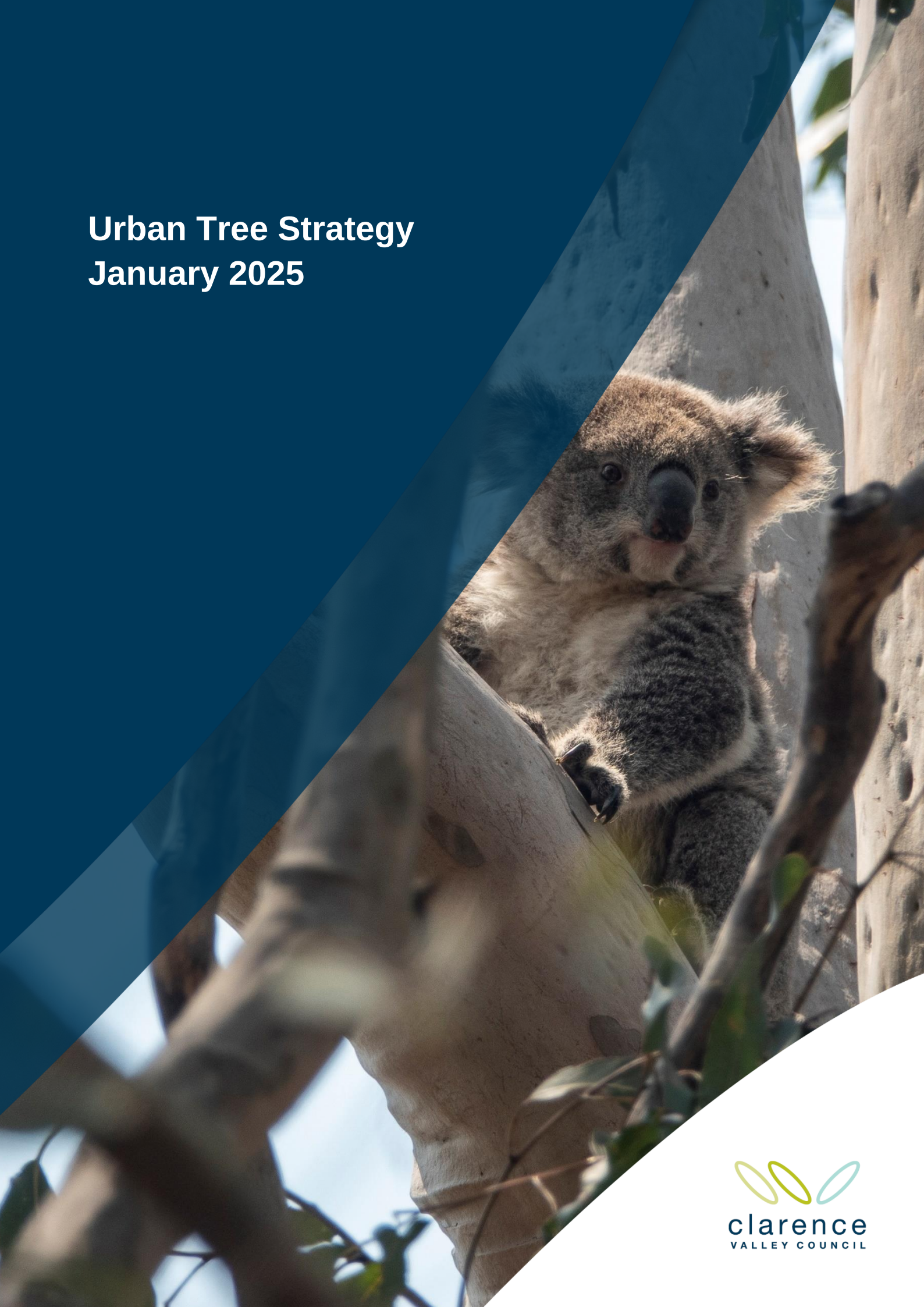
Urban Tree Strategy
January 2025



clarence
VALLEY COUNCIL

CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

EXECUTIVE SUMMARY

URBAN TREE STRATEGY

This urban tree strategy is an update to the 2011 tree management strategy developed by Council. Since the 2011 Strategy there has been significant change in the policy context for urban tree management including an increased emphasis on tree canopy in NSW and across Australia and an increased emphasis on setting tree canopy targets as a way of assessing and determining key management actions.

SUPPORTING COUNCIL'S GREEN INFRASTRUCTURE STRATEGY

This strategy supports Council's Green Infrastructure Strategy adopted by Council in 2023. The Green Infrastructure strategy identified two key actions for tree canopy in the Valley including assessing Council's existing urban tree canopy cover and setting targets for urban tree canopy cover.

17% EXISTING URBAN TREE CANOPY COVER IN THE VALLEY

A key finding of this study is the low urban tree canopy cover across urban towns and villages in the Valley. The average urban tree canopy cover across towns and villages is 17% and this tree canopy cover is relatively consistent across the towns and villages in the Valley. There is significant potential to increase the canopy coverage particularly given the relatively low density of development in the towns and villages across the Valley. The wide street verges provide significant potential for planting of larger trees which provide good canopy cover.

INCREASING TREE CANOPY ACROSS THE VALLEY

A key recommendation in the urban tree strategy is to increase tree canopy cover every year. Tracking the numbers of tree plantings in open space and streets undertaken by Council is recommended. It is also recommended to measure tree canopy in the Valley to assess how Council is progressing towards increasing its tree canopy coverage over time. Consistent with Council's Green Infrastructure Strategy a tree canopy target of 40% for all new residential development areas is also recommended and 30% a new business and industrial development areas.

A TREE CANOPY COVER IMPROVEMENT PROGRAM

To assist in increasing Council's tree canopy coverage a tree canopy cover improvement program is required. This program requires adequate funding and resourcing. Given the finding of relatively low tree canopy cover, relative to the density of development the new tree canopy cover program is considered a priority for Council in both the short and medium term. .

1. INTRODUCTION

1.1. Urban trees and management of tree canopy

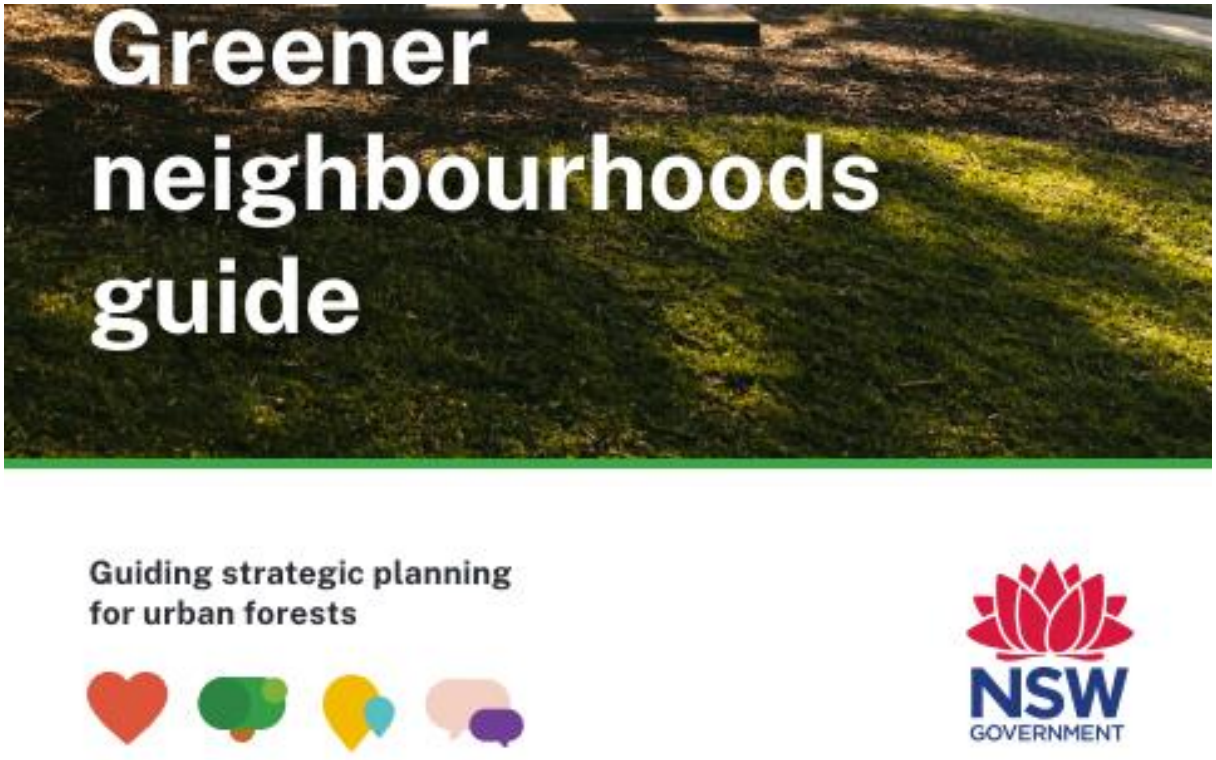
Trees are essential green infrastructure that contribute to healthy and liveable cities. Urban trees are defined as long lived woody plants with the potential to grow to a height greater than 3 metres and grow in urban streets, parks, in resident's back and front yards, on commercial and industrial land and within the rural villages dotted throughout the Clarence, on rural land, along rural roads and river communities and excluding National Parks, coastal reserves and other nature reserves. Trees are one of the core components of Clarence Valley's green infrastructure network.

The 'urban forest' is the sum of all vegetation as well as the soil and water that support it across the Valley. Urban trees are the most dominant element of the 'urban forest'. In urban areas trees provide the greatest community, environmental and economic benefits. As such this strategy focuses on the protection, management and expansion of the Valley's urban trees.

Across Australia, tree planting and greening was an integral part of the design of our towns and villages. Traditionally this was primarily about the ornamental value of trees and often focused on the management of individual trees. Recently, there has been a shift from a focus on individual tree planting and management to a holistic approach that encompasses managing the 'urban forest' as a system and promoting urban canopy.

As outlined in Greener Neighbourhoods Guide the NSW Government recognises the value that trees, and vegetation play in our urban areas and is working to prioritise their provision through targeted policies.

Figure 1 NSW Government's Greener Neighbourhoods Guide supports urban forest planning



1.2. Benefits of urban tree canopy

Urban trees are essential for providing great places to live and work. Research consistently shows that urban trees provide a wide range of benefits including community, environmental and economic benefits. The broad range of these benefits is outlined below.

Community benefits

- Improved amenity and landscape aesthetics of urban villages and streets
- Reduces UV exposure through shading
- Leafy streets encourage people to walk and cycle more, improving physical health
- Urban trees and landscapes improve mental well-being and reduce stress
- Improved physical well-being through reduced stress
- Improved thermal comfort through reduced air temperatures and lower surface temperatures
- Contribute to reduced speeds and traffic calming particularly along treelined avenues and streets
- Urban trees allows people to connect more with nature and build social cohesion
- Trees are important for their heritage significance and important element of the cultural landscape of towns, villages and places in the Clarence Valley.

Environmental benefits

- Trees store and sequester carbon
- Trees reduce air pollution contributing to better air quality
- Provision of food and habitat for local wildlife in urban areas
- Provide connectivity to areas of high biodiversity values
- Provide buffer zones to areas with high biodiversity values and waterways
- Contribute to filtering stormwater pollution and mitigate storm water runoff
- Contribute to reducing soil erosion

Economic benefits

- Enhance sense of place, landscape character and city branding and contribute to local tourism including local festivals and events
- Retail areas with good urban tree canopy and amenity can generate up to 20 percent more productivity – people spend more time, and more money
- Street trees can increase residential property values
- Shading can reduce need for mechanical cooling in summer, reducing cooling costs
- Shade provided by trees can prolong the life of hard infrastructure from UV exposure damage such as reduced need for asphalt resurfacing of local roads
- The heritage value of trees contribute to the appeal of places for living, working and leisure

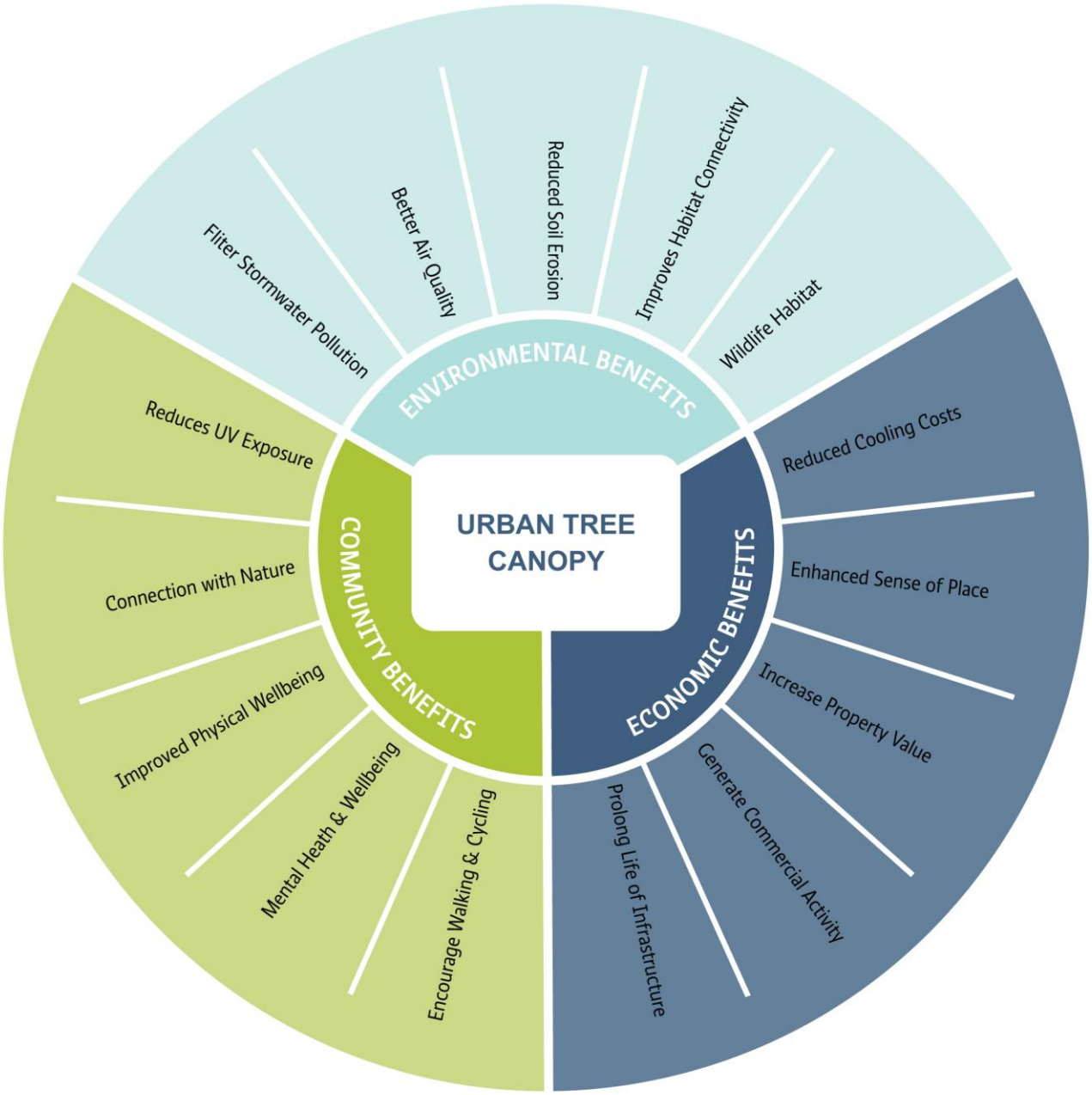


Figure 2 Benefits of urban trees

1.3. Role of the urban tree strategy

This Strategy identifies the need to increase the Valley's urban tree canopy to retain a high quality liveable urban lifestyle in the Valley. The strategy also identifies the need to increase the urban tree canopy to reach the NSW Government's tree canopy targets.

Urban development can place increasing pressures on urban tree canopy cover, particularly infill development and in rural residential developments such as Gulmurrad. A study by RMIT University found that more than half of Sydney's councils lost urban tree canopy cover between the years of 2013 and 2020. While no studies have been done in the Clarence it is likely that pressure from urban development is reducing tree canopy in parts of the Local Government Area (LGA) due to clearing for new sub-divisions and rural residential development.

The role of this strategy is to support the sustainable management of urban trees across the LGA and an increase in canopy cover in urban areas in the LGA. This includes maintaining and protecting the existing tree canopy as well as enhancing and expanding tree canopy cover in the Valley. The strategy also includes a role in raising awareness of existing heritage protection provisions for trees and increasing protection for notable specimens.

This strategy identifies a number of priority areas including:

- Setting a goal to increase the current low canopy cover in towns and villages across the LGA
- Developing a tree planting and tree protection program to achieve an increase in canopy cover across the towns and villages in the Valley
- Engaging with the community to better understand community opportunities to increase canopy cover on the private lot

This strategy guides future urban tree management decision making. The strategy sets the direction for an approach to urban tree management outcomes that best meets the needs of the Clarence Valley community over the next 10 to 15 years.

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2. CLARENCE VALLEY CONTEXT

First Nations communities have lived in this rich valley, enjoying food and natural resources for thousands of years. Since the mid-1800s, the Clarence Valley's wealth has relied on our natural resources including rich alluvial soil and a favourable climate. The natural environment has been a key part of the economic drivers for the Valley including the production of timber, beef, milk, sugar and seafood. Grafton was the first city on the North Coast and this historic centre is the hub of services and opportunities for people of the Clarence Valley, supported by diverse towns and villages including Maclean and Yamba.

Grafton was the first city on the North Coast of NSW and retains streetscapes with mature tree lined avenues. Grafton is historically significant as the first gazetted City on the North Coast of NSW in 1885. Its streetscapes with mature tree lined avenues in wide grassed verges are integral to its sense of place and strong identity. This cultural streetscape and landscape character is highly valued by locals and visitors alike. Further information on the role of trees in Graton's rich historical context can be founds in the Grafton City Community Based Heritage Study (2010) and Thematic History of Grafton (2008)

2.1. Policy context

The NSW Government has identified Green infrastructure as an important element of our cities and urban areas. One of the NSW Government Premier's Priorities is Greening Our City which seeks to increase the tree canopy and green cover in NSW. To support this the NSW Department of Planning has developed a number of supporting strategic documents including the *Greener Places Framework* and *Draft Greener Places Design Guide.* The regional and local policy context of the Urban Tree Strategy is shown in Figure 3 and discussed further in the following sections.

Greener Places – Urban Green Infrastructure Design Framework for NSW (2020)

The Greener Places framework provides a best-practice guide for the planning, design, and management of green infrastructure to deliver better places across NSW. The framework supports the creation of a networked urban ecosystem of green space that encompasses parks and open spaces including urban trees, streets, squares, and waterways to help create a healthier, more liveable, and resilient place to live.

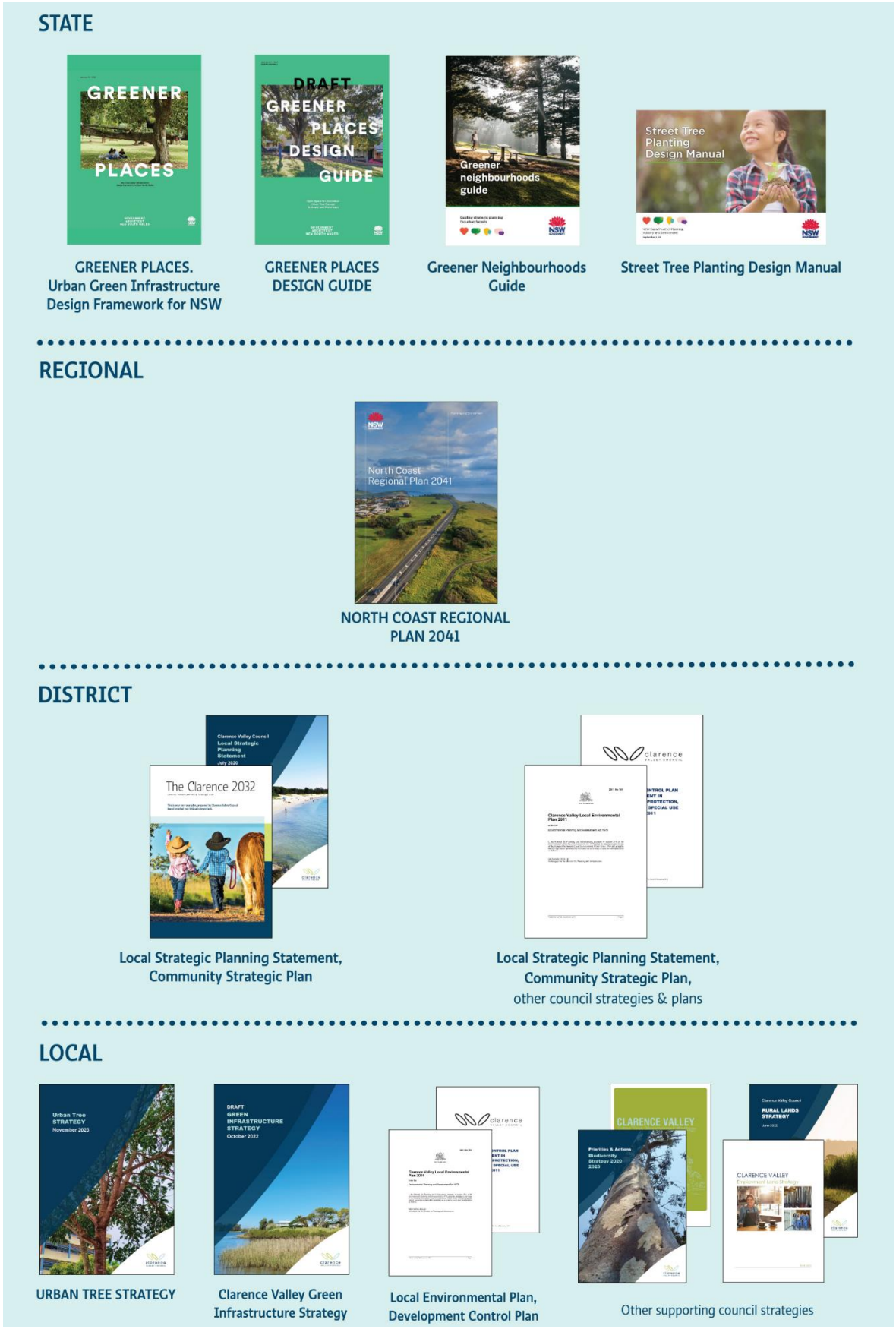
The Greener Places Design Framework provides *an evidence based approach that can be used in a wide range of plans and processes, contributing to improved tree canopy coverage and quality green public space.*

Greener Places Design Guide (Draft, 2020)

The Draft *Guide* proposes an improved approach for NSW, outlining the strategies and indicative targets to achieve improved canopy cover across the Greater Sydney Region, and other urban areas across NSW.

The Guide outlines that *optimal tree canopy varies depending on the climatic and land-use patterns within a city. Targets are best developed based on constraints such as density and land use. For example, dense development patterns with more impervious surfaces often have less opportunity for cover.*

Figure 3 Policy context for the Urban Tree Strategy in the Clarence Valley



The Guide outlines that the

- target for the Greater Sydney Region is to achieve 40 per cent urban tree canopy cover by 2056
- Other urban areas in NSW may choose to adopt a similar target
- Varied targets are recommended depending on the density and type of development as shown in Figure 4
- The 40 per cent target aligns with the Greater Sydney Region Plan and is based on international and national best practice
- Implementing this percentage figure requires spatial analysis that accounts for the varied needs of individual places
- Regional urban areas require further review and feedback

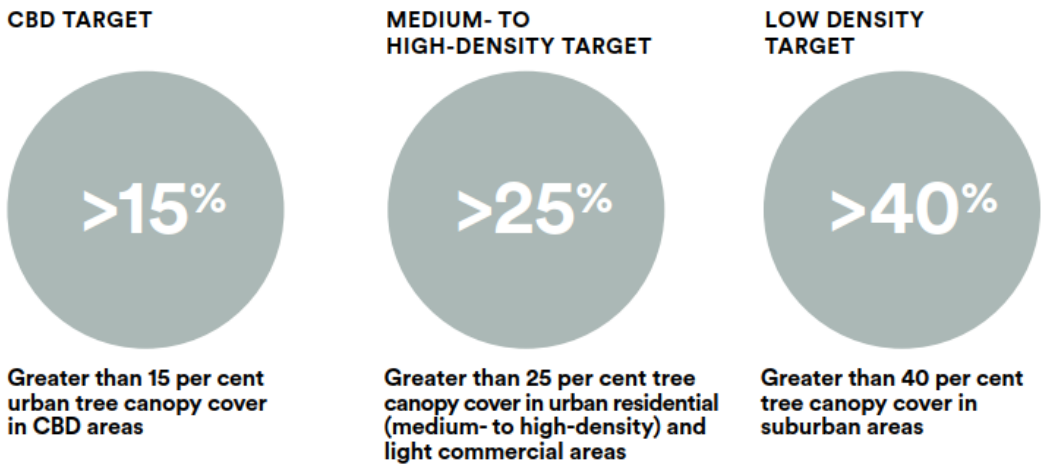


Figure 4 Tree Canopy Targets in the Draft Greener Places Guide (NSW Government, 2020)

The guide includes a number of strategies to increase urban tree canopy including

1. Protect, maintain, and enhance the existing urban tree canopy
2. Create an interconnected urban tree canopy across NSW
3. Build knowledge and awareness of urban tree canopy across State and local government, and the community

Greener Neighbourhoods Guide (NSW Government, 2021)

The Greener Neighbourhoods Guide was developed by the NSW Government to assist local governments across NSW to establish, build upon or re-envisage strategic planning for the urban tree canopy. The Guide includes information on how to understand, plan for, monitor and manage urban tree canopy and promotes best practice and consistency in urban tree management and planning.

It includes the following key components:

- Key elements of urban tree planning including governance, data, engagement and targets

- process for developing an ‘urban forest’ strategy
- advice for ‘urban forest’ planning using spatial data
- examples of setting canopy targets for different development scales
- a range of case studies and resources from across Australia

Street Tree Planting Design Manual (NSW Government, 2021)

The Street tree planting manual outlines the planning, placement and integration of healthier trees in residential streetscapes. The manual supports the NSW Government’s 40% canopy cover target. The manual provides guidance on where to plant trees to maximise benefits and health of street trees.

The manual provides an overview of the planning and design process of planting trees in residential streets. The manual includes three different levels of planning for street tree planting including

- A strategic approach to identify and prioritise streets that will benefit most from the increased tree canopy cover
- examples of holistic approaches to tree planting solutions in the streetscape considering streetscape spatial allocation, soils, services and other constraints
- opportunities for holistic planting design including groundcover, edge treatments, improving tree health through soils and passive irrigation measures

North Coast Regional Plan

The North Coast Regional Plan is a 20-year blueprint for the future of the North Coast. The vision for the North Coast is to create the best region in Australia to live, work and play building on its spectacular environment and communities.

To achieve this vision the NSW Government has set three goals for the region:

- Liveable, sustainable and resilient
- Productive and connected
- Growth, change and opportunity

The North Coast Regional Plan has a number of strategic directions for council’s Urban Tree Strategy including strategies in the Plan which include:

- Objective 5 – Manage and improve resilience to shocks and stresses natural hazards and climate change which includes Strategy 5.4:
    - address urban heat through building and street design at precinct scale that considers climate change and future climatic conditions to ensure that buildings and public spaces are designed to protect occupants in the event of heatwaves and extreme heat events
    - promote economic diversity, improved environmental, health and well-being outcomes and opportunities for cultural and social connections to build more resilient places and communities
- Objective 12 – Create a diverse visitor economy which includes Strategy 12.1:
    - enhance the amenity, vibrancy and safety of centres and township precincts

- create green and open spaces that are accessible and well connected and enhance existing green infrastructure in tourist and recreation facilities

The Regional Plan also has a clear direction to ensure that new growth avoids hazards and avoids and minimise impacts on the natural environment including protecting areas of high environmental value.

Community Strategic Plan - The Clarence 2032

The Community Strategic Plan (CSP) is the highest level of strategic planning for Council and community. The CSP has a strong focus on community and the environment. The plan developed five key priorities and two of these priorities relate to urban trees and tree canopy:

Society

Creating a place where people are healthy, safe, connected and in harmony with the natural environment to retain and improve the quality of community life.

Environment

Valuing, respecting and actively participating in the care and management of the Clarence's natural environment for current and future generations.

The CSP is supported by Council's Delivery Program 2022/2025, which outlines a range of strategies which deliver on the priorities in the CSP. This Urban Tree Strategy directly supports both the priorities in Council's CSP as well as the strategies in Council's Delivery Program.

Local Strategic Planning Statement (LSPS)

The LSPS is Council's key strategic plan for a growing population and increasing jobs, providing housing, community infrastructure and an attractive environment for the community.

The LSPS sets the direction for land use planning in the Valley for the next 20 years. It includes priorities to manage growth and development, protect our environment and the character of our spaces and places.

The LSPS states that

> ***Managing our urban environment to provide for green space and trees will continue to be important, while encouraging more development in our existing urban areas.***

As part of Priority 18, Promoting a low-carbon economy, the LSPS identifies

- *Action 18.6 Identify and support a network of extreme heat refuges, and increase the urban tree canopy and plant life along retail streets, carparks, residential neighbourhoods and other urban areas*

Key opportunities identified in the LSPS for urban tree canopy also include the following:

- *retaining biodiversity and trees to regulate temperatures*
- *wider road corridors with extensive tree planting could make new subdivisions more resilient to heat than current designs and encourage more outdoor healthy active lifestyles.*
- *larger back gardens would also enable tree planting and shadier, cooler microclimates for people to enjoy, and places for wildlife.*
- *further implementing our Urban Street Tree Strategy, and exploring ways of using laneways, arcades and avenues to create microclimates that are cooler in summer, attract more people to enjoy our urban environments year round and re-use vacant buildings and spaces should all be explored to support smaller start up business and attract a younger population and economic activity.*

This Urban Trees Strategy directly supports these priorities in the LSPS.

Green Infrastructure Strategy

Council developed a Green Infrastructure Strategy in 2023. The Strategy identified a key priority to manage the urban tree canopy and increase canopy cover and also included information on the valuation of green infrastructure and how to best apply this in the Valley. The Strategy included a number of actions including

- *undertaking analysis to determine the required tree sizes and soil volumes required to achieve a 40% canopy target for new residential development.*
- *determine the existing tree canopy cover for existing urban areas*
- *Expand the Yamba Street Tree Masterplan to other urban centres across the LGA including species lists and assessment of existing tree canopy cover*
- *Consider minimum targets for canopy cover / minimum tree requirements on private and public land*

This Urban Tree Strategy supports the implementation of the priorities and actions in the Green Infrastructure Strategy and completes a number of actions identified in the Green Infrastructure Strategy.

Clarence Valley Local Environment Plan (LEP) 2011)

Council's LEP, adopted in 2011, identifies trees as a key component of heritage conservation areas, and many trees are also listed as individual items or groups in Schedule 5 of the LEP 2011. The statutory provisions of Clause 5.10 of the LEP protect all trees within the curtilage of a Heritage Item and all trees within Heritage Conservation Areas. Development consent is required for removal on the site of a heritage items and anywhere in the HCAs, including road reserves.

There are 13 Heritage Conservation Areas (HCAs) in the Valley including HCAs in Brushgrove, Chatworth Island, Diggers Camp, Glenreagh, Grafton, Harwood, Lawrence, Maclean, Minnie Water, Sandon, South Grafton, Ulmarra, and Yamba

2.2. Tree canopy in the valley

As part of the development of the strategy a key priority has been to determine tree canopy for key urban areas in the Valley. Canopy mapping was undertaken over the Council area using 2016 Lidar data. 2016

Lidar data was used as this was the most recent point cloud data available through the Australian Governments spatial data platform, “Elvis”. This data was compared to recent aerial imagery and was found to provide a reasonable estimate of current tree canopy in the LGA. While there may be variations between 2016 and 2023 it is expected that these variations are relatively small.

It is noted that the accuracy of the mapping could be improved through Council undertaking its own Lidar data capture and this is recommended into the future to assess the effectiveness of actions undertaken over time.

Analysis of average canopy cover across the Council was conducted for the key urban towns and villages including:

- Grafton including South Grafton and Junction Hill
- Maclean
- Gulmurrad
- Yamba
- Iluka
- Clarenza
- Lawrence
- Townsend

The results for these towns and villages are included as a baseline benchmark of urban tree canopy in the Valley. It is noted that while more detailed thresholds can be used to assess at smaller scales for the purpose and intent of the strategy the analysis has been undertaken at the suburb scale. More detailed mapping can be undertaken in more detailed studies of each township and in preparing more detailed plans for increased street tree planting.

Figure 5 Canopy cover in Lawrence (existing urban area – dashed red line)

Canopy cover was determined using Lidar data and selecting vegetation that was greater than 3m in height. The Lidar data classification has some errors in the data (e.g. captures roofs and other structures as trees). A preliminary screening of large areas of obvious inaccurate data was undertaken manually. It is is also noted that the Lidar data does not distinguish between ‘trees’ and ‘large shrubs’ and captures any vegetation above 3m in height as a ‘tree’. For the purpose of this study this is considered to introduce only small errors in the assessment and is consistent with industry practice of tree canopy assessment.

The data was processed in QGIS to create areas of tree canopy cover. The results of this are shown for Lawrence in Figure 5.The dashed red boundary shows the existing urban area that was adopted for the assessment and the bright green shows the calculated and mapped tree canopy. The urban area was defined by the existing extent of development based on cadastre data, zoning and review of aerials. For urban areas within the Valley, tree canopy coverage was calculated for the top ten towns and villages by area. The total area for each of the main towns and villages is shown in Figure 6. The calculated canopy cover results are shown in Table 1 and Figure 7 for the defined urban areas.


Towns Assessed for Urban Tree Canopy Cover
1. Grafton
2. South Grafton
3. Clarenza
4. Junction Hill
5. Maclean
6. Lawrence
7. Townsend
8. Gulmurrad
9. Yamba
10. Iluka
GRAFTON
MACLEAN
YAMBA
LEGEND
Clarence Valley Council
Roads
Railway
Rivers
National Parks
State Forests
Towns assessed for Urban Tree Canopy Cover
0
100
200
300
400
500m

Tree canopy through time has changed in the Valley. An example of the substantial impact that urban development can have on urban tree canopy is shown in the development of the rural residential areas of Gulmurrad. The figure shows a boundary (in white) of the current development transposed onto the same area in 1959 and 1970. This shows that urban development footprint has resulted in a substantial loss of tree canopy over the last 50 to 60 years.

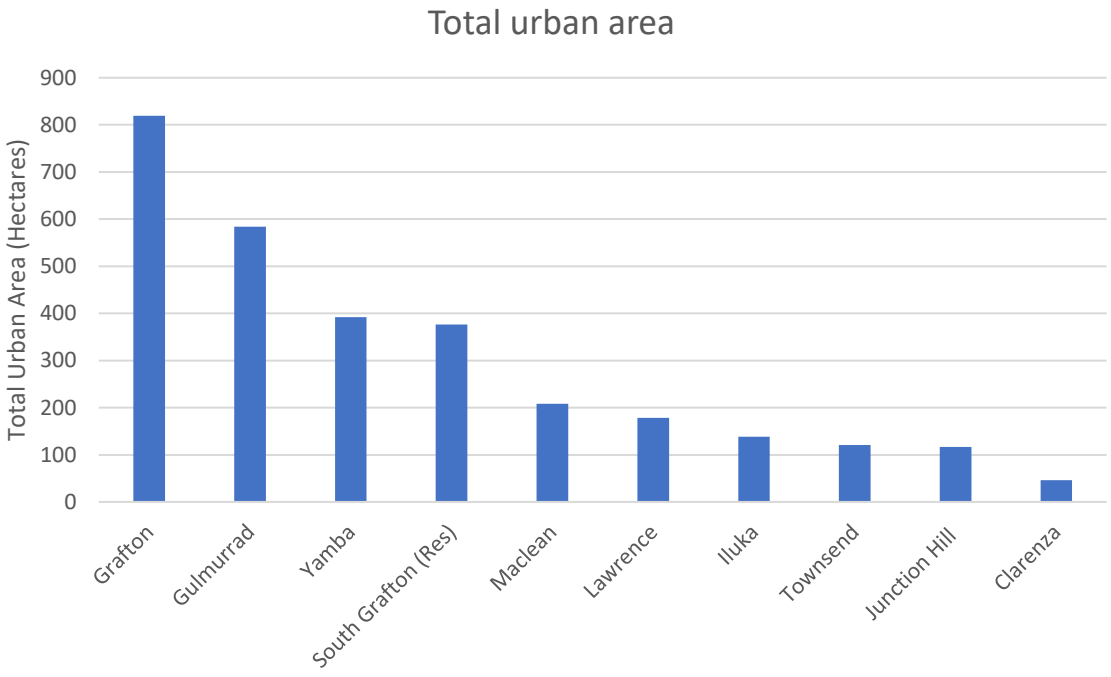


Figure 6 Total urban area in hectares for the main towns and villages

Table 1 Canopy cover in the Clarence Valley's urban areas

Total Area	Total Area (Has)	Canopy Cover (Has)	% Cover
Grafton	819.2	148.96	18.2%
Gulmurrad	584	111.084	19.0%
Yamba	392.24	54.96	14.0%
South Grafton (Res)	376.6	66.2	17.6%
Maclean	208.67	38	18.2%
Lawrence	178.7	26.2	14.7%
Iluka	138.7	26.63	19.2%
Townsend	121	18.97	15.7%
Junction Hill	116.7	16.92	14.5%
Clarenza	46.6	9.81	21.1%
Total	**2982.4**	**517.7**	**17%**

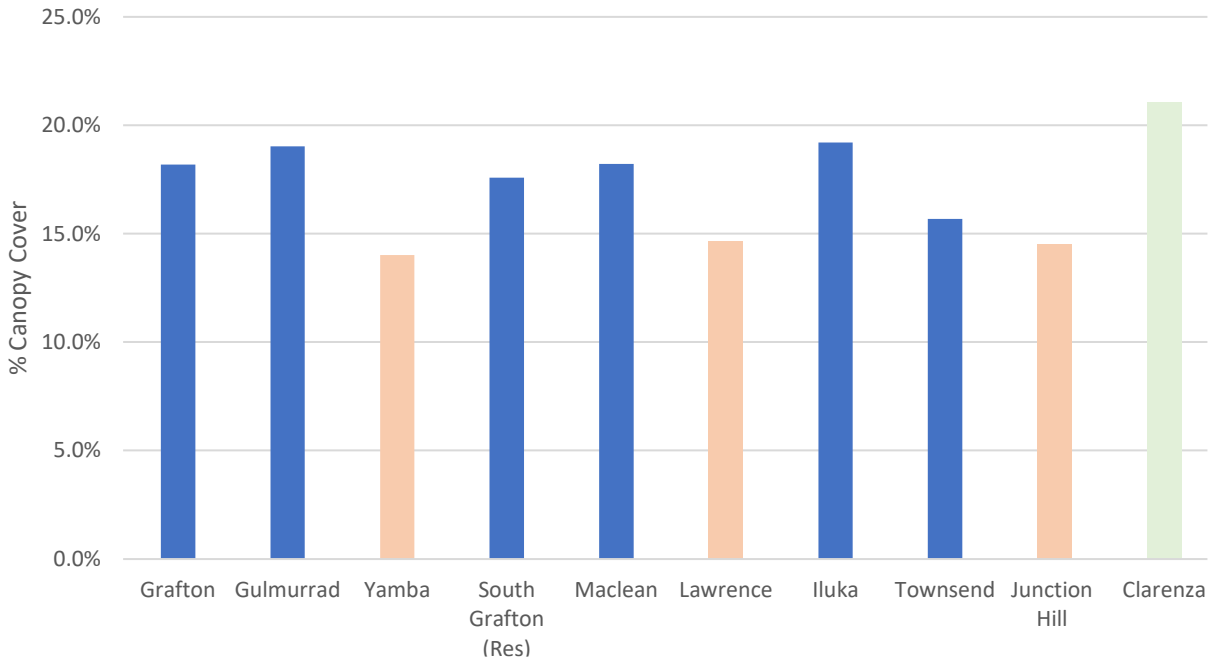


Figure 7 Canopy cover (%) for the main towns and villages (orange shows towns below 15% and green shows towns above 20% canopy cover)

Canopy cover in the urban areas is approximately 17.4% of the total urban area as an average across the LGA. Figure 8 shows the urban area boundary and tree canopy cover for Grafton which has a canopy coverage of 18%, close to the LGA average.

The canopy coverage within the urban areas in the LGA are relatively low for low density residential development with single dwellings on relatively large lots and larger private lots with larger areas of private open space.

The calculated canopy cover for the main towns and villages within the Valley shows that there were only minor differences in canopy cover across the towns and villages with canopy cover varying between 14% and 21%.

Figure 8 Canopy Cover in Grafton (existing urban area – dashed red line, canopy cover in yellow)

2.3. Organisational context

Fundamental to the delivery of healthy urban trees and a healthy urban tree canopy is the organisational capacity to deliver these outcomes.

At the commencement of this project a workshop was carried out with key internal staff to determine the organisation's capacity and identify the current challenges and barriers that may exist in achieving improved urban tree outcomes. The workshop considered the two main urban tree functions within Council:

- Public trees and operations
- Private tree management and planning

Tree asset management database

Council has been progressively developing and adding to its tree management inventory for public trees in the Valley. This database is increasingly being incorporated into its operational procedures and there is potential to further increase the coverage of the inventory.

A tree asset inventory is a critical part of the process for managing public trees to enable Council to understand and analyse and plan for its urban tree assets. There is significant potential to continue to embed the database into Council's day to day asset management processes including

- Tracking, responding to and managing customer requests
- Council risk management and development of risk profiles
- data on tree health and condition
- understanding and planning for tree species diversity and managing age distribution
- best practice urban tree planning

Substantial tree assessment and logging of a street tree database has been undertaken to date. Historically there has been no dedicated resource to undertake this role and much of the data was collected opportunistically by a number of different staff members. In 2023, this process transitioned to a dedicated tree management officer who is responsible for completing tree inspections, adding tree inventory data. Having a dedicated tree management officer also allows Council to be more proactive in Council's tree assessments.

There is the potential for the data that has been collected to also be reviewed and updated where required, particularly as new technologies are developed.

Tree maintenance

Historically tree maintenance has been primarily driven by responses to customer requests. Council is continuing to evolve its approach to maintenance and there is a current emphasis on including more proactive and cyclic tree maintenance programs. In particular, the appointment of a tree management officer

has allowed for a more systematic approach and greater efficiency in undertaking tree maintenance across Council's urban trees.

A lack of resources and budget was identified as being a key barrier to more proactive levels of tree maintenance and more efficient tree maintenance over time. In particular, there are opportunities for improved processing of customer requests though the ability to efficiently assess what works are necessary, what works should be prescribed (if any) and the priority of the works (e.g. safety or budgetary perspective).

Risk management approach

All trees carry some degree of risk and a tree risk-benefit management approach is beneficial to manage Council's risks. This approach recognises that that the risk from trees must also be balanced by the benefits they provide to achieve a tolerable level of risk.

There are benefits in having trees that are inspected by Council staff assessed using industry standard assessment procedures such as Quantified Tree Risk Assessment (QTRA). Council's tree crew is trained in the practice of QTRA and Council's tree management officer is now assessing trees providing an increased standardisation of tree assessment across the LGA.

Tree maintenance service levels have implications for tree risk management. Having proactive tree maintenance programs means that tree risks can be more readily identified and also reduces the likelihood of adverse events occurring.

Tree planting approach

Council has a tree planting program that has been refined over the last few years and the revised processes have significantly increased the effectiveness and success of new tree planting. Council's budget for tree planting was approximately $30,000 in the 2023/24 financial year and tree planting is delivered internally through Council staff. There are significant opportunities to provide increased internal resources to support tree planting programs.

Public land increasingly needs to accommodate more trees, and it is essential that Council has a well-resourced tree planting program to facilitate an increase in canopy.

Opportunities for community education

There are a diverse range of community views regarding trees in urban areas. While many in the community support trees in the urban context, negative community attitudes towards trees was identified as a potential obstacle to improving urban tree canopy outcomes. Negative attitudes can range from a fear of trees based on perceived risks, acceptance of trees from an aesthetic perspective, impacts on views, shading of solar panels, bushfire risks and impacts of trees on maintenance (leaf litter, fruit and nut drop, etc).

Improved education and engagement was identified as an opportunity to increase community acceptance of urban trees. It is recognised that this is difficult to do well with many in the community having strong views

regarding trees and therefore needs a carefully considered approach to achieve ongoing and lasting improvement.

Education was also identified as a potential opportunity to increase tree canopy cover on private land.

Planning and development opportunities and Council's Green Infrastructure Strateg

There are opportunities to achieve better outcomes for protection of existing trees in areas undergoing development as well as planting of new trees in new development, particularly street trees as well as trees for private property. There are opportunities for revised development controls, assessment of development applications with regards to trees by dedicated and experienced staff, the application of conditions of development as well as enforcement of any planning conditions.

A range of recommendations have been made in Council's Green Infrastructure Strategy (2023) which addresses these issues in tree canopy in new development. The Green Infrastructure Strategy also identified the extent of tree canopy loss that is occurring, particularly in rural residential developments such as Gulmurrad.

A standardised suite of conditions has been developed by the Department of Planning to aid in more consistency across local government areas and improve the efficiency of the development planning process (see https://www.planning.nsw.gov.au/policy-and-legislation/planning-reforms/standard-conditions-of-consent/standard-conditions-of-development-consent). These planning conditions include standard planning conditions for tree protection and tree planting requirements. There is opportunity to review Council's current conditions and the Department's conditions to develop a holistic suite that is enforceable and effective.

Currently Council has a policy which requires replacement tree planting for trees that, once assessed, are approved to be removed during development. There is an opportunity to review the effectiveness of the policy to date including a review of previous developments and the effectiveness of replacement tree planting. This could be undertaken for example by reviewing developments which have had requirements for tree replacement in the last 3 to 5 years and analysis of subsequent tree coverage achieved using aerial imagery (such as Nearmap). Based on this review the Clarence Valley Development Control Plan and/or enforcement may need to be revised if the current policy is not found to be effective. The Green Infrastructure also makes recommendations on Council's Biodiversity Offset Policy.

Tree management including tree removal

Compliance and regulation of tree management controls needs review. Consideration of the land zonings that tree management controls apply would benefit from review. An increase in resources would be needed if the tree management controls are applied to rural and rural residential as well as urban areas. Better education is required for customers and tree contractors about tree management controls.

Resourcing

The overall size of the geographical area of the LGA and distance between townships makes resourcing difficult, especially when mobilising equipment and personnel. Some areas are managed using local tree contractors as the response times and efficiency are improved given their geographical centre of operation. There are opportunities to review the current arrangement and there is likely to be a benefit from reviewing this process and formalisation of the preferred process based on this review.

There are opportunities for increased efficiency in operations through purchase and use of equipment such as woodchippers and personnel with the training to use them. Currently for example, tree waste is loaded on trucks using front end loaders and transported. rather than shredding the green waste that could then be re-used in landscape works and park maintenance. The management of greenwaste in general would benefit from review and enhanced processes.

From a planning [perspective there is a need for a suitably qualified resource, such as an arborist, that can assist with the assessment of development applications. Particularly in the review of aboricultural reports lodged with development applications and providing general advice to the town planning staff.

There is also a need for a resource that can assess tree removal or tree pruning applications. The current process and procedure regarding private tree works applications requires review. This task could be undertaken by Council's planning assessment team or through a shared resource within Councils tree assessment team.

It is recommended that a review be undertaken to determine and agree on the requirements for this, and the preferred organisational structure.

2.4. Tree species for replacement and new development

Existing tree species in the Valley

The tree asset management database was assessed to determine the key tree species in the Valley. To date the tree asset management database has completed assessment of trees in Grafton, South Grafton, Maclean and Townsend with other towns and villages currently being added to the database. These have been assessed to understand the dominant tree species in the Valley.

This review found that while there were 150 species of trees planted in streets in Grafton, 13 tree species accounted for 70% of the total tree species with the dominant species, Jacaranda, accounting for more than a third of trees in street tree plantings with the next most common species Tulipwood accounting for 6% of all street trees. This is shown in Figure 9.

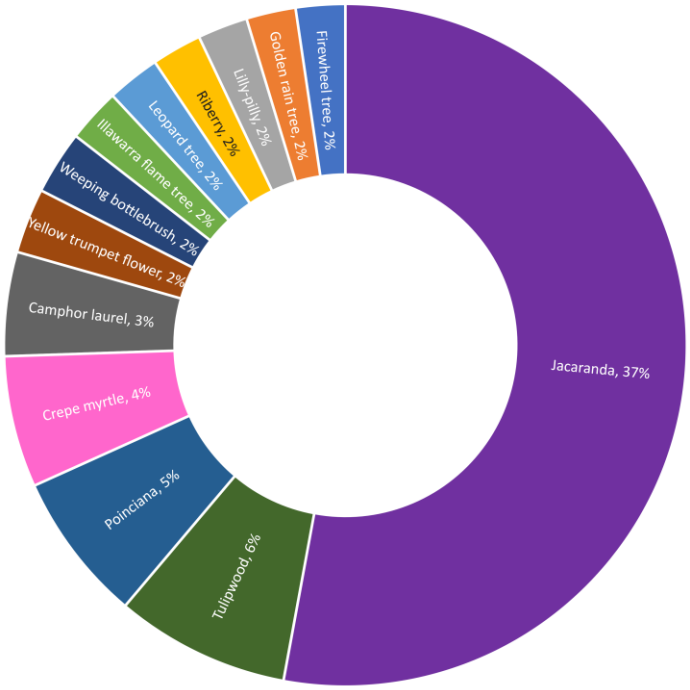


Figure 9 Thirteen tree species in Grafton account for more than 70% of all street trees

The review found similarly in South Grafton there were 120 species of trees planted in streets and similarly 13 tree species also accounted for 70% of the total tree species with two dominant species, Weeping Bottlebrush and Jacaranda, accounting for more than a quarter of trees in street tree plantings with the next most common species Leopard tree and Camphor laurel accounting for 15% combined of street trees. These four species account for more than 40% of all street tree plantings in South Grafton. This is shown in Figure 10.

Figure 10 Thirteen tree species in South Grafton account for more than 70% of all street trees

In Maclean there were approximately 55 species of trees planted in streets and similarly 13 tree species also accounted for approximately 75% of the total tree species with two dominant species, Bottlebrush and African Tulip Tree, accounting for more than a quarter of street tree plantings with the next most common species Cypress trees, Bangalow Palms and Jacarandas accounting for 21% of street trees combined. These five species account for approximately half of all street tree plantings in Maclean. This is shown in Figure 11.

Figure 11 Thirteen tree species in Maclean account for approximately 75% of all street trees

In Townsend there were approximately 25 species of trees planted in streets and 11 tree species accounted for approximately 90% of the total tree species with a more even spread amongst the top 6 species including eucalyptus species, firewheel trees, leopard trees, prickly paperbarks and Bottlebrush. These five species account for approximately 65% of all street tree plantings in Townsend. This is shown in Figure 11.

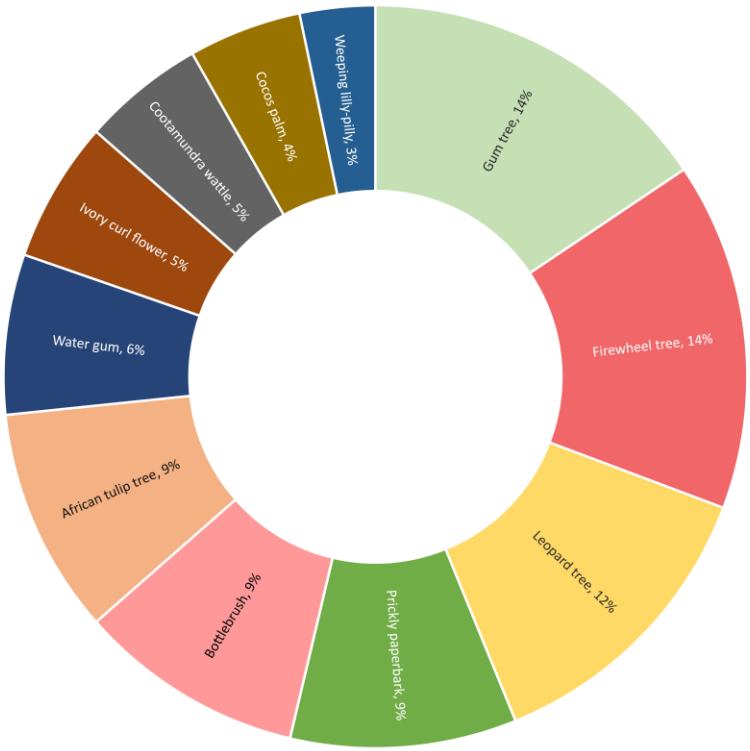


Figure 12 Thirteen tree species in Townsend account for approximately 75% of all street trees

Council resolution to review tree species

Council Resolution 06.22.005 identified the need for a review of Council's Tree Management Policy and Urban Tree Management Strategy. As part of this review the Council Resolution specifically identified opportunities for use of local provenance stock, local native plants as well as retention of existing avenues of Jacarandas.

Council Resolution 06.22.005 is included below:

> *That Council include in the 2022/2023 Operational Plan a review of the Tree Management Policy and the Urban Tree Management Strategy giving consideration to the following:*
>
> *1. Use only local provenance native plants in its plantings in parks and gardens and in street plantings*
>
> *2. Use of local native plants in landscaping wherever possible in developments approved by council*

3. *Maintaining existing avenues of Jacarandas in Grafton and South Grafton and garden beds of flowers*
4. *Allowing other plantings on their merit, where a strong case to use other species can be established*
5. *Review of the practice of planting monocultural lines of trees along streets*
6. *Approval by council for deviation from Policy and Strategy*

The following sections consider the components of Council's resolution in further detail.

Local Provenance Native Plants in Council plantings

Currently there are likely to be significant logistical constraints to adopting widespread use of local provenance native plants in plantings in Council public open space and streetscapes. There is currently insufficient commercial supply of suitable numbers and suitable sizes of local provenance native trees. Council does not have a dedicated nursery or the required resources to be able to currently grow local provenance native trees.

In the first instance it is recommended to approach nurseries who currently supply Council with stock to request information on where their seed is sourced from to understand what the availability of local provenance stock is in the Valley.

As it is likely that local provenance stock isn't generally commercially available, planning and associated lead times will likely be required to:

- engage a suitably qualified resource to collect propagation material
- propagate seed and review germination rates
- grow on stock to a suitable size range (minimum of 45 L pots) before planting at a nursery including potting, fertilising and watering during this period

Planning will also need to consider the procurement process. A significant factor in the success of tree planting is the use of high quality stock. Industry experience has repeatedly shown that poor stock leads to poor tree health and/or poor tree form and/or slow growth and in some cases tree mortality. Hence the plant stock will need to be grown to an acceptable standard using an industry accepted procedure such as AS2303:2018 (tree stock for landscape use). This ensures that the stock is of a suitable quality for planting in public open space and reduces the short and long term risk to Council.

Given the logistical constraints and the lead times required for seed collection and growing on, it is recommended that Council plan for this in the short term and use this period of scaling up to gain experience in the success of local provenance species. This includes experience about what species are able to be collected and germinated in suitable numbers and to identify what species are able to be grown on successfully. The preferred process for this is likely to be:

- Council collection of local provenance seed if sufficient resources are available or alternatively external contractor engaged to collect seed
- Develop a request for tender for local nurseries to germinate and grow on an agreed number of trees
- Evaluate tenders and identify source of funding and appoint preferred tender

This process is likely to take 2 to 3 years allowing for appropriate seasons for seed collection and germination and at least 12 months for growing on trees of a suitable size for use in public open space.

Council has developed a tree species list which is included in Appendix A for both coastal areas and Inland/Floodplain. The species on the list are local native species all of which could be potentially sourced from local provenance stock.

Local native plant species in new development

Council's current Residential Zones DCP 2011 currently includes requirements for native tree planting in new development. Section J11 Street planting states that

- *Species used should be local indigenous plant species*
- *No noxious weeds or registered weed species on the Bushland Friendly Nursery Scheme should be used*

Hence the use of local native species in new development is currently included in Council's DCP and this should be supplemented with an approved list of specific tree species list, which is a key gap in Council's planning process is a list of approved tree species for new development. Typically, this is provided in the form of either an Appendix to the DCP or development guideline or a development manual which is then referenced in the DCP. For example, the ACT Government has a detailed and thorough list of approved tree species for new development with specific requirements and guidance on where and when to use each species. Currently the Northern Rivers Design Manual is focused on engineering design guidance and does not provide guidance on landscape and tree planting requirements.

Secondary gaps in the current planning controls include

- a clear definition of 'local native'. The use of a tree species list provides a clearer reference to the definition of local native species.
- the Bushland Friendly Nursery Scheme is no longer an operational website nor able to be searched for through standard search engines. The use of a tree species list could also include specific species which will not be accepted in the LGA and incorporated into the DCP as an Appendix or similar.

A review of landscape plans for a 277 lot subdivision in Miles St Yamba for "Yamba Gardens" showed that the development proposed using 13 tree species for the street tree planting and all were local native species with the exception of Norfolk Pines, which while not a local native species, is an iconic tree species in Yamba and other coastal towns across NSW.

The landscape plan specifically noted that the species were selected in accordance with the Yamba Street Tree Masterplan. This has been used as the default tree planting species list for the subdivision.

Existing avenues of Jacarandas in Grafton

There are a number of streets, predominantly north-south streets which are dominated by Jacaranda plantings in Grafton. These streets and their locations are shown in Figure 13. This figure shows the location of Jacaranda trees in streets in Grafton and clearly shows dominant streets such as:

- north south Jacaranda lined streets including Kent St, Prince St, Queen St, Turf St and Cranworth St
- east-west streets including North St, Dobie St and Pound St

Figure 13 Jacarandas in Grafton showing location of street tree plantings dominated by Jacarandas

The dominance of Jacarandas is clearly evident in both the total number and their clear spatial distribution of Jacarandas along specific streets. Jacarandas are culturally important to Grafton and protecting and retaining Jacaranda lined streets is an important part of the urban tree management strategy for Grafton.

There are risks associated with a predominance of one species, particularly in a changing climate. There are risks for example that Jacarandas could become susceptible to diseases or pests which affect one particular species. This is occurring for example at present with Plane trees in Perth which are being impacted by Sycamore lace bug which feed on the leaves of Plane trees. Where one species dominates this can have substantial impacts on the total canopy cover and aesthetics of the town.

This risk is also further exacerbated where there is not sufficient diversity in the age of planting. Where opportunities arise succession planting should be undertaken to provide for a broader age distribution of Jacarandas and proactive planning for succession planting would also be beneficial for example through identification of gaps in the tree canopy of tree lined Jacaranda streets where new Jacarandas could be planted.

Current best practice in urban tree management is to plant a greater diversity of trees to reduce the conditions and risks of conditions which favour pests and diseases to flourish and have significant impacts on urban trees.

Currently Jacarandas are 37% of the total tree population in Grafton. The NSW Department of Planning Industry and Environment (2021) *Street Tree Planting Design Manual* recommends that one species should be no more than 10% of the total tree population. This guidance is also recommended by other jurisdictions including the City of Sydney and City of Melbourne. Hence, there is an important balance that needs to be achieved between retaining and protecting Grafton's cultural legacy and increasing diversity to provide more resilience to any potential future shocks.

For example, it is evident in Figure 13 that there are a number of streets which contain Jacarandas but which also contain other tree species. Examples of these streets, include Oliver Street, Victoria Street and Clarence Street. In these streets there may be more opportunities to continue a diversity of planting and replacing Jacarandas with other species over time, once Jacarandas reach the end of their life and/or need to be replaced.

Canberra has a similar cultural legacy of avenues of street tree plantings, originating from the original planning for Canberra by Walter Burley Griffin and Marion Mahony Griffin. One part of the ACT's approach to diversity is to have streets with a single species but a clear diversity of tree-lined species across a suburb. This approach could also be applied to streets in Grafton particularly where this pattern has already been established.

It is recommended that the following processes be undertaken

- Undertake a street tree masterplan for Grafton including South Grafton
- As part of the masterplan clearly define which streets are to be retained and/or enhanced as Jacaranda lined streets
- Identify other significant tree lined avenues (refer section below) and identify streets which are to be retained and/or enhanced as tree lined avenues

- Consider for other streets where Jacarandas are not dominant the potential for increased diversity in plantings over time (when Jacarandas need to be replaced)
- Consider opportunities for expanded significant tree registers, including to rural residential and rural areas, and heritage listing of trees species across the town to provide a level of protection in the planning system, noting that all Jacarandas, Ficus and Brachychiton are already heritage listed in all road reserves in Grafton and South Grafton in Schedule 5 of Council's LEP
- Identifying where local provenance and local native planting could be used within Grafton, without impacting on cultural plantings of tree lined avenues
- Undertake consultation with the community to better understand community preferences and willingness to provide more diversity and resilience in Grafton's urban trees

Avenues of tree planting

Historically avenues of tree lined streets with one species was a common practice across Australia and this approach dominates older streets within these towns. In Grafton, for example, as well as Jacaranda lined streets there are also streets that are dominated by other species as shown in Figure 14:

- Tulipwood tree lined streets including Alice St and Mary St
- Crepe myrtle lined streets including Milton St and Fry St
- A Liquidamber tree lined street (Dobie St south)

Current best practice in urban tree management and planting is to provide diversity of planting. The NSW Department of Planning Industry and Environment (2021) Street Tree Planting Design Manual states:

- *The greater the diversification of tree species within a given area, the lower the risk of losing the entire population in one disaster event such as a pest or disease attack or an extreme heat event…*
- *As a general guide, no more than 30% of trees should belong to any one family, no more than 20% of trees should belong to a single genus, and no species should account for more than 10% of the tree population.*
- *Diversification of origin should also be considered.*

The City of Melbourne has also embarked on a significant diversification of its urban trees, reducing its reliance on Elm's and Plane trees (see for example City of Melbourne's *Urban Forest Diversity Guidelines*, 2011).

However providing diversity is a complex process. Developing selection criteria for street trees and for tree lined boulevards in parks needs to consider both technical urban tree management as well as urban character, cultural landscapes and aesthetics. While appropriate tree species can be identified for the Valley as a whole, the final choice of tree species is also strongly dependent on the existing and desired streetscape or park character and existing cultural landscapes and community values. It is generally not desirable or possible to separate the two key components of tree selection.

Hence best practice in urban tree management is to undertake specific town and village street tree masterplans as has been developed to date for Yamba. These are the primary documents through which local character is explored and balanced with the urban tree diversity needs for future resilience and

planning. In some cases existing tree lined avenues will contribute strongly to the character and identity of a place and the continuation of these existing characters will likely be strongly desired by the community.

Figure 14 Dominant tree lined avenues in Grafton

Current best practice does not apply a high level principle across all streets in existing urban areas. Rather current best practice is to undertake a careful and considered detailed approach at the individual street level

to determine the preferred tree species. This process carefully considers the local technical conditions as well as the social and cultural landscape of the street.

Hence it is recommended to continue the process of developing street tree masterplans for towns and villages across the Valley with a principle of increasing diversity of species in urban trees, while determining the most appropriate species at the individual streetscape level.

In new developments there is more ability and scope to apply best planning practices to provide diversity both at the streetscape level and at the suburb level. Currently Council's development planning controls do not identify this as an outcome that is required and hence this should be included in the DCP as a required outcome adopting the Department of Planning's guidance that no more than 30 per cent of trees should belong to any one family, no more than 20 percent of trees should belong to a single genus, and no species should account for more than 10 percent of the tree population.

3. PRIORITY ACTIONS

The following priority actions have been developed for further discussion and development.

3.1. Increase tree canopy in urban areas

Given the low rate of urban canopy cover in the towns and villages of the Clarence it is recommended that Council target an increase in tree canopy, track the number of new tree plantings by Council across the urban towns and villages and measure changes in tree canopy cover over time. Council should also further setting a tree canopy cover target that it can measure the effectiveness of its programs in achieving an agreed goal. For example the NSW Government's recommends a target of 40% canopy cover for suburban and low density development areas.

It is recommended that Council increase canopy cover from currently 18% across the towns and villages in the Valley and track changes towards achieving an increase in canopy cover

3.2. Develop an urban tree canopy improvement program

A key finding of the Tree Strategy is the low rate of urban canopy cover in the towns and villages of the Clarence. To achieve a higher urban canopy cover, it is recommended that Council develop a tree planting protection program with sufficient funding to increase canopy cover in the Valley.

Development of a tree planting and protection program that tracks and records annual tree planting undertaken, and associated funding, to further inform a potential future tree canopy target for Council

An appropriately resourced tree canopy improvement program will assist in achieving Council's vision for its urban trees. It will also assist in Council transitioning to increases in local provenance native trees across the towns and villages of the Valley.

3.3. Build organisational capacity to support the implementation of the urban tree canopy improvement program

To support the increase in the urban tree canopy, it is recommended to provide increased organisational capacity to increase tree canopy cover in the LGA. Increased organisational capacity would support better planning processes including to source and procure local provenance native trees, resourcing for tree protection and tree preservation, improved assessment of tree related matters in planning and development applications, on ground resources to support increased tree planting programs, increased support to the tree asset database and its wider adoption to increase efficiency of work practices and additional physical equipment and resourcing to increase efficiency of work practices. Increased organisational resources would also support community education and community tree planting to assist in increasing canopy cover in the Valley.

Building organisational capacity would provide a clear commitment to increasing tree canopy cover across the towns and villages in the Valley.

3.4. Engage with the community on the tree canopy cover

There is significant potential to achieve increased tree cover on private lots and properties. There is a knowledge gap about the community's attitudes towards tree canopy cover and the key factors that would encourage the community to increase canopy cover on private lots.

Engagement would assist in understanding what community education programs are needed to support increases in tree cover on private lots across the towns and villages in the Clarence. For example, community engagement could understand whether programs such as the provision of free give-aways of local provenance native trees or better information about what types of tree to plant, would support the community in increasing tree canopy on private lots.

There is also the opportunity to increase awareness about tree protection on private lots and the importance of the existing tree canopy cover in the Valley as well as the processes that are required to be followed for tree removal across the Valley.

4. URBAN TREE STRATEGY ACTIONS

A key outcome of the Urban Tree Strategy is to provide clear direction for strategic planning to progress increases in urban tree canopy within the Valley. The following sections includes a set of actions for each of the four key priority area outlined in section 3.

Each of the actions has an anticipated implementation timing which is based on a combination of anticipated ease of implementation and the priority of the action.

Anticipated Implementation Timing	
Immediate	1 – 2 years
Short-term	2 – 5 years
Medium-term	5 – 10 years
Long-term	10+ years
Ongoing	Continues through the period of the plan
As required	Timing is dependent on other factors

Figure 15 Street trees – Junction Hill

4.1. Increase tree canopy across towns and villages

Table 2 Actions to support increasing tree canopy

Action	Responsibility	Timing
1. Consult with the community about increasing tree canopy across urban areas in the Valley	Lead: Support:	Immediate
2. Council to formally adopt a goal to increase tree canopy across urban areas in the Valley	Lead: Support:	Immediate
3. Determine the required tree sizes and soil volumes to achieve a 40% canopy target for all new residential development and 30% for all new business and industrial development and review the Northern Rivers Development and Design Manual and develop a locally appropriate amendment for a minimum zone for street trees within the streetscape free of utility assets and review the current DCP setbacks and requirements for planting within the landscape areas for private development..	Lead: DA planners Support: Strategic planners	Immediate
4. Investigate and determine the most cost effective method to measure tree canopy over time (Locally procured Lidar, commercial providers such as Nearmap, commercial source satellite data etc)	Lead: Support:	Short Term
5. Undertake a tree canopy cover assessment by 2026 (noting current tree canopy cover assessment was undertaken using 2016 data)	Lead: Support:	Short Term
6. Adopt a 40% tree canopy target for all new residential development and 30% for all new business and industrial development in Council's DCP and for all new site specific DCPs	Lead: Support:	Short term
7. Consider setting a tree canopy target for the urban areas across the Valley	Lead: Support:	Medium term
8. Regularly undertake a tree canopy cover assessment (ideally every 2 years and no less than every 5 years and with the frequency informed by the outcomes of task #4 above)	Lead: Support:	Ongoing

4.2. Urban tree canopy program

Table 3 Actions to develop and implement an urban tree canopy program

Action	Responsibility	Timing
1. Undertake an assessment of the impact of the current tree planting program on increasing tree canopy in the LGA	Lead: Support:	Immediate
2. Complete the capture of data in the tree asset database for town and villages in the LGA	Lead: Support:	Short term
3. Develop a business case for funding of an enhanced tree canopy program based on the outcomes of action #1 above including procurement, initial establishment and maintenance of new trees	Lead: Support:	Short term
4. Develop a business case for the procurement of local provenance native trees for the tree canopy improvement program (this action could be included as part of #4 above)	Lead: Support:	Short term
5. Undertake a gap assessment of streets using aerial data and Council's tree inventory system to determine where street tree planting can occur	Lead: Support:	Short term
6. Review street tree planting contributions applicable to former Council areas to ensure resources are applied effectively	Lead: Support:	Short term
7. Undertake a gap assessment of parks using aerial data to determine where tree planting can occur in urban parks	Lead: Support:	Medium term
8. Using data captured in the regular tree canopy monitoring program determine the amount of tree canopy loss occurring over time and the effectiveness of current tree protection policies	Lead: Support:	Medium term
9. Review the effectiveness of replacement tree planting policy for trees that are approved to be removed during development and review the effectiveness of replacement tree planting for previous approved developments using aerial imagery or similar (such as Nearmap).	Lead: Support:	Medium term
10. Review the existing data captured and infill data elements to complete existing entries in the tree	Lead: Support:	Medium term and ongoing

Action	Responsibility	Timing
asset database (particularly age and condition)		
11. Continue integration of the tree asset database with Council's GIS asset management system and integration of work orders and customer requests with data captured in the tree asset database	Lead: Support:	Ongoing
12. Expand the Yamba Street Tree Masterplan to other urban towns and villages across the LGA to support the tree canopy improvement program	Lead: Support:	Ongoing
13. Powerline Conversion Initiative: Council liaise and advocate for Essential Energy to progressively convert open powerlines to bundled lines in all residential areas, prioritising those with heritage-significant tree avenues and extending wherever feasible	Lead: Support:	Long term and ongoing
14. Expansion of Greener Neighbourhoods Program: Council advocate for the expansion of the Greener Neighbourhoods Program to bolster canopy enhancement initiatives across all towns in NSW, fostering a greener, more sustainable environment.	Lead: Support:	Long term and ongoing

STREET TREE CANOPY GAP ASSESSMENT

There is a significant opportunity to retain existing trees and plan for better street trees in new development areas in both residential and employment lands to achieve increased canopy cover in both the streets and private lots. The figure below shows the canopy cover in new residential development in Townsend.

It can be seen that there are significant gaps in the tree canopy cover and that there are opportunities for tree planting in front of more than half of the dwellings in the image below.

The tree canopy gap assessment could also identify key tree planting consideration requirements including key considerations such as

- any overhead power line constraints
- any underground service constraints
- verge widths, soil volumes and recommended tree sizes (small/medium/large trees)
- clearances required to driveways, footpaths and road pavements

4.3. Build organisational capacity

Table 4 Organisational capacity building actions

Action	Responsibility	Timing
1. Determine the resources required to assess tree canopy targets and tree protection related matters in planning and development applications including on site enforcement of tree protection measures	Lead: DA Planners Support:	Short term
2. Determine the internal resourcing and external resources required to procure, plant and establish new trees to meet the needs of a tree canopy improvement program	Lead: Support:	Short term
3. Determine the additional physical equipment required (e.g. new chipper) to increase efficiency of work practices and develop a business case for the purchase of new physical equipment	Lead: Support:	Short term
4. Determine the time required to complete the tree asset database including a review of all existing data and updating existing data to complete all fields. Consider if this could be undertaken as an external contract to accelerate the capture of data.	Lead: Support:	Short term
5. Determine the internal resources required to support a local provenance native stock planting program	Lead: Support:	Short term
6. Review Council's current planning conditions for tree protection and tree planting and consider adopting Department of Planning standardised suite of conditions	Lead: DA Planners Support: DA Building Surveyors and Open Spaces - arborist to assist	Short term
7. Consider internal organisational resources required to support community education and community tree planting to assist in increasing canopy cover in the Valley	Lead: Support:	Medium term
8. Building on the development of the tree asset database increase work efficiencies in logging and responding to customer requests	Lead: Support:	Medium term
9. Review the current arrangement of use of external contractors and consider formalisation of the preferred contracting process based on this review.	Lead: Support:	Medium term
10. Review Council's management of greenwaste and	Lead:	Medium term

Action	Responsibility	Timing
provide recommendations on how green waste could be enhanced (some Council's provide mulch from its operations free of charge to residents)	Support:	
11. Progressively add risk assessment data to the tree asset database using industry standard assessment procedures such as Quantified Tree Risk Assessment (QTRA). Consider a standardised process that includes this as part of any tree inspection work undertaken by Councils Tree Management Officer and for any inspections due to customer requests	Lead: Support:	Ongoing
12. Review use of latest field auditing apps to improve efficiencies and ease of data collection for the tree asset database	Lead: Support:	Ongoing

4.4. Community education

Table 5 Actions for community education about tree canopy coverage in the LGA

Action	Responsibility	Timing
1. Develop a 12-18 month community engagement strategy which develops key messages for the community and incorporates the actions below	Lead: Support:	Immediate
2. Begin the conversation with the community (e.g. social media campaign) about tree canopy cover and raise community awareness about the low tree canopy cover in the towns and villages in the LGA. Communicate the benefits of increased tree canopy cover to the community	Lead: Strategic Planners Support: DA Planners	Immediate
3. Better understand the community's attitudes towards tree canopy cover on private lots and the key factors that would encourage the community to increase canopy cover on private lots through an online community survey and targeted surveys at community events or similar	Lead: Support:	Short term
4. Undertake community engagement to understand whether programs such as the provision of free give-aways of trees, or other incentives, tree planting days, etc and similar would be most supported by the community.	Lead: Support:	Short term
5. Raise awareness about tree protection on private lots and the importance of the existing tree canopy cover in the Valley	Lead: Support:	Short term
6. Building on the outcomes above develop a community orientated program targeted at increasing canopy cover on private lots	Lead: Support:	Medium term
7. Raise awareness about the processes that are required to be followed for tree removal across the Valley	Lead: Support:	Medium term

GLOSSARY

CSP – Community Strategic Plan

CVC – Clarence Valley Council

DCP – Development Control Plan

DPE – Department of Planning and Environment

EEC –Endangered Ecological Community

HCA- Heritage Conservation Area

LEP – Local Environment Plan

LGA – Local Government Area

LSPS – Local Strategic Planning Statement

SEPP – State Environmental Planning Policy

WSUD – Water Sensitive Urban Design

DEFINITIONS OF KEY TERMS USED

DEEP SOIL: Deep soil is a landscaped area connected horizontally to the soil system and local ground water system beyond and is unimpeded by any building or structure above or below ground. Deep soil zones with a minimum dimension of 3m allows sufficient space for the planting and healthy growth of new trees that provide canopy cover and assist with urban cooling and infiltration of rainwater to the water table.

TREE: Tree is defined in AS4970-2009 1.4.6 as a long lived woody perennial plant greater than (or usually greater than) 3m in height with one or relatively few main stems or trunks (or as defined by the determining authority).

URBAN HEAT: The term 'urban heat' refers to higher temperatures which can negatively impact the health and wellbeing of people and communities. Research in 5 major Australian cities showed that temperatures above 28˚C had greater impacts on human health

URBAN HEAT ISLAND EFFECT (UHIE): Urban heat and the urban heat island effect impact people's health and wellbeing, economic productivity, urban wildlife and ecosystems, and urban infrastructure and services.

URBAN TREES are defined as long lived woody plants with the potential to grow to a height greater than 3 metres and grow in urban streets, parks, in resident's back and front yards, on commercial and industrial land and within the rural villages dotted throughout the Clarence, on rural land, along rural roads and river communities and excluding National Parks, coastal reserves and other nature reserves.

URBAN TREE CANOPY (UTC) refers to the layer of leaves, branches, and stems of trees that cover the ground when viewed from above

clarence
VALLEY COUNCIL