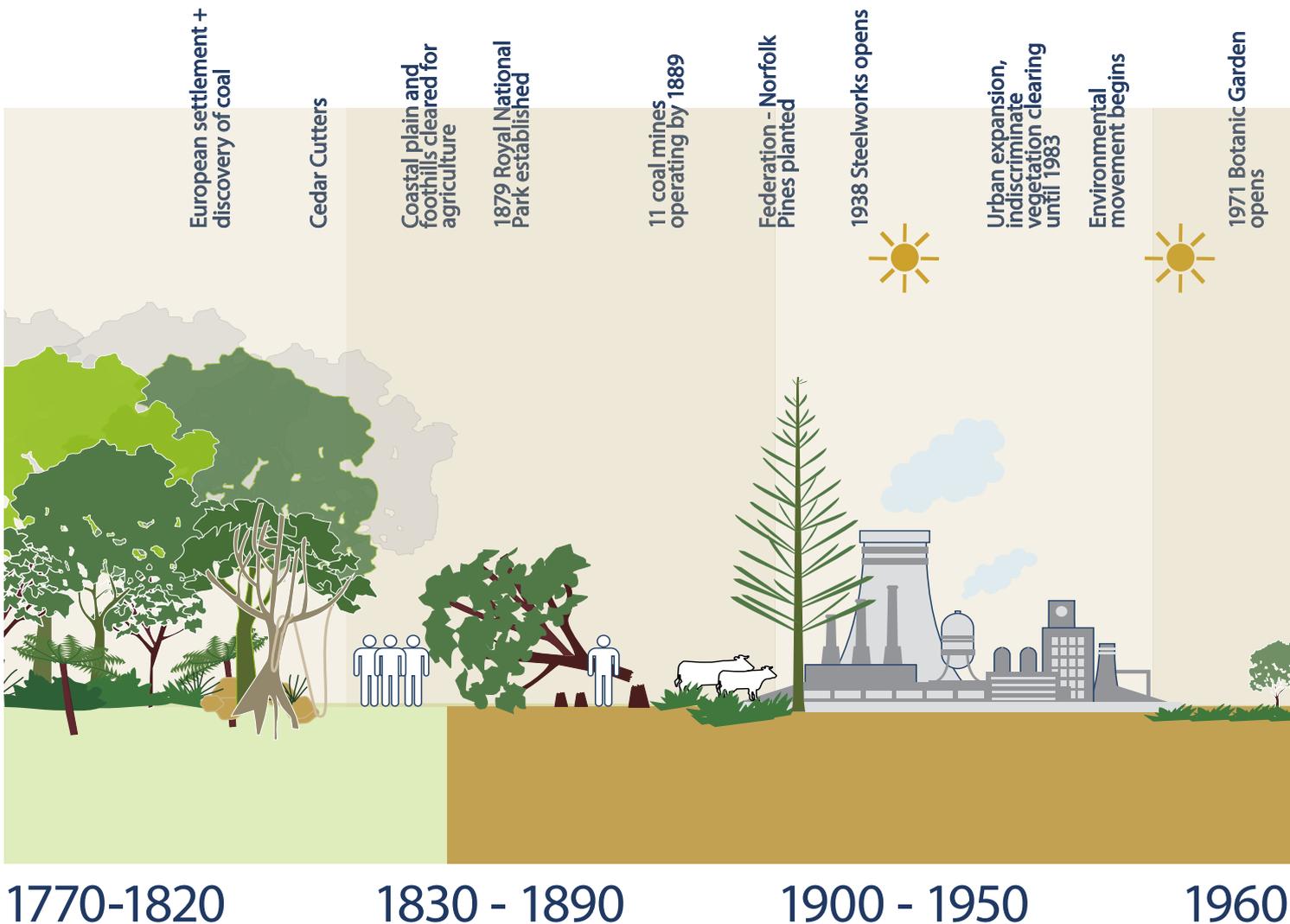
Apart from fauna – fish and shells from the ocean, or kangaroos and wombats in the woodlands – the flora, the original forest, provided much of value. They roasted mangrove seedlings to eat, made boomerangs from the Swamp Oak, ate many berries and made fishing lines from the Illawarra Flame Tree's bark.

Natural resources have continued to underpin our region's prosperity. Cedar cutters profited from the colony's demand for timber in the early 19th Century. Grazing and dairy were followed by the commencement of the local steelworks, supporting a growing population of people from a diverse range of community and cultural backgrounds.

Wollongong remains strongly identified with mining and manufacturing industries, yet is in the process of diversifying its economic base. Lifestyle-based industries including tourism, health services, telecommunications, hospitality, education and information technology will play an increasing role in the City's future.

In 1821 an early Cedar cutter remarked that "...there was scarcely a creek or stream, valley, ravine or gorge, between Bulli and Broughton Creek, between the sea and the mountains, that was not dotted with cedar trees, many of them of great size and beauty...".

By the 1840s the Illawarra forests had been cleared, and few of these once common giants remained.



Towards a greener Wollongong

Promoting a clean, green City was a key strategy emerging in the 1970s to combat Wollongong's reputation as a polluted, unattractive industrial City.

At that time, Council had a simple nursery operating out of Central Depot. Plants were grown in old tin cans, salvaged from the tip. Two plants per resident were available to be planted on verges in an effort to revegetate the City.

Political support, along with the funding and profile brought by national environmental initiatives from the late 1960s, is widely credited with providing the impetus for Wollongong to grow a civic greening program.

Wollongong's Botanic Garden was established in 1971, and a well-equipped Nursery facility was built in 1981. Council's

Greenplan was introduced in 1986, offering residents 20 plants per year. The Nursery continues to support greening programs, providing plants to residents, schools and ecological restoration programs.

Since 1986, the Wollongong Botanic Garden has been distinguished by the technical collection, study, conservation and propagation of local native plant species.

Efforts to regenerate natural areas, with a particular focus on remnant vegetation and riparian areas, have evolved over the years to become major Council services in collaboration with other agencies and the community.

Key milestones in Wollongong's management of trees and vegetation are illustrated below.

Council's Bushcare and Rise and Shine programs have been supporting volunteer action to green Wollongong for over 30 years

Locally relevant canopy targets to support community health are being developed by the PowerLab at UOW to be fed into the Strategy in 2018-19



The Urban Forest Today

The public realm today is dominated by a relatively small palette of species, planted according to chance, fashion, street hierarchy and design. Water Gums, Melaleucas, Callistemon, Crepe Myrtle, Tuckeroos, Flame Trees, Planes and Palms tend to dominate. Large Eucalypts in suburban areas provoke the most calls for removal. Verges maintained by residents range from bare grass to dense plantings, and present a key opportunity for well-manged community greening.

Historical photographs (see page 21) reveal the vegetation on the coastal plain changing over time. Land that was thoroughly cleared for timber, grazing and residential development has changed significantly, with a higher proportion of hard surfaces a key feature. Riparian areas have been slowly restored over time, with efforts to connect areas of biodiverse value through natural area restoration.

Council manages natural area restoration contracts worth approximately \$1.2million per year



New plantings with footpath upgrades



Town, Village and City Centres



Established eucalypts, 50-60 years old



Public spaces



Significant Trees in the urban realm



Parks and Natural Areas

Where are all the trees?

Canopy Cover

Tree canopy cover is the measure of the area of tree canopy when viewed from above, and is recorded as a percentage of total land area.

Canopy cover is important to understand for strategic goal setting. It can be used to benchmark, manage and evaluate the urban forest as a whole.

How does Wollongong compare?

Two approaches have been used in developing the Strategy. It is worth noting that neither of these techniques can determine the species or condition of individual trees.

The online tool iTree Canopy was used to give a broad overview of baseline canopy cover, grass, shrubs and hard surfaces. iTree methodology estimates Wollongong's average urban canopy cover of 22%, well below the national average of 39% (ISF Benchmarking report).

A second, more accurate and detailed analysis, was commissioned using LiDAR and aerial imagery. Together, these give a 'big picture' of the height, density and distribution of canopy across the local government area. A 'canopy' tree is classified as one over 3 metres in height.

Wollongong's average urban canopy cover measures only 17%. Experts recommend an optimal urban canopy cover of 35 - 40%. Working towards an enhanced canopy goal will require significant commitment and investment over time.

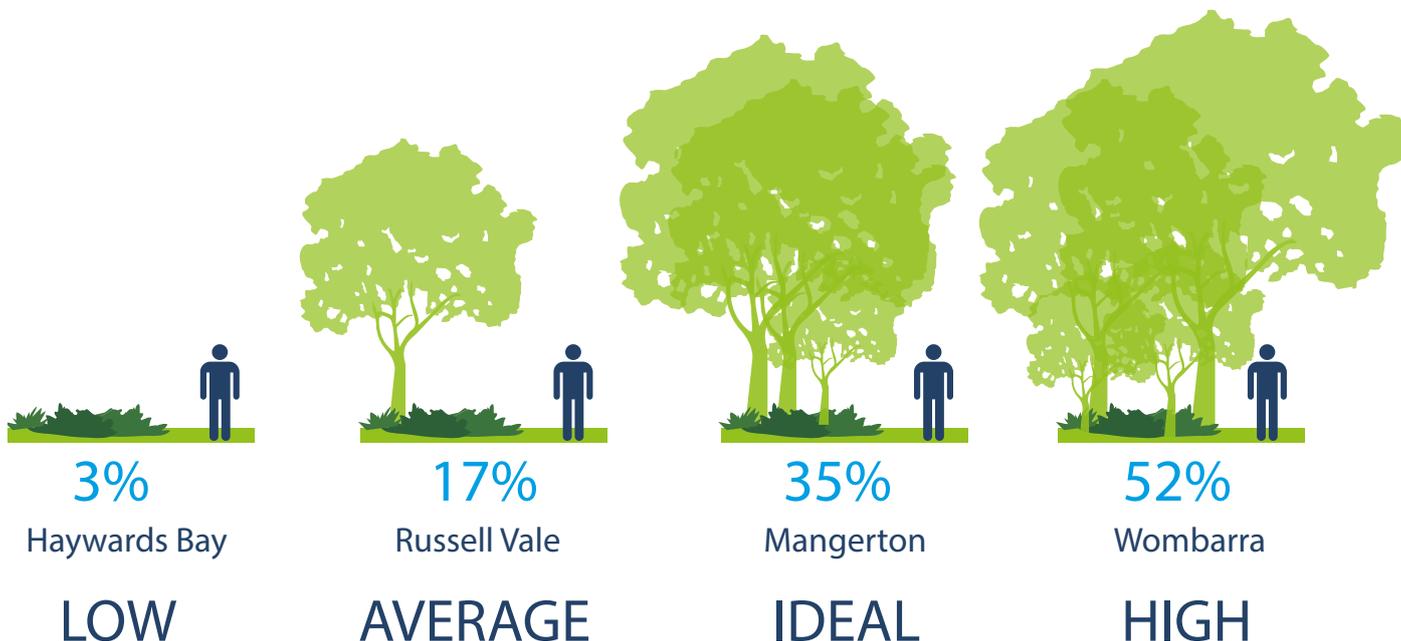
There is considerable variation in canopy cover when looking at finer scales such as suburb or land use. For example, our suburbs range from 3% - 52%, and there are interesting correlations between high canopy cover and high median property prices in Wollongong (see image below).



Example of LiDAR tree canopy imagery.

canopy cover targets will be set at levels that are achievable - the Strategy aims to increase canopy cover in priority areas by 20% by 2020

The tallest tree in the study area is in Coledale, standing at 45m in height



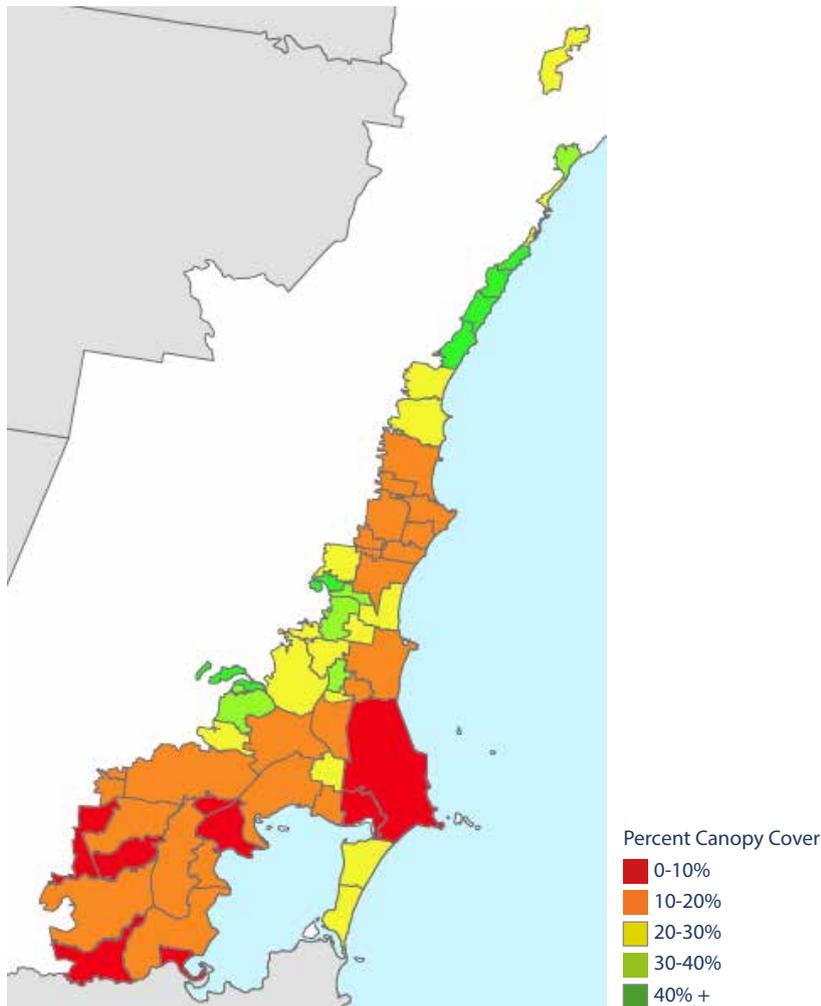
Canopy Cover by Suburb

* see Council's website for details of canopy cover in your suburb

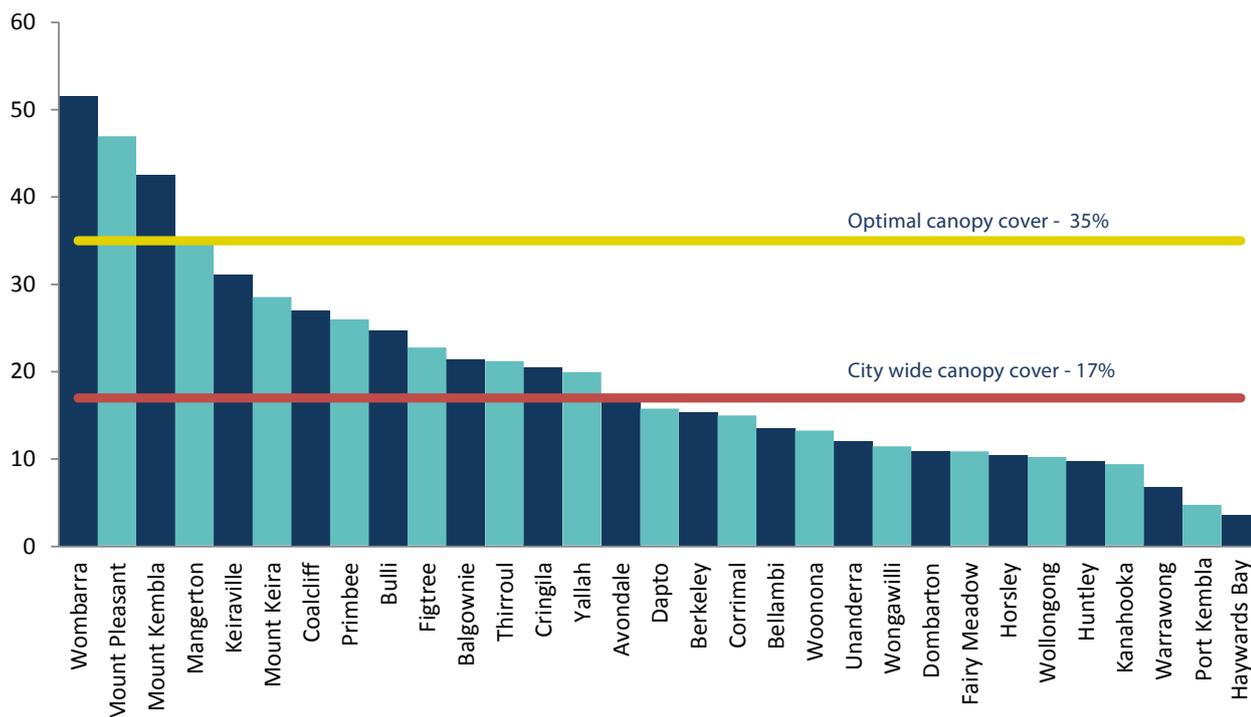
There are **nine suburbs with existing optimal canopy cover**: Wombarra, Kembla Heights, Scarborough, Coledale, Mount Pleasant, Austinmer, Mount Kembla, Mangerton and Stanwell Park. These suburbs are almost all adjacent to the Illawarra Escarpment, with development historically occurring in areas of extant or regenerating forest, with environmental or development constraints on larger lot sizes. Urban forest management in this context would focus on zero net reduction in existing canopy, balancing bush fire risks, minimising threats to biodiversity through weed management and appropriate species selection.

There are **eight suburbs with less than 10% existing canopy cover**, which is exceptionally low. There are a variety of factors influencing low canopy cover - agricultural history in areas such as Huntley, Marshall Mount and Cleveland. Intensive industry partly explains low canopy in Port Kembla.

Warrawong is an important town centre exhibiting low canopy cover across all land use areas. In the decade or so since the establishment of the new residential development of Haywards Bay, which is surrounded by reserve with a long waterfront, only 3% canopy cover has been achieved.



Variation in canopy cover across the City



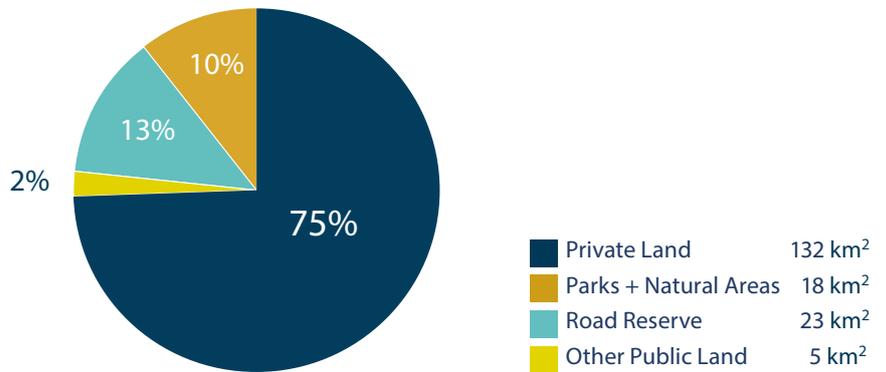
Land Use Analysis

What are the land uses in the Study Area?

The pie chart illustrates the breakdown of land uses in the private and public realm by percentage of the total study area of around 178 km²

Three quarters of all land in the study area is privately owned and controlled.

Public land is broken down into Parks and Natural Areas, Road Reserves, and other Public Land such as vacant lots and town centres.

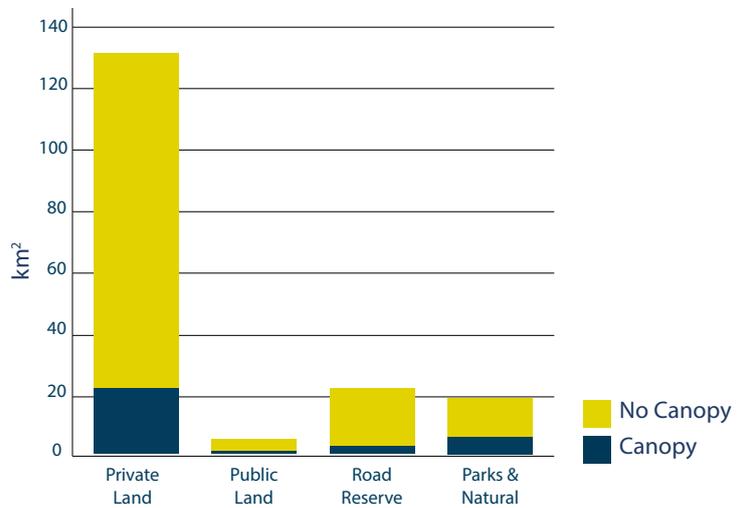


Canopy vs. No Canopy

The bar chart shows the relative proportion of canopy and no canopy cover by area within each of these land uses.

It illustrates that due to the high proportion of land area involved, both gains and losses in percentage canopy cover on private land have a major impact on overall canopy area.

The opportunity to avoid net loss on private land, whilst increasing canopy cover in the public realm, is clear.



Where is the canopy by land use category?

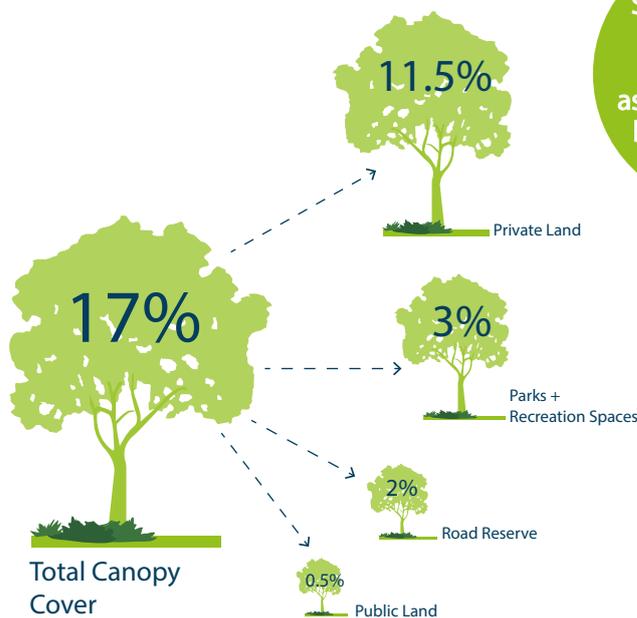
This picture illustrates the distribution of existing tree canopy over 3 metres across each of the land use categories.

Of the total 17% canopy cover in Wollongong, only 5.5% occurs on public land.

There are clear drivers for a new, asset based approach to public tree management and the priority actions for this Strategy must be those which are within Council's direct care and control.

However, as the majority of the existing canopy occurs on private land, the Strategy must provide a framework for a consistent approach to protecting and managing the urban forest as a whole.

The following section analyses the factors influencing canopy distribution across the City in order to identify opportunities for Council to increase canopy cover.



Shady trees can increase the useful life of asphalt pavement by at least 30%

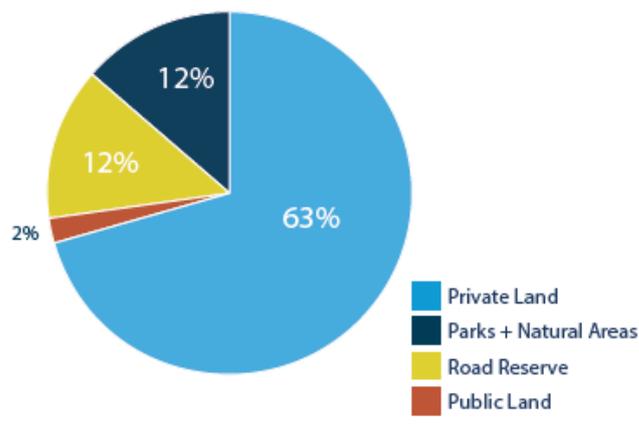
A Closer Look at Ten Suburbs

Ten suburbs were selected for further analysis to more closely understand the distribution of canopy on public versus private land. These suburbs were selected to illustrate a range of identified strategic priorities, canopy covers, demographics, size and geographical distribution.

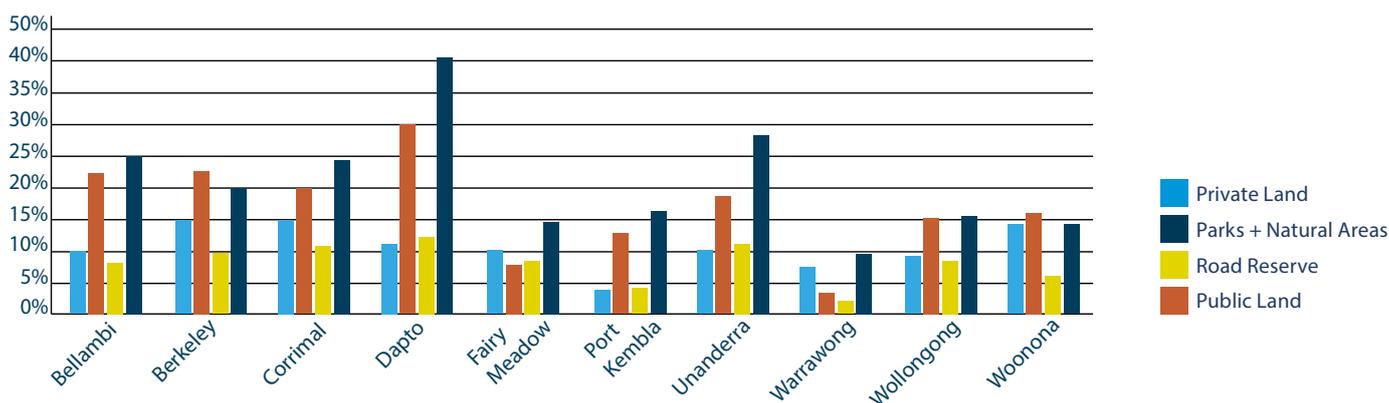
The majority of land area within each suburb is private. The road network consistently makes up between around 13% - 19% of the suburb area. Parks and natural areas comprise between 5% and 25%, with the public realm only a very small percentage of the total suburb area.

The pie chart shows the division of the entire tree canopy area for the ten suburbs into the different land use types. 63% of the tree canopy area occurs in the private realm, 23% in parks and natural areas, 12% from road reserves and 2% in public space.

The total area of canopy held in parks is only around a third of the area of private land canopy.



Tree canopy area by land use across all ten suburbs



Percentage of total tree canopy cover broken down by land use in each of the ten suburbs

The Public Realm

The chart above illustrates the canopy cover percentages for each of the land use types. This reveals that despite the relative size, both parks and natural areas and the public realm have much higher tree canopy coverage rates per square metre than the private realm. This is to be expected given that development is more likely to occur in the private realm.

This demonstrates firstly the long term importance of the public realm (the total of public, parks and road reserves) in providing canopy cover for the community. Secondly, it highlights the clear opportunity to increase canopy cover over the road network.

The Private Realm

Tree canopy cover percentages for the private realm range from 4% in Port Kembla to 15% in Berkeley and whilst these are well below optimum rates of 40%, the sheer size of these land areas and corresponding tree canopies remain the largest portion of the total urban canopy.

For example, in Unanderra, private tree canopy cover is only 10% and parks tree canopy cover is 28%. Yet, the total area of private tree canopy is 480,541m² and parks is 148,660m².

Analysis of these 10 suburbs reveals:

- Private tree canopy remains an important and majority contributor to the entire urban forest.
- Private tree canopy is probably not at optimum levels, given the large amount of land area categorised as private.
- Council should consider the planning and regulatory mechanisms required to protect the private realm tree canopy from diminishing in the face of urban renewal.
- There is ample opportunity for increasing tree canopy cover and other vegetation across the road network.

Changes in vegetation over time

Aerial photography from 1948 - 2016 is available on Council's website and provides an interesting tool to compare changes in morphology, land use and other attributes over time. The following examples illustrate significant changes in vegetation in three sites. Evidence of Council, agency and community efforts in greening natural areas along creeklines and public parks can be seen. The legacy of the major tree planting efforts coinciding with the commencement of Greenplan can also be seen.

DAPTO

WOLLONGONG CBD

CORRIMAL

1948



1977

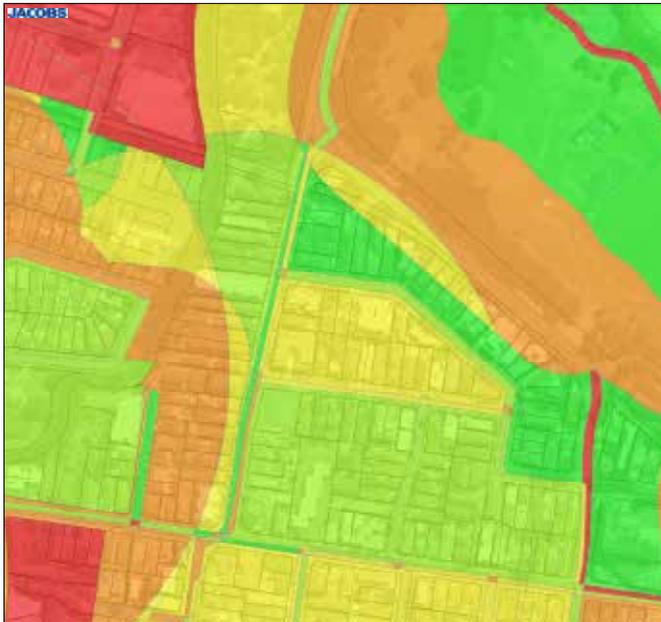


2016



Spatial Analysis

The following maps illustrate the use of some spatially mapped attributes to undertake desktop analysis of factors influencing the prioritisation of urban greening.



Census data highlights areas of social vulnerability, where there is a higher need for shade and streetscape quality.



Biodiversity values include natural areas asset mapping methodology, riparian areas, waterways, corridors and conservation assessment layers.



Vacant tree sites highlight potential 'windfalls' for immediate planting.



LiDAR imagery illustrates existing canopy density, height and distribution.

Using these and other datasets (such as stormwater) allows us to design multi-purpose landscapes which integrate green space with urban development, creating a network of high quality greening to improve our City's performance and connect people with town centres, public transport, recreational areas, schools, natural areas - improving the beauty and performance of the places we live and work and play.

Council's Role

Council delivers services and decisions which impact on the quality of urban greening in our city every day.

Planning + Regulation

- Development Applications
- Strategies, policies and plans
- Tree Management Permits
- Planning proposals
- Biocertification, BioBanking
- Statutory legislative responsibilities
- investigations of illegal vegetation clearing
- Leases and licences
- Environmental assessments

Public Programs

- Environmental events and education
- Botanic Gardens and Nursery
- Demonstration sites
- Greenplan
- Volunteer programs
- Bushcare, Dunecare, FireReady
- Scientific conservation and collaboration

Natural Areas

- Biodiversity and conservation programs
- Restoration contract management
- Weed and pest management

Streets + Parks

- Tree maintenance, pruning
- Arboriculture
- Horticulture
- Landscape design
- Mowing
- Tree removal
- Tree planting
- Tree procurement



Council's Role

Urban greening depends on best-practice management of the tree canopy and other vegetation as a whole.

Consultation has identified a range of longer term and immediate opportunities to improve current practice. To move towards best-practice, Council will need to focus initially on putting in place new public tree management plans and processes.

A staged approach enables Council to focus on actions which:

1. Establish and implement discrete plans and targeted programs to maximise the benefit of street trees, which strategically identify what to plant and where.
2. Identify resources for proactive public tree work, which is currently dominated by responding to immediate risks and requests for removal.
3. Collect the data required for monitoring and planning tree and vegetation issues across the City, and proactively invest in condition monitoring and enhancement.
4. Coordinate tree and vegetation management within Council to better manage risks and ensure greater consistency in outcomes across all approval or decision-making pathways on both private and public land. Improve the consistency and follow-through with compliance.
5. Support tree planting and maintenance with dedicated budgets linked to a targeted program.
6. Capitalise on the immediate opportunity of vacant tree sites and reviewing tree replacement protocols.
7. Manage trees as assets, recognising the economic value of trees, which unlike 'grey' assets, appreciate over time.

See the Implementation section for details of a staged approach to delivering priority actions for Council.

Council received almost 2500 enquiries relating to public trees in 2016/17

Council received 1497 applications to prune or remove private trees in 2016/17

Data is not available on trees removed as a result of development approval or unauthorised removal

What else do we need to know?

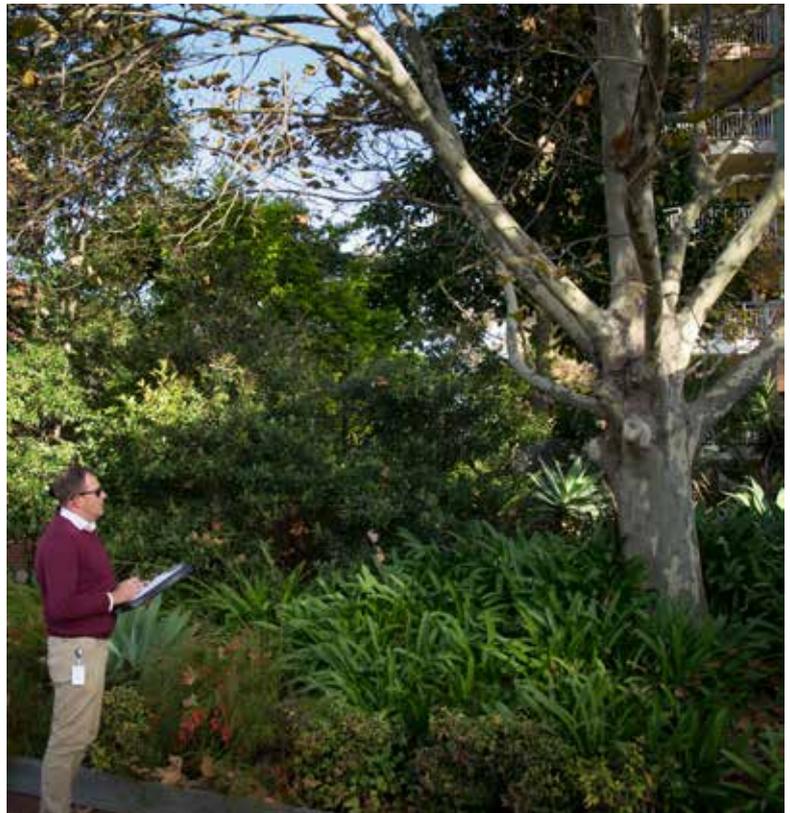
Public trees, on streets and in parks, largely fall within the care and control of Council. Council bears the risk, responsibility and cost of caring for these resources on behalf of the community.

Whilst canopy mapping is a valuable tool to understand spatial characteristics, it doesn't provide the qualitative data required to develop, budget for, and implement a robust public tree asset management plan.

Data such as species, age, structure, health, useful life expectancy and pruning requirements of individual trees are needed to ensure Council understands the quality and health of our tree assets.

This information, as well as the documented risk profile of each tree, helps to make evidence-based decisions for tree removal and replacement programs, pruning and maintenance scheduling as well as tree planting programs.

The data are collected in the form of a full public tree inventory which is undertaken by a qualified arborist. It is intended to be integrated, over time, into Council's asset register.



Issues

Issues for urban greening in Wollongong include the following:

Site Constraints

Our urban streets are highly variable with a range of site constraints, yet must all be safe, accessible, and functional. They need to house an array of infrastructure that can be easily accessed for maintenance and upgrade purposes.

Trees and vegetation must be compatible with the topography and context of the site. They must also accommodate overhead powerlines, stormwater drains, and underground services.

City and Town Centres

Our City and Town Centres drive the local economy, attract new business and provide places for people to connect. The amenity, environmental performance, business confidence and quality of urban centres is compromised by a lack of shade and greening.

Legacy Plantings

During the 1980's, a strong push for native street tree plantings saw a flush of Eucalypts, Melaleucas and Callistemons planted in our streets. Many of these trees only have a limited life span and, anecdotally, are triggering requests for removal across the City. There is no consistent or agreed approach to tree replacement.

Conflicts with Infrastructure

There is a significant population of trees that have outgrown their location and are causing damage or interference to infrastructure including footpaths, stormwater and sewer. Many trees under powerlines are being heavily pruned by contractors working for utilities, risking damage to their root systems. Compromised tree health from savage pruning limit a tree's ability to provide benefits.

Urban Renewal and Development

Current planning schemes for urban areas across Australia prioritise increasing urban density to cope with population growth and housing shortages. Wollongong's CBD will see a significant increase in residents over the next five years, bringing both renewed vibrancy and demand for improved amenity.

Subdividing traditional residential blocks is another means to accommodate urban growth, increasing housing density within the existing land parcel. This will decrease the amount of private tree canopy over time as larger lot sizes are cleared to make way for multi dwellings.

Compliance and enforcement, auditing of DCP controls, and ongoing administration of development and tree applications is likely to lead to increased resourcing costs for Council.

Public Perceptions

There continue to be challenges in managing the expectations of private residents around urban trees. Illegal tree clearing and vegetation vandalism are issues in many coastal areas. Wollongong has a spectacular natural setting, which has contributed to a prestige market for views. Conflicts arise around vegetation growth and views. Other issues include perceptions around coexisting with birds and animals, solar access, leaf and seed drop.

Education, consultation, good design, regulation, and clear guidelines will help to optimise the City's private and public vegetation for the benefit of all.

Council's Asset Management Programming

Currently street trees are not integrated with other capital asset management programming such as new or upgraded roadworks, footpaths and drainage works. Streamlining decision making for priority areas to integrate all relevant infrastructure - including trees - is an important step in gaining efficiencies and maximising the community benefit from financial resources.

101 breaches of Tree Management Orders were reported in 2016/17



Managing risks, including fire hazard



Pruning for powerlines



Vegetation vandalism



1980's era Melaleucas

Opportunities

Key opportunities for urban greening in Wollongong include:

More Urban Greening

The vacant sites data, canopy cover data and social vulnerability data all point to the need for more urban greening within Wollongong. Increased greening will help to deliver a range of priorities in the Community Strategic Plan, and is consistent with the objectives of A City for People.

Highlight Wollongong's World-Class Location and Setting

Wollongong is exceptional in many ways. The urban realm provides an opportunity not only to create a world-class urban landscape defined by our unique natural setting, but also to support local biodiversity.

Achieving canopy targets does require a focus on proven performers - those species which will integrate with existing infrastructure, provide deep shade, and be resilient in changing conditions. Quality trees on major arterial roads can define and 'announce' the quality of our City via enhanced entranceways.

Many of Wollongong's backyards already provide sanctuary for native birds, reptiles and frogs. They are stepping stones between our urban and natural areas, and help to provide important links for the City's biodiversity. There is potential to increase the representation of local native species through promoting biodiverse plantings in backyards, reviewing the overall species palette as part of the Technical Guidelines action, and also piloting cultivation and planting of endemic species with horticultural potential in the public realm.

Connectivity between urban and natural areas can be achieved by promoting appropriate local native species and avoiding weedy species across all land types - particularly those spatially identified as biodiversity corridors.

Gaining Better Knowledge

In obtaining a public tree inventory, Council will gain a baseline understanding of the asset, its deficiencies and opportunities. Investment can be targeted and prioritised towards locations that are in need of shade, amenity and

neighbourhood character through a Street Tree Management Plan or 10 Year Tree Planting Program. Adequate maintenance budgets can be secured to ensure risk profiles of the tree assets are at acceptable levels for community safety, transitioning from a reactive to a proactive management approach.

Tree inventory data has far reaching uses, making it a necessary and worthwhile investment. From this data, Council can measure performance of the urban forest over time and its ability to provide the required benefits. It is also the basis of the business case to attract greater funding towards urban greening.

Coordination

There is a clear opportunity to review responsibilities for tree and vegetation issues across Council. A coordinated approach will ensure consistency across key areas of responsibility in both the public and private realm, as well as between divisions, through a multi-disciplinary approach to planning and implementation.

Public tree data can be used to inform other asset management programs, strategic plans and urban development and renewal by centralisation within the existing asset management system.

Align with Wollongong's Land Use Planning

Given that urban renewal is considered both a major driver and an issue for Wollongong's urban forest, there is a clear opportunity to align outcomes from the Strategy with Wollongong's planning instruments to ensure that trees, both public and private, are considered in all development. This includes a review of DCP controls relating to urban greening.

New residential developments provide a 'blank slate'. This is an opportunity to integrate a full stocking rate of quality street trees and vegetation at the build stage of future road reserves; reestablish connectivity in fragmented existing green or riparian corridors; and to ensure natural areas and parks are transferred to Council with high quality urban greening values.

Review Programs, Processes and Technical Guidelines

Developing a suite of policy and process documentation for urban tree management, including technical guidelines, will address a range of issues. Street tree issues, for example, include: selecting the right species for the right position; compatibility with powerlines and underground services; safety; pruning, maintenance and removal; replacement of mature trees; shade and solar access; pedestrian access; and habitat.

Once completed, guidelines will provide clear and consistent standards which will not only inform public tree work, but can be included within specifications for contractors, guidelines for developers or to help negotiate better tree outcomes with utility service providers.

Community

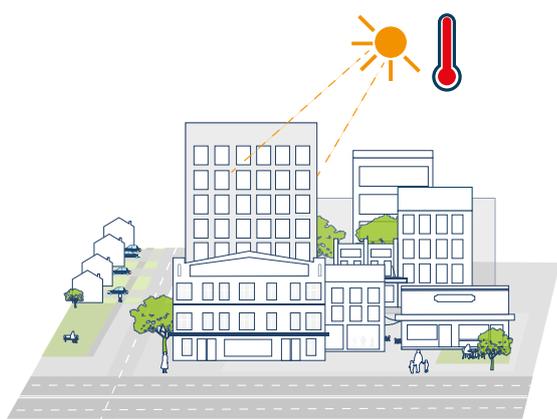
The provision of clear and documented information regarding Wollongong's urban forest is an important first step in building awareness and recognition of its value. This will include engaging in constructive dialogue around the impacts of illegal tree removal, vegetation clearing and vandalism.

Our community values our natural environment above all else, and our City benefits from ongoing participation of our people in existing greening programs. Ensuring there are well-resourced opportunities for collaboration in decision making and programming is critical to the success of the Strategy.



Public and private carparks offer clear opportunity for greening.

Wollongong will grow and nurture a healthy, diverse and well-managed urban forest to deliver a renewed and resilient place for people, enterprise and the ecosystems that support us.



From this

To this

Goals

The Strategy has identified these FOUR goals for Urban Greening in Wollongong. Each goal is supported by a series of strategies and actions, described in the following section.

Grow



Green the City - Increase Canopy Cover

Grow the City's canopy cover through a targeted planting program to harness the economic, social and natural benefits of trees and urban greening.

Manage



Protect and Maintain Existing Vegetation

Manage existing vegetation through a coordinated regulatory, planning, design and maintenance program to deliver a quality, world-class urban landscape.

Improve



Diversify planting and improve urban ecology

Improve the ecological function of urban areas through design which is diverse in form, connects urban and natural areas, improves water management and supports biodiversity.

Engage



Educate and Partner with our community

Engage the community, business, agencies and private landholders to inspire care and connection to our unique natural setting.

01 Grow

Green the City - Increase Canopy Cover

Grow the City's canopy cover through a targeted planting program to harness the economic, social and natural benefits of trees and urban greening.

More and better quality green space nearby supports mental health in children



Objectives

- Increase canopy cover in priority areas to 35% by 2046 through a targeted tree planting program
- Reduce the number of vacant tree sites in priority areas to zero by 2046
- Increase tree numbers in industrial areas, public carparks, arterial and collector routes
- All new developments will have full tree stocking rates consistent with technical guidelines prior to handover to Council
- 20% increase in existing canopy cover in priority areas by 2020



Strategies

1.1 Establish baseline data and monitoring systems

Build our knowledge of the existing urban forest in order to make informed decisions about future goals, and monitor progress.

1.3 Integrate tree planting into existing Council programs and works

Actively pursue opportunities to integrate new planting into the capital works program and Council facilities, across the whole cycle from planning to renewal.

1.2 Invest in a targeted tree planting program to maximise the benefits of urban greening

A business case will support a proactive planting program which is supported by data and focuses on priority areas for greening.

1.4 Pursue a range of opportunities to increase canopy cover in the private realm

Opportunities and incentives to increase canopy cover on private land are identified and promoted.

Key Actions

1.1 Establish baseline data and monitoring systems

- 1.1.1 Establish a cross-disciplinary Urban Greening advisory group to coordinate short to medium-term decision-making
- 1.1.2 Collect Tree Inventory
- 1.1.3 Establish centralised data collection and record keeping for tree assessment, planting, maintenance and removal
- 1.1.4 Perform regular analysis of Wollongong's urban canopy

1.2 Invest in a targeted tree planting program to maximise the benefits of urban greening

- 1.2.1 Develop a priority tree planting program based on existing data
- 1.2.2 Allocate ongoing budget and resources to adequately deliver a coordinated tree planting program

1.3 Integrate tree planting into existing Council road, footpath, facilities and public space works

- 1.3.1 Use spatial mapping to identify synergies between scheduled works and urban greening
- 1.3.2 Develop a pilot planting program

1.4 Pursue a range of opportunities to increase canopy cover in the private realm

- 1.4.1 Technical Guidelines (action 2.1.1) will include a review of the Development Control Plan (DCP) and other relevant guidelines and incentives for developers and private landholders
- 1.4.2 Investigate and promote all opportunities to increase canopy cover in the private realm

02 Manage

Protect and Maintain Existing Vegetation

Manage existing vegetation through a coordinated regulatory, planning, design and maintenance program to deliver a quality, world-class urban landscape.



Objectives

- Council programs implement best practice urban tree and vegetation management
- New planted tree mortality is below 10%
- No net loss of vegetation on private land
- Consistent and clear management of trees and vegetation across all land types



Strategies

2.1 Establish clear policies and guidelines for the management, protection and maintenance of urban vegetation

A complete set of urban tree guidelines will be developed to provide an ongoing approach to resolve current management issues.

2.3 Collect and use high quality asset data to inform decision-making

Public tree data will link to Council's asset register, and be used to inform budget and resourcing requirements for an ongoing tree program.

2.2 Implement a program of cost-effective, best practice, proactive tree management

A management plan will support an ongoing, scheduled program of street and park tree maintenance.

2.4 Protect and maintain vegetation in the private realm

Opportunities and incentives to protect and maintain canopy cover on private land are identified and promoted.

Key Actions

2.1 Establish clear policies and guidelines for the management, protection and maintenance of urban vegetation

- 2.1.1 Develop a full suite of Technical Guidelines to inform tree selection, species, procurement, planting, replacement, maintenance, removal, risk management, habitat and best practice management.
- 2.1.2 Integrate the application of Technical Guidelines across the public and private realm

2.2 Implement a program of cost-effective, best practice, proactive tree management

- 2.2.1 Develop an ongoing, scheduled street and park tree maintenance program based on asset data and Technical Guidelines
- 2.2.2 Develop a business case and implement the proactive public tree maintenance, assessment and renewal program
- 2.2.3 Establish improved planning and management outcomes between public and private entities including utilities, service providers and asset managers with major tree resources or programs

2.3 Collect and use high quality asset data to inform decision-making

- 2.3.1 Report annually on trees planted and trees removed on public land
- 2.3.2 Integrate tree data into the asset management system
- 2.3.3 Develop a Significant Tree Register
- 2.3.4 Collect and interpret data to inform adequately fund and coordinate public urban greening programs

2.4 Protect and maintain vegetation in the private realm

- 2.4.1 Implement improved Development Control Plan (DCP) controls, and other relevant guidelines (1.4) to protect and maintain vegetation in the private realm
- 2.4.2 Review mechanisms to incentivise improved tree protection and management in the private realm

03 Improve

Diversify planting and improve urban ecology

Improve the ecological function of urban areas through design which is diverse in form, connects urban and natural areas, improves water management and supports biodiversity.



Objectives

- Increase tree corridors along urban streets providing habitat and linking areas of biodiversity value
- Increase the amount of stormwater passively filtered into the urban landscape
- Increase permeability across all urban areas, particularly the CBD
- Increase the diversity of vegetation form, height and species



Strategies

3.1 Urban design will enhance the diversity and ecological function of urban areas

Using great design, supported by quality guidelines, the public realm will play host to a healthier, more diverse urban ecology.

3.2 Urban areas will integrate and connect with natural areas where possible

Council's investment in our natural areas will be enhanced and supported by a thoughtful, integrated approach to greening nearby urban areas.

3.3 Stormwater will be more effectively managed for urban greening

Soil, waterway and vegetation health will be improved by incorporating water sensitive urban design.

Key Actions

3.1 Urban design will enhance the diversity and ecological function of urban areas

- 3.1.1 Through the pilot projects (action 1.3.2.1) and proactive planting program (action 1.2.2) identify and prioritise areas with ecological connection at the planning and design phase to include an improved palette of local native species
- 3.1.2 Develop design guidelines for green roofs, green walls and facades, rain gardens and other structural vegetation

3.2 Urban areas will integrate and connect with natural areas where possible

- 3.2.1 Logs, hollows, nesting boxes and other habitat in urban areas will be managed as per Technical Guidelines (action 2.1.1), with the opportunity to retain and relocate felled sections of tree hollows and logs pursued
- 3.2.2 Investigate and promote all opportunities to incentivise and promote integration and connectivity with natural areas in the private realm

3.3 Stormwater will be more effectively managed for urban greening

- 3.3.1 Review Water Sensitive Urban Design (WSUD) guidelines as part of Technical Guidelines (action 2.11)
- 3.3.2 Pursue opportunities to incorporate WSUD principles in scope and design phases of public works, and also in private development

04 Engage

Educate and Partner with our community

Engage the community, business, agencies and private landholders to inspire care and connection to our unique natural setting.

Did you know? Volunteers actively manage 65 Bushcare sites across the City.



Objectives

- Increase in resident requests to plant more trees
- Increase in resident satisfaction with the amenity of streets and open spaces
- Increased engagement of private landholders in supporting biodiversity
- Increased participation in community greening initiatives



Strategies

4.1 Increase awareness about the high value and importance of the urban forest

Trees and vegetation are valuable assets which underpin the health, wellbeing, prosperity and amenity of our City.

4.2 Provide opportunities to actively participate in urban greening.

The community is inspired and skilled up to care for, enhance, and connect with our unique natural setting.

4.3 Engage the whole community in designing and protecting urban landscapes

Genuine engagement will ensure that the community is actively involved in planning for quality green spaces.

Key Actions

4.1 Increase awareness about the high value and importance of the urban forest

- 4.1.1 Review environmental education programs, policy and strategy to improve and enhance urban greening goals and objectives
- 4.1.2 Deliver a diverse range of engagement opportunities across all platforms, targeting people across a range of clearly identified demographics and behaviours
- 4.1.3 Fund, develop and deliver a communications strategy to highlight Council's commitment and promote the benefits of urban greening

4.2 Provide opportunities to actively participate in urban greening

- 4.2.1 Support, enhance and resource existing hands-on community programs (Bushcare, Dunecare, Fiready, Landcare, community gardens) and enable community greening initiatives on public land
- 4.2.2 Adopt proactive Verge Garden Guidelines consistent with tree technical guidelines (2.1.1) and precinct or tree masterplans
- 4.2.3 Provide incentives and mechanisms to facilitate urban greening outcomes on private land including planting of appropriate canopy trees, riparian corridors, habitat enhancement and retention, and weed management

4.3 Engage the whole community in designing and protecting urban landscapes

- 4.3.1 Develop and maintain partnerships with external agencies
- 4.3.2 Directly engage local residents and stakeholders in design and planning processes for urban landscapes
- 4.3.3 Prepare a public tree community consultation and notification protocol/policy

Implementation

The role of the Implementation Plan

The Urban Greening Strategy provides a framework for a consistent approach to managing the urban forest as a whole, on both private and public land.

The Strategy identifies detailed specific strategies and actions to support each of the four goals. It will be a key supporting document to inform annual planning priorities and budgeting processes.

Not all actions identified in the Strategy are fully funded from existing capital and operational budgets.

The following summary describes a sequence for delivery of short term actions which have been identified as priorities. Further detail is contained within the Urban Greening Strategy Implementation Plan 2017-21.

The majority of these actions are concerned with public tree management, technical guidelines, and community engagement.

They have been identified as immediate and achievable opportunities to improve Council's current approach.

Long term resource implications for a new approach to public tree management can only be estimated following improved coordination, asset data collection, and proactive management programs.

Existing 2017-21 operational and capital budget is adequate to commence targeted actions to yield the necessary data and guidelines in the short term.

A business case will need to be prepared to fully analyse Council's current and future liabilities, to understand the resource capacity, and plan for the longer term implications of Implementation.

The Implementation Plan provides a refined list of action-based projects reviewed annually as part of the Council's business planning cycle.

The staged approach enables Council to focus on actions which:

1. Establish and implement discrete plans and targeted programs to maximise the benefit of street trees, which strategically identify what to plant and where.
2. Identify resources for proactive public tree work, which is currently dominated by responding to immediate risks and requests for removal.
3. Collect the data required for monitoring and planning tree and vegetation issues across the City, and proactively invest in condition monitoring and enhancement.
4. Coordinate tree and vegetation management within Council to better manage risks and ensure greater consistency in outcomes across all approval or decision-making pathways on both private and public land. Improve the consistency and follow-through with compliance.
5. Support tree planting and maintenance with dedicated budgets linked to a targeted program.
6. Capitalise on the immediate opportunity of vacant tree sites and reviewing tree replacement protocols.
7. Manage trees as assets, recognising the economic value of trees, which unlike 'grey' assets, appreciate over time.

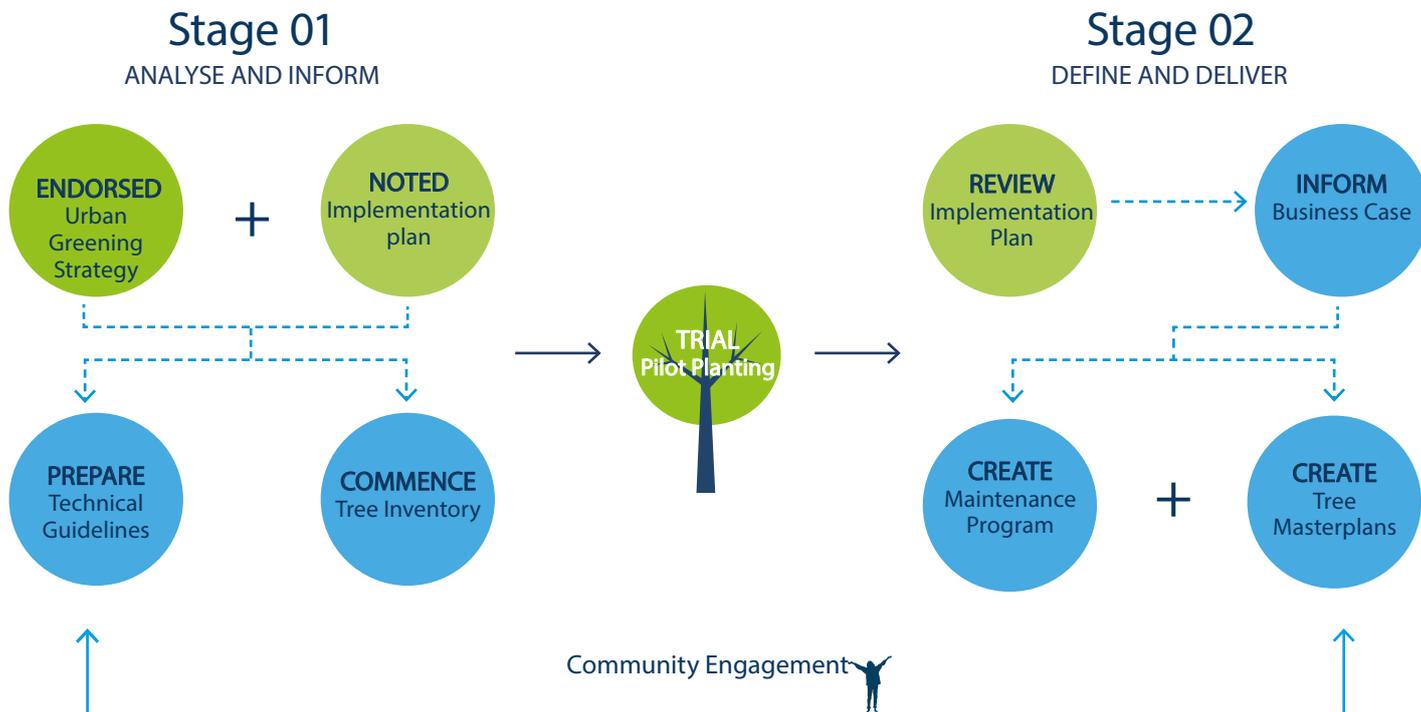


Local native White Aspen *Acronychia oblongifolia* used as a street tree in Fairy Meadow

Priority Actions 2017-2021

An overview of the staged approach to implementation

The diagram below outlines the process and sequence of actions to put in place the elements required for Council to deliver improved urban greening outcomes:



Urban Greening Strategy

This Strategy includes an endorsed vision and set of objectives, strategies, targets and actions for improving urban greening in Wollongong, with a focus on the urban forest. It provides the over-arching framework for strategic management of urban trees and vegetation in Wollongong.

Implementation Plan

This internal working document includes a detailed suite of actions for Council to work towards achieving the outcomes identified in the Strategy. It will include timeframes, funding, performance indicators and responsibilities for individual actions in a prioritised, staged format. Key actions on pp 31 - 39.

Technical Guidelines

Technical Guidelines will provide clarity and consistency for urban vegetation management. This body of work over time will form the 'how-to' guide: an Urban Greening Technical Manual. It may include a range of policy documents, reviews of existing planning and statutory tools, and processes. It may result in a centralised source of tree information, helping to deliver a consistent approach which is well publicised and creates clarity around compliance and reporting. Guidelines for application across the public and private realm will specify: site selection, ground preparation, tree planting, maintenance, pruning, risk assessment, removals, tree protection, tree replacement and infrastructure conflict management. It will include a comprehensive review of the preferred suite of species for selection in various urban settings.

Tree Inventory

Tree Inventory data will reveal the condition and resource implications for the existing public tree asset. **Together with the Technical Guidelines, it will** lay the groundwork to pilot, and put in place, an holistic public tree program. It will, over time, generate a complete set of data pertaining to every urban street and park tree in Wollongong. Data collected will include: species, height, health, age, useful life expectancy, hazards and pruning requirements. Data will be integrated into Council's asset management system.

Pilot Plantings

A pilot program will focus on establishing the capacity across Council to plan and deliver a broader, long-term program. This will help to test a new approach to site selection, design, planting and maintenance across a range of contexts. Trees and vegetation must be compatible with site constraints, accommodating an array of infrastructure, power-lines, drains and underground services. Planting will following best management practices to ensure quality plants are selected and provided with the conditions required to thrive. Pilot plantings may include: canopy-focused street trees integrated into the design phase of the capital program of road and footpath renewal on priority streets; trialling an expanded palette of local native species in various contexts; and high-impact town centre projects showcasing a diversity of urban greening approaches.

Business Case

The Strategy, Implementation Plan, Council and executive reports together form a Business

Case outlining the true value of the public tree asset, identifying resourcing and funding required to achieve a more effective public tree management program for Wollongong.

Tree Masterplan

Potentially in the form of a proactive Tree Planting Program, a Tree Masterplan includes what type of tree will be planted, in what numbers, where and when. This action is closely linked to place, and will be developed in close consultation with the community to ensure desired neighbourhood characters and amenity are met through appropriate species selection and design.

Maintenance Program

As Tree Inventory data is collected, a maintenance program can be planned to transition towards proactive, risk-averse tree work. It specifies replacement and renewal protocols based on inventory data. Scheduled works include regular hazard assessments for relevant trees, cyclic pruning programs to ensure sightlines, road safety and visibility are maintained in streets and parks, pest and disease monitoring, plus reducing the conflicts between trees in infrastructure (canopy pruning, root pruning).

Community Engagement

A serious commitment to community participation underpins the entire approach to urban greening in Wollongong. This includes input into higher level strategy, providing inspiring opportunities to be involved and supported in greening programs, all the way down to involvement in the detail of precinct and street tree planning.

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