

# Urban Forest Plan

## **Greening our Community**

## Acknowledgement Of Country

The Shire of Campaspe is the traditional lands of the Dja Dja Wurrung, Taungurung and Yorta Yorta Peoples.

We respect and acknowledge their unique Aboriginal cultural heritage and pay our respect to their ancestors, descendants and emerging leaders as the Traditional Owners of this Country.

We acknowledge their living culture and their unique role in the life of this region.

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# Introduction

Campaspe Shire Council's position along the Murray and Campaspe Rivers lends itself to unique landscapes that are characterised by the majestic River Red Gums in the north and Box Ironbark forests in the south.

The largely rural nature of our Council showcases wide vistas interspersed with pockets of forest and riverside vegetation. And yet, the trees contained within each of our townships, i.e, our urban forest, are more representative of past management practices and decision making rather than a reflection of these local landscapes.

Campaspe Shire Council manages around 30,000 public urban street and park trees, with the majority of these in the main townships of Echuca, Kyabram, Rochester and Rushworth. They provide much needed shade during summer, store and sequester carbon, provide food and habitat to wildlife and intercept rainfall before it flows into the rivers.

We aim to maximise the benefits of our urban trees and have recently made significant improvements to the way we look after our trees. However, we also recognise there is room for improvement. To date, we haven't had a clear strategic direction for the planning and management of our urban trees. As a result some aspects of tree management have not been funded or resourced. For example, our tree inventory data suggests that we could lose over 50% of our entire public tree population by the year 2047, as these trees reach the natural end of their lives. And yet, we haven't had a succession plan for the next generation of trees to succeed these ageing ones. We also know that our township tree canopy cover is relatively low, especially in Echuca, the largest of our towns. This means we don't have enough natural shade to provide relief and comfort to residents during the hot, dry summers and inadequate landscape resilience towards climate change. Tree canopy cover is especially low in the areas where socio-economic disadvantage is the highest and where the benefits of those trees are needed the most.

We've also seen legacy practices from past decades resulting in less than ideal outcomes. Poor pruning of trees under powerlines, incorrect species selection, a lack of formative pruning and adequate tree establishment programs has contributed to a current tree population that is not as healthy or resilient as it could be. And while there is a large diversity of tree species planted across our townships, newer residential housing developments are supporting swathes of identical plantings which has extremely low levels of species, genetic and age diversity, increasing the risk of landscape scale failures.

By focusing on these issues, we've developed a framework in this Urban Forest Plan to help protect our existing urban forest and grow a resilient urban forest of the future. This will be critical in helping to meet our Community Vision of creating:

- A place where we belong
- Towns and land that we love
- Activity for all
- An environment for all, now and always
- Engaged and participative people

# The Plan

#### Scope

This plan applies to all trees within the urban areas of Campaspe Shire Council, defined as the areas within the township boundaries. The plan predominantly focuses on the trees that Council own and manage e.g, street and park/reserve trees within the townships of Council. The plan will also discuss the value of trees in the private realm e.g, trees in backyards and trees on land owned and managed by other agencies.

### **Objectives**

- Enhance township character and landscape resilience through strategic tree planting and good tree management.
- 2. Grow urban tree canopy to increase natural shade over our townships.
- 3. Protect and maintain our existing urban trees to maximise their benefits.
- 4. Embed good practice urban tree management into our everyday decision making.

### Vision

Our places and our communities are vibrant, sustainable and green.

### Targets

We will aim to increase Tree canopy over townships by 2045 as follows:

Township	Baseline Tree Canopy Cover (2023)	Targeted Tree Canopy Cover (2033)
Echuca	11%	20%
Kyabram	13%	20%
Rochester	24%	30%
Rushworth	33%	35%
Tongala	14%	20%
Gunbower	18%	20%
Lockington	17%	20%
Colbinabbin	7%	10%
Stanhope	13%	20%
Girgarre	12%	15%

We will aim to improve the overall diversity, health and resilience of our public tree population by 2030 as follows:

- 80% of trees will be recorded in good health.
- 25% of all trees will be in the "young" tree age category.



## **Benefits Of Urban Trees**

Campaspe Shire Council's urban trees provide a wide range of benefits to the community and environment including:



#### **Economic benefits**

- People are more likely to stay longer and spend more in a treed retail area increasing economic activity by up to 20% (Mullaney et al., 2015; Wolf, 2005).
- Well maintained street trees increase house prices (Mullaney et al., 2015; Plant, Rambaldi & Sipe, 2017).
- Well-placed trees can reduce air-conditioning costs by 56% (US Forest Service, nd).
- A 10% increase in deciduous tree cover can reduce building heating and cooling costs by 5-10% (McPherson et al., 1994).
- Well maintained street and park trees improve the overall amenity and character of a town, thereby strengthening tourism outcomes.



#### **Social benefits**

- Urban trees provide attractive and shady streetscapes, encouraging pedestrian and cycling activity, increasing community interaction and reducing stress (van Dillen et al., 2012).
- Shade from urban trees improves human thermal comfort on the hot summer days, lowering air and surface temperatures and intercepting UV radiation (Langenheim et al., 2020).
- Street trees can reduce traffic noise (Mullaney et al., 2015).



#### **Environmental benefits**

- Street trees can reduce daytime temperatures by between 5 20°C (Mullaney, Lucke & Trueman, 2015).
- Urban trees improve air quality by capturing particulate matter and other air pollutants with large trees absorbing 60-70 times more pollution compared with small trees (McPherson, Nowak & Rowntree, 1994; Mullaney et al., 2015).
- Through root uptake and canopy interception, trees can reduce the volumes of stormwater and pollution in stormwater run-off (Livesley, McPherson & Calfapietra, 2016; Mullaney et al., 2015).
- Urban trees sequester carbon and releases oxygen (Mullaney et al., 2015).
- Trees provide habitat and food sources for wildlife (Mullaney et al., 2015).

# Strategic Context

By strategically managing urban trees within Council, Council will also be meeting some of its existing priorities and objectives as follows:

### Campaspe Tomorrow 2021-2025

- 1. A place where we belong.
- 2. Towns and land we love.
- 3. Activity for all.
- 4. Opportunity for all.
- 5. An environment for all, now and always.
- 6. Engaged and participative people.

### Council Plan 2021-2025

- 1. Flourishing Local Economy: Making our townships attractive places to visit and invest in.
- 2. Resilient and protected healthy natural environment: Increasing township landscape resilience through greater tree canopy and permeability.
- Well planned places: creating high quality green urban public spaces through strategically planted and maintained township entry ways, boulevards, avenues, streets and parks.
- 4. Growing Quality of Life: creating inclusive, safe and connected urban green spaces for improving health and wellbeing.

### **Campaspe Planning Scheme**

Council's key strategic directions in the Campaspe Planning scheme includes promoting land use and development that is resilient to climate change impacts. This includes maintaining significant vegetation where possible and providing landscaping that is suitable for the location and climate.

#### Environment Strategy 2022-2023

A framework for the protection of our natural environment and delivery of programs and services to support a connected and healthy community. This includes the protection and enhancement of native urban trees that support biodiversity values and community health and wellbeing.

### Open Space Strategy 2022-2032

Creating an open space network that is of high quality, connected and provides access for all. This includes the provision of large canopy trees to provide natural shade and amenity to all open space users.

### **Active Transport Strategy 2019**

Focus areas:

- 1. Getting to school by walking and cycling.
- 2. Creating walking and cycling towns.
- 3. Connected and liveable developments.

### Integrated Water Management Strategy (Draft – 2020)

Focus area: Retaining water in urban landscapes.

#### Key projects:

- 1. Safer, greener, more vibrant Echuca East Community precinct. Cooler streetscapes to improve the amenity adjacent to Echuca East Community Precinct.
- 2. Greening Rushworth's main street.
- 3. Gunbower Lions Park renewal.

### **Place Based Plans**

There is significant opportunities to include tree planting, renewal and maintenance as part of Place Based Plans. Communities are at varying stages with the Place Based Plans but there is certainly opportunities to capitalise on projects from these plans and implement actions from the Urban Forest Plan.

# Campaspe Shire's Urban Trees

There are approximately 30,000 street and park trees across Campaspe's townships. It is not known how many trees there are on private property or on crown land. Each of these public trees have detailed information collected on them to help us make informed tree management decisions. Street and park tree numbers in each township are detailed below:

Town	No of trees	% of population
Echuca	11,408	36.2%
Rochester	4,852	17.3%
Kyabram	3,846	12.1%
Rushworth	2,891	10.7%
Tongala	1,852	6.7%
Stanhope	1,614	5.3%
Girgarre	1,459	4.7%
Lockington	1,221	3.9%
Gunbower	574	1.8%
Colbinabbin	317	1.3%
TOTAL	30,034	100%

Table 1: Number of street and park trees in each township

### **Tree Canopy Cover**

The amount of tree canopy cover across an urban area is a useful measure for understanding the quantity of benefits being offered by the tree population e.g. the amount of shade provided, carbon stored and sequestered, stormwater intercepted. Tree canopy cover for each of our 10 main townships is shown in Image 1.

Colbinabbin	7%				
Echuca	11	%			
Girgarre		12%			
Stanhope		13%			
Kyabram		13%			
Tongala		14%			
Lockington			17%		
Gunbower			18%		
Rochester				24%	
Rushworth					33%

Image 1: tree canopy cover measured for the 10 main townships of Campaspe.

Overall, tree canopy cover across the urban townships is relatively low with the exception of Rochester and Rushworth. All other townships record cover lower than 20%. Research suggests that optimal tree canopy cover for an urban area, depending on climate, is between 30-40% (Ziter, 2019). As the main town within the municipality, Echuca's tree canopy cover levels are very low, at only 11%.



## Vacant Street Tree Sites

Campaspe Shire Council's data shows that across the 10 townships, there are approximately 4,500 vacant street tree sites. These sites are those that are readily available to have a tree planted within them and are predominantly within streetscapes. Echuca, followed by Kyabram, has the largest opportunities for tree planting, though every township contains some vacant sites.



*Image 2a: distribution of vacant street tree sites across Campaspe's two main townships.* 

## **Vacant Street Tree Sites**



Image 2b: distribution of vacant street tree sites across Campaspe's four remaining main townships.

## **Vacant Street Tree Sites**



Image 2c: distribution of vacant street tree sites across Campaspe's four smaller townships.

## **Species Diversity**

One measure of a tree population's overall resilience is how diverse it is. The greater diversity in tree species, the greater resilience against impacts such as pest, disease attacks and climate change. Overall, Campaspe's townships show a great level of diversity. Over 360 tree species have been recorded in the public tree population. River Red Gums are the most dominant species which is to be expected given the proximity of townships and public open space to river systems. Of the top 20 most common species, 15 are native to Australia.

The top three most common species are all endemic to Campaspe Shire Council including, River Red Gum, Grey Box and Red Ironbark.

	Species	No of trees	% of population
1	River Red Gum (Eucalyptus camaldulensis)	3,125	9.90%
2	Grey Box (Eucalyptus microcarpa)	1,964	6.22%
3	Red Ironbark (Eucalyptus sideroxylon)	1,659	5.25%
4	Callery Pear (Pyrus calleryana)	1,610	5.10%
5	Prickly Paperbark (Melaleuca styphelioides)	1,392	4.41%
6	Yellow Gum (Eucalyptus leucoxylon)	1,116	3.53%
7	Spotted Gum (Corymbia maculata)	1,048	3.32%
8	Weeping Bottle Brush (Callistemon viminalis)	1,028	3.26%
9	Desert Ash (Fraxinus oxycarpa)	895	2.83%
10	Sugar Gum (Eucalyptus cladocalyx)	873	2.76%
11	Yellow Box (Eucalyptus melliodora)	807	2.56%
12	Crimson Bottle Brush (Callistemon citrinus)	789	2.50%
13	Peppercorn Tree (Schinus molle)	730	2.31%
14	Snow in Summer (Melaleuca linariifolia)	684	2.17%
15	Willow Bottle Brush (Callistemon salignus)	632	2.00%
16	Queensland Brush Box (Lophostemon confertus)	618	1.96%
17	Claret Ash (Fraxinus Raywood)	527	1.67%
18	Purple Cherry Plum (Prunus cerasifera 'Nigra')	503	1.59%
19	Lemon-scented Gum (Corymbia citriodora)	445	1.41%
20	River She-oak (Casuarina cunninghamiana)	417	1.32%

Table 2: Top 20 most common species across the townships of Campaspe.

Whilst, from a municipal scale, there is a good diversity of trees species planted across townships, there are some local issues of very low diversity. Many residential housing subdivisions, particularly in Echuca and Kyabram have all been planted with only one species, the Ornamental Pear (Callery Pear). While there is certainly an aesthetic benefit to an avenue of single tree species, this monoculture across whole estates poses significant risks due to a lack of diversity. Added to this, whole estates not only have the same species, but many trees were planted at the same time. This will lead to a dramatic change in landscape amenity when all of these trees reach the end of their useful lives at the same time.

Campaspe Shire Council will seek to further guide developers in planting a diversity of trees species within each housing estate, to mitigate this potential management challenge using the Landscape Design Manual that is already in existence, and Campaspe Planning scheme.



Image 4: Concentrations of Ornamental Pears circled in green across Echuca and Kyabram.

## **Tree Value**

Using a tree valuation model called I-Tree Eco (Ref P29), each of Campaspe Shire Council's public urban trees were valued.

Together, Council's 30,000 public urban trees are worth an estimated \$170,000,000. This is their structural value and the cost of having to replace all trees to their same size and structure.

In addition, these trees return approximately \$440,000 annually in environmental benefits:

- Air pollution removed: 7.764 tons = \$17,300 per year.
- Carbon storage: 17,780 tons = \$405,000 per year.
- Carbon sequestration: 452 tons per year = \$10,300 per year.
- Oxygen produced: 1,207 tons per year.
- Avoided run-off: 2,586 m3/year = \$5,850 per year.

Some of the most valuable trees are the large River Red Gums in Echuca's Aquatic Reserve which are worth \$72,489 each.

Image 5: Some of the Aquatic Reserve River Red Gums are the most valuable trees within our townships.



## **Current Tree Management**

Urban trees are managed by a dedicated in-house Tree Management team that responds to customer requests and carries out an array of tree works from removals and pruning to young tree maintenance. A panel of qualified contractors also take care of some tree works.

Council undertake:

- The annual tree planting program based on identified vacant spots and customer requests.
- Tree risk assessments including annual inspections of of trees along the Echuca township waterfront and individual tree inspections by resident requests.
- Maintenance, both reactive and proactive.
- Tree and stump removal.
- Tree protection.
- Arboricultural advice to other council internal work areas, including tree protection requirements for projects being undertaken near trees.
- Electrical line clearance in Council's three declared urban areas; Echuca, Kyabram and Rochester.
- Responding to conflicts between Council's trees and built infrastructure.



## What's working well

- We have in-house qualified and dedicated arboriculture staff.
- We have a comprehensive tree inventory.
- Existing policies regarding requests for tree removal and tree planting are in place.
- Our electrical line clearance obligations are met.
- Our tree planting program plants slightly more trees than are removed.



## What needs improvement?

- Tree planting is not making inroads into increasing canopy and therefore targets so needs to be boosted.
- Stronger protection and retention of existing trees, particularly educating other work areas around the importance of trees, roots and canopies.
- Tree planting undertaken by third parties.
- Greater appreciation of trees as critical urban infrastructure.
- Community awareness around the importance of trees and educating the public.
- Continuing to identify vacant street tree planting sites.
- Greater recognition of the importance of trees on private property.

# Tree Management Challenges

Council face key challenges that with be addressed through the delivery of this plan.

#### 1. No strategic plan for tree planting

Most trees are still planted on a reactive basis from customer requests. This means our establishment program is not streamlined and is inefficient. There are over 4,500 vacant street tree sites across the urban areas offering significant potential to ramp up the planting program.

#### 2. Inherited legacy

Council face the common issue of dealing with trees that were planted decades ago that are now inappropriate for the site and cause conflicts with infrastructure including powerlines, footpaths, kerb and channel, road surfaces etc. The ongoing maintenance costs for these conflicts is high and yet many of these trees provide much needed amenity and shade for the streetscape.

#### 3. Trees are not valued enough

Council has been recognising the value of trees over the past few years, yet it is not widespread. Without clear recognition of the values urban trees provide, their protection and/or planting are not seen as a priority, particularly by both the community and assets renewal/ works within Council. Further, Council currently has little recourse to penalise homeowners and developers who remove public urban trees for development.

#### 4. Development

Within subdivisions, homogenous plantings of Ornamental Pears dominate the landscape. While these trees are robust and look beautiful, the dominance of one species within all subdivisions presents a significant future risk management issue. Further to this, development is not allowing enough private open space for trees. Some developments are compensating for this by allowing for larger parcels of passive open space planted with more indigenous species.

#### 5. Private trees

Apart from the heritage planning overlays, Council has very little control to protect or mandate the replanting of trees on private property. In some towns, such as Echuca, a cultural history of removing and not replacing private tree canopy means that very little private tree canopy cover remains. It is thought that this relates back to the lack of value placed on trees by the general community.



# 10-Year Urban Tree Management Action Plan

This 10-year plan outlines:

- Six key actions to guide Council's Tree Management program.
- 10 township tree planting guides.

	Action	Detail	Cost
1.	Develop an annual strategic tree planting program.	Aim to plant 980 trees per year, based on the Township Tree Plans where trees are needed the most e.g, within heat vulnerable communities, in high pedestrian areas and where tree canopy cover is low.	\$100,000 per annum
2.	Develop a proactive maintenance schedule to improve the overall health and longevity of existing trees.	Every Council tree to be inspected every 4 years and proactive works scheduled. Tree inventory to be updated as part of inspection.	Existing budgets and resources
3.	Improve internal planning and communication.	<ul> <li>Tree team to work closely with following programs to seek better outcomes for trees:</li> <li>10-year capital works plan.</li> <li>Asset renewal schedule: roads reseal, footpath, kerb and channel, drainage upgrades.</li> <li>Integrated Water Management projects.</li> <li>Open space and active transport projects and upgrades.</li> </ul>	Existing budgets and resources
4.	Embed best practice urban tree management.	<ul> <li>Develop in-house technical tree management guidelines to include:</li> <li>2-year establishment period for all new trees: mulching, watering and formative pruning.</li> <li>Document handover process for subdivision trees.</li> <li>Introduce a standard tree replacement charge for all trees that are removed for works and development to ensure there is no net loss of trees from the landscape.</li> <li>Produce a factsheet for tree protection and how to calculate a tree protection zone to apply to all works impacting trees.</li> <li>Embed Tree Management Plan objectives into other Council documents and contractors' specifications.</li> </ul>	\$30,000

	Action	Detail	Cost	
5.	Engage and educate the community about the importance of urban trees.	Raise the profile of the value of urban trees within the community. Incentivise and encourage residents to both request street tree planting and plant trees on their own property, including:	\$20,000 per annum	
		<ul> <li>Street tree planting letters to residents prior to planting explaining the benefits of urban trees, how their nature strip contributes and some ideas on how to care for it.</li> </ul>		
		<ul> <li>Customer requests for street tree planting to be advertised through social media.</li> </ul>		
		<ul> <li>Update Council's website to provide information on Council's role in public tree management, the benefits of urban trees and why Council is investing in them.</li> </ul>		
		<ul> <li>Community tree planting days. Have information available about Council's tree planting program and the benefits of urban trees.</li> </ul>		
6.	Review Plan every 5 years.	Future considerations:	\$10,000	
		Appropriate measures to protect and enhance trees on private land.		
		<ul> <li>Local planning policy to provide local response to the creation of healthy and sustainable neighbourhoods.</li> </ul>		
		<ul> <li>The creation of an 'urban tree fund' for revenue generated from amenity tree removals that will go towards tree planting projects.</li> </ul>		

# Township Tree Planting Plans

These have been developed for the 10 townships within Campaspe (see Appendix B):

- Echuca
- Kyabram
- Rochester
- Rushworth
- Tongala
- Gunbower
- Stanhope
- Colbinabbin
- Lockington
- Girgarre

These plans highlight the opportunities and priority areas for tree planting and tree renewal in each town. A set of targets has been set for each township to improve:

- Tree canopy cover and therefore shade and amenity
- Overall tree health.
- Diversity of ages to ensure a new generation of trees are being planted.
- The useful life expectancy profile of each towns tree population, to ensure poorly performing trees are removed and replaced with vibrant young new trees, ready for the future.

Species have not been selected as part of these plans. Instead, the Tree Management team will utilise an independently developed species list, for all Councils in the Goulburn Murray Climate Alliance, as part of the Naturally Cooler Towns project. These species have been selected for resilience and appropriateness for planting in urban areas.



## **Echuca**

### **Existing Township character**

Low overall canopy cover, a mix of street species both native and exotic, large number of vacant street tree sites, wide road reserves and wider than average nature strips, surrounded by river red gums along the two river frontages. Echuca has four main precincts: Echuca East, CBD and The Port Precinct, Echuca West and the entranceways into town.

#### Identified trends and concerns

- Within a 30-year period, Echuca is likely to lose 70% or 8,079 of its public trees.
- Very low diversity of tree species and age in new subdivisions leaving the tree population exposed to a second wave of tree loss by 2050.

#### **Priority Areas for Tree Planting, Renewal and Maintenance**

Council will aim to increase its tree planting in Echuca to approximately 500 trees per year, to cover tree renewal, infill planting of vacant street tree sites and gateways into town. Priority areas are circled in red. New subdivisions should refrain from planting any Pyrus species.



Image 6: Areas of high heat vulnerability and pedestrian intensity (circled in red) for priority street and park tree planting.



#### **Existing Township character**

Kyabram is derived from an aboriginal word "kiambram" which means "thick forest." There is little evidence remaining of this. Though Kyabram has a high portion of Australian native species in its more established area, a larger number of exotic trees are in the newer areas, particularly south of Fenaughty Street. Trees in the town's parks and reserves are predominant indigenous and native.

#### Identified trends and concerns

- Large number of native, mature trees with average structure.
- Likely to lose 80% of its current trees within a 30-year period due to end of useful life.
- Although many trees are in good health, only 16% of trees have good structure. A legacy of pruning for powerline clearance and more recently, trees handed over from new developments with sub-standard form.

### Priority Areas for Tree Planting, Renewal and Maintenance

Council will aim to increase its tree planting in Kyabram to approximately 130 trees per year to both cover tree renewal and infill planting of vacant street tree sites. Priority areas are circled in red.

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Image 7: Areas of high heat vulnerability and pedestrian intensity (circled in red) for priority street and park tree planting.

## Rochester

### **Existing Township character**

Rochester's town centre is planted with more exotic species including Elms. The Phoenix palms set a unique character along the main thoroughfare through town along Moore Street. Rochester has a significant number of Peppercorns, showcasing its heritage plantings as well as River Red Gums along the river corridor. The residential areas are planted out with a greater diversity of native, indigenous and exotic species throughout streetscapes. Rochester has the added advantage of very wide road reserves, lending themselves to more road reserve style plantings that can house larger canopied trees.

### Identified trends and concerns

- Tree population in relatively good health.
- 81% of all existing trees to be lost within a 30-year period due to end of useful life.
- Many vacant sites.

### Priority Areas for Tree Planting, Renewal and Maintenance

Council will aim to increase its tree planting in Rochester to approximately 150 trees per year to both cover tree renewal and infill planting of vacant street tree sites. Priority areas are circled in red.

Image 8: Areas of high heat vulnerability and pedestrian intensity (circled in red) for priority street and park tree planting.



## Rushworth

### **Existing Township character**

Rushworth is the only township with a distinct unique character due to its proximity to surrounding Box-Ironbark Forest. The majority of the town apart from the centre is covered by a bushfire management overlay. There is a prevalence of native and indigenous trees throughout the streets with only 7% of trees being exotic, most of which are located in the town centre. There is a heritage overlay in town centre as a result. Electrical line clearance undertaken by the distribution company has had very little consideration of the impact on tree structure and amenity. Rushworth is categorised by narrow streets and low overhead wires.

### Identified trends and concerns

- Very few young trees.
- Over 90% of trees are in good or fair health.
- Many trees have been badly pruned for electrical line clearance leaving trees with poor structure.

### Priority Areas for Tree Planting, Renewal and Maintenance

Council will aim to increase its tree planting in Rushworth to approximately 50 trees per year to both cover tree renewal and infill planting of vacant street tree sites. Given the low number of vacant sites, Council will focus on a tree renewal program in Rushworth, primarily replacing those trees with ULE less than 10 years, including those disfigured by poor overhead line clearance pruning. Priority areas are circled in red.

Image 9: Areas of high heat vulnerability and pedestrian intensity (circled in red) for priority street and park tree planting.



# Tongala

### **Existing Township character**

Tongala's character is supported by highly maintained parcels of open space such as the Avenue of Honour, gardens around the library, the recreation reserve and around the swimming pool. These parks are dominated by native species such as Ironbarks, Spotted Gums, Casuarinas, Sugar Gums and River Red Gums. The streetscapes themselves are more diverse containing a mix of exotic and native species. Tongala's public urban trees are supported by a scattering of larger trees set within the private realm on resident's front and rear properties which increases general amenity.

### Identified trends and concerns

- Within a 30-year period, Tongala is likely to lose 80% or 1,519 of its public trees due to useful end of life.
- Over 75% of Tongala's trees are mature suggesting there has been little tree planting across the township over the last decade.

### Priority Areas for Tree Planting, Renewal and Maintenance

Council will aim to increase its tree planting in Tongala to approximately 50 trees per year to both cover tree renewal and infill planting of vacant street tree sites. Priority areas are circled in red.

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Image 10: Areas of high heat vulnerability and pedestrian intensity (circled in red) for priority street and park tree planting.

## Gunbower

### **Existing Township character**

Gunbower sits on the banks of Gunbower Creek and is typical of a small rural township with wide road reserves and nature strips, stocked with a mix of predominantly native tree species. Callistemons feature heavily throughout Gunbower. Parkland is well maintained and irrigated in summer to improve township amenity.

#### Identified trends and concerns

- Gunbower is overly dominant with Weeping Bottle Brush, which represents 18.6% of the tree population.
- Within a 30-year period, Gunbower is likely to lose 80% or 460 of its public trees due to end of useful life.

### Priority Areas for Tree Planting, Renewal and Maintenance

Council will aim to increase its tree planting in Gunbower to approximately 20 trees per year to both cover tree renewal and infill planting of vacant street tree sites. Priority areas are circled in red.

Image 11: Areas of high heat vulnerability and pedestrian intensity (circled in red) for priority street and park tree planting.



# Lockington

### **Existing Township character**

Lockington is nestled amongst farmland and supports some irrigation channels running east-west and north-south. The town has been predominantly planted with Eucalypts and houses two well maintained parks in the centre of town. The main street verge is relatively narrow and supports small to medium trees. Surrounding residential streets have wider verges, some taller trees but more importantly, space for more trees.

### Identified trends and concerns

- Lockington has a high representation of native tree species, especially Eucalypts.
- Within a 30-year period, Lockington is likely to lose 81% or 895 of its public trees due to end of useful life.

### **Priority Areas for Tree Planting, Renewal and Maintenance**

Council will aim to increase its tree planting in Lockington to approximately 20 trees per year to both cover tree renewal and infill planting of vacant street tree sites. Priority areas are circled in black.

Image 12: Areas of high heat vulnerability and pedestrian intensity (circled in red) for priority street and park tree planting.



# Colbinabbin

### **Existing Township character**

Colbinabbin is a very small township characterised by one main street, flanked by narrow laneways either side to the north and south. Its view to the surrounding hills and setting amongst farmland form Colbinabbin's relaxed and spacious character. Its main street is wide with a gravel verge and has recently been planted with Angophora's.

### Identified trends and concerns

- Colbinabbin's tree canopy cover is the lowest across all townships at only 7%.

### Priority Areas for Tree Planting, Renewal and Maintenance

Council will aim to increase its tree planting in Colbinabbin to approximately 10 trees per year to both cover tree renewal and infill planting of vacant street tree sites.

Planting should target any vacancies in the main street and renewal of low useful life trees in the recreation reserve. Colbinabbin doesn't record high or medium social vulnerability to heat and as such isn't a high priority for shade provision. Instead, further tree planting should be done to increase the amenity of the township.

Image 13: Vacant Sites and low ULE trees across Colbinabbin.



# Stanhope

### **Existing Township character**

Stanhope is home to a large Fonterra facility, yet retains a leafy and relaxed character. This is aided by the Grey Box Forest and ironbarks, with their bold dark trunks lining the southern side of the Midland Highway running east-west through town. Stanhope is also characterised by the presence of many well maintained private front gardens. The Rushworth Rail Trail runs into town on the western side and is flanked by native trees. The back residential streets do not have kerb and guttering adding to the relaxed feel with grass verges. The main shopping strip, Birdwood Avenue supports kerb outstands containing deciduous trees for a more formal look.

### Identified trends and concerns

- Stanhope has a very high percentage of Grey Box within the tree population. However, these individuals occur
  predominantly in the roadside vegetation along the southern side of the Midland Highway in remnant style vegetation
  and is not a cause for concern.
- There are very few young trees so there is no succession for the larger old trees.

### Priority Areas for Tree Planting, Renewal and Maintenance

Council will aim to increase its tree planting in Stanhope to approximately 20 trees per year to cover both tree renewal and infill planting of vacant street tree sites. Priority should be given to filling in vacant sites and renewing old trees along streets. Priority areas are circled in black.

Image 14: Areas of high heat vulnerability and pedestrian intensity (circled in black) for priority street and park tree planting.



# Girgarre

### **Existing Township character**

Girgarre is characterised by wide road reserves, many with gravel verges and spacious medians. It is home to Girgarre Cheese Factory to the east and the Gargarro Botanic Gardens. Its commercial area comprises the memorial hall and a newsagent on Morgan Crescent and the remainder is low density residential. The predominantly native mix of small to medium trees gives the town a local and relaxed character.

### Identified trends and concerns

- 71% of Girgarre's trees are likely to reach their end of useful life within a 30-year period.
- There are a very small number of young trees meaning there is no succession planning for when trees need to be removed.

#### **Priority Areas for Tree Planting, Renewal and Maintenance**

Council will aim to increase its tree planting in Girgarre to approximately 20 trees per year to both cover tree renewal and infill planting of vacant street tree sites.

Girgarre Vacant sites Useful Life Expectancy 0 1-5 Years 6-10 Years 9-20 Years 20-30 Years 30-40 Years 40-50 Years > 50 Years Open\_Space **Priority Score** High vulnerability (9-15) 📕 Med -high vunerability (8-9) 🕼 Med vulnerability (7-8)

Image 15: Areas of high heat vulnerability and pedestrian intensity (circled in black) for priority street and park tree planting.

# Glossary

#### **Canopy cover**

The area covered by tree crowns as a percentage of a total area.

#### **Cultural treatments**

The practice of arboriculture includes cultural techniques such as selection, planting, training, fertilization, pest, pathogen control, pruning, shaping and removal.

#### Integrated water management (IWM)

IWM is a holistic and collaborative approach to the way we plan for and manage all elements of the water cycle. IWM considers how the delivery of water, wastewater and stormwater services can contribute to water security, public and environmental health and urban amenity.

#### I-Tree Eco

This is a flexible software application designed to use data collected in the field from single trees, complete inventories, or randomly located plots throughout a study area along with local hourly air pollution and meteorological data to quantify forest structure, environmental effects and value to communities.

#### PSP

Precinct Structure Plan is a master plan which sets out the location and requirements for future growth in a particular area.

#### Risk

A combination of the potential for tree failure and the likely consequences if failure does occur.

#### Social vulnerability to heat

The susceptibility of some members of the community to extreme heat or prolonged periods of hot weather. This includes older people, young children, those who are socio-economically disadvantaged, those with existing illnesses or who need assistance.

#### Street tree

For the purpose of this Urban Forest plan, a street tree is defined as a tree in an urban area or township that is actively managed by Campaspe Shire Council, that form part of the street scape within commercial and public park recreation zones and those that are planted in road reserves in residential zones within the municipality.

#### Structural value

Can be thought of as the cost of having to replace a tree with a similar tree. It can be calculated with factors like the tree trunk area and the tree's health condition. That data, also known as the compensatory value, can be used to measure the costs inflicted by catastrophic events such as wildfires or pest infections in their destruction of trees.

#### **Tree structure**

A tree defect rating system that reviews the condition of the roots, trunk, branches and bark. The majority of defects identified can typically be addressed through pruning or other management practices.

#### **Useful life expectancy (ULE)**

Useful life expectancy is the amount of time that a tree has left in the landscape before it will need to be removed. A number of factors influence a tree's ULE such as age, species, location in which it is planted, health, climatic conditions, structure and proximity to infrastructure. The data works as management tool to help tree managers plan in advance for tree renewal.

#### **Urban forest**

The sum all trees and other vegetation within urban areas as well as the soil and water that supports it. An urban forest is made up of all vegetation in streets, parks, gardens, campuses, creek and river verges, wetlands, transport corridors, community gardens, balconies and rooftops.

#### **Urban trees**

Trees that occur with urban environments that are usually planted but can also be part of remnant vegetation communities.

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