

Alice Springs Greening Strategy & Action Plan 2024



Acknowledgement of Country

Alice Springs Town Council acknowledges the Central Arrernte people as the Traditional Custodians of the land on which we live and work. We pay our respects to their history, culture and their Elders past, present and emerging and extend that respect to all Aboriginal and Torres Strait Islander peoples.



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Foreword

Message from the Mayor

It is my great pleasure to introduce the Alice Springs Town Council Greening Strategy.

Alice Springs is a unique destination that is made up of incredible unique and beautiful natural wonders. It's also true that we face unique challenges with our climate as temperatures climb year to year. This strategic document represents a significant milestone in our journey towards reducing impacts of heat in our community, helping us increase our climate resilience along the way.

As a Council, our traditional role has always been that of 'rates, roads and rubbish'. This is clearly important, but our role has also expanded over time to one that is far more holistic in our duty to the community. This Greening Strategy is a prime example of us working in this way, setting out a path of collaboration with key stakeholders to benefit Alice Springs.

This Greening Strategy is the result of extensive consultation and collaboration with various industry professionals and the wider community, and it will chart a clear path to increasing our tree canopy. It outlines a comprehensive strategy moving forward, detailing our commitments to enhancing canopy while also considering the barriers to greening. It is important for us to take a strategic approach to greening our town so we can deliver real and tangible outcomes in an efficient way.

I would like to thank everyone that has contributed to the development of this Strategy. Your passion and knowledge will help make our future as a town a more sustainable and comfortable one.



Mayor Matt Paterson



Introduction

Executive Summary

Alice Springs Town Council believes greening the town in a strategic, considered manner is one of its highest priorities. Climate resilience is essential to ensure the viability of living in the town and connected tree canopy plays an important role in that priority.

Over the past few decades many towns, cities, local governments, states and countries have begun to recognise the importance of climate resilience and the complex nature of the plans and strategies required to become a climate resilient society. The 'Paris Agreement' of 2015 is a legally binding treaty whose "overarching goal is to hold the increase in the global average temperature to well below 20°C above pre-industrial levels and to limit temperature increase to 1.50°C above pre-industrial levels". (UN, 2015,2023).

The Northern Territory Government released its 'Climate Change Response: Towards 2050' strategy in 2020. It states "The Northern Territory Government has committed to taking action on climate change to maximise the economic, social and environmental well-being of Territorians". The strategy notes that "over the last century, annual average temperatures across the Territory have increased.. by 2.20°C in the south-east." (NTG, 2020).

Alice Springs Town Council has a number of policies and plans that inform this Strategy. First amongst them is the "Climate and Environment Policy" 2022. Secondly; 'Alice Springs Liveability and Sustainability 2030' plan and thirdly; the "ASTC - Climate Action Plan 2018-2021" which gives clear direction to address climatic change. It is within the context of the above documents that this Strategy is now being implemented.

The Alice Springs Greening Strategy and Action Plan will focus and be accountable to five goals:

- Governance
- Economic resilience
- Prioritisation of the environment
- Strengthening of a sense of place
- Improving the health and well-being of its residents.

Focusing on the above goals of the Strategy will engender a layered approach to solving a simple, yet complex equation.

The Action Plan guides, in a strategic step-by-step plan that will enable ASTC to implement the actions required to meet canopy cover targets set by this Strategy.

The Strategy nominates achieving a 25% canopy cover for the city in 26 years. This is an ambitious target that will see an overall proportional increase in canopy of 63%. It will ensure higher levels of comfort and amenity for residents and visitors as well as mitigating the effects of climate change.

In order to achieve 25% canopy cover, 16,000 new trees will be planted, established and maintained.

The average annual budget for this project will be \$340,000 per year with an overall budget of \$8.8M.

The implementation of this Strategy and Action plan will require a strong commitment from many stakeholders, particularly the Alice Springs Town Council and the Community for a sustained period of time.



"The long-term success of street tree plantings is the end result of a complex process involving many players. To date, it would seem that there has been a fair amount of good luck rather than good management. As streets and roads become more intensively developed, the number of constraints to be considered in the tree selection process increases. Community expectations continue to broaden. Society is becoming more litigious. Managers must be more accountable financially, environmentally and commercially. All of these factors make it more important than ever to develop a systematic process of tree selection and establishment that delivers the benefits to which we all aspire"

(Fakes, 2000)

Why a Greening Strategy?

A Greening Strategy is one of the most important 'spokes in the wheel' of climate resilience. It outlines a plan and set of actions to assist in mitigating heat and enhancing liveability.

The Alice Springs "Climate and Environment Policy" 2022. "The policy commits ASTC to fulfilling, and exceeding where possible, its statutory climate and environmental responsibilities" (Policy Purpose).

The Alice Springs Liveability and Sustainability 2030 Plan is the 'driver for Council in the development of its annual practical planning' pg 12.

The Alice Springs Climate Action Plan 2018-2021 calls for a major change in thinking about the way Alice Springs views and manages climate resilience.

It is as a result of this plan that the Greening Strategy has been commissioned to specifically focus on the **benefits of canopy cover in relation to the mitigation of heat.**

The Strategy and Action plan brings together resources, knowledge and commitment to improve outcomes for the town that would be difficult to achieve if all bodies acted alone.

Some of the predicated effects of climate change in Alice Spring include:

- "Increased bushfire intensity;
- Intensity of extreme weather events;
- Increased droughts;
- Loss of and risk to biodiversity;
- Higher chance of mortality and exacerbated health conditions during heat waves;
- Events such as sporting or cultural events cancelled during extreme weather;
- Economic cost due to drop in tourism; and
- Population decrease in Alice Springs"

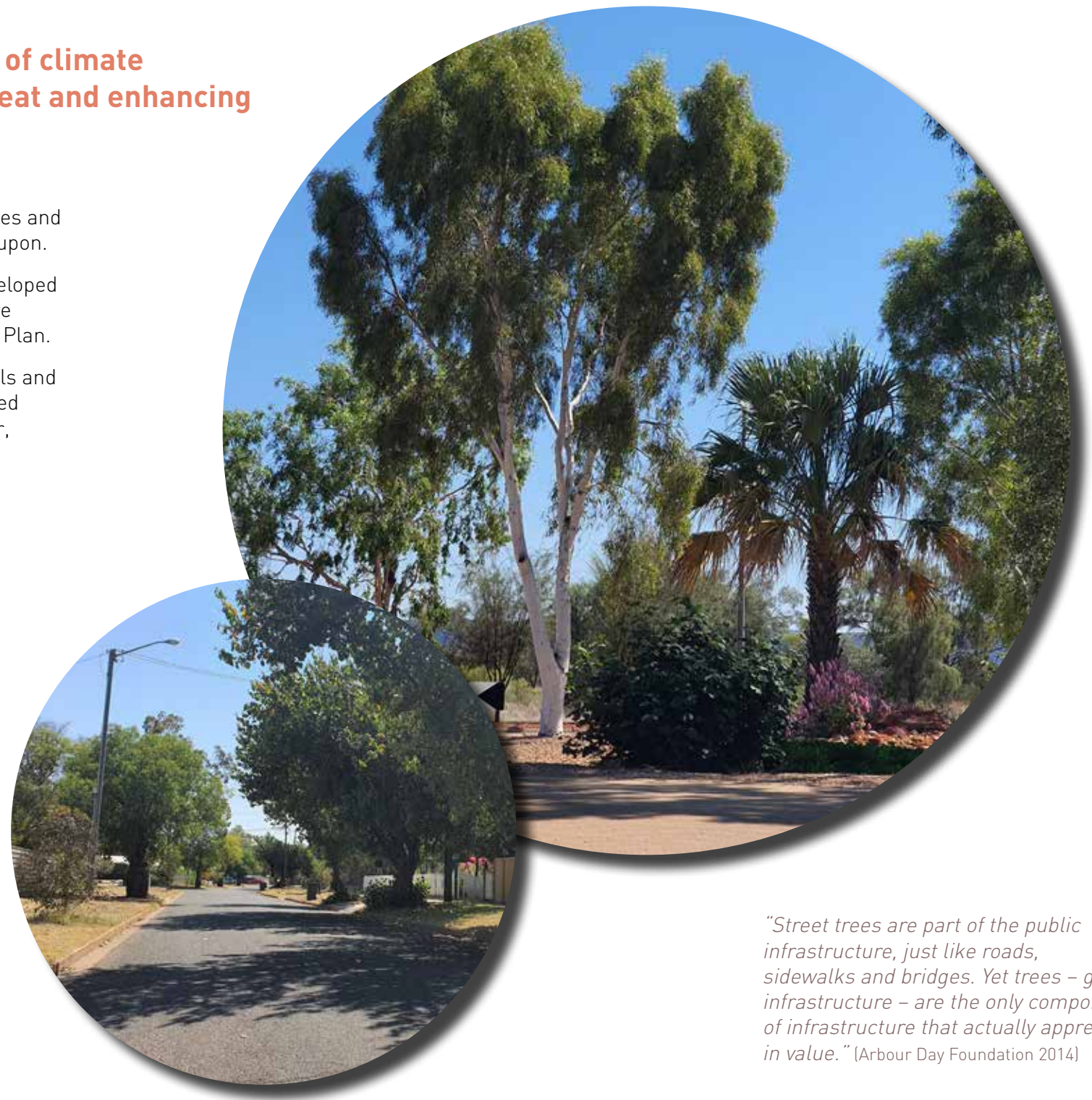
Alice Springs Climate Action Plan 2018-2021 (pg 11).

It is the above points within current ASTC policies and plans that this strategy will focus on and build upon.

The Greening Strategy and Action plan has developed five goals that complement and enhance the five pillars of the Liveability and Sustainability 2030 Plan.

The subject site is shown on all plans. The goals and principles outlined in this strategy can be applied equally outside of the subject site. In particular, south of The Gap.

"[Green Infrastructure] saves energy, increases property value, and extends the life of grey infrastructure. It is a 'must have' for healthy, walkable, liveable and climate resilient communities". (AILA, 2023)



"Street trees are part of the public infrastructure, just like roads, sidewalks and bridges. Yet trees – green infrastructure – are the only components of infrastructure that actually appreciates in value." (Arbour Day Foundation 2014)

Vision

Create a climate resilient, liveable and healthy community through a sustainable greening strategy.



Alice Springs Canopy Vision for 2070

Entering Alice Springs from the north the ridge lines of the McDonald Ranges are dominant along the skyline with scattered trees and lower foothills of native trees. Mulga country dominates the arrival from the central plains and as you descend into Alice Springs. The Todd River floodplain opens up the eastern side of the towns edge with filtered views to its heart through the River Red Gums.

It is at once evident that the Todd River sets the scene for a unique landscape that dominates the character of the town. Red River Gums, the mighty warriors of this landscape speak to all who pass by them.

All who seek shelter and shade appreciate the existing canopy of large gums that spread throughout the streets including plantings from more than 100 years ago as well as celebrating the growth of 50 years of purposeful greening by the community and government officials.

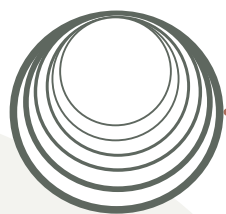
A variety of trees suited to the arid conditions line every street in Alice Springs, the connected canopy shading most of the towns walkways. Residents celebrate their achievements in adding to the connectivity through the private plantings they have lovingly attended to.

By 2070, Alice Springs celebrates the foundation they have laid for a healthy and well maintained town forest that is carefully managed and valued by all. The town forest is a priority for Alice Springs town Council and its residents. It contributes positively to the economic, environmental and social well-being of the town.

Goals

The strategy focuses on five goals, identified below, to guide all decision making throughout the life of this project. Through realisation of these goals and actualisation of canopy cover targets, by 2070 the town will enjoy densely shaded streetscapes and parks.

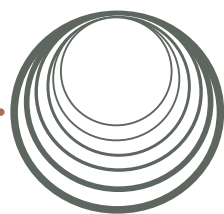
The following five goals have been inspired by the five pillars of the Liveability and Sustainability 2030 Plan. They will enhance all ASTC climate policies.



Governance

Develop a 'whole of government' and community-led approach to planning in order to steer the Greening Strategy and Action Plan.

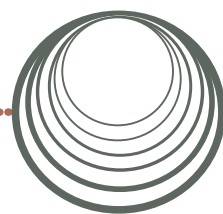
- Policy collaboration
- Networked learning through peer education
- Up-skilling of leaders and proactive dialogue
- Review of working group priorities and budgets
- Advocacy of green spaces
- Implementation of the Action Plan



Economic

Create economic resilience through innovative climate resilient strategies

- Recognition of the economic benefits of greening
- Reduction of energy costs
- Lifespan of council's 'Grey' assets is prolonged
- Increase in property values of residential areas
- Business stimulus
- Council promotes street trees as a high value asset



Environmental

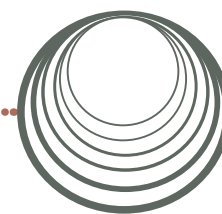
Prioritise climate resilience

- Reduction in 'heat island effects'
- Tree leaves reflect and absorb heat
- Increase biodiversity
- Reduce greenhouse gas emissions
- Improve air quality

Canopy Cover Targets

Canopy cover has been mapped for 2011 and 2023. 2023 will act as the base year. Goals for targets will include:

- No net loss of canopy; and
- Percentage increases in canopy cover that are consistent with urban areas in other arid regions.

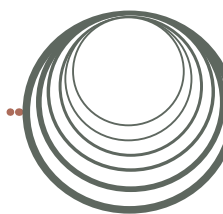


Sense of Place

Value and build on Alice Springs unique sense of place

- Local distinctiveness - recognise and appreciate the existing character of Central Australian flora
- Narratives – places tell stories and so do trees
- Maximise opportunities for greening utilising Alice Springs distinctive aesthetics and sense of place
- Protect and maintain existing trees

"Sense of place is the lens through which people experience and make meaning of their experiences in and with place" (Adams, 2013)



Health and Well-being

Improve health and well-being of the community

- Cooler public spaces
- Providing an increased connection with nature - reducing anxiety and improving well-being
- Increase shade to areas of the town that have a shade deficit.
- Provision of greener, shaded public open space that is accessible to residents
- Encourage active transport through the provision of shade to paths, enabling cooler journeys
- Provision of outdoor shaded spaces in which to enjoy regular active and passive recreation

Review of Precedents

Government authorities in Australia and in arid urban places around the world are addressing climate resilience and the management of their urban forests as a matter of priority. A review of precedents has been undertaken and these offer ideas and potential solutions for this Greening Strategy and the town.

Planning Instruments

Planning instruments set strategic planning vision for a state /territory or local government. They help determine broad goals, guide behaviour and evaluate performance.

Importantly, they set the scene for the development of strategies, policies, laws and action plans. In this case NTG control planning for ASTC. As there is little capacity within this study to influence the territory planning scheme then the policies and local laws of ASTC are most relevant.

Policy & Local Laws

Policy and local laws are an important part of the mechanism that drives a strategy forward. Without these supporting documents, LGA's find it difficult to affect change in a meaningful way. They are a proven method for LGA's to promote behaviour change within their communities. Policies and Local Laws reviewed include:

- Alice Springs town Council. Community Consultation Framework; Management of public places; Liveability and Sustainability; Climate and Environment Policy Council Policy; Verge Development Guidelines.
- Northern Territory Government. Northern Territory Subdivision Development Guidelines.
- PowerWater. Safety around trees and powerlines; Standard Drawings.
- Brisbane City Council. Natural Assets Local Law.
- Brimbank City Council. Significant Tree Policy.
- City of Gold Coast. Residential Tree Scheme Policy.
- City of Ipswich. Streetscape Design Guideline.
- City of Booroondara. Tree Protection Local Law.
- City of Wanneroo. Nature Strip Treatment Guidelines.
- Sunshine Coast Regional Council Street Tree Master Plan

Urban Forest Strategies

Urban Forest Strategies (Greening Strategies) have become increasingly import to Local Government Authorities around the world as a result of climate change. There have already been many strategies written in Australia from which to draw inspiration and information.

This is a growing field in which data is quite young and many methods for collection and analysis are being tested. Strategies reviewed include:

- City of Phoenix. Urban Tree Planting; Shade Phoenix; Urban Forest Plan and Tree and Shade Master Plan
- Brimbank City Council. Urban Forest Strategy 2016–2046.
- City of Darwin. GreenStreets Streetscape Strategy 2012-2020; Developing a Darwin Heat Mitigation Strategy and Greening Darwin Strategy 2030.
- City of Gold Coast. Urban Tree Canopy Study.
- City of Melbourne. Urban Forest Strategy; Explore Melbourne's Urban Forest.
- City of Yarra. Urban forest strategy.
- Greater Shepparton City Council. Urban Forest Strategy; Urban Forest Strategy 2017-2037.
- Green Adelaide. An Urban Greening Strategy for metropolitan Adelaide.
- Greener Spaces Better Places. Where Are All the Trees?; Where Should All the Trees Go?; Where Will All the Trees Be?
- Greening the West.
- Management of Urban Forests in Remote and Arid Environments.

Literature

As climate change and climate resilience is an emerging field with new work continuously being produced, a literature review was undertaken to inform related topics such as water, geology, canopy mapping, heat island effect and a range of other topics. Literature reviewed include:

- Adams. Theorizing a sense of place in transnational community.
- Arup. Cities Alive.
- The University of Adelaide. Urban tree protection in Australia.
- City of Melbourne. Urban Forest Tree Valuations.
- Clark et al. Private tree removal, public loss.
- Climate Active. Guideline: Accounting for Carbon Sequestration from Tree Plantings Sept. 2022.
- Isaifan & Baldauf. Estimating Economic and Environmental Benefits of Urban Trees in Desert Regions.
- Jo & Park. Effects of pit plantings on tree growth in semi-arid environments.
- Lotfata et al. Climate adaptation in informal areas in hot arid climates.
- Matthew et al. A framework for climate adaptation decision-making by local government in central Australia.
- O'Callaghan et al. Guide to Road Design.
- Office of Climate Change. Northern Territory Climate Change Response: Towards 2050.
- Queensland Health. Healthy Places, Healthy People.
- Shaka, H. (2019). Rethinking Cities in Arid Environments for the 21st Century.
- State of New South Wales. Framework for Valuing Green Infrastructure and Public Spaces.



Opportunities for Planting

Many streets of the town have ample room for additional trees.

Current Framework and Major Barriers for ‘Greening’

There are examples of successful greening in Alice Springs. However, analysis has also found many barriers to the planting of trees and raises concerns for quality/health mortality rates.

Policy and Local law

The ASTC and NTG have a number of policies which have been reviewed and taken into account whilst formulating this strategy. There are many aspects within these policies and laws that are constricting the increase in canopy cover. Below are some examples of specific points of concern:

- Rates for level of service of trees is currently nominated in policy as 1 or 2 per lot. Given the large sizes of land lots and local climate, rates of trees per lot could be increased
- Treatment plans recommend the removal of trees if they are damaging concrete footpaths. This approach prioritises ‘Grey’ over ‘Green’ infrastructure
- Tree planting is currently funded by council budget allowances.
- It is also noted that there may be policies missing from the ASTC suite that would provide better protection and management of existing trees - for example, a ‘Tree Protection’ policy.

Technical Practices

Within the ASTC, in-house designs and maintenance regimes are being prepared and planned. These practices are affected by the following:

- Limited/progressing leadership skills and training in the emerging field of climate resilience
- Existing tree crew and tree maintenance budgets do not support an increase in sustainable planting and increased canopy coverage
- Staffing levels and frequent turnover within the design and maintenance crew limit the transfer of knowledge. Strategies for staff retention and knowledge transfer could be improved

- Staff knowledge and experience is limited by lack of time and training
- Tree procurement is complex in ASTC and it is one of the leading factors in the recent reduction of tree planting. No sustainable supply of appropriate stock is currently available. The stock that is available is often poor quality
- Plant and equipment assets are currently only adequate for minimum/reactive work. A proactive and expanded approach to planting will require an increase in appropriate assets
- Select engineering details and/or supplier guidelines preclude tree planting
- Cycle/pedestrian lanes, priority crossings etc. (i.e. Asset Management Plan instructs removal of trees which are damaging pavements).

The Centralian Culture

There are a number of practices that are unique to Centralian culture and in particular to the town of Alice Springs that are or may be affecting the growth of tree canopy cover. These practices include the following:

- Vehicle parking on road verges. This practice is widespread and causes compaction of the ground, which in turn minimise air circulation around the root zones of trees and the ability of water to permeate deep within the soil
- There is a high rate of vandalism and theft of existing and newly planted trees within the CBD
- Removal of large trees (and tree canopy) within private property. Currently, ASTC does not have a policy covering tree removal within private property. Many of the existing large-canopied trees in Alice Springs are in private property and their potential removal represents a substantial loss of canopy to the town

- Maintenance practices of the existing town forest canopy tend to be reactive due to budgetary constraints and limitations within ‘Green’ infrastructure policies

“The roots are the tree’s lifeline. They supply nutrition and water, store food, synthesize hormones, and provide structural support. So, if the roots are damaged, it can adversely affect the tree’s overall health and stability. It’s like a ship without an anchor, adrift and vulnerable. Therefore, it’s essential to understand and identify the signs of root damage for effective tree care”. 72 Tree Seed & Land Co.

Canopy Coverage Decline

Where canopy has declined over time it has occurred as a result of several factors including:

- Storm damage,
- Use of undesirable species
- Prioritisation of ‘Grey’ infrastructure in decision making
- Reduction of private canopy cover.
- Little or no replacement of trees where they have been removed/reduced
- Environmental factors and maintenance regimes reduce the survival rate of new stock
- Species selection and densities do not provide sufficient coverage to sufficiently mitigate shade
- Use of simple, reactive management systems lacking oversight of whole of forest ‘trends’

Procurement

One of the major barriers to implementing the Greening Strategy is the procurement of appropriate, quality tree stock:

- There are no commercial nurseries operating in

town

- Stock sourced from Darwin is often not climate appropriate nor is it climatically hardened
- Stock that has been supplied is often of inferior quality and not NATSPEC certified.

Aesthetics and Species Selection

Species selection in general can be highly subjective, open to opinions on aesthetics, growth habit, appropriateness of location etc. In summary:

- There is some disagreement between stakeholders about which species are appropriate/beautiful as identified during the stakeholder engagement
- Some non-native species thrive in the town’s climate. They have excellent form, shade performance, a low reliance on watering and are not classified as weeds and would make good additions to the species list but are not valued by those who prefer native plants. Some non-native species survive in town but they become poor performing specimens in terms of form, reliance on water and longevity. In the later category for example this is true of Jacaranda and Poinciana in particular
- A number of species which are highly suitable for the town are not available commercially and/or easy to procure
- Some residents believe exotics should not be used at all.

Urban Heat Island Effect & Central Australian Climate

It is widely acknowledged that the number of ‘extreme heat’ days in Central Australia are increasing. This is particularly so in built up ‘urban’ areas where there are greater proportions of ‘Grey’

infrastructure. Matthew states “Days over 35°C are expected to increase from a current 90 days to 132-182 days per year by 2070 due to climate change” Matthew, S 2015. Investigations found that;

- Current technical practices and policies focus on the protection of ‘Grey’ infrastructure over the implementation of ‘Green’ infrastructure
- The most recent ASTC Climate Change Action Plan 2018 – 2021 does not focus on increasing canopy cover. Its only mention of trees is in relation to reduction of CO2 in the atmosphere.

Power lines

The towns power lines are predominantly low to the ground (relative to other networks). In Australia 415 V power lines can be in the range of 7-4.5m. Most in Alice Springs are in the lower range. Low powerlines minimises opportunities to plant underneath, particularly within the current guidelines set out by PowerWater.

In general, Council is unable to influence the pruning regime under power lines and this results in heavily ‘over pruned’ trees throughout the town.

This issues raised above greatly reduce canopy shade to the streetscape.

Removal of trees on Private Land

Privately owned trees dominate canopy cover in most cities of the world. There are currently no tree protection mechanisms in the town for privately owned trees.

Exaggerated tree ‘risk’ is often a cause of removals and without either ASTC policy or public education it is likely that mature canopy tree reductions will continue to occur through the town.

“In many major cities, local governments want to increase tree cover because of the benefits to human health and well-being and doing so on private land is critical to this goal. For example, in the US city of Chicago, over 60 percent of the urban forest canopy is on private land. In the Los Angeles Million Trees Initiative more than two-thirds (700,000) of the new trees proposed were for private property”

Clark 2020

Ownership of Roads

One of the major barriers to designing for the continuity of trees species/character is the ownership and management of roads, which is currently split between NTG and ASTC.

As there is currently little or no collaboration by NTG for work being undertaken, it is difficult for ASTC to co-ordinate tree planting efficiently and effectively.

Water

Being located in central Australia, the availability, cost and sourcing of water is one of the most important and potentially contentious issues for the increase in canopy coverage. Investigations found that:

- Low rainfall in the town does not provide a consistent source of water for trees, in particular for the tree establishment phase
- Watering of new trees is one of the most critical elements for their survival
- Where soil moisture is a limited, irrigating trees will increase growth, evapo-transpiration rates and cooling (and shade and reduce temperature in our urban environments) however the cooling benefits must be weighed against the cost of supplying additional water to the site.
- Trees are being watered with the town’s potable supply
- Non- potable water/recycled water is currently available to the town and would be an appropriate water supply for trees. However, it’s connection and distribution via water trucks is currently restricted
- Groundwater is high where closest to the Todd River which will impact species selection for this zone

Fire

Due to extreme heat and low rainfall, fire is a constant threat to trees, including the following:

- Natural edges - damage, particularly to mature tree stock is seen in the Todd River and along the natural edges of town in the event of fire

- Trees in the Todd River - when vandals light fires at the base of mature River Red gum they ignite and burn quickly due to their age and surrounding fuel load.

Public Participation

There are a number of current opportunities for the town’s residents to participate in greening activities. In general, the residents did not attend the engagement meetings and may or may not be sufficiently engaged. Higher levels of engagement amongst the community would be of benefit to the program. In particular established groups such as Landcare etc. are keen to promote greening, though are currently underutilised.

“Inclusive participation processes give voice to diverse actors, ensuring that the voices of vulnerable and disadvantaged groups are heard, and also positions governments to promote inclusive growth. Participation in all stages of climate action enhances the sustainability of policy measures across political mandates since an engaged civil society can maintain climate change on the political agenda, even as governments change”.

World Bank 2022

Solar Panel Shading

The town is committed to a low-carbon future and part of that commitment is to support rooftop solar power. Concerns have been raised regarding the shade cast by additional trees and how this will relate to solar power.

We recommend further investigation by Council and ALEC on this matter. Part of this discussion could be centred around the competing interests (i.e. energy generation vs heat mitigation) and the compromises required to achieve both objectives.

Major Risks

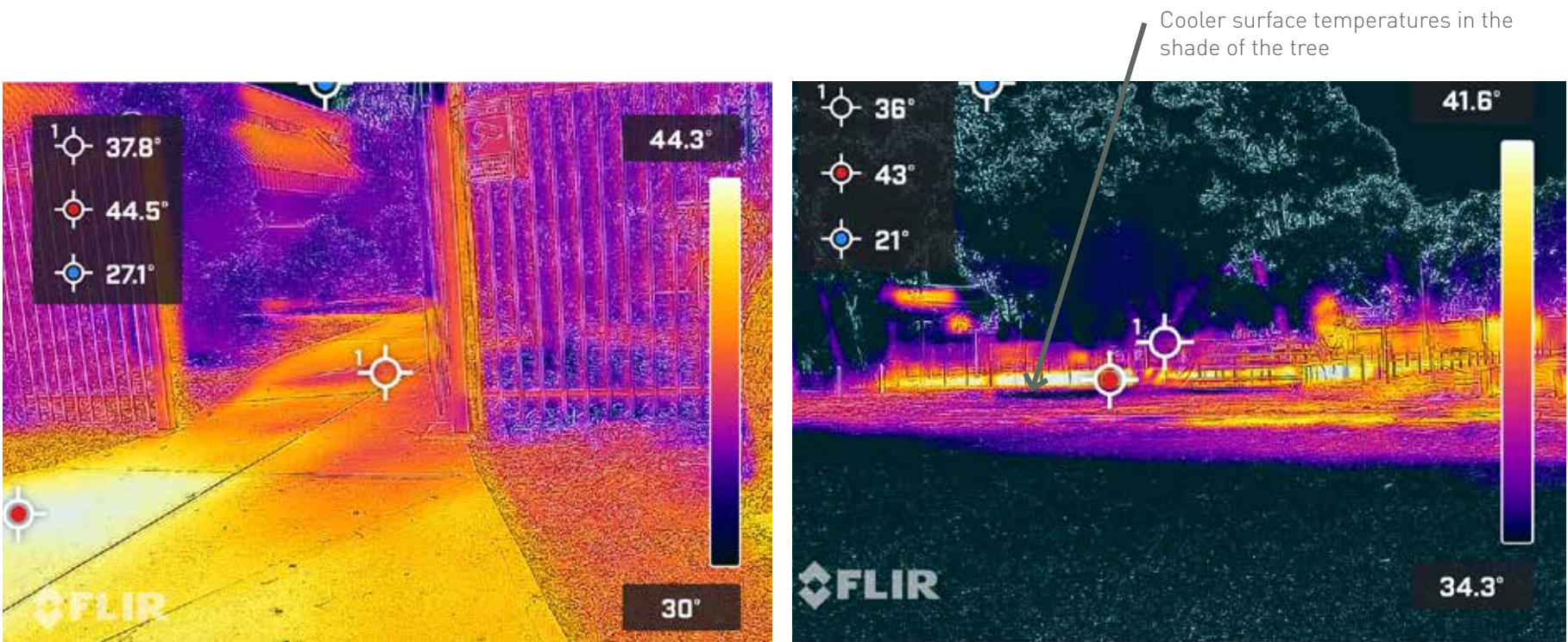
The analysis highlights the following major risks to not addressing barriers to planting:

- ‘Grey’ over ‘Green’ thinking and prioritisation of budgets
- Absence of specific policies supporting tree planting
- General policies not supporting change
- Core staffing levels and skills base changing regularly
- Tree stock procurement being economically viable and timely/available
- Poor quality tree stock
- Lack of plant and equipment to increase maintenance requirements
- Compaction of residential verges via private vehicle parking
- Vandalism and theft
- Lack of a Tree Protection Policy or similar controls allows large tree canopy removal in private lots
- Reactive maintenance practices (due to budget constraints)
- Predominance of ‘low’ power lines and either not planting under or lopping existing tree which are too tall for these locations
- Lack of collaboration between NTG and ASTC on planting design of for major roads
- Supplying sufficient water to newly planted trees at the appropriate time to allow for successful establishment
- Public participation and uptake of concepts quickly.

Thermal Imagery

Thermal images demonstrate surface heat differential between tree canopy, shaded areas below, and nearby unshaded hard surfaces.

The Air in Alice Project is currently underway. Initial findings are being prepared by Prof Supriya Matthew. The following thermal imagery has been provided by Air in Alice for our usage.



Thermal images courtesy of Air in Alice Project, taken in February 2024

“Trees and vegetation provide a cooling effect in 2 ways:

- Shading of hard surfaces that would otherwise absorb heat from direct sunlight and then re-radiate it into the air*
- Through evapo-transpiration – as trees release water into the atmosphere from their leaves, surrounding areas are cooled from the evaporation of this water.”*

[NSW Government, 2023]



Car temperature 1pm at CDU campus

Kilgariff park slide temperature 7pm

Thermal images courtesy of Air in Alice Project, taken in January 2024



Heat Levels

Areas of shade are much lower in temperature than ground that is not shaded

Canopy Mapping

Canopy mapping has been undertaken for the subject site in order to gain understanding of the current level of canopy cover and establish a benchmark for later comparison.

Process of Canopy Mapping

The data has been generated by manually tracing canopy from an aerial photo array into a GIS platform (ESRI). This allows for possible future integration into digital geospatial mapping and asset management systems.

Aerial photo arrays from the following dates have been used:

- October 2023 - The latest NearMap aerial photo capture
- October 2011 - The earliest NearMap aerial photo capture available at the same time of year

The mapped data is presented via a custom designed interactive dashboard (opposite). Users can use pan and zoom functions to display all or cropped areas of the Area of Interest (AOI) and the reported percentage of canopy cover updates accordingly.

Canopy Statistics

This data can be used as a broad guide of:

- the change in canopy coverage between the two dates across the whole town; and
- the difference in canopy coverage between different areas i.e.:
 - 9% - 24% across various residential neighbourhoods;
 - 6%-9% across the CBD; and
 - 4% typical in industrial areas.

Shade Equity

"Shade equity is fairness or justice in the way people have access to tree shade in their communities regardless of their social identity (e.g., race, ethnicity, income, etc.)."

Donihue, 2022

Trees and shade are not equally distributed across the town. There are differences in coverage between land use zones (residential v industrial v CBD), and between different neighbourhoods within residential zones - refer Appendix A.

Private vs Public Canopy Cover

Comparing canopy coverage targets of other cities, where their target may include canopy in private property (private canopy generally makes up the majority of canopy cover in urban areas), with this study may not be relevant as mapped canopy only includes public open space of the AOI.

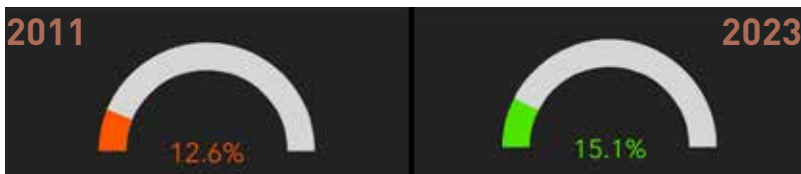
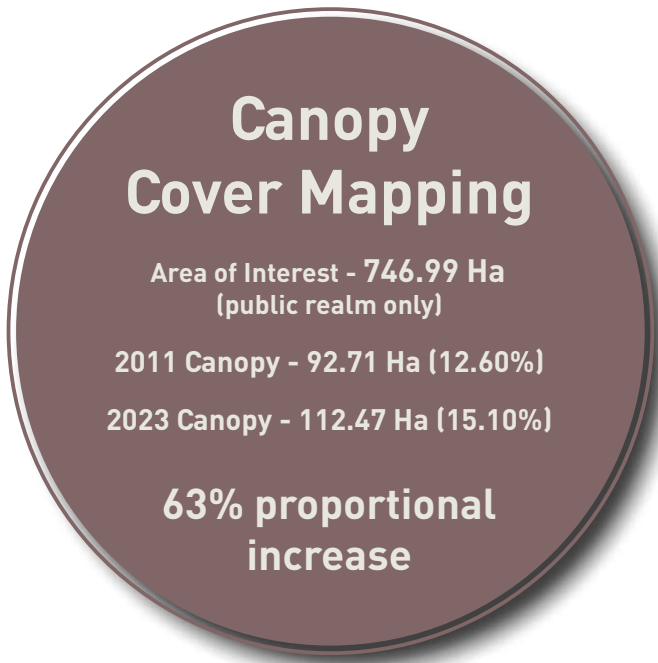
"There is no global benchmark for optimal tree canopy cover. Of more sense and which is used around the world, is benchmarking a figure that represents what the public and private realm can optimally support. A canopy cover over 30% for any Australian town or city is above the Australian average (UTS, 2013) but there are now aspirations to reach ambitious yet achievable canopy cover targets such as 40%."

[City of Melbourne, 2012]

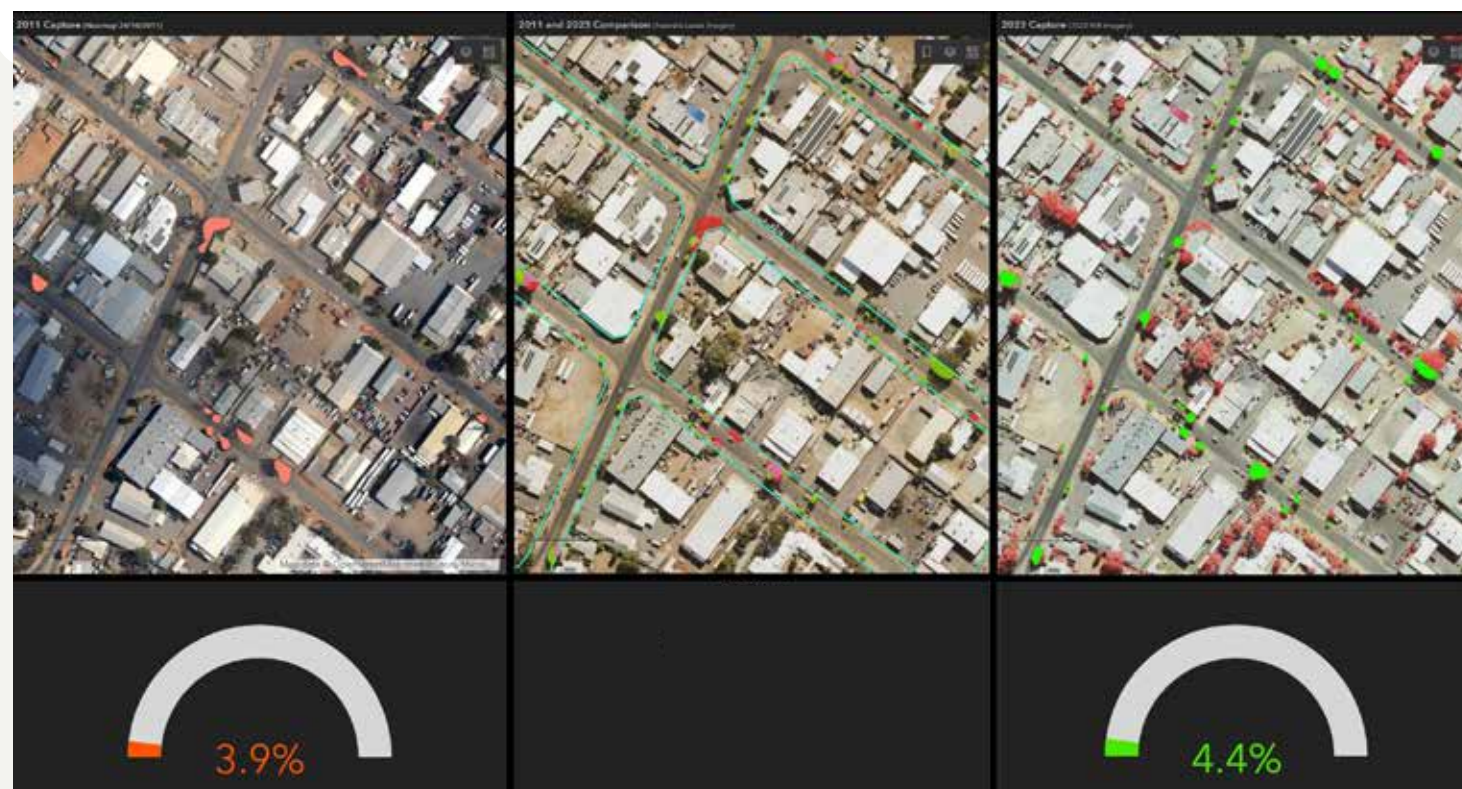
Limitations of this Data

As the mapping technique is a manual one, an error rate of not more than +/- 5% is expected (i.e.. 15% Canopy Cover could be considered to represent between 14.25 - 15.75%).

The data can be considered as providing indicative guide to the level of cover and change without going to the great expense of a detailed and more accurate data capture and GIS integration, for asset management purposes, that larger LGA's and capital cities have implemented.



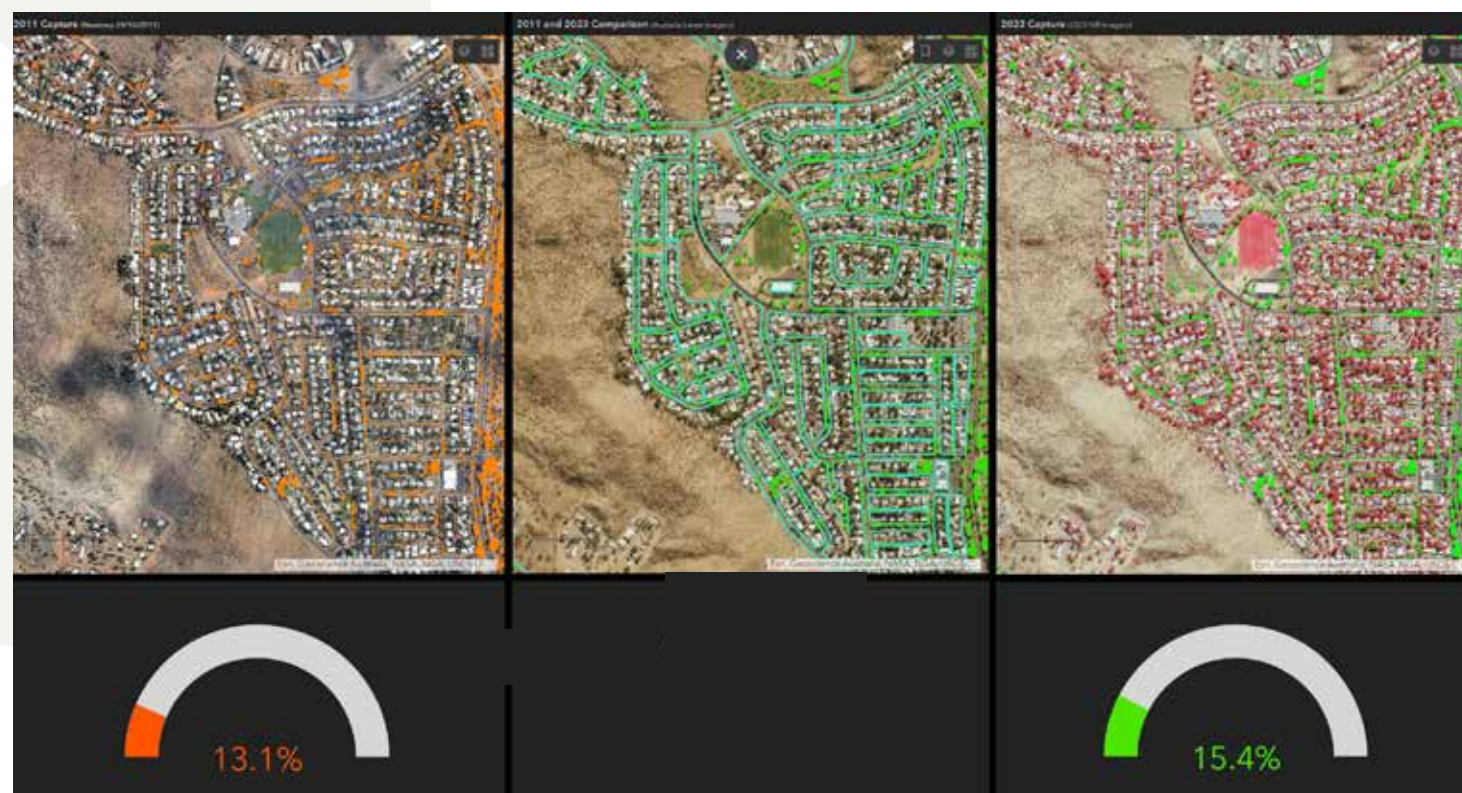
Canopy Mapping (AOI) - % Change



Canopy Cover Mapping - example of low coverage in industrial areas, Gillen.



Canopy cover mapping - example of higher coverage, Eastside.



Canopy cover mapping - example of medium coverage residential, Braitling.



Canopy cover mapping - example of low/medium coverage, CBD.

Stakeholder Goal:
"To be able to walk without shoes in the shade of continuous tree canopy stretching along each street in Alice Springs"



Consultation and Engagement

A cornerstone of this project is collaboration and partnership with all sectors who deliver, champion or influence urban greening outcomes, including federal and Territory government agencies, cross-sector collaboration, industry peak bodies, research institutions, non-government organisations, Arrernte peoples and local residents.

As a result of the initial stakeholder engagement (online and in-person) the community told us...

Community Workshop

The general public forum included members who were enthusiastic about the Greening Strategy and keen to understand how it would work.

General comments included:

- Concerns around selecting the right species for the right place. Particularly, in light of the storms in October 2022. Lemon Gums are of particular concern;
- Depth of groundwater should have a bearing on which species are planted;
- Heritage, older and sacred trees require better management practices;
- How will the pilot projects be chosen;
- A business case for the management of the Todd River is required in order to increase maintenance budgets;
- Native plantings are preferred; and
- Actions must be part of the strategy, not just a strategy.

Practitioners Workshop

Practitioners called for change in the way that the multiple stakeholders involved in managing Alice Springs Tree canopy undertake their work. Concerns revolved around ineffective collaboration, implementation of tree planting and maintenance.

They would like to see some of the following implemented:

- Use of recycled water to service new/increased tree plantings;
- Community involvement encouraged in a variety of ways - such as 'Adopt a Street' strategy;
- Restructuring of Council tree crews to allow for the expansion in tree planting;
- Tree policy be developed to protect trees of a certain size/species/age on private property;
- Groups such as Landcare be allocated funds to manage/carry out greening projects on behalf of Council;
- Incentives for residents to plant in verges;
- Funding of knowledge banks/training for leaders in the community;
- Public to maintain their own verges so that money spent on maintenance budgets by Council for mowing etc. can be re-allocated to the Greening Strategy new tree plantings; and
- Todd River maintenance budgets increased including review of maintenance program and removal of buffel grass.

Elected Members Forum

Elected members, the CEO and Directors were present and confirmed they were keen to have this project move forward in a proactive way. General comments and concerns included:

- Dealing with vandalism and stealing of trees;
- Encouraging the community to be active in the strategy and actions;
- What would be the cost of the tree planting programs;
- What are industry and other standards for canopy cover increases - i.e. what is the benchmark particularly for arid zones;
- Concerns around trees causing safety issues (CPTED, climbing, hiding, sightlines);
- Industrial areas will be difficult to plant out due to heavy vehicles;
- Would like to get other bodies such as the Department of Education involved;
- Pilot projects are well thought out and we could get wins in all of them;
- Be aware of restrictions on ASTC in relation to NTG roads;
- CEO asked if we could we explore the economic value of trees (in relation to carbon credits) to potentially fund the Greening Strategy;
- Would like to see a pilot project in the CBD;
- Important to maintain existing themes of trees;
- Aesthetics of the town are very important;
- Education of the public is important; and
- Capability issues within tree crew are limiting capacity.
- Could heat mapping be used to prioritise areas.

Online Survey

An online survey was conducted both for practitioners and the general public. A total of 44 responses were received. A portion of the surveys and responses are included in Appendix E.

Feedback included:

- River Red Gums are very important to the local community, especially those along the Todd River. These are considered iconic not only aesthetically but are considered a spectacular asset to the town that is synonymous with the outback. These trees hold intrinsic value and beauty, along with providing vital habitat for local species.
- Trees are valued for their intrinsic beauty, ability to provide shade and significance culturally/historically/to the town, as well as their essential role supporting ecosystems, native birds and other native wildlife.
- Overall the community emphasised that most of Alice Springs, its suburbs and CBD needed more shade from tree canopy cover. Specifically, parks, playgrounds, routes to/near schools, carparks/near shopping centres, Stuart Highway, rivers, suburban streets, inner and wider CBD needed extra attention.
- The vast majority of respondents (over 90%) considered it extremely important to reduce the effects of Heat in Alice Springs with more tree canopy cover.
- The vast majority of respondents (over 70%) were interested in planting trees in the community and their own backyard.
- A number of key stakeholders and community members highlighted the importance of protecting trees from Buffel grass.

A second round of stakeholder engagement (online and in-person) was undertaken and the community told us...

General Public Meeting

The general public meeting included a variety of members of the public who were enthusiastic about the Greening Strategy and keen to understand how it would work. About half those who attended had read the strategy in full.

General comments included concerns and comments around:

- Not including shrubs and groundcovers as well as not controlling Buffel grass in the strategy;
- Why did ASTC focus this study on tree canopy only? What about other biodiversity targets and hard shade canopy?;
- Existing trees are not currently maintained correctly and there was concern that future plans would have similar problems. In particular, that there is no longer a hotline to call for maintenance concerns;
- Use of potable water for trees, and why recycled water is not being used/available;
- Opportunities for businesses to be involved whether by employment or pilot projects;
- Procurement of stock that is not adjusted to Alice Springs conditions;
- Growing on of stock, who would do that? Could it be done by a number of local suppliers rather than just one contract?;
- Hardening off of stock as it is planted to ensure it survives, concerns around too much water being given;
- Tree protection from vandalism, tree guards and best types were discussed;
- How will ASTC fund this strategy and how will we ensure it is followed?; and
- Does ASTC have the staff required, both skills and numbers to fulfill this strategy?.

Practitioners Meeting

No Practitioners attended the scheduled meeting.

Online Survey

Two online surveys were conducted both for practitioners and the general public. A total of 20 responses were received plus a full review of the report received via email from a resident. A portion of the surveys and responses are included in Appendix E.

Feedback included:

- Overall there were many positive comments about the structure of the document and the strategy moving forward;
- Respondents, on the whole were positive about being involved in future activities to promote the strategy;
- Current council maintenance around Town is lacking and concerns were raised over increasing that requirement with current resources & skill sets;
- More trees are needed along cycling paths;
- Would like to see more use of recycled water on trees;
- Would like to see a socials page by Council to facilitate progress, troubleshoot, feel connected and accountable;
- There was a mix of opinions regarding the use of natives vs exotics;
- Concerns around shallow rooted trees and storm damage;
- Would like to see some 'plain English', 'bite size' information packs for the general public;
- Comments regarding all new vegetation to be set back to allow for pedestrian use of the footpaths was important as well as maintaining clear height trunk pruning to ensure access to all paths;
- Respondents were concerned that only 'pocket parks' were part of the strategy and not all parks;
- Seating along paths was also requested; and
- Concerns regarding the Adopt a Tree program and transfer of responsibility as residents move house.



Images supplied by ASTC

Ancestor Trees

"We don't rip branches off trees, only the wood that's fallen to the ground is picked up to be used for firewood. Nowadays people might chop wood with axes and saw it up for the fire, but only the dead wood is used, not the green timber. The old-days people used to just pick up the dry wood from the ground for burning. The firewood and the trees are part of our country, and must be treated with respect. And not only firewood, but also these trees and others we collect from to make digging sticks, trees like mulga and witchetty bush. Or sometimes people might make something to exchange with visitors for other things, like shields made from the wood of the bean tree, arne tyweretye. They used to make coolamons out of bloodwood timber, coolamons to carry meat in, or to carry babies. Or it might be a scoop to hold water; they'd make that out of the burl on a bloodwood tree. Angkerle is one of those little clumps; that's that burl now. You chop that out, and you make a small scoop out of it to dig with.

The only other time people might want to cut into a tree is if wild honey was there that they needed to climb up to collect. They never cut the tree down, just cut steps into it, so far apart, to climb up. Tetye, where they can put their feet you know, when they're climbing up. What do you mob call them? 'Notches', ye. They used to climb by putting their feet in the notches to collect the wild honey, cutting them as they went. They never used to break off the limbs and branches, because those trees grow out of Sacred Country. That's how we related to trees and things.

Might be the Ancestors Came through from other countries and stopped here on their journey. And they became another tree here, left part of his – what do you call it? – image there. A plant or a tree became them as they walked past and became who they are. And then they changed into another one. They might have dropped seeds there and other trees came out of those Ancestors before they travelled on. Alakenhe. That's why people never used to do wrong things when they go out hunting for wild honey. So in a corkwood tree, or any type of tree really, they'd chop steps into the side to climb to the top. Or sometimes they used to put up a forked stick, might be an old log they used to get, and lean it over onto the tree, then climb on that and chop from that. But they never used to cut into and damage a river red gum tree; not in any way, not anywhere."

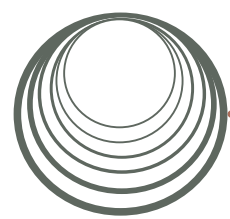
by Margaret Kemarre Turner (2010, pp.151).

An aerial photograph of Alice Springs, Australia. In the foreground, there is a dense area of green trees and shrubs. Behind this, a row of residential houses with white roofs is visible. In the background, a large, flat-topped hill (Uluru) rises against a sky filled with many small, white, puffy clouds. The hill has some communication towers on its peak. The overall scene is a mix of natural landscape and urban development.

Strategic Direction

Guiding Principles

The guiding principles of the strategy will inform all decision making.



Governance

Committees and Working Groups

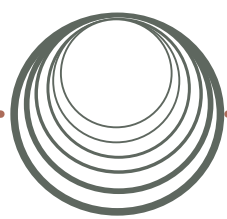
Formation of the following committees will guide the strategy on both micro and macro levels;

- Steering committee who play an overarching role in guiding the strategy and action plan.
- Cross-sector technical working group who will provide technical expertise to the steering committee.
- Community and business working group that will lead on-ground community initiatives and report to the technical working group.

Council Leadership

Leadership and skill base in innovative 'green' solutions is required. Council will commit to:

- Up-skilling staff, particularly leaders in green infrastructure;
- Create conversations internally, at the elected member level and with residents to ensure key messaging is consistent and repeated



Economic

Financial Effectiveness

The financial effectiveness of each action is key to the delivery of this program, including:

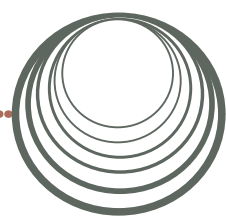
- Reducing the inefficiencies of maintenance regimes. This will have the flow-on effect of diverting budget to procurement;
- Increasing levels of staffing with the expertise to ensure tree growth and survival; and
- Ensuring only high quality stock is planted which will reduce stock loss.

Green - Grey Infrastructure Approach

Re-framing the towns mindset to be that of promoting a healthy and financially sustainable approach through green infrastructure solutions where possible.

Investment in the environment pays for itself many times over. This approach can:

- Introduce cost savings in energy;
- Reduce maintenance of hard surfaces;
- Be more sustainable, long term;
- Improve health and well-being and reduce cost on health system; and
- Create more liveable environments in line with tourism offer.



Environmental

Layered Overlapping Connected Canopy (LOCC)

Establishing a planting strategy that maximises shade is crucial to the strategy.

Species Diversity

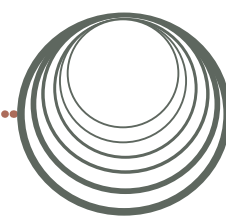
A limited range of species will thrive in the town. It's important that diversity is maximised within this constraint to minimise vulnerability to mass pest and disease, climate change, and natural disaster.

The more diverse a tree population, the more resilient it is. Ongoing use of mixed planting themes is recommended. While being aware of potential overuse of single species.

Age Diversity

Young growing trees capture more carbon than older trees. Older trees offer more shade. Successive planting across the town is important to maintain the balance of trees coming into and out of the Urban Forest.

Ensuring that a spread of tree maturity is maintained throughout the Urban Forest allows consistent levels of shade to be maintained.

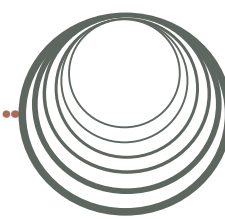


Sense of Place

Landscape Character

The landscape character of Alice Springs is distinct. Local distinctiveness and an appreciation of the existing character of Central Australian flora is an important guiding principal in species selection.

In particular, use of iconic species is important to maintain well known and acknowledged references to Centralian bush character.



Health and Well-being

Care and Maintenance of Existing Trees

The existing urban forest is currently estimated at 15.1% of the AOI. Without these trees the ground and air in Alice Springs would be hotter and far less pleasant to live in.

One of the priorities is ensuring there is no net loss of this forest. Given the average age and estimated useful life expectancies of the existing tree population is currently unknown this may mean council needs to ensure that every tree removed is replaced with at least one new tree.

Shade Equity

Shade equity is important to ensure all residents are afforded the same levels of climatic comfort whilst in open space. Shade inequity is an acknowledgement that some neighbourhoods have low levels of shade (tree planting) due to:

- Socio-economic conditions; and
- Higher levels of renters vs owners.

Governance and Important Partnerships

The success of this strategy will be in the strength of cross-collaboration between a variety of key partners. The strategy suggests the formation of a 3-tiered collaborative governance approach. The following roles and responsibilities are suggested:

Northern Territory Government

Department of Infrastructure, Planning and Logistics (DIPL)

Their role would be an overarching one that represents a link between the goals of the NTG strategies and the ASTC strategies.

Key components of the representatives role may include:

- Access and knowledge of emerging strategies and plans to complement ASTC;
- Knowledge of funding streams available through NTG relevant to the ASTC Greening Strategy;

Department of Education (DoE)

An important partner in the Cool Schools project through:

- Educating their student, teacher and parent bodies about the importance of the project; and
- Facilitating planting on school land to increase canopy coverage.

Alice Springs Town Council

Elected Members

The elected members represent in a formal way the opinions of their constituents. They are able to advocate for progress and budgetary allocations.

Council Staff - Technical Services

Technical Services staff will drive this project internally within Council. Their key staff in this project will be drawn from Roads, Environment and Parks.

Additional staffing will need to be budgeted for to implement this plan.

Service Providers

PowerWater - PowerWater are an NTG company who maintain all trees under powerlines. Collaboration with them is vital in retaining existing trees and maintaining good form.

Indigenous Corporations

There are a number of Indigenous corporation within the town who may be interested in acting in an Advisory role at important junctures in the Strategy.

Not-for-Profit Organisations

Olive Pink Botanic Gardens - The staff and volunteers have invaluable knowledge surround local native plants and their capacity within the environment. They also have a mandate to provide native, endemic trees to Central Australia.

Territory Natural Resource Management (TNRM)

Land for Wildlife and Garden for Wildlife - Volunteers that advocate for nature conservation and urban wildlife habitat. Expert advice is available through these groups.

Alice Springs Landcare Inc. - Volunteers spread across a number of groups in the town that have invaluable knowledge surround local natural environments.

Arid Lands Environment Centre (ALEC) - A group of scientist, activists, lawyers and conservationists who offer advocacy and education for the protection of the climate in the desert country.

Residents and community

School Communities - Parents and School councils provide a valuable human resource in terms of advocacy for the future of their students (future

residents)

General Residents - The residents of town are an active and engaged, multi-layered community that can provide valuable on ground support.

Other Major Landholders (Golf Club) - Landholders (tenants) such as the golf club can have a major impact on peripheral issues that concern tree planting. For example reduction in water usage, planting more trees on the golf course.

Business Owners - Business owners can offer a high level of support for tree planting surrounding their businesses which will aesthetically improve their buildings.

Chamber of Commerce Alice Springs - Member based employer organisation. Collectively their advocacy and support would be a valuable asset to the strategy.

Formal Structures - recommended members

Steering Committee Representatives from:

- Lhere Artepe
- DIPL
- ASTC - Elected Members & Technical Services
- Reps from the working groups

Primary Roles:

- Ensure delivery of the Action Plan;
- Set upcoming key actions incl. review of budgets;
- Promote partnerships within the infrastructure networks of the town;
- Annually, track progress of actual actions against the action plan retrospectively and prospectively and make recommendations for change where necessary; and
- Publicly report on progress of the strategy via the online Council dashboard.



Actions

- Establish a dedicated page on Council's website with quarterly updates on the greening strategy.
- Establish a Steering Committee to who provide an overarching role in guiding the strategy and action plan.
- Establish a cross-sector technical working group to champion greening outcomes and provide technical expertise to the steering committee.
- Establish a community and business working group to encourage and motivate other community members in greening outcomes, particularly private greening.

The committee shall meet as a minimum quarterly, to discharge its responsibilities in the initiation phase.

Lessons learnt during the implementation of pilot projects and other actions shall be reported back to the committee. They shall make determinations on how future actions and methods shall be adjusted in response.

Cross-sector technical working group

Representatives from:

- PowerWater
- ASTC - Technical Services
- ALEC
- Landcare/Olive Pink Botanic Gardens
- Private practitioners

Primary Roles: bring technical expertise to the steering committee including bi-annual:

- Technical review, of the pilot projects and cool school implementation;
- Review of stock growing program; and
- Review of planting methodology and its effectiveness.

Community and business working group

Representatives from:

- ASTC - Technical Services
- Cross-sector technical working group
- Business owners/Chamber of Commerce
- Residents

Primary Roles: lead on-ground community initiatives and report to the technical working group including:

- Leadership of 'Adopt a street' programs; and
- Community planting days.

Focus Strategy

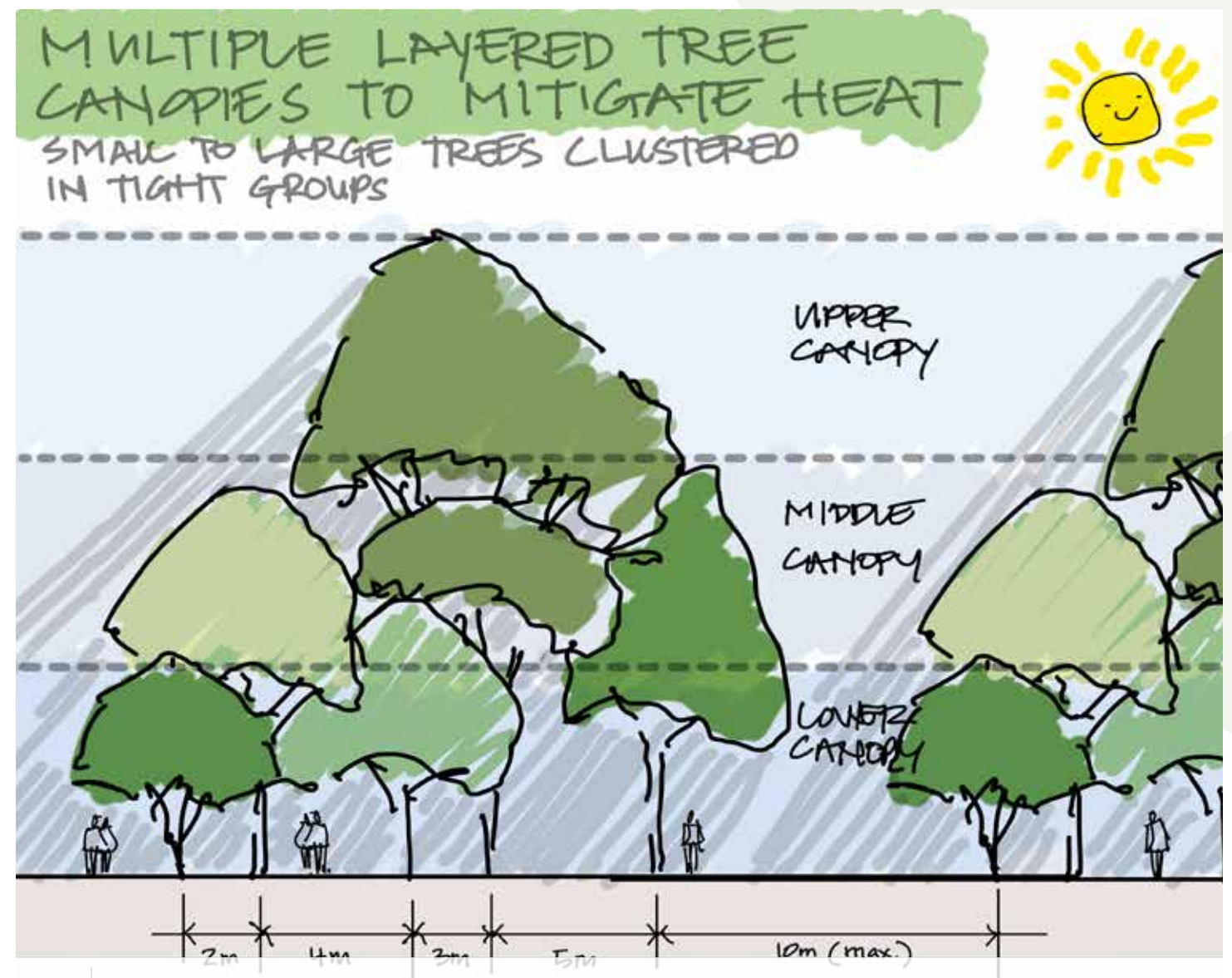
Layered Overlapping Connected Canopy (LOCC)

Establishing a guiding principle for a planting strategy that maximises shade and mitigates heat is paramount. LOCC involves:

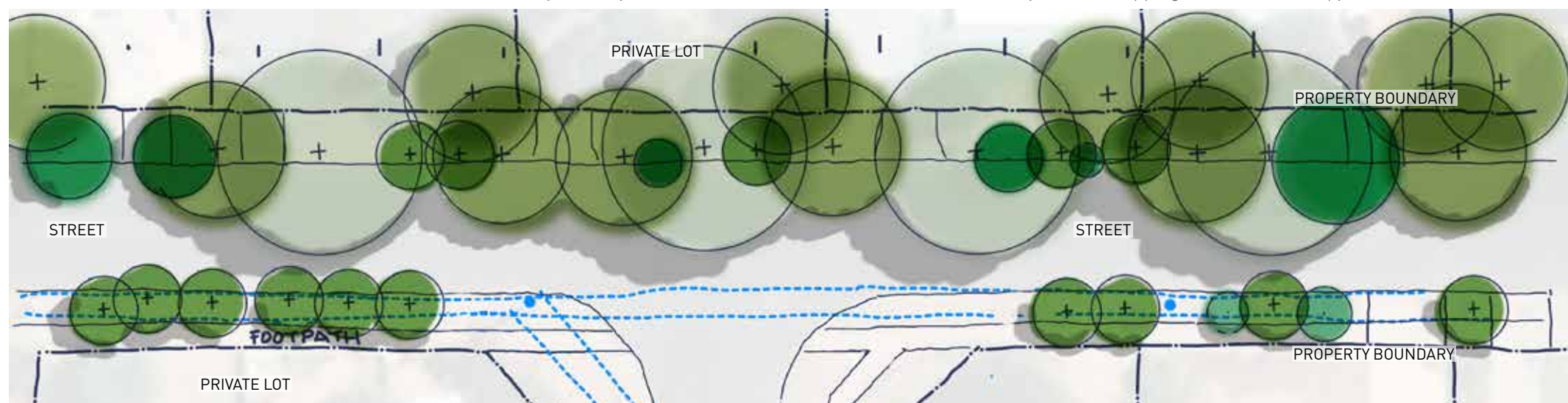
- Multiple, overlapping layers of canopy integrating upper, middle and lower canopy
- Trees clustered (i.e. spaced closely together)
- Diversity of canopy widths and densities
- Large canopy trees that create dappled shade
- Medium canopy trees that create dense shade
- Small canopy trees that achieve shade quickly
- Arrangement of trees (as identified above) to enable 'connected canopy'.



Bayside City Council



Layered overlapping Connected Canopy (LOCC) - Elevation



Layered overlapping Connected Canopy (LOCC) - Plan (not to scale)



Bayside City Council

STRATEGISE, PLAN, PLANT, MAINTAIN

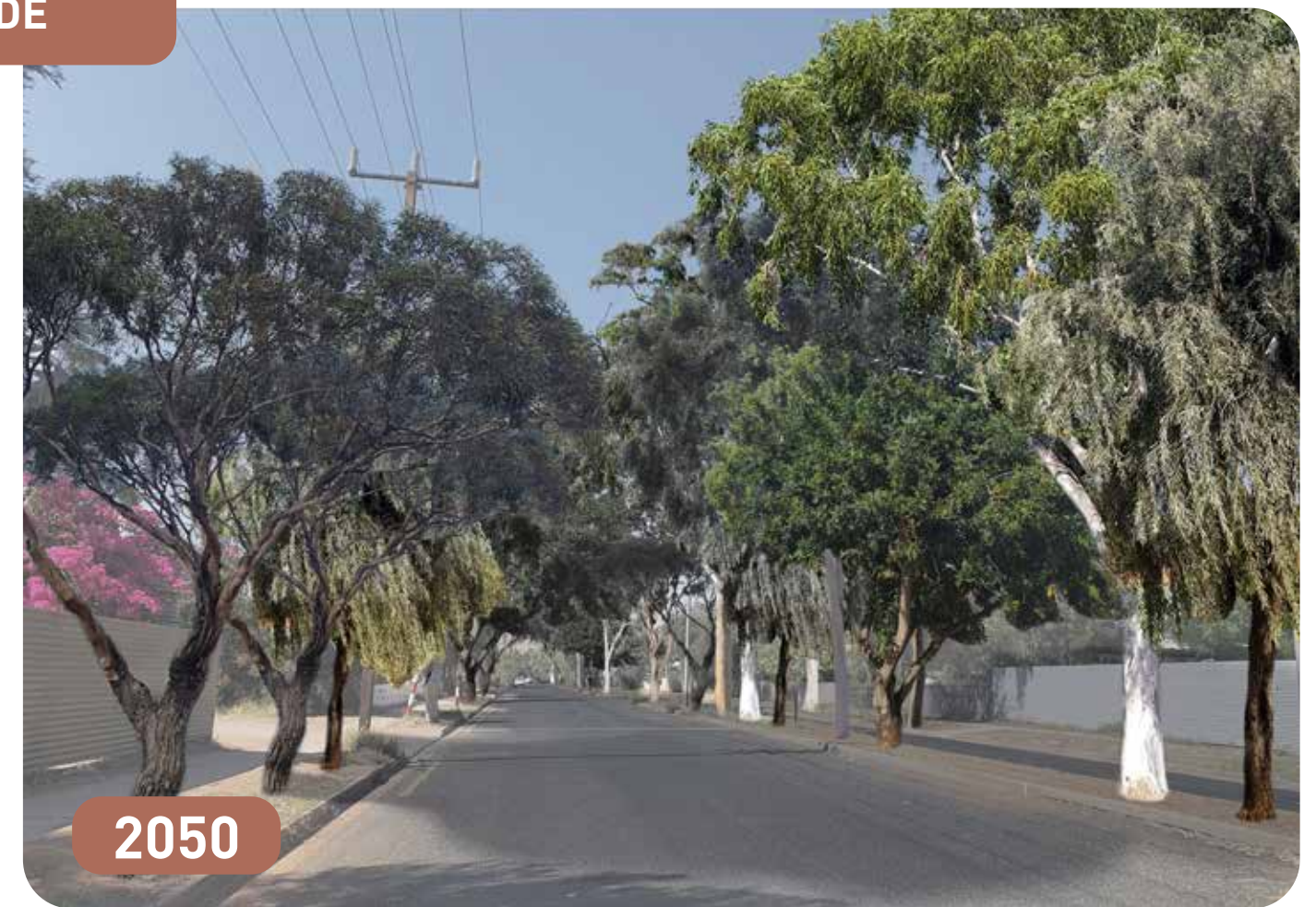
*“The true meaning of life is to plant trees,
under whose shade you do not expect to sit.”*

— Nelson Henderson

LINDSAY AVENUE EASTSIDE



Lindsay Avenue, Eastside - current photo



Lindsay Avenue, Eastside - vision for 2050 after implementation of Layered Overlapping Connected Canopy pilot project (artists impression)

Strategy Projects

The Strategy will utilise a number of projects that are specific to Alice Springs in order to progress the Strategy

Cool School Routes

The aim of this project is to provide continuous connected tree canopy shade along walking and cycling routes between school gates and homes within a 10min walk (via the shortest route possible).

The following school campus' are located within the subject area:

- Acacia Hill Special School
- Araluen Christian School
- Bradshaw Primary School
- Braitling Primary School
- Centralian Middle School
- Centralian Senior College
- Gillen Primary School
- Our Lady of the Sacred Heart College – Year 4*
- Our Lady of the Sacred Heart College – Year 5-8
- Our Lady Of The Sacred Heart College
- Larapinta Primary School
- Living Waters Lutheran School
- Ross Park Primary School
- Sadadeen Primary School
- St Philip's College
- St Joseph's Catholic Flexible Learning Centre
- Yipirinya School

* Note: No cool school routes are proposed for this campus as it has zero residential zoned properties within 500m radius of the school gate.

Pilot Projects

The aim of the pilot projects is two fold:

- To implement site specific projects around the town that can be an example of 'best practice shading' and heat mitigation strategies; and
- To provide strategies that improve current practices of both professional staff and residents.

The successes and failures of pilot projects shall be reviewed periodically by the Steering Committee. The pilot projects are:

1. 'Best case scenario' tree installation;
2. Tree Infill planting to an existing street;
3. Pocket Park infill planting
4. Industrial Street infill planting; and
5. Brochure/Communications strategy

Streetscape Typology Plan

A streetscape typology plan defining which trees will be in which streets has been developed and takes into consideration the following:

- Aesthetics and thematics;
- Mix of large, medium and small canopy trees;
- Diversity of species;
- Species under powerlines; and
- Existing conditions.

The plan breaks the streets down into the following categories:

- Approach Roads;
- Avenues;
- Todd River Edge;
- Natural/Widened Edges;
- CBD;



- Suburbs and Industrial; and
- Parks.

Easy Wins

There are a number of small projects that can be delivered efficiently and in a cost effective manner throughout the town. They include:

- Bus stops;
- Local shops;
- Residential lot Infills; and
- Incentivised residential lot planting.



'Cool School' Routes

The aim of this project is to provide more shade along walking and cycling routes between school gates and homes within a 10min walk (via the shortest route possible). The ultimate aim is to achieve a multi-layered, connected tree canopy. This will provide near continuous shade the above routes. The methodology applies to one side of the street only (with existing path).

LEGEND

ASTC Owned - Open Space

ASTC Managed - Organised Recreation Areas

ASTC Managed - Drains, VCL, CL Reserve, Road Reserve Parks

ASTC Managed - Other Open Space

Prepared and produced by the Department of Infrastructure, Planning and Environment (DIPE), Southern Region, Northern Territory of Australia, April 2002.
The Northern Territory of Australia accepts no liability for the accuracy of the information provided. Furthermore the Northern Territory of Australia does not warrant that this product contains the latest information available nor that the information is free for errors.

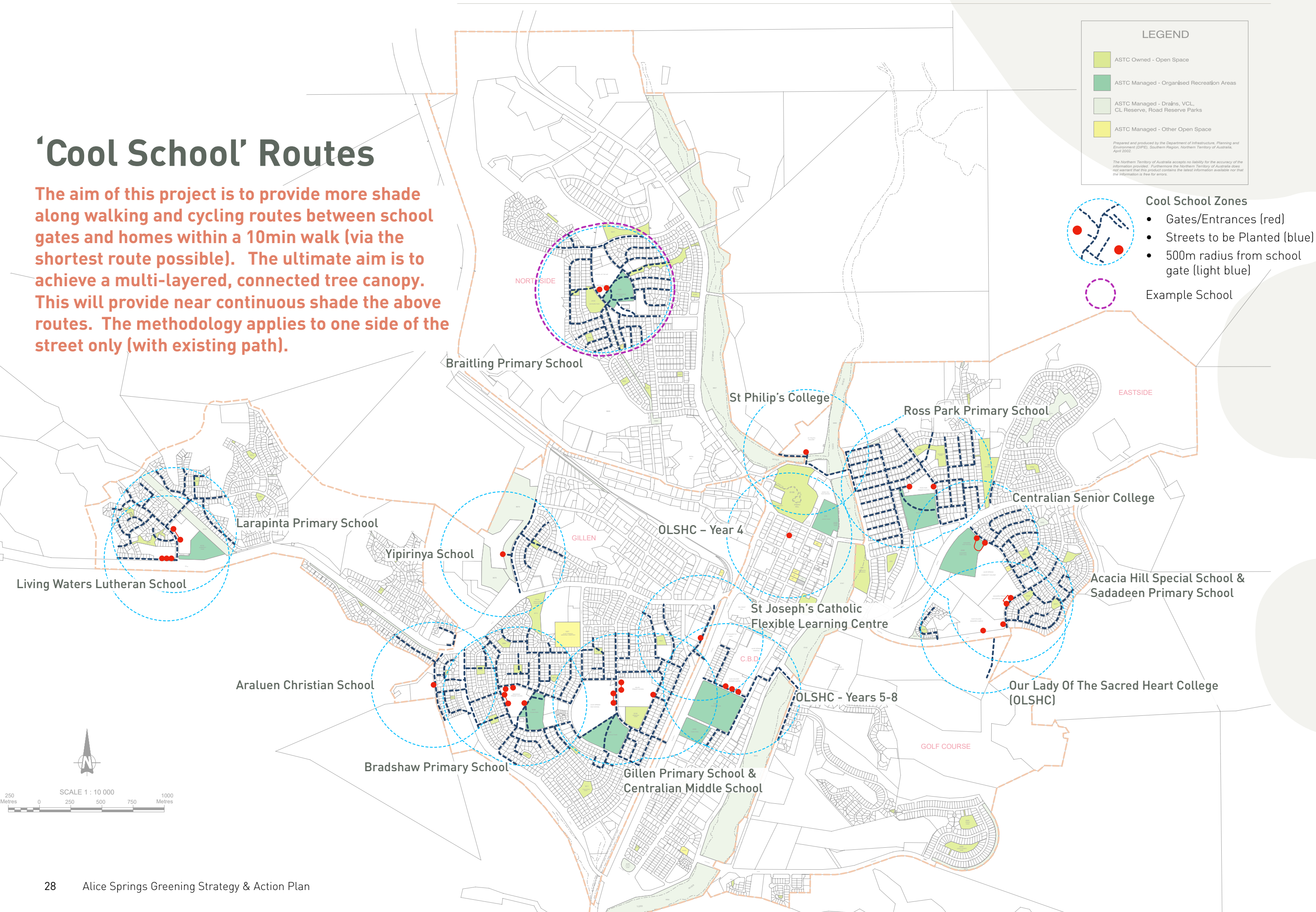
Cool School Zones

Gates/Entrances (red)

Streets to be Planted (blue)

500m radius from school gate (light blue)

Example School



Methodology

Summary

In order to stagger annual budgets, the methodology proposes dividing each school zone (as shown on the overall plan) into 4 stages. These stages can be years or groups of years. For budgeting purposes the methodology uses calendar years.

The current scope includes routes for schools which have residential zoned lots within the defined 10min walk catchment.

Practical Steps for implementation

- Locate school gates (Primary Destination)
- Undertake tree count to locate and identify existing trees (in order to ascertain number of trees required)
- Prepare detailed design of each site
 - Identify primary routes which extend up to 500m away from school gate(s), along existing path networks and through parks and reserves
 - This represents an approximate walk of 10 minutes (less on bicycle)
 - At the outer extents of the catchment allow 200m max. (approximately 12 residential lots) between primary routes - i.e. any student within the catchment may have to walk 100m maximum to reach the shaded network.

Existing conditions/Infill Planting

- There are existing trees along the subject routes. They are to be retained
- New planting shall be infill/supplementary planting to achieve multi-layered continuous canopy where possible
- Species shall be guided by streetscape masterplan typologies and tree schedules
- New planting shall be prioritised on one side of the street only
- Planting shall be prioritised to the side of the street with a sealed path
- Example shows 10m diameter canopy trees.

Metrics and Measuring success:

Years 1-2

- Survey to confirm existing trees
- Detailed design prepared
- Procurement of stock required
- Plant, establish, maintain
- Bi-annual checks on:
 - Vandalism - replacement where tree is damaged or missing. Records to be kept on replacements over the 5 years.
 - Health of all trees
 - Impact of cars parking on the verge - potential infringement notices to be issued to residents parking (where they impact trees)
 - Benchmark report to the Steering Committee at end of Year 2

Years 3- 5

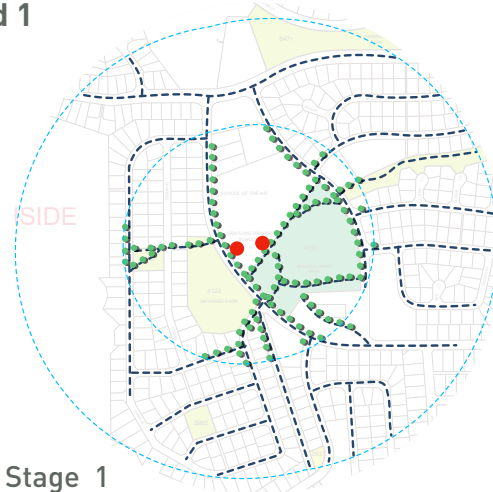
- Implement recommendations of the Steering Committee

Legend

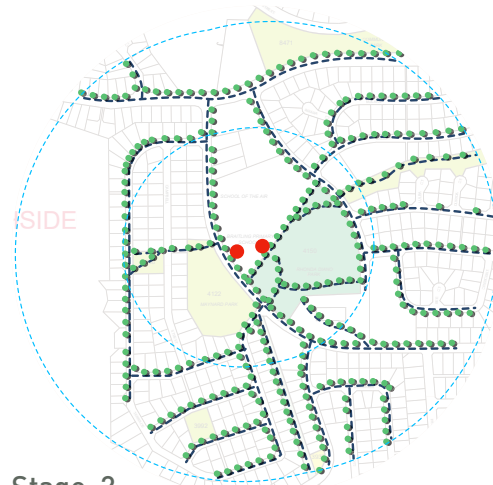
Tree adjacent lot



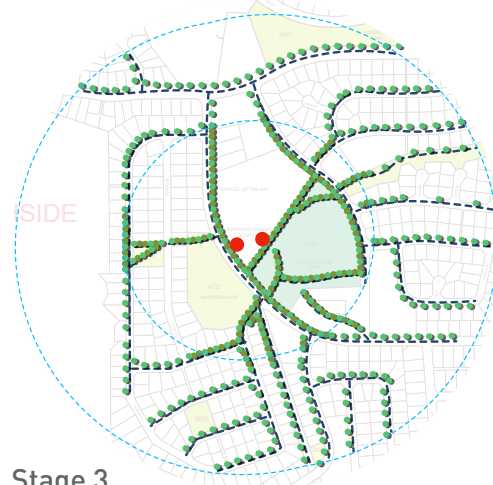
Method 1



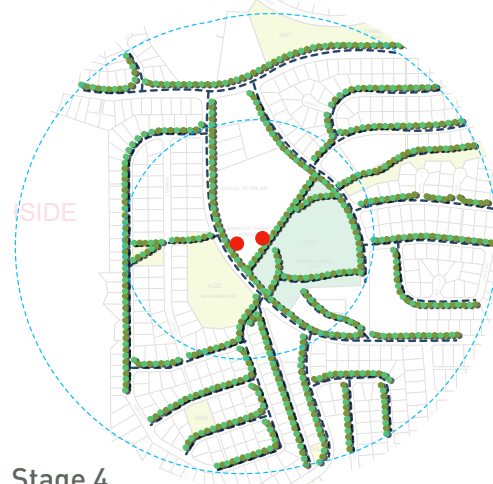
Stage 1



Stage 2

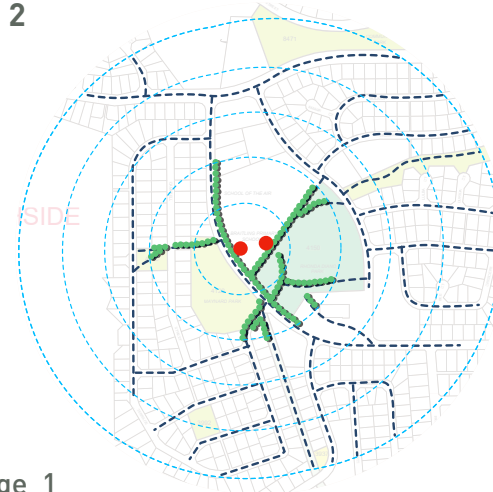


Stage 3

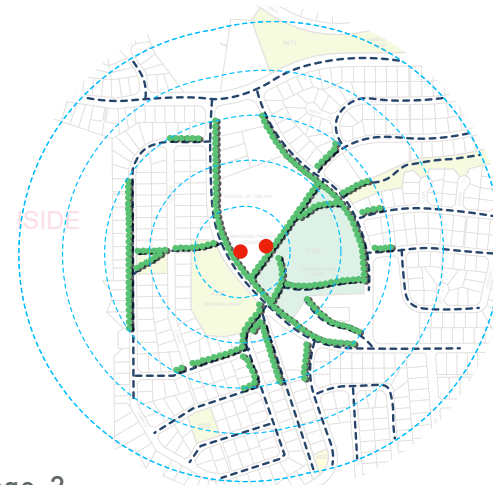


Stage 4

Method 2



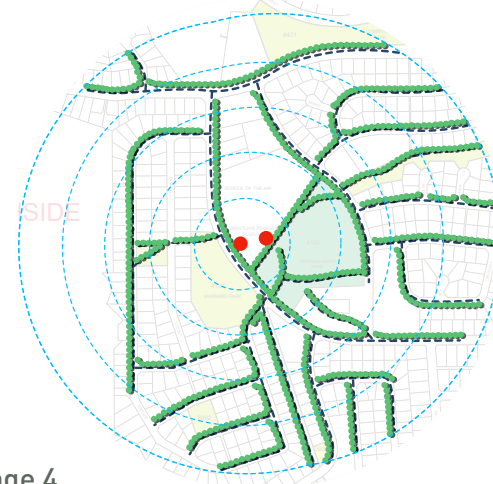
Stage 1



Stage 2



Stage 3



Stage 4

Example School

Staging of implementation

Staging could occur in different ways subject to available budget. Below are two methodologies that could be used.

Method 1

Stage 1 (minimum service provision of 1 tree per lot) on the side of the street with a path - 60% infill

1. Infill to achieve 1 tree per lot along all routes within 250m of school gate
2. Infill to achieve 1 tree per lot along all routes within 500m of school gate
3. Infill remaining LOCC opportunities for planting within 250m of school gate
4. Infill remaining LOCC opportunities for planting within 500m of school gate

Advantages:

- Equitable increase in canopy cover across the school sites

Disadvantages:

- Higher maintenance costs due to maintaining across a wider zone and having to return to zones for LOCC

Method 2 - (based on achieving LOCC immediately within each zone) on the side of the street with a path

1. Infill plant to achieve 100% infill up to 200m from school gates
2. Infill plant to achieve 100% infill up to 300m from school gates
3. Infill plant to achieve 100% infill up to 400m from school gates
4. Infill plant to achieve 100% infill up to 500m from school gates

Advantages:

- Lower maintenance costs due to intensive maintenance zone

Disadvantages:

- Minimum service levels and full canopy is achieved quicker in areas closer to the school

Note: Full cost estimates based on 60% infill are found in Appendix C

Pilot Project 1

Best practice scenario for tree installation

Summary

In order to improve the health, vitality and resilience of street tree plantings in ASTC a pilot project is proposed to improve upon current practices.

Goal

Develop a standardised planting method that is specific to ASTC conditions.

The project involves the following:

- Investigation of current planting and maintenance methodologies by ASTC, NTG and O2LA to determine the most successful strategies
- Review of what works and what doesn't work in Alice Springs (barriers to planting)
- Investigation and development of a holistic approach to tree planting and maintenance specific to Alice Springs, including:
 - Procurement methodology for trees (external to Alice Springs and within Alice Springs)
 - Procurement and preparation of materials for the planting pits (and where these can be sourced sustainably) i.e. source of organic material and the manufacture of improved planting media including use of compost from the ASTC composting project
 - Procurement or local manufacture of appropriate soil mix components to include generally:
 - Local topsoil 50%
 - Coco Coir or similar 10%
 - Perlite or similar 10%
 - Compost 30%
 - A soil test and recommendation that is specific to the amelioration of the towns soil is recommended (to be prioritised before planting begins) by an agronomist
- Investigation of methods to detain water in the planting pit
- Investigation of the use of structural soil in zones where structural support of pavements is also required
- Costings and strategies for engagement of outside contractors
- Monitoring of health, size and value of tree stock. Record keeping of this data and roles and responsibilities required in order to implement
- Seasonal timing of planting
- Planting technique(s) specific to Alice Springs including construction detailing
- Tree protection cage detail to be design and costed. Enough to be produced for 1 year of new trees, to be re-used each year in new locations. Several designs could be trialled.
- Protecting the verge (root zones) from compaction from motor vehicles, and other vandalism
- Maintenance (labour, equipment, methodology):
 - Sustainable water supply/procurement
 - Dedicated water truck equipment - investigation of a purpose built small water truck/ute with a remote controlled boom that directs water with appropriate force to new plantings
 - Watering regime during establishment
 - Pruning
 - Mulch
 - Tree Removals
- Undertake a review process 'lessons learnt' at the conclusion of Year 1 (and at agreed time frames thereafter) and adjust the process accordingly.



ASTC report image

Metrics and Measuring success:

Years 1-2

- Investigation/review undertaken and reporting to steering committee by Technical Services staff
- ASTC Planting detail and specification prepared
- Preferred procurement type for trees investigated, analysed, decided upon and adopted
- Preferred procurement type for contractors determined and adopted
- Maintenance manual/standard prepared and issued to staff
- New maintenance equipment (if any) acquired
- Maintenance staff trained in the new standard
- Implement recommendations of the Steering Committee and revise the above as required for continual improvement
- Verge Protection strategy determined communicated and enforced

In the meantime

As this trial will take two years to complete, it is suggested that the pilot projects and "easy wins" commence through the use of outside contractors employed to progress tree planting whilst internal trials and policies are being investigated.

NTG roads appear to be an example of successful planting within the town and it is suggested that ASTC use the same contractors for the initial work.



Current ASTC street tree planting

Establishment & Maintenance

Guidelines below are based on NATSPEC section 0256b and section 0259 and include but are not limited to:

Establishment

- 13 weeks, weekly as a minimum, additional watering as required
- Fertilising, weeding, rubbish removal, top up mulching, watering
- During this period 30-40L of water to be added to each tree well weekly

Maintenance

- 39 weeks, monthly as a minimum, additional watering as required
- Fertilising, weeding, rubbish removal, top up mulching, watering
- During this period 30-40L of water to be added to each tree well monthly



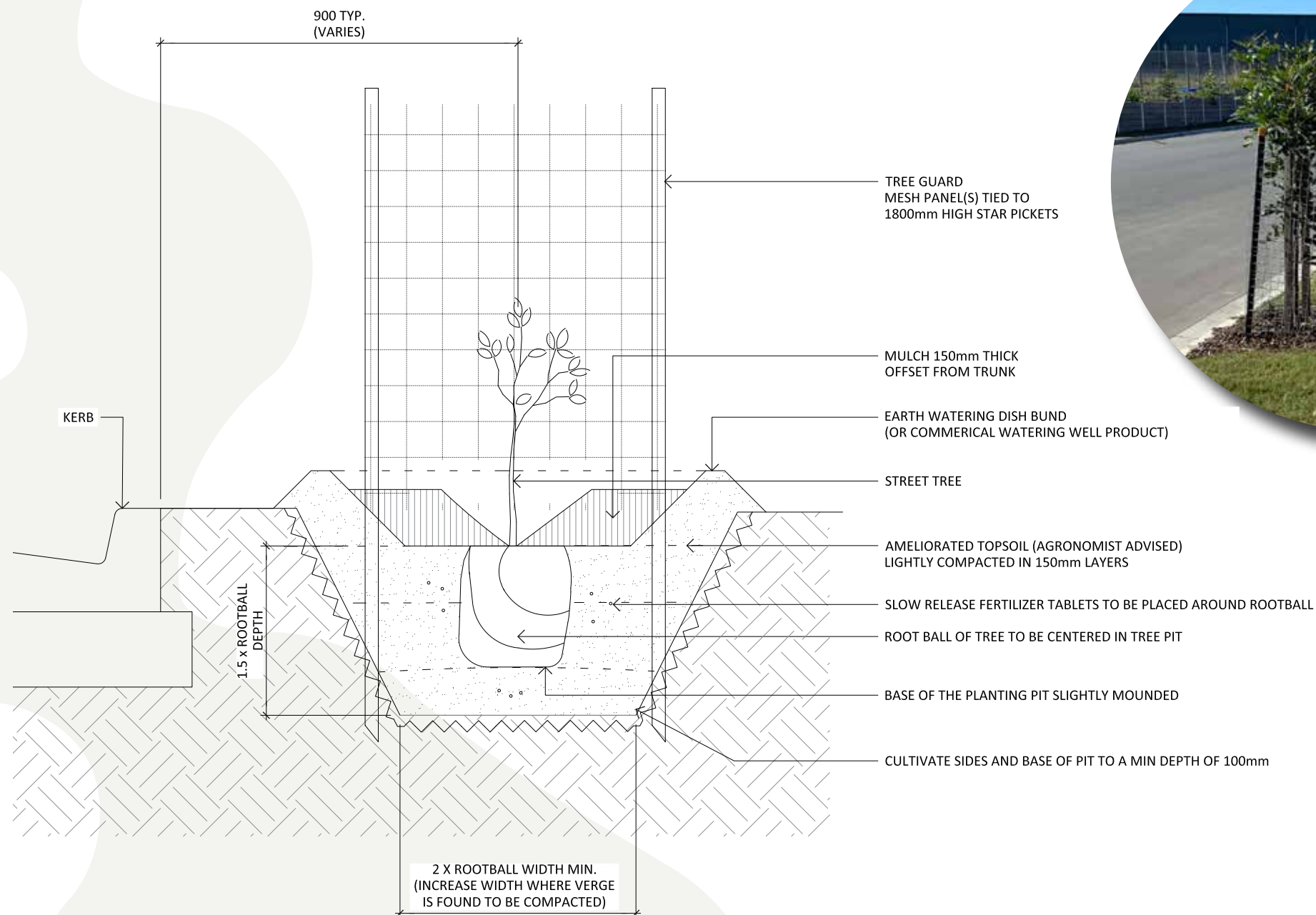
Actions

- Enter into negotiations with OPBG to grow tree stock for future planting
- Engage external contractors to supply and plant for the first 2 years of the strategy
- Undertake soil testing and amelioration prior to any planting
- Create a standard (revised) maintenance manual
- Maintenance/installation equipment to be reviewed and procured
- Ensure that all new trees are planted with appropriate clearances, with respect to AS 1428 DDA Guidelines and AusRoads guidelines Part 6A: Walking and cycling
- ASTC to weight up the considerations/ constraints of AusRoads guidelines with the need for shade in Alice Springs

City of Yarra Council Tree Guard



Commercial watering well product



Typical Tree in Verge - Section (not to scale)

Logan City Council Tree Guard



Pilot Project 2

Tree infill planting to an existing residential street - Lindsay Avenue, Eastside

This project aims to quickly achieve a demonstration site that embodies the guiding principles outlined in this strategy. This will be achieved by planting out the remaining gaps in a street which already has some of the elements in place. Guiding principles include:

- Layered overlapping connected canopy (LOCC)
- Species diversity
- Age diversity
- Mature height diversity
- Scenario diversity (under powerlines, median, narrow verge etc.)
- Inspections/reviews to be undertaken on site

The process of implementing and managing this project will also provide an opportunity to learn further about the process of infill planting. This learning can then inform the approach taken across the remainder of the town's streets.

Lindsay Avenue, East Side has been selected as the subject site by Council. Signage to indicate this 'demonstration project' be installed on site to communicate the goals of the project to the community.

Refer to Appendix A for canopy mapping and Appendix C for infill streetscape costings (not specific to this pilot)

Metrics and Measuring success:

Years 1-2

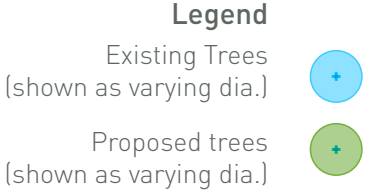
- Survey to confirm existing trees
- Detailed plan prepared
- Procurement of stock required
- Plant, establish, maintain
- Bi-annual checks on:
 - Vandalism - replacement where tree is damaged or missing. Records to be kept on replacements over the 5 years.
 - Health of all trees
 - Impact of cars parking on the verge - potential infringement notices to be issued to residents parking (where they impact trees)
- Benchmark report to the Steering Committee at end of Year 2

Years 3- 5

- Implement recommendations of the Steering Committee
- Develop plan for all Residential streetscape infill streets based on this pilot and its findings



Lindsay Avenue (Google Streetview)



Lindsay Avenue (LOCC) - Plan (not to scale, Google maps image)

Pilot Project 3

Pocket park infill planting

One 'pocket park' (Kilgariff Park) has been chosen to exemplify the effects of increased shade on usability. Refer to the next page of this report to review all parks considered in this project and the subsequent roll out of the program.

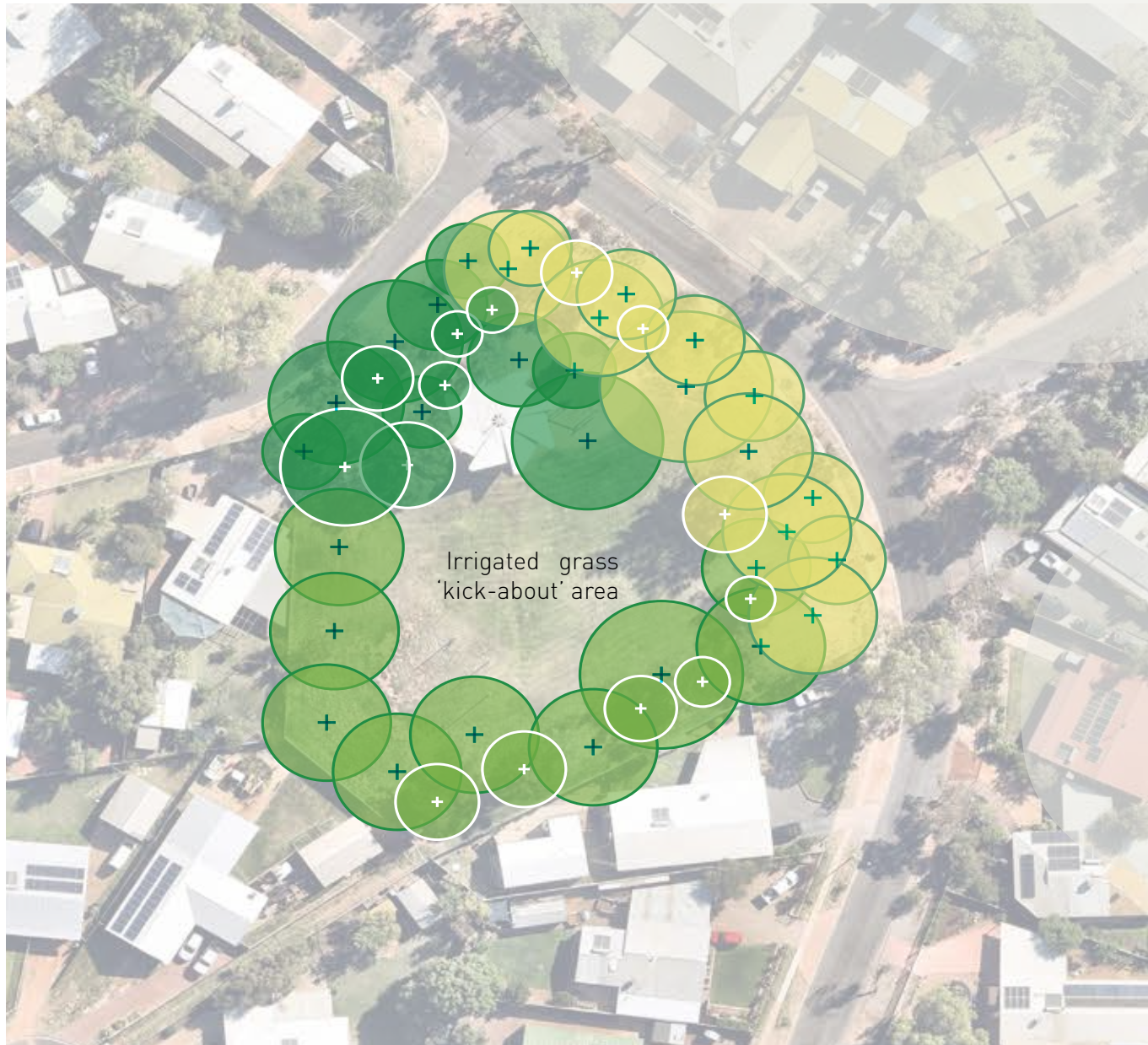
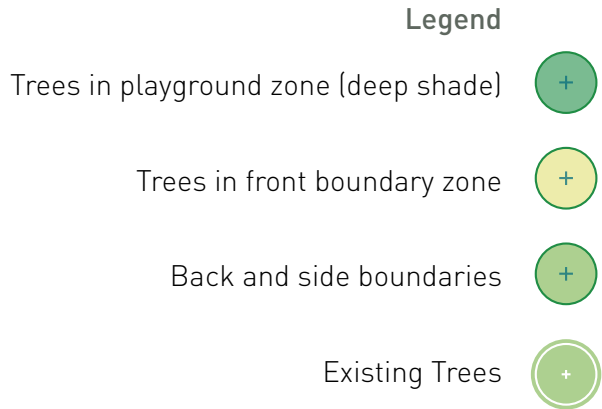
The strategy is four-fold and includes:

- Creation of 'deep shade' in the playground zone. This is the highest use zone within the park and the LOCC method of planting design will be used
- A double avenue of trees along the road frontage to the park will be installed.
 - The first row being large canopy shade trees placed immediately inside the property boundary (either within the line of existing bollards or just behind them)
 - The second row of trees will be a mix of medium and large canopy trees installed within the verge
- The back and side boundaries of the park will be planted using the LOCC method while no trees are to be planted within 5m of adjacent residential boundaries.
- Trees are not to be planted to the irrigated kick-about zone.
- Inspections/reviews on site to be undertaken

Refer to the next page of this report to review all parks considered in this project and the subsequent roll out of the program. There are 31 parks of this type including Kilgariff Park.

It is envisaged that the pilot project will be rolled out in the 1st year of the strategy with a review in years 1 & 2. Further to that a plan will be developed to implement the roll out of all pocket park plantings from years 3 - 10.

Note: Full cost estimates are found in Appendix C



Kilgariff Park - Plan (not to scale, Google maps image)

Metrics and Measuring success:

Years 1-2

- Survey to confirm existing trees
- Detailed plan prepared
- Plant, establish, maintain
- Bi-annual checks on:
 - Vandalism - replacement where tree is damaged or missing. Records to be kept on replacements over the 2 years.
 - health of all trees

End of Year 2

Assessment of the 2 years of records before rolling out the 10 year plan. Adjust planting to include:

- New species -(if some species have not been particularly successful)
- Replacement species or additional species to allow for vandalism
- Review if the program duration (10 years) is still suitable.



Kilgariff Park 2019 (Google Streetview)



Bowman Park Araluen, 2015 - A living example of desired shade outcome (Google Streetview)

LEGEND

ASTC Owned - Open Space

ASTC Managed - Organised Recreation Areas

ASTC Managed - Drains, VCL, CL Reserve, Road Reserve Parks

ASTC Managed - Other Open Space

Prepared and produced by the Department of Infrastructure, Planning and Environment (DPIE), Southern Region, Northern Territory of Australia, April 2002.

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- Pocket Park
- Pilot Project



Pilot Project 4

Tree infill planting to an existing industrial street - Elder Street, Ciccone

This project will be a demonstration project for industrial streets that embodies the guiding principles outlined in this strategy.

Guiding principles include:

- Develop and employ an adjusted methodology for planting trees in industrial streets to protect the verge from compaction and trees from direct vehicle damage
- Only proceed with interested partners and/or supporting business in the street (i.e. don't force planting adjacent to businesses which are not supportive of having tree planting in their verge)
- Accept that LOCC may be limited to short runs/ groups of trees (due to functional constraints of industrial streets)

- Species diversity
- Age diversity
- Tree sizes favouring larger species (streets are wider, vehicles are taller)
- Scenario diversity (under powerlines, median, narrow verge etc.)
- Inspections/reviews to be undertaken on site

The process of implementing and managing this project will provide an opportunity to learn about the process of infill planting in this challenging context. This will inform the approach taken across the remainder of the town's industrial streets and answer the following questions:

- Does ASTC have the appetite and resources to engage with and recruit allied business and

enforce the protection of verge planting zones?

- Can the culture of parking on the verge be overcome or managed sufficiently to allow trees to perform?
- Is success in overcoming the challenges reliant on the support of the adjacent businesses as anticipated?,

Elder Street, Ciccone has been selected as the subject site to demonstrate the principals of this strategy (this site is subject to liaison with the community to move forward).

Signage to indicate this 'demonstration project' be installed on site to communicate the goals of the project to the community.

Metrics and Measuring success:

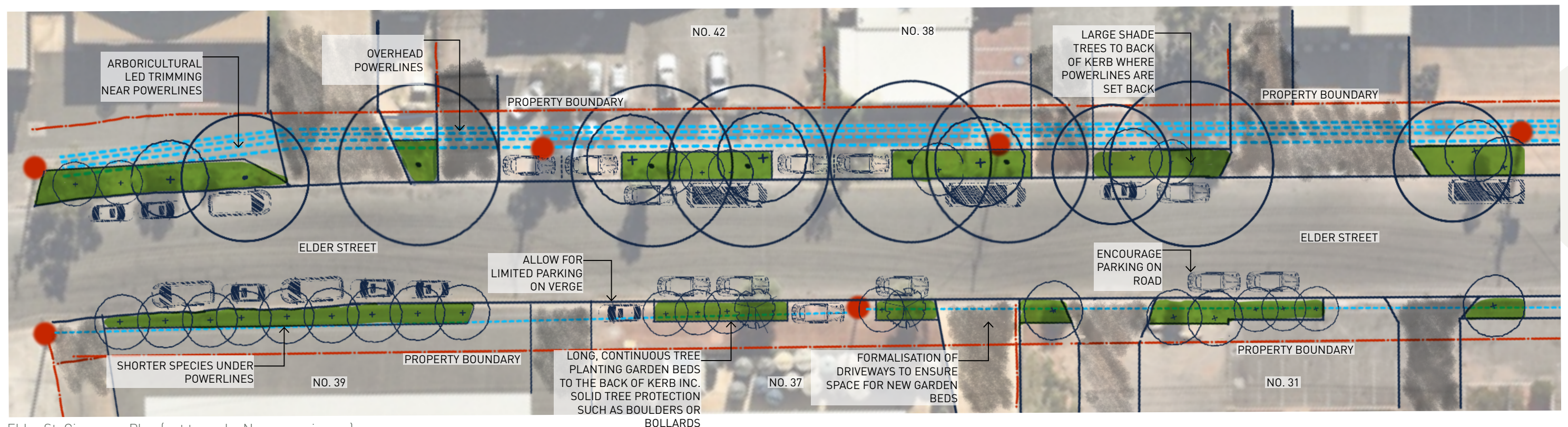
Years 1-2

- Confirm support of adjacent businesses
- Survey to confirm existing trees
- Detailed plan prepared
- Procurement of stock required

- Plant, establish, maintain
- Bi-annual checks on:
 - Vandalism - replacement where tree is damaged or missing. Records to be kept on replacements over the 5 years.
 - Losses - are these sustainable?
 - Prevention of vehicles on verge
 - Health of all trees
 - Impact of cars parking on the verge - potential infringement notices to be issued (where they impact trees)
- Benchmark report to the Steering Committee at end of Year 2
- Any additional metric specific to industrial streets

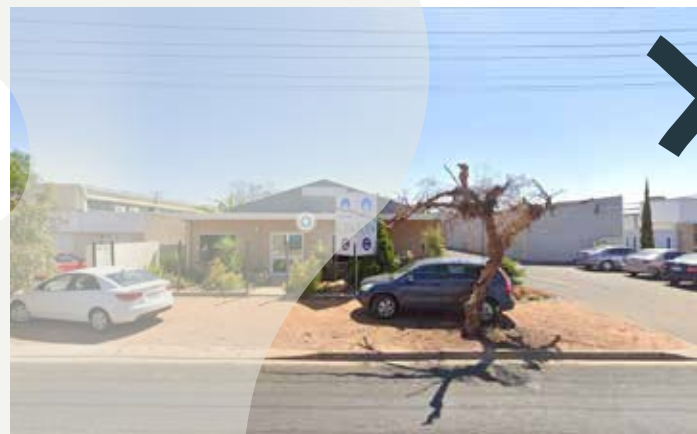
Years 3- 5

- Implement recommendations of the Steering Committee
- Update methodology to guide future infill in industrial streets



Elder St, Ciccone - Plan (not to scale, Nearmaps image)

Shade - the good and the bad



EXISTING



EXISTING



EXISTING

Solutions



PROPOSED

EXCAVATE PLANTING ZONES WHERE SOLID HARDSTAND EXISTS



PROPOSED

CREATE CLUSTERS OF LARGE, MEDIUM AND SMALL SHADE TREES



PROPOSED

CONSOLIDATE BACK OF KERB PLANTING WHERE POSSIBLE. PROTECT TREES WITH SOLID OBJECTS

Issues and Barriers:

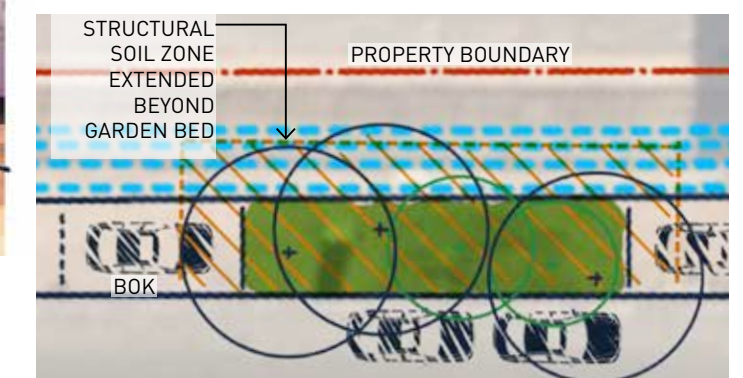
- Businesses using verge for overflow parking
- Businesses paving over the verge
- Signage and other furniture items being placed in verge by businesses
- Compaction of root zones surrounding trees
- Vehicles mounting kerbs in a variety of locations
- Vehicle cross-overs not being the only access to verges
- Currently little or no shade within the streetscape or road edges
- Powerlines on at least one side of the street and often on both
- Powerlines are at varying heights, which may vary the depth of sag of the lines themselves
- Rough lopping of trees rather than arboricultural led trimming leading to misshaped trees

Opportunities

- Business community working together to achieve comprises that result in shade i.e. better environment for both staff and clients/customers
- Reduction of heat island effect
- Creation of shaded pedestrian zones

Strategy basics

- Where possible group a minimum of 2-3 trees in a dedicated garden bed
- Ideally garden beds to be 7-10m long and a minimum of 1.5m wide (preferably 2m wide)
- Protect garden bed with large boulders at either end and/or physical barrier such as bollards
- Include structural grade subsoil to reduce the effects of compaction of the root zone
- Structural subsoil could also be extended further into the verge to increase root volume capacity (refer sketch below)
- Increase community awareness through trial signage in the garden beds



Pilot Project 5

Communications strategy and collateral

This project aims to provide guidance to residents and businesses about how they can align with Council to achieve the goals of this strategy.

The main points of communication would be:

- To build knowledge generally about the benefits of trees and shade
- That stakeholder investment leads to overall success for the strategy
- That young street trees that are desired and nurtured by adjacent residents have the best chance of surviving and thriving in urban landscapes. (This is observed in Alice Springs as in other towns and cities.)
- 'Adopt a Tree or Two' program
- 'Adopt a Street' program

Council will also make the strategy available online with the following snapshots:

- Goals
- Benefits
- Guiding principles
- Scorecard/dashboard

'Adopt a Tree or Two'

Program information would include:

- How to express interest
- Information about Council's incentive scheme
- How/where to collect a tree (for the front yard)
- Guidance on:
 - Species selection,
 - Locating in the frontage of your property,
 - Planting methodology,
 - Ongoing care and maintenance including
 - Watering
 - Fertilising
 - Mulching
 - Staking
- Clear communication regarding council's responsibilities and how the community can value-add through supplementary care of the tree in the verge, for example:
 - Avoid parking on verge
 - Mulch (avoid placing lawn clippings around trunk)
 - Supplementary deep watering

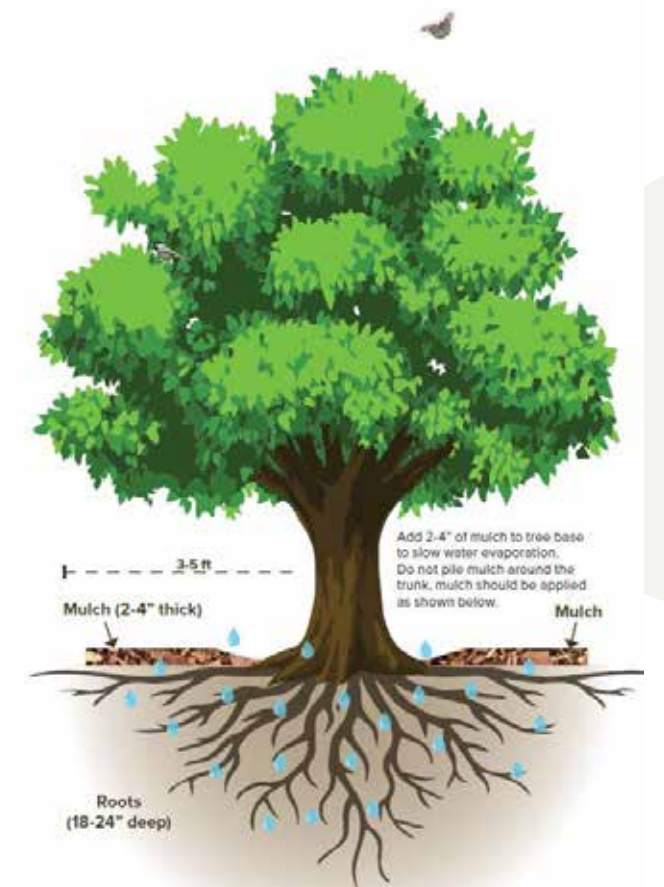
Adopt a Street'

Program information would include:

- How to express interest
- Information about which groups are running the program
- Collation of streets involved (perhaps a map on the website for resident information)
- Guidance around
 - Ongoing care and maintenance including
 - Watering and supplementary deep watering
 - Fertilising
 - Mulching (e.g. avoid fresh lawn clippings around trunk)
 - Staking
 - How to report losses and how to have a replacement tree installed
 - Avoid parking on verge
- Clear communication regarding council's responsibilities and how the community can value-add through supplementary care of the tree in the verge, for example:
 - Avoid parking on verge
 - Engage with neighbours regarding the program

Examples from other Councils:

<https://www.wdrc.qld.gov.au/Community-Recreation/Environment-Nature/Adopt-a-Street-Tree>



Example graphic for a communication strategy 'How to mulch, How often to Water' Salt Lake City Urban Forestry



Actions

Create a communications strategy, engage graphic designers

Create an online dashboard for the strategy



Streetscape and Park Typology Plan

Categorising, defining and mapping the different typical streetscape and parkland typologies of Alice Springs.

Approach Roads

There are 4 major approach roads to town from the North, South, East and West.

- Some approach roads are owned and managed by the NTG. Any further planting of these roads will need to be negotiated with NTG.
- Major tree planting has been undertaken.
- North South Road - mature trees are plentiful with a distinct character. Infill planting would be beneficial to increase shade and begin to address the succession planting.
- Eastern approach - new plantings (1-5 years) are plentiful. Infill planting of small canopy trees between current plantings would be beneficial.
- Western approach - has a intermittent and inconsistent coverage. Substantial infill planting of all species (taken from existing palette) is required.

Avenues

There are a number of Avenues (wider roads) that exist within or on the edges of the four main suburbs, noting:

- These roads are owned and managed by ASTC
- As avenues are wider, and often have wider verges, there is the potential for a predominance of large canopy trees with underplantings of medium and small canopy trees
- The LOCC approach is particularly suitable.

Todd River Edge

The roads along the river edge are bounded by a

major ecological corridor and contribute a very high aesthetic value to the town noting:

- The edge is bounded by the town to the West and various tourist activities and suburbs to the East
- It is in an area of high groundwater
- The verge is generous and in most parts has a winding path along it. Where the path does not exist it is evident foot traffic is relatively high
- There are existing trees of all sizes as well as some infrastructure such as chairs, picnic tables etc.
- Infill and replacement plantings (particularly River Red Gum), are required.

Natural/Widened Edges

The town has many roads with natural edges (i.e. those whose property boundary is bordered by NTG or LGA land) and widened verges.

This situation allows for an alternative type of planting palette, such as:

- One that responds to the natural setting behind the verge
- Additional planting where the verge is extended.

CBD

The CBD of Alice Springs has a number of complicated and competing demands.

A number of the roads are owned and managed by the NTG. Any further planting of these roads will need to be negotiated with NTG.

Suburban Streets

Increase health and well-being of community members by creating opportunities for active transport, shaded play and shaded carparking.

Industrial Streets

Increase health and well-being of community members by shading active transport routes and carparking near places of work.

Parks

Increase health and well-being of community members:

- Via cooler public spaces
- Through an increased connection with nature - reducing anxiety and improving well-being.

This strategy can be applied to areas outside of the subject site e.g. south of The Gap

Planting Priorities

Suburbs, Industrial roads and Natural/Widened Edges can be infill planted as per the Infill planting strategy

Parks will be planted after the conclusion of the Kilgariff park pilot project

Avenues will be planted after the conclusion of the Lindsay Avenue, infill street pilot project

Approach Roads can be planted where negotiation with NTG has occurred and/or when NTG plant these roads

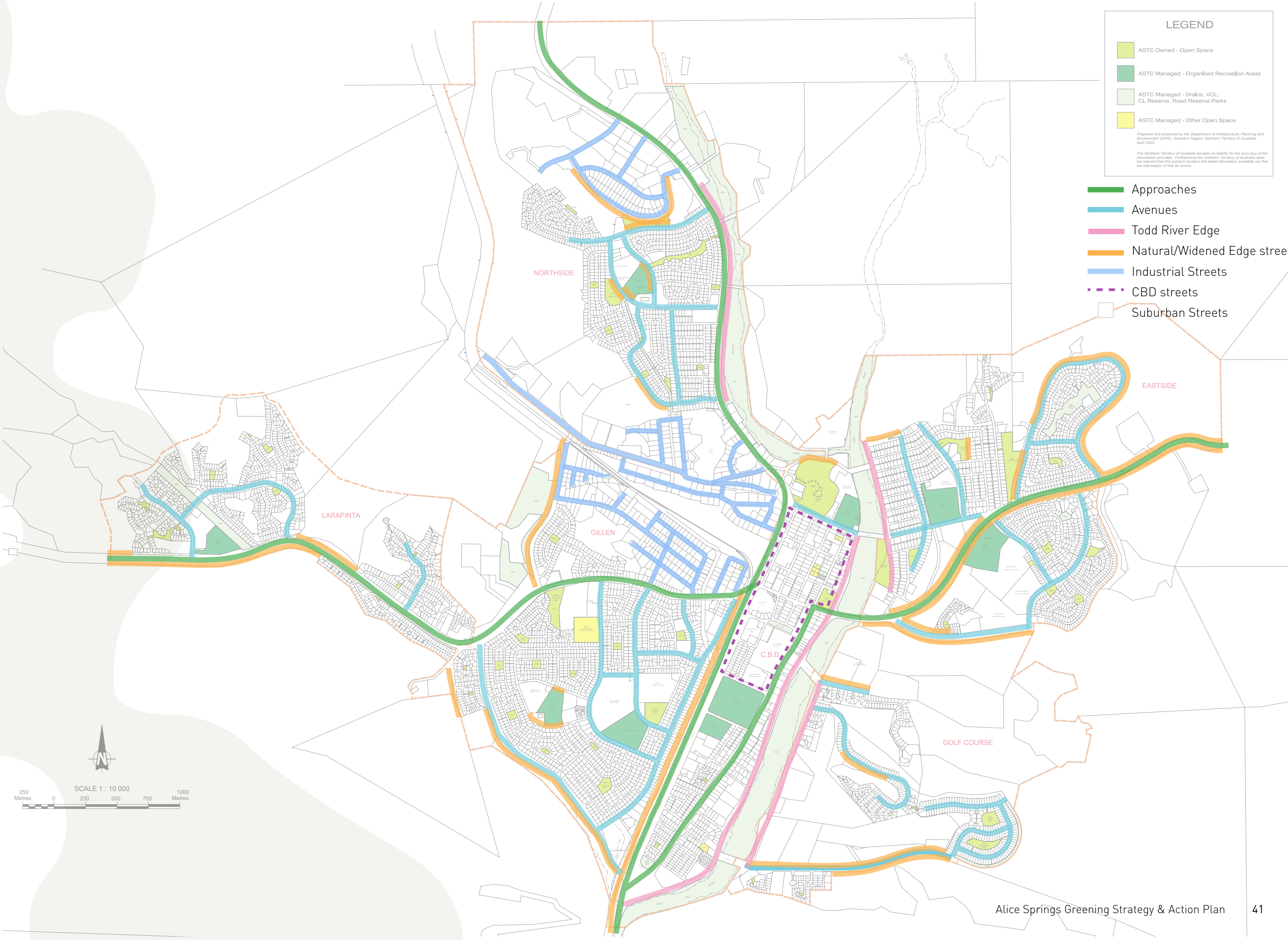
Todd River edge and CBD could be a standalone detailed design project - with an engaged specialist as this is a high use area

NOTE: All plantings should take into consideration areas of least shade as priority planting zones.



Actions

Enter into discussions with NTG regarding future plans for approach roads and the CBD. Discussions to include transparency during the design and construction phase for any new works.



LEGEND

ASTC Owned - Open Space

ASTC Managed - Organised Recreation Areas

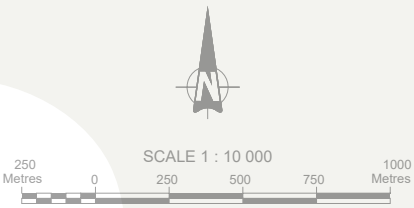
ASTC Managed - Drains, VCL, CL Reserve, Road Reserve Parks

ASTC Managed - Other Open Space

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- Approaches
- Avenues
- Todd River Edge
- Natural/Widened Edge streets
- Industrial Streets
- CBD streets
- Suburban Streets



Town-wide Street Tree Planting Infill Strategy

Residential Streetscape Infill Planting

Stage 1: Ensure as a minimum that each residential lot has 1 tree on their verge.

The project involves the following:

- Division of the city into planting catchments (approximately 100 houses per catchment);
- Development of a matrix to deliver planting across the catchments over 15 years of the Strategy.

Stage 2: Ensure that there is connected canopy in all residential streets in the verge.

The project involves the following:

- Use the catchments from Stage 1 to develop a matrix to deliver secondary planting across the catchments over the second 15 year period of the Strategy (beginning in Year 12)

Note: there will be a range of infill planting requirements. For example some catchments will require 10% infill planting, whilst others may require 80%.

Therefore specific counts of trees needed for infill planting will be required.

Refer to the next page for worked examples and costings of an example street in town.



Demonstration of 10% Infill (Nearmap image)



Demonstration of 70% Infill (Nearmap image)

Metrics and Measuring success:

Stage 1

Years 8-12

Plant, establish, maintain

- Bi-annual checks on:
 - Vandalism - replacement where tree is damaged or missing. Records to be kept on replacements over the 5 years.
 - Health of all trees
 - Impact of cars parking on the verge - potential infringement notices to be issued to residents parking (where they impact trees)

End of Year 8

Assessment of the 5 years of records before rolling out the remainder 10 years of the plan. Adjust planting to include:

- New species -if some species have not been particularly successful
- Replacement species or additional species to allow for vandalism
- Review if the program duration is still suitable.

Stage 2

Years 9 - 26

Assessment Stage 1 reviews. Adjust planting to include:

- New species -if some species have not been particularly successful
- Increase or decrease number of trees according to the direction of the Steering Committee in conjunction with ASTC annual budgets.



Actions

Create 'infill planting neighbourhoods'

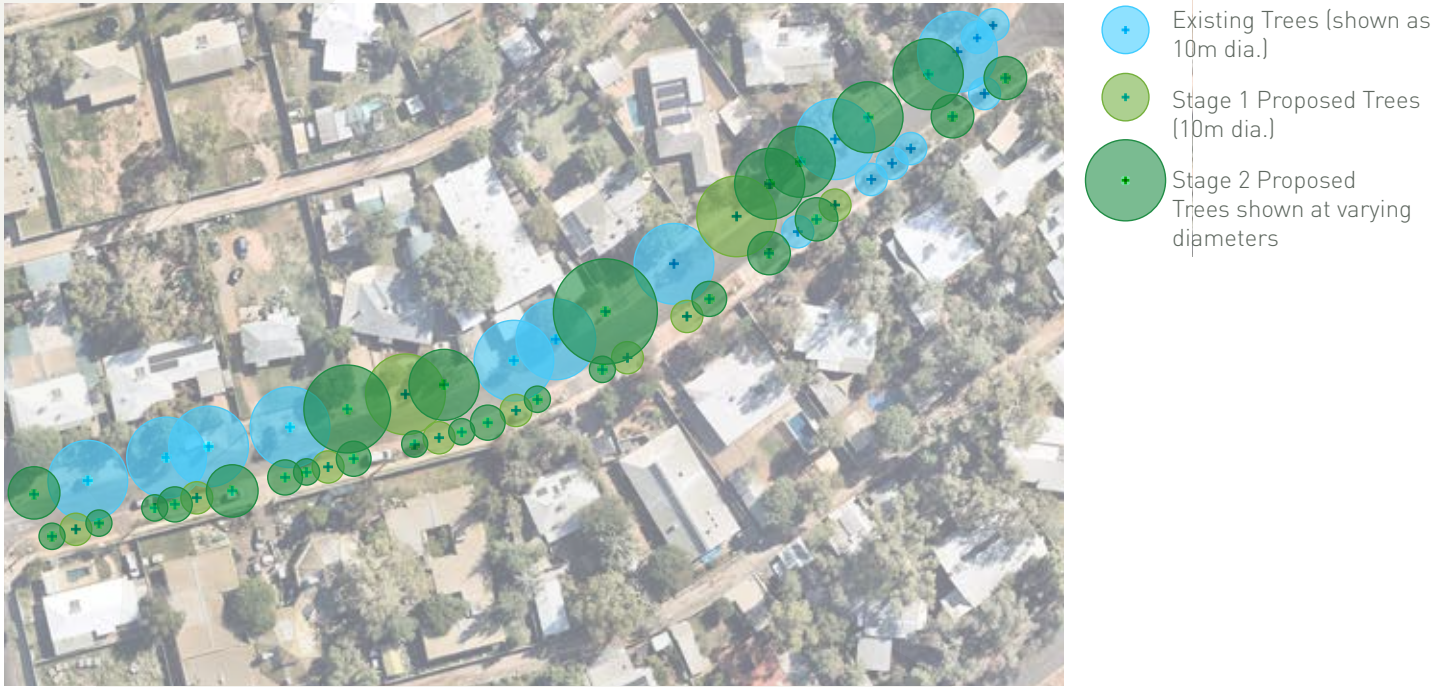
Method 1 - Worked Example

Stage 1: Ensure as a minimum that each residential lot has 1 tree on their verge. Example street in Eastside. 60% of lots require a tree (60% infill).



Demonstration Street - Plan (not to scale, Nearmap image)

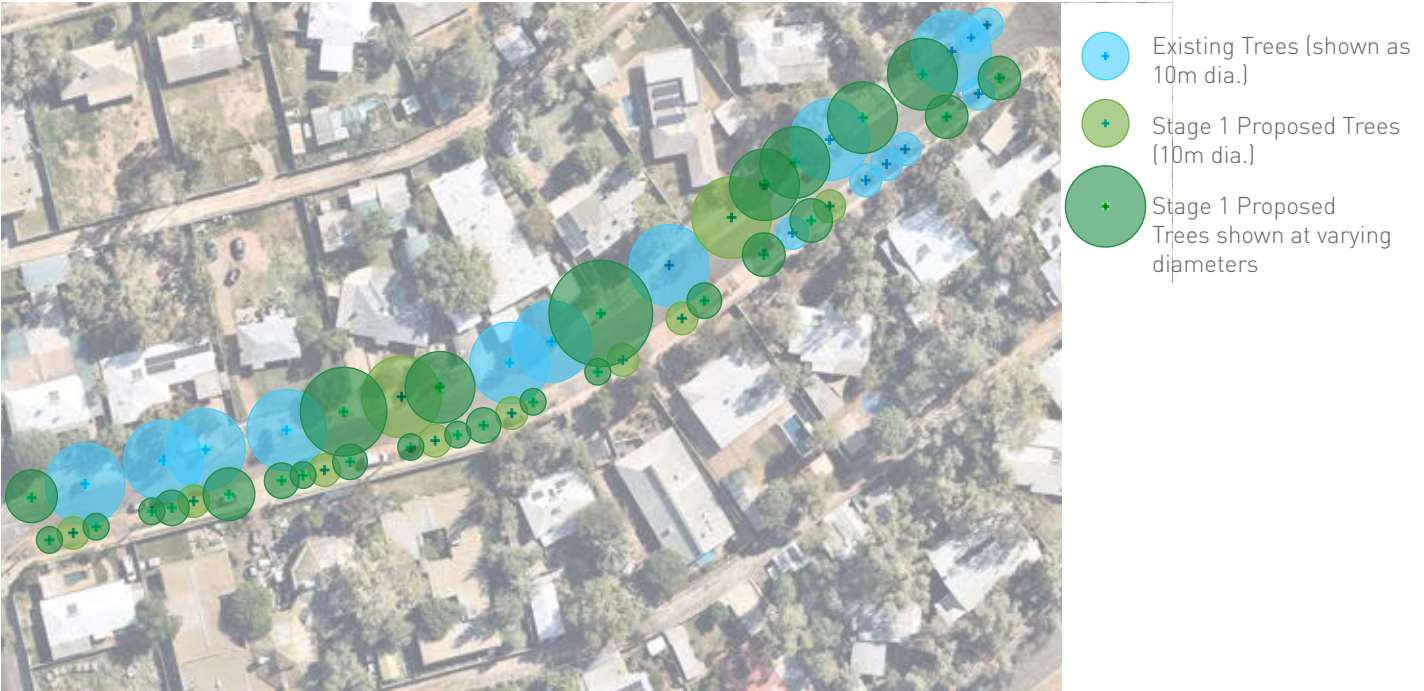
Stage 2: Ensure that there is connected canopy in all residential streets in the verge. Example street approximately 40% of verge not connected i.e. not LOCC.



Demonstration Street - Plan (not to scale, Nearmap image)

Method 2 - Worked Example

Stage 1: Ensure that there is connected canopy in all residential streets in the verge. Example street requires 100 trees to achieve LOCC.



Demonstration Street - Plan (not to scale, Nearmap image)

Note:

Refer to Appendix C for full costings



Actions
Infill Street roll out plan to be confirmed with Steering committee

Tree Species List

Which tree where

The tree species list has been formulated through site investigations, research, anecdotal information and on-ground work.

It takes into consideration many factors such as:

- Height;
- Crown spread;
- Suitability near powerlines; and
- Habitat value etc.

The relevant criteria are listed in the table opposite.

Most species on the list are locally endemic (Local species), from the Alice Springs area. Other species include those from Australia but do not occur locally i.e. not endemic.

Note: Specific species lists can be found in Appendix B which relates to each streetscape typology.

Promoting Biodiversity

The more diverse a tree population, the more resilient it is to a variety of factors (e.g. pests and diseases). It's important to be aware of potential species overuse when creating an urban forest. Ongoing use of mixed planting themes is therefore recommended. This approach reduces risk of mass deaths arising from pest, disease, change in growing conditions and natural disasters.

Further, genetic diversity within each species can increase resilience of the urban forest. Sourcing seed or mother stock from a range of sources is recommended.

Specific consideration should be given to locating trees which are attractive to wildlife in order to:

- protect wildlife movements
- those vulnerable to attack by predators or
- susceptible to road deaths

Species Diversity Targets

Diversity within the existing tree population is currently unknown. By collecting this data and analysing it, an informed benchmark could be set for Alice Springs .

A frequently cited, though not scientifically based, rule of thumb from the United States (Santamour 1990) suggests:

- Plant no more than 30% of a family
- Plant no more than 20% of a genus
- Plant no more than 10% of a species

After identifying risks in the diversity of their own forest the City of Melbourne is proposing to shift its composition to the following by 2040:

- No more than 20% of any one family
- No more than 10% of any one genus
- No more than 5% of any one species

As the town has conditions that are different from many other towns and cities around the world (e.g. sporadic rainfall, hard soils and intense heat) the percentages will vary from those above.

The proposed species list is made up predominately of Myrtaceae, Proteaceae and Mimosaceae families.

The suggested composition for town would be:

- 40% family (with focus on Myrtaceae, e.g. 40% Myrtaceae, 20% Mimosaceae, 15% Proteaceae, 10% others)
- 20% genus (with focus on Eucalyptus, e.g. 20% Eucalyptus, 15% Corymbia, 10-15% Acacia, 10-15% Melaleuca/Callistemon, 5% Brachychiton etc.)
- 10% species (10% of each 'iconic', less of others)

This suggestion is to be further explored with the Working Technical Group.

Exotics

Exotics have been included in the list because of the benefits they provide, primarily dense shade. Of note:

- Exotic species (along with some rainforest species) usually provide more dense shade. They generally have denser foliage than native species

- They are not recommended in harsh local soils where maintenance would be limited
- They will perform better on ameliorated, de-compacted soils. (Most of the species indicated will)
- Exotics are best planted in built up areas, where there is less risk of them becoming weedy (i.e. avoid planting near natural waterways or bushland)
- Only a few exotics have been nominated in order to focus plantings on local species. These perform well based on local evidence but there may be more species that could be included through further research
- Widespread use of exotics risks diluting the local identity of the city. In particular, Jacaranda and Poinciana are not recommended as they do not develop good form and structure in arid environments and when lopped become unsightly

Storm Damage

Large growing trees are susceptible to storm damage. It is difficult to specify 'storm resistant' species as damage from storms and other natural disasters is often unpredictable.

Recent research from the UK suggests that storm damage to mature trees is increasing as climate change is evolving. Weston reported in the Guardian. org that "Forests with two or three tree species are on average 35% more resilient than forests with only one species" (Weston, 2024). She also noted that slower growing species are more resilient to storm damage. Professor Lukac noted in the same article that "Trees growing in a mixture not only produce more biomass, but the forests they create are better able to ride out the impact of adverse factors, including wind storms".

These recent findings support the LOCC method of planting and whilst challenging to apply in the town are worth pursuing, given the increasing climate related storm surges.

List derivation

The tree species lists have been compiled utilising the following methods and inputs:

- Physical research (review of all current street trees in Alice Springs and their condition by O2LA team and their consultant arborist)
- Online research by O2LA consultant arborist
- Review of literature on Alice Springs vegetation by Greening Australia, OPBG brochures, Landcare mapping and NTG
- Historical research regarding Alice Springs plantings
- Research of species at OPBG
- Advice from Geoff Miers (Local Arborist) and David Albrecht (Herbarium)
- Anecdotal advice via residents and Councillors
- AZRI were contacted for comment but no contact could be established. Trees on site at AZRI were photographed and it was noted all species present were on the 80% report issued to Council.

Street Tree List

Botanical name	Common name	Arrente Name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Unimpeded spaces	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species	Recommended by AS consultant •David Albrecht •Geoff Meirs •Bryce Shannon	COMMENTS AND LEGEND NOTES
<i>Acacia anuera</i>	Mulga	Artetye	4-10m	2-6m	S		•	•		•		•					•		
<i>Acacia cyperophylla</i>	Red Mulga		3-12m	3-8m	M		•	•		•	•	•							
<i>Acacia estrophiolata</i>	Ironwood	Athenge, Atyarnpe	4-16m	5-10m	L		•	•				•							Slow growing
<i>Acacia pendula</i>	Weeping Myall		4-9m	4-6m	S		•	•		•	•	•							
<i>Acacia pruinocarpa</i>	Black Gidgee		4-10m	2-6m	S		•	•		•		•							
<i>Acacia sericophylla</i>	Dogwood	Awenthe	3-10m	3-5m	S		•	•		•	•	•							
<i>Atalaya hemiglauca</i>	Whitewood	Arlperre	3-9m	2-4m	S		•	•	•		•	•						•	Can be susceptible to frosts when young but recovers. • An excellent tree that should be planted more often
<i>Brachychiton acerifolius</i>	Flame tree		15m	5-8m	M	•			•				•						A rainforest species but grows well in dry climates
<i>Brachychiton gregorii</i>	Desert Kurrajong	Apenge	4-8m	2-4m	S		•	•	•	•	•	•					•		
<i>Brachychiton rupestris</i>	Queensland Bottle Tree		6-15m	5-10m	M		•	•	•		•		•						
<i>Callitris glaucophylla</i>	White Cypress Pine	Irlweke	4-10m	3-8m	S		•	•		•	•	•							
<i>Corymbia aparrerinja</i>	Ghost gum	Ilwempe	8-18m	4-10m	L	•	•	•	•		•	•					•		
<i>Corymbia opaca</i>	Desert bloodwood	Arrkerneke	15m	8m	M	•	•	•	•			•					•		
<i>Eucalyptus camaldulensis 'wiluna'</i>	Wiluna River Red Gum - dwarf form	Apere	12-15m	4-6m	L	•	•	•	•	•		•			•		•	••	Suitable for low-lying locations. Subject to availability
<i>Eucalyptus coolabah ssp. arida</i>	Coolibah	Ankerre	6-15m	5-10m	L	•	•	•	•	•		•			•				Suitable for low-lying locations
<i>Eucalyptus intertexta</i>	Bastard Coolibah		6-18m	5-12m	L	•	•	•	•	•		•							
<i>Eucalyptus leucophloea</i>	Migum		3-10m	2-6m	S		•	•					•						
<i>Eucalyptus torquata</i>	Coral Gum	Atyweretye	6-10m	5-8m	S		•	•	•		•		•						
<i>Eucalyptus victrix</i>	Dwarf ghost gum		2-10m	2-6m	S		•	•					•						Potential good small tree for streets
<i>Eucalyptust thozetiana</i>	Thozet's Box		7-20m	4-10m	M	•	•	•		•	•		•						Adaptable
<i>Grevillea robusta</i>	Silky Oak		5-25m	6-15m	L	•	•	•	•		•		•						A rainforest species but appears to grow well in AS.
<i>Grevillea striata</i>	Beefwood	Ityentye	6-15m	3-6m	M			•			•	•				•			
<i>Melaleuca bracteata</i>	Black teatree		4-8m	3-5m	S		•	•	•			•							Suitable for low-lying locations
<i>Pittosporum angustifolium</i>	Native apricot		10m	4m	M		•	•				•						•	
<i>Exotic species</i>																			
<i>Melia azedarach 'Elite</i>	Seedless White Cedar		16m	8-12m	L	•		•	•	•	•			•				•	• Hybrid does not produce seeds (fruit)
<i>Phoenix canariensis</i>	Canary Island Date Palm		20m	6-10m	L	•			•		•				•			•	Common in AS. • Considered heritage plant, thrives in the desert
<i>Schinus molle</i>	Peppercorn Tree		18m	8-12m	L	•			•	•	•				•			•	Reported as a weed in some locations but seems not to be in AS • Needs a higher level of management

Street Tree List - Under Powerlines

Botanical name	Common name	Arrente Name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Suitable Under powerlines	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species	Recommended by AS consultant •David Albrecht •Geoff Meirs •Bryce Shannon	COMMENTS AND LEGEND NOTES
<i>Callistemon 'Harkness'</i>	Bottlebrush		3-7m	3-6m	S	•	•	•			•		•						Responds well to lopping under powerlines
<i>Callistemon 'Kings Park Special'</i>	Bottlebrush		2-5m	2-4m	S	•	•	•			•		•					•	Responds well to lopping under powerlines. • Grows extremely well in Central Australia
<i>Eremophila bignoniiflora</i>	Emu bush	Atynynerlenge, Utnerrenge	5m	5m	S	•	•	•			•	•						••	
<i>Eucalyptus gamophylla</i>	Blue Mallee	Uleperre,Tyertepe	6-8m	4-6m	S	•	•	•			•	•				•			Low growing but may be too wide for narrow spaces
<i>Eucalyptus gillenii</i>	Mallee Red Gum		3-7m	2-6m	S	•	•	•		•		•							Low growing but may be too wide for narrow spaces
<i>Eucalyptus kruseana</i>	Book-leaf Mallee		2-5m	3-5m	S	•	•	•		•	•								Low growing but may be too wide for narrow spaces
<i>Eucalyptus lucens</i>	Shiny-leaved Mallee		2-5m	2-3m	S	•	•	•		•	•	•							Low growing but may be too wide for narrow spaces
<i>Eucalyptus minniritchi</i>	Round-leaved Mallee		1.5-6m	2-5m	S	•	•	•		•	•	•						•	Recommended over E. orbifolia as it is the local species
<i>Eucalyptus oxymitra</i>	Sharp-capped Mallee		6m	2-5m	S	•	•	•								•			Low growing but may be too wide for narrow spaces
<i>Eucalyptus pachyphylla</i>	Red-bud Mallee	Ntyenyne, Alhelpe	1.5-4m	3-5m	S	•	•	•		•	•	•							Low growing but may be too wide for narrow spaces
<i>Eucalyptus sargentii</i>	Salt River Mallee		5-10m	4-7m	M	•	•	•		•					•				Low growing but may be too wide for narrow spaces
<i>Eucalyptus socialis ssp. eucentrica</i>	Red Mallee		3-12m	4-8m	S	•	•	•		•		•							Low growing but may be too wide for narrow spaces
<i>Hakea divaricata</i>	Fork-leaved Corkwood		4-7m	2-4m	S	•	•		•		•							•	Recommended over E. ereana as it is the local species
<i>Hakea lorea</i>	Long-leaved Corkwood		6m	5m	S	•	•				•								
<i>Melaleuca (Callistemon) viminalis</i>	Weeping bottlebrush		4-8m	3-6m	S	•	•	•	•		•		•						Responds well to lopping under powerlines
<i>Melaleuca dissitiflora</i>	Paperbark		3m	2-4m	S	•	•	•			•	•							Suitable for low-lying locations
<i>Melaleuca glomerata</i>	Inland Tea-tree	Ilperle	2-5m	3-5m	S	•	•	•		•		•			•				Suitable for low-lying locations
<i>Myoporum montanum</i>	Boobialla		2-4m	1-3m	S	•	•	•		•	•	•						•	Recommended over M. acuminatum as it is the local species

Tree Species - Images



ACACIA anuera
Mulga
H: 4-10m | W: 2-6m



ACACIA cambagei
Gidgee
H: 5-12m | W: 4-7m



ACACIA coriacea
Dogwood
H: 3-10m | W: 3-5m



ACACIA cyperophylla
Red Mulga
H: 3-12m | W: 3-8m



ACACIA estrophiolata
Ironwood
H: 4-16m | W: 5-10m



ACACIA maconochieana
Salt Wattle
H: 3-5m | W: 2-4m



ACACIA pendula
Weeping Myall
H: 4-9m | W: 4-6m



ACACIA pruinocarpa
Black Gidgee
H: 4-10m | W: 2-6m



ATALAYA hemiglauca
Whitewood
H: 3-9m | W: 2-4m



BRACHYCHITON
acerifolius
Flame tree
H: 8-15m | W: 5-8m



BRACHYCHITON gregorii
Desert Kurrajong
H: 4-8m | W: 2-4m



BRACHYCHITON rupestris
Qld Bottle Tree
H: 6-8m | W: 5-10m



CALLISTEMON 'Harkness'
Bottlebrush
H: 3-7m | W: 3-6m



CALLISTEMON 'Kings Park Special'
Bottlebrush
H: 2-5m | W: 2-4m



CALLITRIS glaucophylla
White Cypress Pine
H: 4-10m | W: 3-8m



CORYMBIA aparrerinja
Ghost Gum
H: 8-18m | W: 4-10m



CORYMBIA opaca
Desert Bloodwood
H: 15m | W: 6m



EUCALYPTUS camaldulens
River Red Gum
H: 30m | W: 6-12m



Actions

Trials of additional species to be investigated and undertaken to expand the Tree Species List.

Tree Species - Images



**EUCALYPTUS coolabah
ssp. arida
Coolibah**
H: 6-15m | W: 5-10m



**EUCALYPTUS gamophylla
Blue Mallee**
H: 6-8m | W: 4-6m



**EUCALYPTUS gillenii
Mallee Red Gum**
H: 3-7m | W: 2-6m



**EUCALYPTUS intertexta
Bastard Coolibah**
H: 6-18m | W: 5-12m



**EUCALYPTUS kruseana
Book-leaf Mallee**
H: 2-5m | W: 3-5m



**EUCALYPTUS leucophloea
Migum**
H: 3-10m | W: 2-6m



**EUCALYPTUS leucoxydon
ssp. megalocarpa
Large-fruited yellow gum**
H: 5-10m | W: 5-8m



**EUCALYPTUS lucens
Shiny-leaved Mallee**
H: 2-5m | W: 2-3m



**EUCALYPTUS mannensis
Mann Range Mallee**
H: 10m | W: TBA



**EUCALYPTUS
odontocarpa
Sturt Creek Mallee**
H: 4m | W: TBA



**EUCALYPTUS oleosa = E.
socialis
Red Mallee**
H: 3-12m | W: 4-8m



**EUCALYPTUS orbifolia/
miniritchi**
H: 1.5-6m | W: 2-5m



**EUCALYPTUS oxymitra
Sharp-capped Mallee**
H: 6m | W: 2-5m



**EUCALYPTUS pachyphylla
Red-bud Mallee**
H: 1.5-4m | W: 3-5m



**EUCALYPTUS petrensis
Limestone Mallee**
H: 4m | W: 2-3m



**EUCALYPTUS sargentii
Salt River Mallee**
H: 5-10m | W: 4-7m



**EUCALYPTUS thozetiana
Thozet's Box**
H: 7-20m | W: 4-10m



**EUCALYPTUS torquata
Coral Gum**
H: 6-10m | W: 5-8m

Tree Species - Images



EUCALYPTUS victrix
Dwarf Ghost Gum
H: 2-10m | W: 2-6m



GREVILLEA robusta
Silky Oak
H: 5-25m | W: 4-15m



GREVILLEA striata
Beefwood
H: 6-15m | W: 3-6m



HAKEA divaricata
Fork-leaved Corkwood
H: 4-7m | W: 2-4m



HAKEA eyreana
Corkwood
H: 2-7m | W: TBA



HAKEA lorea
Long-leaved Corkwood
H: 6m | W: 5m



KHAYA senegalensis
African mahogany
H: 15-30m | W: 8-14m



MELALEUCA bracteata
Black Teatree
H: 4-8m | W: 3-5m



MELALEUCA dissitiflora
Paperbark
H: 3m | W: 2-4m



MELALEUCA glomerata
Inland Tea-tree
H: 2-5m | W: TBA



MELALEUCA viminalis
Weeping Bottlebrush
H: 4-8m | W: 3-6m



MELIA azedarach
White Cedar
H: 16m | W: 8-12m



MYOPORUM acuminatum
Boobialla
H: 2-4m | W: 1-3m



PHOENIX canariensis
Canary Island Palm
H: 20m | W: 6-10m



SCHINUS molle
Peppercorn Tree
H: 18m | W: 6-10m

They want to hold you

"So Many Illwempe

Ghost Gums

Some grow near creek beds

And some on rocky hills

To see them so beautiful

Growing wherever you go

Shining branches

Spreading out

Just like they want to hold you

It's a perfect sight to you

They know you

In your own country

Ilwempe Ilwempe

Ghost Gums"

by Amelia Kngwarraye Turner (2021, pp. 52).

ADDITION OF ARRENTE STORIES IN
THIS SPACE
XXXXX



Tree Species - Trial List

The right tree in the right place - trials and evaluation

Building the Forest of the Future - 2070

As the science of climate change is evolving and adapting, creating room within the species list for adaptation is recommended. The Sunshine Coast LGA and the Melbourne Study address this through species diversity and investigation trials from areas compatible with anticipated changes/transition and/or similar climates.

Trials should be built into the Action Plan with the assistance of local Arborists, Horticulturists, Ecologists and plant enthusiasts who have technical or local knowledge in this area.

It should be noted that while trialling new species, failure in some areas is to be expected.

Stakeholders have requested that exotic and non-endemic species be trialled for use as street trees.

The following tree species trial list has been formulated through the following methods:

- Online research into street trees growing in similar climatic zones in Australia and
- Advice from local, Alice Springs arborists, tree growers, horticulturists and botanists

It is recommended that this list be reviewed by the Technical working group and that trials commence as soon as possible under their guidance.

An important aspect of this trial is to future proof the effects of climate change on existing trees. As temperatures increase and rainfall decreases, trees that survive now may not in the future.

The addition of, in particular, exotic and non-local species may have the following negative consequences that need to be considered and monitored over a 5 year period:

- Poor development of form due to climatic conditions (i.e. not enough regular rain, intense

- heat)
- Poor development of deep roots due to soil structure
- Failure to thrive due to environmental conditions
- Capacity to adapt
- Performance during storms

Important inclusions

- Increase resilience to stresses such as drought, pests and disease
- Improve species diversity
- Include any previous research that has been undertaken

Metrics and Measuring success:

Years 1-2

- Technical group to review species list
- Number of trials to be established i.e. how many plants and where
- Procure plants

- Plant, establish, maintain
- Bi-annual checks on:
 - Vandalism - replacement where tree is damaged or missing. Records to be kept on replacements over the 5 years.
 - Losses - are these sustainable?
 - Prevention of vehicles on verge
 - Health of all trees
 - Impact of cars parking on the verge - infringement notices to be issued (where they impact trees)
- Benchmark report to the Steering Committee at end of Year 2
- With regard to the benchmark report Technical group to review species list and add or delete species where necessary

Years 3- 5

- Continue with trials
- Yearly summary of findings to Steering Committee

Year 5

- Trial recommendations to Steering Committee
- Commencement of procurement or growing of new species



Tree trial under powerlines - SA Power

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Unimpeded spaces	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetics	Locally endemic native species	Australian Species	Exotic Species	Salinity	Recommended by AS consultant David Albrecht Geoff Meirs Bryce Shannon	COMMENTS AND LEGEND NOTES
<i>Acacia maconochieana</i>	Salt Wattle	3-15m	2-4m	S	•	•	•	•	•	•	•	•	•	•	•	Conflicting opinions on heights. Could be good under powerlines but may be too tall.
<i>Adansonia gregorii</i>	Boab tree	5-15m	9-12m	L	•	•	•	•	•	•	•	•	•	•	•	Iconic northern Australian species
<i>Bauhinia</i> species	Orchid tree	7-10m	5-8m	M	•	•	•	•	•	•	•	•	•	•	•	
<i>Brachychiton populneus</i>	Kurrajong	12m	6m	M	•	•	•	•	•	•	•	•	•	•	•	
<i>Ceratonia siliqua</i>	Carob tree	10m	6m	M	•	•	•	•	•	•	•	•	•	•	•	
<i>Eucalyptus leucoxylon</i> ssp. <i>megalocarpa</i>	Large-fruited yellow gum	5-10m	5-8m	M	•	•	•	•	•	•	•	•	•	•	•	• E. Rosea does not grow well in AS
<i>Eucalyptus mannensis</i>	Mann Range Mallee	10m	4-6m	M	•	•	•	•	•	•	•	•	•	•	•	Local species growing well in the OPBG
<i>Eucalyptus sargentii</i>	Salt River Mallee	5-10m	4-7m	M	•	•	•	•	•	•	•	•	•	•	•	Fast growing local species. Drought and frost tolerant
<i>Hymenosporum flavum</i>	Native frangipani	6-8m	5-7m	M	•	•	•	•	•	•	•	•	•	•	•	Grown in Adelaide as a street tree
<i>Largestromia indica</i>	Crepe myrtle	5-7m	5-6m	S	•	•	•	•	•	•	•	•	•	•	•	Grown in Adelaide as a street tree
<i>Olea europaea</i>	Olive tree	8m	6m	M	•	•	•	•	•	•	•	•	•	•	•	Grown in Adelaide as a street tree. Fruit dropping in street needs to be considered. Most LGAs do not use fruit trees for this reason
<i>Pistacia chinensis</i>	Chinese Pistachio	6-8m	4-6m	M	•	•	•	•	•	•	•	•	•	•	•	Grown in Port Pirie as a street tree
<i>Syzygium</i> sp	Lilly pilly	3- 20m	3-10m	S,M,L	•	•	•	•	•	•	•	•	•	•	•	Many sizes and forms suitable for different locations
<i>Ulmus parvifolia</i>	Chinese elm	7-10m	6m	M	•	•	•	•	•	•	•	•	•	•	•	U. flavra 'lutescens' and U. hollandia grown in Adelaide as a street tree

Tree Species - Park List

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Unimpeded spaces	Local Availability	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Iconic species
<i>Albizzia lebbeck</i>	Silk tree	20m	10-15m	L	•			•	•		•		•			
<i>Callistemon 'Harkness'</i>	Bottlebrush	3-7m	3-6m	S	•	•	•			•		•				
<i>Callistemon 'Kings Park Special'</i>	Bottlebrush	2-5m	2-4m	S	•	•	•			•		•				
<i>Corymbia aparrerinja</i>	Ghost gum	8-18m	4-10m	L	•	•	•	•		•	•	•				•
<i>Corymbia opaca</i>	Desert bloodwood	15m	8m	M	•	•	•	•			•	•				•
<i>Eremophila bignoniflora</i>	Emu bush	5m	5m	S	•	•	•			•	•					
<i>Eucalyptus camaldulensis</i>	River Red Gum	20m	6-12m	L	•	•	•	•	•		•			•		•
<i>Eucalyptus coolabah ssp. arida</i>	Coolibah	6-15m	5-10m	L	•	•	•	•	•		•	•				
<i>Eucalyptus gamophylla</i>	Blue Mallee	6-8m	4-6m	S	•	•	•			•	•				•	
<i>Eucalyptus gillenii</i>	Mallee Red Gum	3-7m	2-6m	S	•	•	•		•		•					
<i>Eucalyptus intertexta</i>	Bastard Coolibah	6-18m	5-12m	L	•	•	•	•	•		•	•				
<i>Eucalyptus kruseana</i>	Book-leaf Mallee	2-5m	3-5m	S	•	•	•		•	•						
<i>Eucalyptus lucens</i>	Shiny-leaved Mallee	2-5m	2-3m	S	•	•	•		•	•	•					
<i>Eucalyptus minniritchi</i>	Round-leaved Mallee	1.5-6m	2-5m	S	•	•	•		•	•	•					
<i>Eucalyptus oxymitra</i>	Sharp-capped Mallee	6m	2-5m	S	•	•	•								•	
<i>Eucalyptus pachyphylla</i>	Red-bud Mallee	1.5-4m	3-5m	S	•	•	•		•	•	•					
<i>Eucalyptus sargentii</i>	Salt River Mallee	5-10m	4-7m	M	•	•	•		•					•		
<i>Eucalyptus socialis ssp. eucentrica</i>	Red Mallee	3-12m	4-8m	S	•	•	•		•		•					
<i>Hakea divaricata</i>	Fork-leaved Corkwood	4-7m	2-4m	S	•	•		•		•						
<i>Hakea lorea</i>	Long-leaved Corkwood	6m	5m	S	•	•				•						
<i>Melaleuca (Callistemon) viminalis</i>	Weeping bottlebrush	4-8m	3-6m	S	•	•	•	•		•		•				
<i>Melaleuca dissitiflora</i>	Paperbark	3m	2-4m	S	•	•	•			•	•					
<i>Melaleuca glomerata</i>	Inland Tea-tree	2-5m	3-5m	S	•	•	•		•		•			•		
<i>Melia azedarach 'Elite'</i>	Seedless White Cedar	16m	8-12m	L	•		•	•	•		•		•			
<i>Myoporum montanum</i>	Boobialla	2-4m	1-3m	S	•	•	•		•	•	•					

Easy Wins

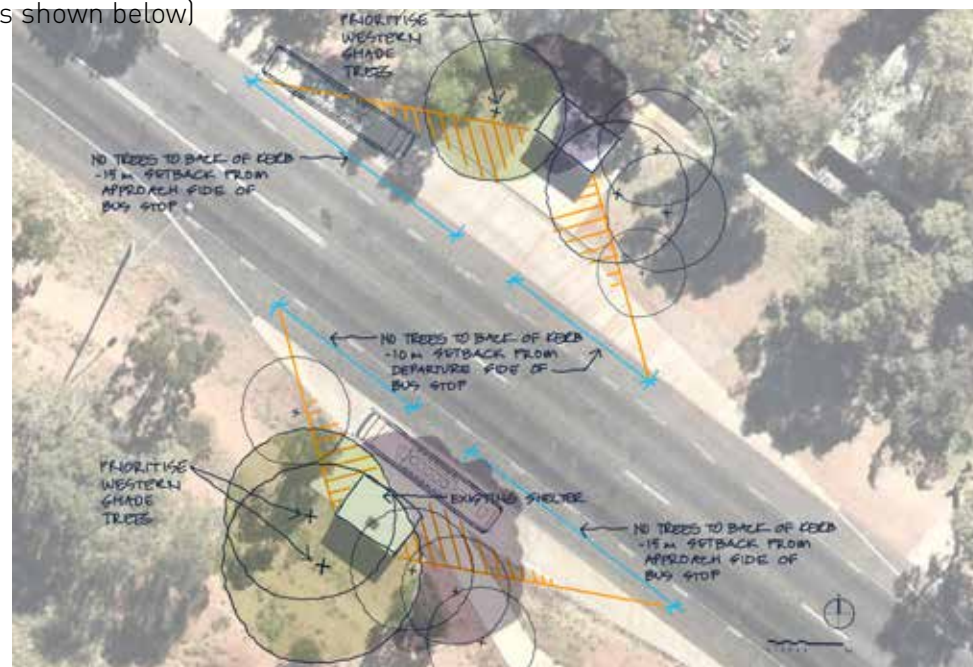
In order to establish canopy quickly and where people need shade the most, there are a number of “easy win” projects that can be implemented within the first two years.

Bus Stops

The majority of bus stops in town are not shaded by tree canopy, but have ample room for planting to the surrounds of the physical bus stop shelter.

The project involves the following:

- Analysis of which are the most used bus stops - these will take priority
- Planting of large, medium and small canopy trees around the bus stop over several years (or could be done as one planting)
- Trees on the western side(s) to be planted first.
- Large canopy trees placed to the western aspect wherever possible
- Small canopy tree placed close to the bus stop
- Medium canopy trees can be placed within a 4-6m proximity of the bus stop over successive years.
- Placement of trees to ensure patrons have clear sightlines to approaching buses (as shown below)



Actions

Locate all bus stops and create planting schedule and timeline for planting

Local Shops

There are a number of small local shopping precincts, accessed by car, bicycle and walking.

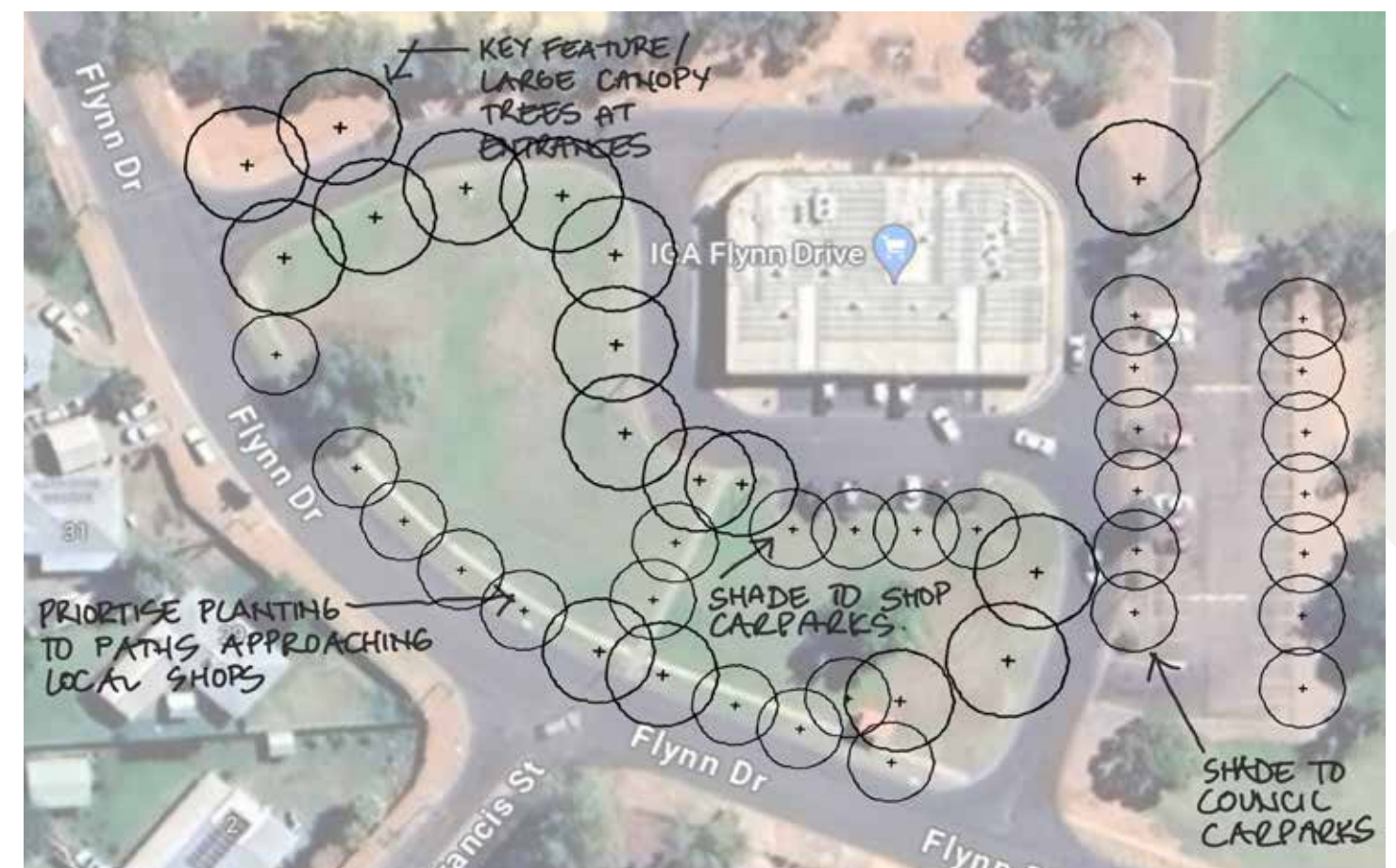
The project involves:

- Co-ordination and incentives with the private owners of these premises to work on their land
- Establishment of lines of responsibility between owners and council for works to be undertaken
- Supply, plant and maintain:
 - A mix of shade trees, close to the carparks (to shade parked cars and reduce heat load to the road pavement)
 - Planting adjacent to existing paths and gathering/seating areas;
 - Additional planting of large shade trees along the driveways to the shops.



Actions

Enter into an arrangement with local shop owners and create a schedule of works



Plan (not to scale)

Incentivised Residential Lot Planting - 'Adopt a Tree or Two'

Creation of an incentivised residential lot planting program ('Adopt a Tree or Two') and a supplementary street tree care program by residents who live adjacent to Council street tree planting projects.

The purpose of this project is to increase canopy cover (shade) overall. As shown in the figure across shade from a privately owned tree in a residential lot has the potential to shade the verge which is highly desirable to residents.

Prior to commencing tree planting projects in a street, Council will approach residents and seek expressions of interest:

- to assist in the success of the project via supplementary care of street trees. Provide these residents with appropriate information via brochure, website and possibly workshop (Pilot 3)
- to "Adopt a Tree or Two" and plant it within the frontage of their private property to supplement the LOCC strategy.

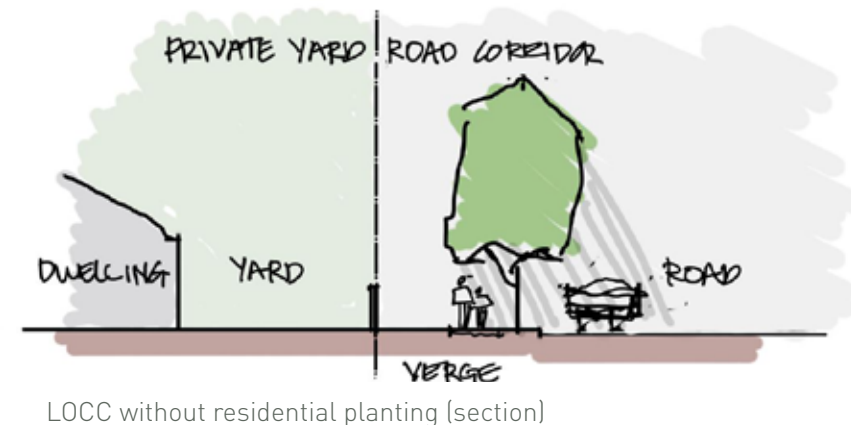
Residents who join the 'Adopt a Tree or Two' program shall be provided a tree (for their front yard) and an incentive to plant it so that it supplements the LOCC. Guiding information (Pilot 3) on locating, planting and care of the tree shall be provided.

The 'Adopt a Tree or Two' initiative can be made available to any residents (even if they are not due for new street trees). This would allow privately owned trees to commence growing and contributing sooner to shading the street and in advance of any planting project.

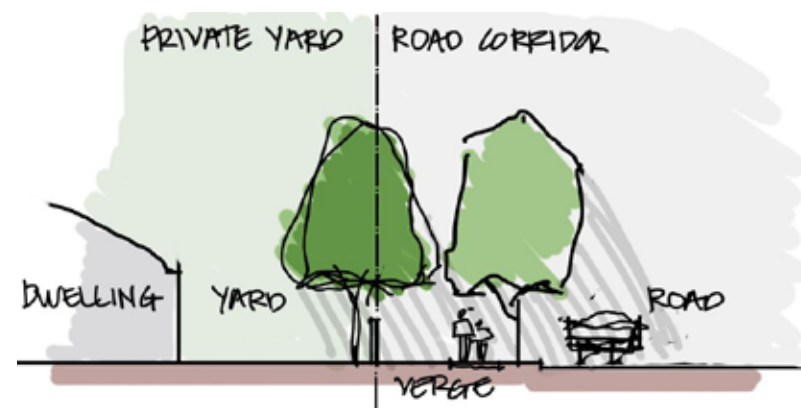
Council acknowledges that it may have less control over these trees, but invests in good faith on the relationship/engagement with the resident and likely overall shade benefit.

Trees in this category could be those requiring more maintenance and care than normal. For example exotic trees or slow growing trees.

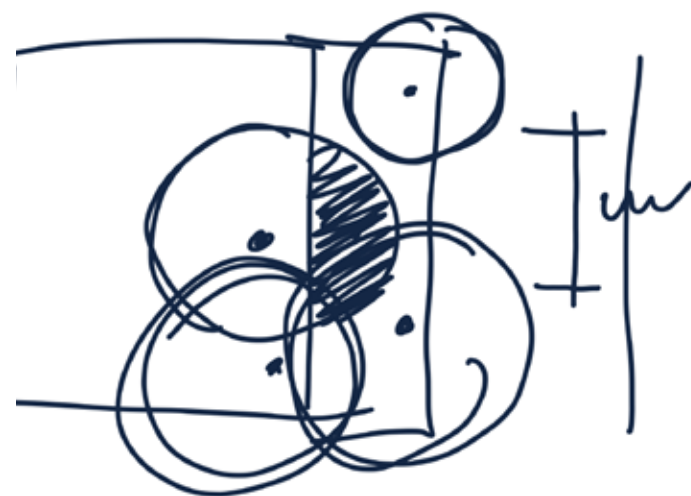
A brochure/communications strategy will be made available to the residents.



LOCC without residential planting (section)



LOCC with contributing residential planting (section)



LOCC with supplementary residential planting (plan)

Private Lot Planting (Resident)

Verge Planting (Council)



Actions

Create incentive scheme for residents to encourage private lot planting and care of their verge tree

Care and Maintenance of Existing Trees

The existing urban forest is currently estimated at 15.1% of the town. Specific attention needs to be paid to ensuring there is no net loss of this forest (unless a tree is in natural decline for its age). Issues to be addressed by further training and resourcing of the tree crew include the following:

- 'Green budget' to be established
- Pest and disease management regimes - annual plan
- Removal of pest plants from trunk/base including effective control of Buffel grass
- Planned maintenance for all mature trees (rather than reactive approach to pruning) based on specialist horticultural and arboricultural advice
- Annual works
 - re-mulching/top up mulching
 - establishment or re-establishment of the bund wall to retain moisture
 - addition of compost
 - fertilisation
- Minimise and/or phase out lopping of trees (not sound arboricultural practice). Largely to be negotiated with NTG under powerlines
- Previously lopped trees to be assessed for retention or otherwise
- Protection of the base of trees from mechanical equipment i.e. placement of large mulched rings to the surrounds of the tree to eradicate the need for brush cutting around trunks and to reduce evaporation
- Discourage carparking over the root plate of trees via the use of signage and physical elements such as rocks and bollards where possible
- Hand/mechanical de-compaction of root zones
- Tree evaluations by a certified Arborist of mature tree stock for defects, every two years

- Additional watering where specific trees are under stress during drought
- Management of vandalism and fire setting to old growth River Red Gums in Todd River

In order to effectively manage the above items it is recommended that:

- a Care and Maintenance of Existing Trees procedure be written for the Tree Crew
- Training be undertaken for the above
- Annual schedule of works be written in order to ensure that all existing trees are being maintained.



Actions

Care and Maintenance of Existing
Trees procedure be written



Targets for Canopy Cover

Important considerations and assumptions in determining canopy targets

General

In lieu of specific accurate data, targets have been set using assumptions and benchmarking against pilot project modelling while being mindful of what are reasonable urban forestry canopy targets.

Reliability of the targets can be increased in the future by establishing an inventory of existing trees, and maintaining a management system with specific local metrics and up-to-date implementation costs specific to Alice Springs. Some of this specific local data, for newly planted trees at least, will come to hand while undertaking the pilot projects.

When considering reasonable targets and we look to approaches taken elsewhere we need to bear in mind the following which can vary from strategy to strategy:

- not all strategies use canopy cover targets as a measurable to inform future planning and track progress.
- some strategies choose to consider private canopy as well as public canopy in their targets, some public realm only.
- the climate of the subject urban area

Targets for Arid Cities

Targets in arid cities can be expected to be lower than humid cities. Availability of water is a major consideration in arid zones and thus reduces capacity for tree establishment and growth rates compared with humid cities.

Further, the public realm includes spaces which will always maintain open areas such as sports fields and clearings in parks. Likewise it is not considered appropriate to 'max out' canopy in parks and reserves with of a natural landscape type (e.g. rocky hills and Todd river spaces). A conservative target is therefore

considered reasonable and appropriate for Alice Springs

The table below lists statistics gathered from other strategies limited to the public realm.

Assumptions

New trees

Scientific evidence of growth rates of trees in Alice Springs is not available for the purpose of this strategy. As this is not a scientific study, assumptions about growth have been made in order to propose growth targets.

Therefore in order to project baseline data for growth, average growth rates for Brisbane have been used and adjusted. Brisbane has humid conditions, 1200mm annual precipitation and average 800mm growth in height.

A conservative reduction in growth (by percentage) has been assumed based on the following Alice

Springs conditions including:

- Poor soils
- Low rainfall
- High temperatures for long periods of the year
- High rates of evaporation due to high temperatures and dry heat rather than humid conditions

The diagram shown across uses average growth rates (in height) of an average tree in Alice Springs to determine average canopy diameter growths.

Basic assumptions are:

- 1m growth in height over 5 years (200mm per year)
- 1m growth in canopy diameter over 5 years.

An assumption that canopy makes up 2/3 of the height of an average tree has been used.

Existing Forest

Existing trees will continue to grow. However the average age and useful life expectancy (ULE) and expected rate of canopy loss of the existing tree population is currently unknown.

Basic assumptions are:

- Growth of existing tree canopy will continue at 2011-2023 rates for the projected 20 year horizon
- lack of ULE is tempered by limiting targets to a 20 year horizon

We note that at different rates and different intervals these trees will reach maturity and begin to go into decline and then be removed, or be prematurely damaged by natural events, pose a safety risk, conflict with services and then be removed.

Understanding ULE can assist in the management of the tree population and allow planning for the eventual removal and replacement of extant trees.

ULE is not a measure of the tree's biological life within the natural range of the species. It is a measure of the tree's health status and capacity to positively contribute to its immediate urban landscape.

Alice Springs Canopy Cover Targets

The mapped 'Area of Interest' (AOI) is 746.99Ha (public realm only). 15.1% Canopy cover mapped for 2023 is the baseline value.

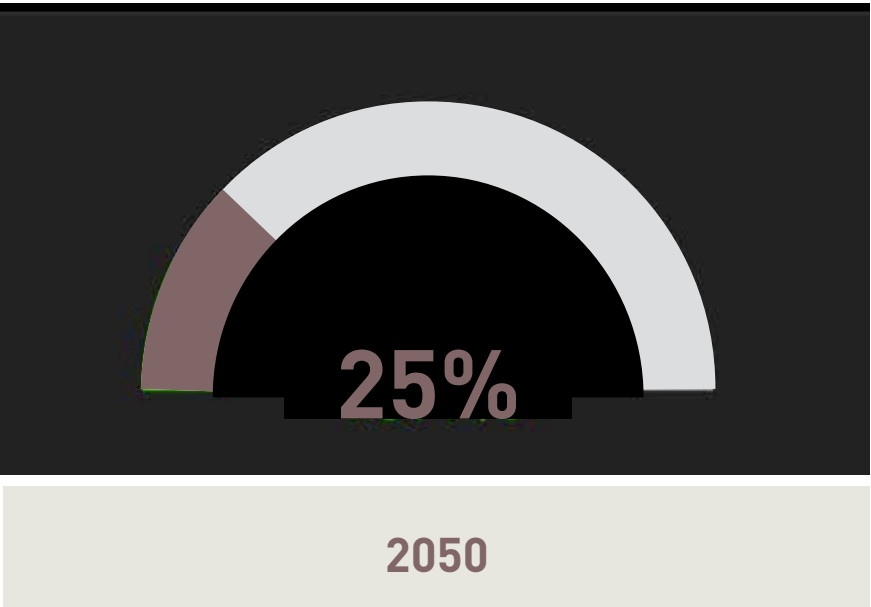
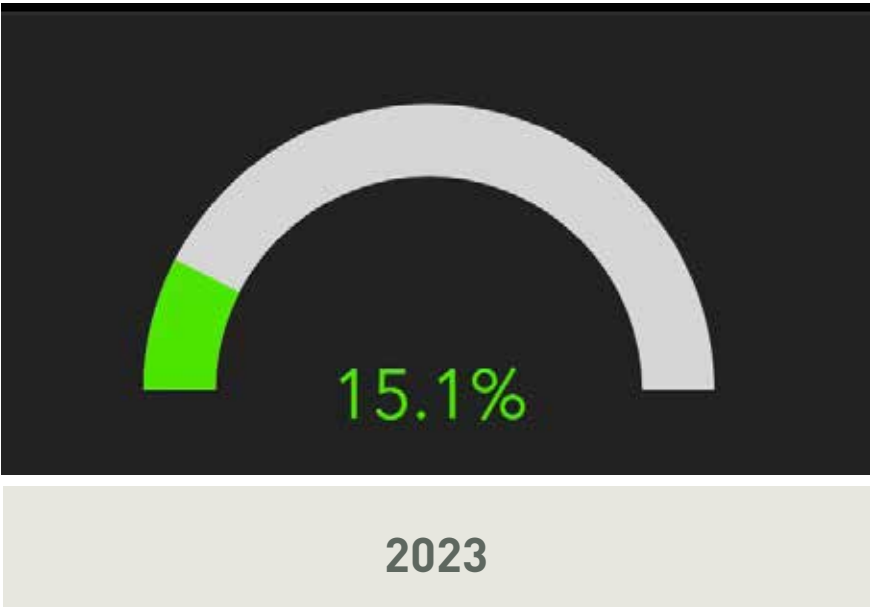
The target for this strategy is a proportional increase of canopy by 63% to reach a target of 25% canopy coverage at 26 years.

Local Government Authority	Baseline Year	Climate	Existing Public Realm	Public Realm Target %
Arid and Semi- Arid Climates				
Alice Springs	2023	Semi Arid	15%	
Denver	2022	Semi arid	13%	18%
Albuquerque, NM	2014	Semi-arid	13%	unknown
Salt Lake City, UT	2022	Dry-summer continental	13%	unknown
Non-Arid Climates				
City of Melbourne	2012	Temperate oceanic	22%	40%
Shepparton	2017	Dry, mild, temperate	18%	40%

Canopy cover statistics from a variety of strategies



Canopy Cover Projections						
2023	Yr 1	Yr 6	Yr 11	Yr 16	Yr 21	Yr 26
15%	16%	18%	19%	21%	22%	25%



Budgeting for the Future

Standard costings

General

As there is very little data available on current costs for tree planting for the ASTC the following assumptions have been made:

- Stock will be 25L or equivalent
- A base price of \$220 for supply and install is used regardless of species or procurement model
- A base price of between \$50 - \$120 has been used for 12 months establishment and maintenance. This rates will vary dependent mainly on the distance travelled between trees to maintain them
- Water pricing is at current rates (this may change if re-cycled water becomes available)
- Protection cages are assumed as a capital expense as they will/can be re-used

Exclusions

- Allowances for double up in pilot projects or infill planting has not been allowed for. Nor have the easy win projects
- Allowances for the rates of replacement due to death or vandalism
- Scope creep costs i.e. if the project takes longer/ shorter or if costs rise or fall
- Costs of maintenance of the existing forest

Infill Planting

As there is no current data on the exact location of trees in the town an infill rate has been suggested as 60% to achieve one tree per lot as a minimum across the town. This will vary and could be reduced up or down. However, one tree per lot would be a minimum standard.

The LOCC method has been assumed as the ultimate canopy coverage where all streets have connected canopy, providing continuous shade. The rate suggested is 40% infill. This will vary and could be reduced up or down.

Summary Costing Assumptions

The table shown over, illustrates one, of a number of ways, the ASTC budget for this project could be distributed.

Its broad assumptions are based on a number of costs (as outlined earlier) that could vary up or down depending on:

- Supply of stock
- Procurement models
- Availability of staff
- Availability of materials and water

Summary

In order to achieve the recommended 25% canopy cover target, the standard costings recommends the planting, establishment and maintenance of 16,000 trees over a 26 year period.

The average budget required is \$340K per year for 26 years using Method 1.

Full costings, using the same assumptions can be found in Appendix C



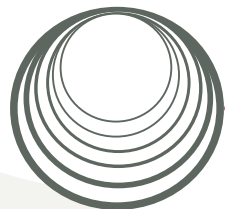
Summary costings

Year/Stage	Residential Streetscape Lot Infill Planting	Total Trees	Pocket Park	Total Trees	Cool Schools	Total Trees	Yearly Amounts	Yearly Tree Totals
	100% Infill		100% Infill		100% Infill			
1	\$ 68,000	120	\$ 21,200	35	\$ -		\$ 89,200	155
2	\$ -	0	\$ -	0	\$ 115,104	222	\$ 115,104	222
3	\$ -	0	\$ 79,500	131	\$ 377,088	759	\$ 456,588	890
4	\$ -	0	\$ 79,500	131	\$ 480,096	978	\$ 559,596	1109
5	\$ -	0	\$ 79,500	131	\$ 594,276	1193	\$ 673,776	1324
6	\$ -	0	\$ 79,500	131	\$ 567,048	1164	\$ 646,548	1295
7	\$ -	0	\$ 79,500	131	\$ 217,452	436	\$ 296,952	567
8	\$ 185,980	328	\$ 79,500	131	\$ 203,112	416	\$ 468,592	875
9	\$ 185,980	328	\$ 79,500	131	\$ -		\$ 265,480	459
10	\$ 185,980	328	\$ 79,500	131	\$ -		\$ 265,480	459
11	\$ 185,980	328	\$ -	0	\$ -		\$ 185,980	328
12	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
13	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
14	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
15	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
16	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
17	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
18	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
19	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
20	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
21	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
22	\$ 371,960	656	\$ -	0	\$ -		\$ 371,960	656
23	\$ 185,980	328	\$ -	0	\$ -		\$ 185,980	328
24	\$ 185,980	328	\$ -	0	\$ -		\$ 185,980	328
25	\$ 185,980	328	\$ -	0	\$ -		\$ 185,980	328
26	\$ 185,980	328	\$ -	0	\$ -		\$ 185,980	328
Project Total	\$ 5,647,400	9966	\$ 657,200	1085	\$ 2,554,176	5168	\$ 8,858,776	16219
			Average annual total over 26 years				\$ 340,722.15	624

Measuring Success

Key Indicators

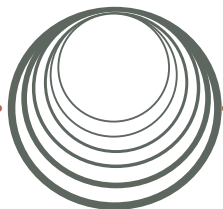
Measurements of success of the Action plan over time may include:



Governance

Develop a 'whole of government' and community-led approach to planning and action

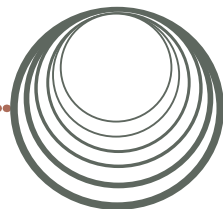
- Governance systems are operating effectively and efficiently
- Collaborative approaches to governance are streamlined creating gains in the urban forests health and growth
- Co-ordination with NTG regarding planting of NTG roads in town is collaborative



Economic

Create economic resilience through climate resilient strategies

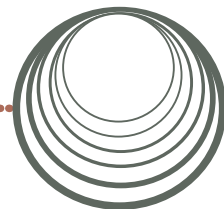
- Capital and operational budgets are being maintained and reviewed annually (allowing for escalation)
- Council staff are consistently trained in the techniques required to improve, increase and maintain the urban forest
- Asset management systems are in place (appropriate to the towns budget)



Environmental

Prioritise climate resilience

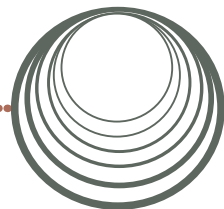
- An annual increase in the numbers of street trees purchased/propagated, planted and maintained
- Less than 10% young street tree losses/required replacements
- Net positive ratio for number of trees planted: number trees removed
- Net increase in canopy cover over time (assessed via comparison of successive canopy mapping exercises)
- Tree species are remaining as diverse as possible given the growing conditions
- Trials are continuing for new species to be added to the diversity without comprising character



Sense of Place

Value and build on Alice Springs unique sense of place

- Community survey registering positive attitudes towards the greening strategy
- The increasing urban forest is remaining true to its Central Australian character



Health and Well-being

Improve health and well-being of the community

- Ongoing registration and interest in council's Adopt A Street Tree Program and other community engagement programs as they are developed
- The canopy of trees is starting to improve shade for residents and opportunities for rest in cool spaces

Moves Forward

The main moves to implement the strategy.

- Implementation and/or creation of the:
- Governance Structure
 - Cross Agency Collaboration
 - Priority changes to Planning and Policy
 - Pilot Projects
 - Cool Schools
 - Easy Wins
 - Review of and implementation of appropriate budgets

Possible Future Actions

Initiatives that could be considered beyond this strategy

- Policy**
- Consider developing a Tree Protection Policy including tree valuation methodology. There are a number of slightly different ways that other cities go about this.
- Asset Management**
- Consider appropriate Asset Management System for managing the Urban Forest of Alice Springs
 - With more sophisticated urban forest asset management systems the following can be tracked ‘live’ and reported on at any point in time:
 - Species Diversity
 - Age Diversity
 - Trees planted
 - Tree size
 - Tree financial value
 - Tree losses (vandalism, natural attrition, removal)
 - Useful life expectancy
 - Canopy cover
 - Prospective canopy cover
 - Financially value of trees (and by extension the forest asset as a whole)

- Biodiversity and climate resilience**
- Consider trials of tree species with potential for use in Alice Springs to further diversify the tree list



Action Plan

Action Plan

Overview

	2024/25	2026	2027	2028	2029	2030	2035	2040	2050	2060	2070
	Intense Initiation Phase										
Governance											
Steering Committee	●	●	●	●	●						
Policy Changes	●	●				●					
ATSC Responsibilities	●	●	●	●	●						
Budget	●	●	●	●	●						
Cool Schools											
Braitling Primary - Pilot School	●	●	●	●							
All Remaining Schools (refer detailed plan)	●	●	●	●	●	●	●				
Pilot Projects											
Pilot 1	●	●									
Pilot 2	●	●	●								
Pilot 3	●	●	●								
Pilot 4	●	●	●								
Pilot 5	●	●	●								
Easy Wins											
Bus Stops	●	●	●								
Local Shops		●	●								
Residential Lots Infill Planting	●	●	●	●	●	●	●	●	●	●	●
Incentivise Residential Lot Planting	●	●	●	●	●						

Detailed Action Plan

	2024/25	2026	2027	2028	2029	2030	2035	2040	2050	2060	2070
Governance	Intense Initiation Phase										
Steering Committee											
Formation of committee	●										
Quarterly Meetings of Steering Committee	●	●	●	●	●						
Annual review of Strategic Plan with Technical Working Group and meeting of the Steering Committee	●	●	●	●	●	●	●	●	●	●	●
Annual Meetings of Steering Committee					●	●	●	●	●	●	●
Milestone review of Strategic Plan with all committees (5 yearly)					●	●	●	●	●	●	●
Cross-Sector Technical Working Group											
Formation of working group	●										
Quarterly Meetings of working group	●	●	●	●	●						
Annual review of Strategic Plan with Steering Committee	●	●	●	●	●						
Community & Business Working Group											
Formation of working group	●										
Quarterly Meetings of working group	●	●	●	●	●						
Annual review of Strategic Plan with Steering Committee	●	●	●	●	●						
ASTC Responsibilities											
Policy Changes											
Review of relevant ASTC policies for potential change	●					●					
ATSC Policy Changes		●	●			●					
Tree Protection Policy - creation of		●									
Enter into negotiations with NTG on collaboration of NTG roads, particular approach roads	●	●									
Staffing - Operational and Technical											
Allocation of specific staff resourcing for the implementation of the strategy	●										
Annual review of staffing requirements	●	●	●	●	●	●	●	●	●	●	●
Annual benchmarking reporting to the Steering Committee	●	●	●	●	●	●	●	●	●	●	●
Engagement of external contractors to implement the first 2 years of planting as per the strategy	●										
Enter into negotiations with contractor to grow tree stock for future planting	●										
Bi-annual review of growing scheme. Adjust as required.	●	●	●	●	●						

Detailed Action Plan

	2024/25	2026	2027	2028	2029	2030	2035	2040	2050	2060	2070
	Intense Initiation Phase										
Marketing and Media											
Creation of dedicated landing platform on ASTC website											
Quarterly updates after each steering committee											
Publish annual benchmarking and major yearly achievements											
Publish 5 yearly benchmarking and major achievements											
Budget											
Review of current and future budgets for Strategy, ascertain which projects (or all) protects to be funded											
5 year 'green budgets' set for startup phase of Strategy & annual review											
5/10 year budgetary review and new budget setting											
Cool Schools											
Using maps and work descriptions provided in Strategy											
School site 1											
School site 2											
School site 3											
School site 4											
School site 5											
School site 6											
School site 7											
School site 8											

Detailed Action Plan

	2045/25	2026	2027	2028	2029	2030	2035	2040	2050	2060	
Sites to be monitored bi-annually for the first 2 years after planting											
Yearly reviews by the Steering Committee of the planting.											
Pilot Projects											
Pilot 1 - Best case scenario tree installation											
Confirm costs for contractors to supply, plant and maintain new tree stock											
Trial of new planting techniques (trial site, Pilot 2)											
Monitor trial site (6 & 12 months) refer to monitoring targets											
Investigate and procure materials for planting and tree protection devices											
Investigate and secure a tree growing program with a local provider											
Benchmark report to Steering Committee											
Pilot 2 - Connected Canopy Tree Infill (LOCC)											
Survey of street to confirm existing trees											
Procurement of stock listed (refer strategy)											
Plant out street (trial site, Lindsay Ave)											
Monitor trial site bi-annually for 2 years											
Benchmark report to Steering Committee											
Implement recommendations of the Steering Committee											
Develop plan for infill streets											
Roll out LOCC infill streets											

Detailed Action Plan

	2024/25	2026	2027	2028	2029	2030	2035	2040	2050	2060	2070
	Intense Initiation Phase										
Pilot 3 - Pocket Park Infill Planting											
Survey of park to confirm existing trees											
Procurement of stock listed (refer strategy)											
Plant out street (trial site, Pilot 1)											
Monitor trial site bi-annually for 2 years											
Benchmark report to Steering Committee											
Implement recommendations of the Steering Committee											
Develop plan for infill parks											
Pilot 4 - Industrial Street											
Community consultation to find subject site											
Survey of street to confirm existing trees											
Procurement of stock listed (refer strategy)											
Plant out street (trial site)											
Monitor trial site bi-annually for 2 years											
Continue communication with community											
Benchmark report to Steering Committee											
Implement recommendations of the Steering Committee											
Develop plan for remaining streets, if any											

Detailed Action Plan

	2024/25	2026	2027	2028	2029	2030	2035	2040	2050	2060	2070
	Intense Initiation Phase										
Pilot 5 - Brochure/Communication Strategy ‘ Adopt a Street Tree’											
Graphic Design of brochure for distribution											
Development of website based platform to promote key points and milestones											
Social media promotions											
Development of relationship with Community/Business working group to promote strategy within the community											
Ongoing development of ‘Adopt a Street Tree’ supports with the working group											
Roll out infill parks											
Easy Wins											
Bus Stops											
Locate all bus stops											
Devise 3 year planting plan & enact planting											
Local Shops											
Locate all local shops and enter into negotiation for planting on their land											
Devise 3 year planting plan & enact planting											
Residential Lots Infill Planting											
Divide town into ‘neighbourhoods’											
Develop matrix to deliver planting across the town in 15 years - goal is to achieve a minimum of 1 tree per lot (existing or planted)											

Detailed Action Plan

	2024/25	2026	2027	2028	2029	2030	2035	2040	2050	2060	2070
	Intense Initiation Phase										
Incentivise Residential Lot Planting											
Incentive scheme for residents to encourage private lot planting and care of their verge tree											
Street Tree Trials											
Trials of additional species to be investigated by the Technical Group											
Species selected and procured											
Plant, establish & maintain trial sites											
Monitor trial site bi-annually for 2 years											
Benchmark reporting											
Continue with trials for 5 years											



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Glossary

ALEC	Arid Lands Environment Centre
AS	Alice Springs
ASTC	Alice Springs town Council
CBD	Central Business District
DIPL	Department of Infrastructure, Planning and Logistics
NTG	Northern Territory Government
LGA	Local Government Authority
TR	Todd River

Arrernte	The Aboriginal Arrernte (pronounced arrunda) people are the traditional custodians of Alice Springs and the surrounding region. Mparntwe (pronounced m’barn-twa) is the Arrernte name of Alice Springs
Blue Infrastructure	Network of natural or designed water elements that are permanently or occasionally inundated or flowing (SA HB 214:2023)
Endemic Species	Native Australian species that occur locally

Green Infrastructure	Green infrastructure includes both natural and designed greening – from parks and street trees to green roofs, rain gardens and green laneways. (CoM, 2023)
Grey Infrastructure	Conventional forms of engineered infrastructure (SA HB 214:2023)
Human Thermal Comfort	Combination of levels of heat, humidity and air movement considered pleasant for humans (SA HB 214:2023)
Layered Overlapping Connected Canopy (LOCC)	A system of tree planting that encourages groups of trees to grow closely together to maximise tree canopy and shade
Lhere Artepe	Lhere Artepe Aboriginal Corporation is the registered and recognised Prescribed Body Corporate representing the Native Title Holders of Alice Springs following their court determination ruling and registered Incorporated body in 2002.
Lopping	Practice of cutting tree limbs
NATSPEC	Preferred specification system for major building professionals. Government departments, contractors, consultants and architects endorse NATSPEC.
Net Gain	Increase in green cover or tree canopy cover within a defined period after a development project is complete (SA HB 214:2023)

No Net Loss	Return to original green cover or tree canopy cover within a defined period after a project is completed (SA HB 214:2023)
Resilience	Adaptive capacity of an organization or system in a complex and changing environment (SA HB 214:2023)
Tree Canopy Cover	Combined area of tree crowns that obscures the ground when viewed from above (SA HB 214:2023)
Urban Green Infrastructure	All of the vegetation that provides environmental, economic and social benefits such as clean air and water, climate regulation, food provision, erosion control and places for recreation. (CSIRO 2023)
Urban Green Infrastructure Target	Defined objective or outcomes, often stated within an urban green infrastructure strategy (SA HB 214:2023)
Urban Heat Island Effect (Heat Island Effect)	Localised warming in towns and cities as compared to surrounding non-urbanised vegetated landscapes (SA HB 214:2023)

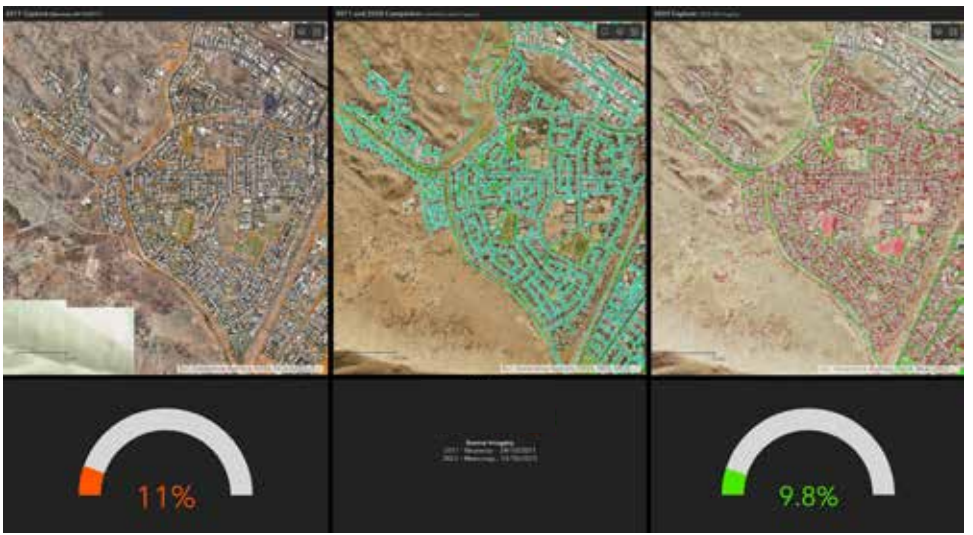
Appendices



Appendix A - Canopy Mapping



Canopy Cover Mapping - Larapinta Residential



Canopy Cover Mapping - Gillen Residential

Canopy Cover Differences Between Residential Areas:

- Larapinta Residential: 11.6%
- Gillen Residential: 9.8%
- Braitling Residential 15.4%
- Eastside Residential: 13.5%
- Golf Course Residential: 14.4



Canopy Cover Mapping - Braitling Residential



Canopy Cover Mapping - Eastside Residential



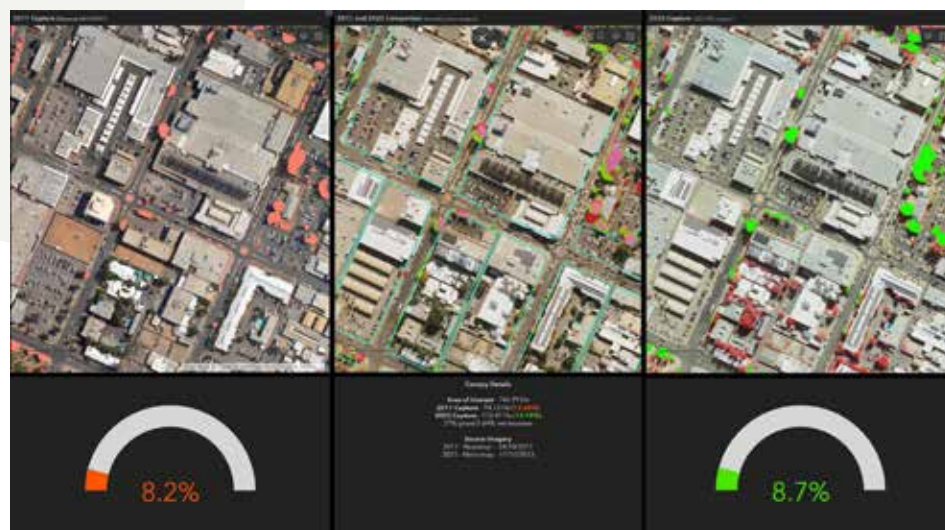
Canopy Cover Mapping - Golf Course Residential



Canopy cover mapping - Central Business District



Canopy cover mapping - Central Business District



Canopy cover mapping - Central Business District

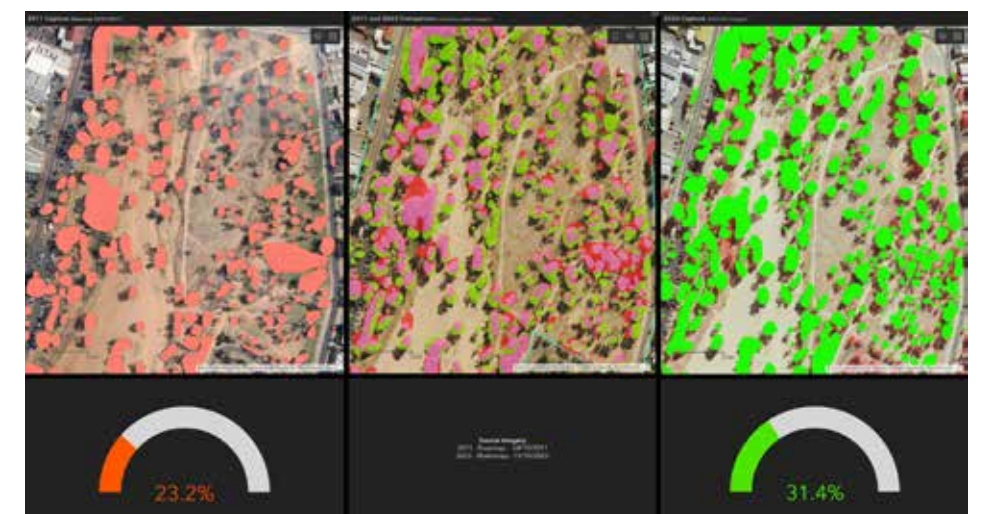
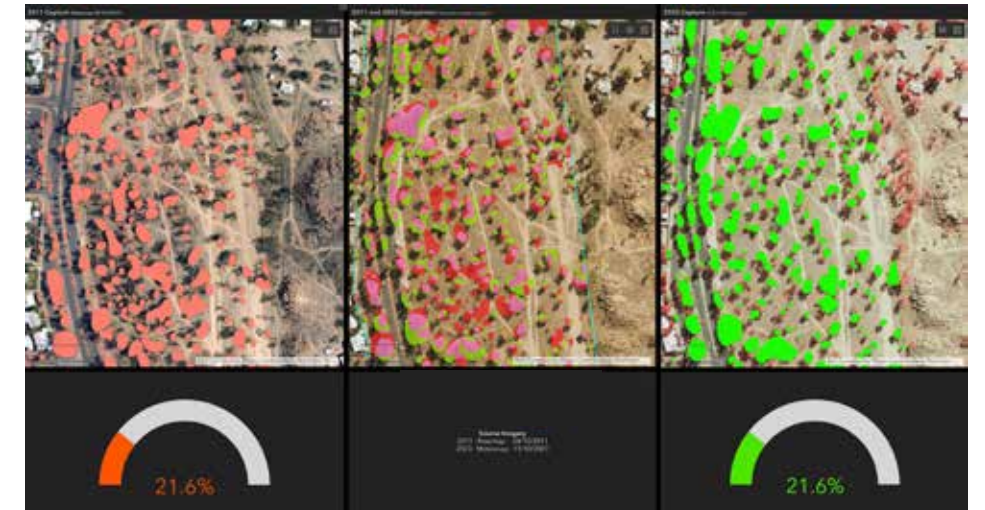
Canopy Coverage - CBD

Coverage in the CBD is highly variable and possibly up to 13% - however this figure is skewed by the atypical park like setting around of the council offices and the car parks on Hartley St having a much higher density of trees than the typical CBD streetscapes. This figure is also inflated by the trees along the Stuart Hwy, which again are not typical of the CBD.

When we look more closely at areas which exclude the council offices and the highway planting the coverage is generally between 6-9%. This drops as low as 4% when just considering some streets/blocks in the south-west corner.

Canopy Coverage - Todd River

Not surprisingly the Todd River has the highest level of canopy cover. Generally over 30% in the areas sampled (right). The 21.6% result is likely skewed down by the bare hills taking up approximately 25% of the frame.



Sample Canopy Coverage, Todd River

Canopy Coverage - Pilot project - Lindsay Avenue



Canopy Coverage - Pilot project - Kilgariff Park



Appendix B - Tree Species

Approach Roads

Recommended tree mix

- 30% large canopy
- 50% medium canopy
- 20% small canopy

Street Tree List

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L.M.S)	Unimpeded spaces	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Acacia anuera</i>	Mulga	4-10m	2-6m	S		•	•		•		•					•
<i>Acacia cyperophylla</i>	Red Mulga	3-12m	3-8m	M		•	•		•	•	•					
<i>Acacia estrophiolata</i>	Ironwood	4-16m	5-10m	L		•	•				•					
<i>Acacia pendula</i>	Weeping Myall	4-9m	4-6m	S		•	•		•	•	•					
<i>Acacia pruinocarpa</i>	Black Gidgee	4-10m	2-6m	S		•	•		•		•					
<i>Acacia sericophylla</i>	Dogwood	3-10m	3-5m	S		•	•		•	•	•					
<i>Atalaya hemiglauca</i>	Whitewood	3-9m	2-4m	S		•	•	•		•	•					
<i>Brachychiton acerifolius</i>	Flame tree	15m	5-8m	M	•			•				•				
<i>Brachychiton gregorii</i>	Desert Kurrajong	4-8m	2-4m	S		•	•	•	•	•	•					•
<i>Brachychiton rupestris</i>	Queensland Bottle Tree	6-15m	5-10m	M		•	•	•		•		•				
<i>Callitris glaucophylla</i>	White Cypress Pine	4-10m	3-8m	S		•	•		•	•	•					
<i>Corymbia aparrerinja</i>	Ghost gum	8-18m	4-10m	L	•	•	•	•		•	•					•
<i>Corymbia opaca</i>	Desert bloodwood	15m	8m	M	•	•	•	•			•					•
<i>Eucalyptus coolabah ssp. arida</i>	Coolibah	6-15m	5-10m	L	•	•	•	•	•		•			•		
<i>Eucalyptus intertexta</i>	Bastard Coolibah	6-18m	5-12m	L	•	•	•	•	•		•					
<i>Eucalyptus leucophloea</i>	Migum	3-10m	2-6m	S		•	•					•				
<i>Eucalyptus torquata</i>	Coral Gum	6-10m	5-8m	S		•	•	•		•		•				
<i>Eucalyptus victrix</i>	Dwarf ghost gum	2-10m	2-6m	S		•	•					•				
<i>Eucalyptust thozetiana</i>	Thozet's Box	7-20m	4-10m	M	•	•	•		•	•		•				
<i>Grevillea robusta</i>	Silky Oak	5-25m	6-15m	L	•	•	•	•		•		•				
<i>Grevillea striata</i>	Beefwood	6-15m	3-6m	M			•			•	•				•	
<i>Pittosporum angustifolium</i>	Native apricot	10m	4m	M		•	•				•					

Street Tree List - Under Powerlines

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L.M.S)	Suitable Under powerlines	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Eremophila bignoniflora</i>	Emu bush	5m	5m	S	•	•	•			•	•					
<i>Eucalyptus gamophylla</i>	Blue Mallee	6-8m	4-6m	S	•	•	•			•	•				•	
<i>Eucalyptus gillienii</i>	Mallee Red Gum	3-7m	2-6m	S	•	•	•		•		•					
<i>Eucalyptus kruseana</i>	Book-leaf Mallee	2-5m	3-5m	S	•	•	•		•	•						
<i>Eucalyptus lucens</i>	Shiny-leaved Mallee	2-5m	2-3m	S	•	•	•		•	•	•					
<i>Eucalyptus oxymitra</i>	Sharp-capped Mallee	6m	2-5m	S	•	•	•								•	
<i>Eucalyptus sargentii</i>	Salt River Mallee	5-10m	4-7m	M	•	•	•		•					•		
<i>Eucalyptus socialis ssp. eucentrica</i>	Red Mallee	3-12m	4-8m	S	•	•	•		•		•					
<i>Hakea divaricata</i>	Fork-leaved Corkwood	4-7m	2-4m	S	•	•		•		•						
<i>Hakea lorea</i>	Long-leaved Corkwood	6m	5m	S		•				•						
<i>Myoporum montanum</i>	Boobialla	2-4m	1-3m	S	•	•	•		•	•	•					

Tree Species

Avenues

Recommended tree mix

- 40% large canopy
- 40% medium canopy
- 20% small canopy

Street Tree List

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Unimpeded spaces	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Acacia sericophylla</i>	Dogwood	3-10m	3-5m	S		•	•		•	•	•					
<i>Atalaya hemiglauca</i>	Whitewood	3-9m	2-4m	S		•	•	•		•	•					
<i>Brachychiton rupestris</i>	Queensland Bottle Tree	6-15m	5-10m	M		•	•	•		•		•				
<i>Callitris glaucophylla</i>	White Cypress Pine	4-10m	3-8m	S		•	•		•	•	•					
<i>Corymbia aparrerinja</i>	Ghost gum	8-18m	4-10m	L	•	•	•	•		•	•					•
<i>Corymbia opaca</i>	Desert bloodwood	15m	8m	M	•	•	•	•			•					•
<i>Eucalyptus camaldulensis 'wiluna'</i>	Wiluna River Red Gum - dwarf form	12-15m	4-6m	L	•	•	•	•	•		•			•		•
<i>Eucalyptus coolabah ssp. arida</i>	Coolibah	6-15m	5-10m	L	•	•	•	•	•		•			•		
<i>Eucalyptus intertexta</i>	Bastard Coolibah	6-18m	5-12m	L	•	•	•	•	•		•					
<i>Eucalyptus leucophloea</i>	Migum	3-10m	2-6m	S		•	•					•				
<i>Eucalyptus torquata</i>	Coral Gum	6-10m	5-8m	S		•	•	•		•		•				
<i>Eucalyptus victrix</i>	Dwarf ghost gum	2-10m	2-6m	S		•	•					•				
<i>Eucalyptust thozetiana</i>	Thozet's Box	7-20m	4-10m	M	•	•	•		•	•		•				
<i>Grevillea robusta</i>	Silky Oak	5-25m	6-15m	L	•	•	•	•		•		•				
<i>Grevillea striata</i>	Beefwood	6-15m	3-6m	M			•			•	•				•	
<i>Melaleuca bracteata</i>	Black teatree	4-8m	3-5m	S		•	•	•			•					
Exotic species																
<i>Phoenix canariensis</i>	Canary Island Date Palm	20m	6-10m	L	•			•			•			•		
<i>Schinus molle</i>	Peppercorn Tree	18m	8-12m	L	•			•	•		•			•		

Street Tree List - Under Powerlines

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Suitable Under powerlines	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Eremophila bignoniiflora</i>	Emu bush	5m	5m	S	•	•	•			•	•					
<i>Eucalyptus gillienii</i>	Mallee Red Gum	3-7m	2-6m	S	•	•	•		•		•					
<i>Eucalyptus kruseana</i>	Book-leaf Mallee	2-5m	3-5m	S	•	•	•		•	•						
<i>Eucalyptus lucens</i>	Shiny-leaved Mallee	2-5m	2-3m	S	•	•	•		•	•	•					
<i>Eucalyptus minniritchi</i>	Round-leaved Mallee	1.5-6m	2-5m	S	•	•	•		•	•	•					
<i>Eucalyptus oxymitra</i>	Sharp-capped Mallee	6m	2-5m	S	•	•	•								•	
<i>Eucalyptus pachyphylla</i>	Red-bud Mallee	1.5-4m	3-5m	S	•	•	•		•	•	•					
<i>Eucalyptus sargentii</i>	Salt River Mallee	5-10m	4-7m	M	•	•	•		•					•		
<i>Eucalyptus socialis ssp. eucentrica</i>	Red Mallee	3-12m	4-8m	S	•	•	•		•		•					
<i>Hakea divaricata</i>	Fork-leaved Corkwood	4-7m	2-4m	S	•	•		•		•						
<i>Hakea lorea</i>	Long-leaved Corkwood	6m	5m	S		•				•						
<i>Myoporum montanum</i>	Boobialla	2-4m	1-3m	S	•	•	•		•	•	•					

Tree Species

Todd River Edge

Recommended tree mix

- 50% large canopy
- 30% medium canopy
- 20% small canopy

Street Tree List

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Unimpeded spaces	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Atalaya hemiglauca</i>	Whitewood	3-9m	2-4m	S		•	•	•		•	•					
<i>Callitris glaucophylla</i>	White Cypress Pine	4-10m	3-8m	S		•	•		•	•	•					
<i>Corymbia aparrerinja</i>	Ghost gum	8-18m	4-10m	L	•	•	•	•		•	•					•
<i>Corymbia opaca</i>	Desert bloodwood	15m	8m	M	•	•	•	•			•					•
<i>Eremophila bigoniflora</i>	Emu bush	5m	5m	S	•	•	•			•	•					
<i>Eucalyptus camaldulensis 'wiluna'</i>	Wiluna River Red Gum - dwarf form	12-15m	4-6m	L	•	•	•	•	•		•			•		•
<i>Eucalyptus coolabah ssp. arida</i>	Coolibah	6-15m	5-10m	L	•	•	•	•	•		•			•		
<i>Eucalyptus gamophylla</i>	Blue Mallee	6-8m	4-6m	S	•	•	•			•	•				•	
<i>Eucalyptus gillenii</i>	Mallee Red Gum	3-7m	2-6m	S	•	•	•		•		•					
<i>Eucalyptus intertexta</i>	Bastard Coolibah	6-18m	5-12m	L	•	•	•	•	•		•					
<i>Eucalyptus kruseana</i>	Book-leaf Mallee	2-5m	3-5m	S	•	•	•		•	•						
<i>Eucalyptus leucophloea</i>	Migum	3-10m	2-6m	S		•	•					•				
<i>Eucalyptus lucens</i>	Shiny-leaved Mallee	2-5m	2-3m	S	•	•	•		•	•	•					
<i>Eucalyptus minniritchi</i>	Round-leaved Mallee	1.5-6m	2-5m	S	•	•	•		•	•	•					
<i>Eucalyptus oxymitra</i>	Sharp-capped Mallee	6m	2-5m	S	•	•	•								•	
<i>Eucalyptus pachyphylla</i>	Red-bud Mallee	1.5-4m	3-5m	S	•	•	•		•	•	•					
<i>Eucalyptus sargentii</i>	Salt River Mallee	5-10m	4-7m	M	•	•	•		•					•		
<i>Eucalyptus socialis ssp. eucentrica</i>	Red Mallee	3-12m	4-8m	S	•	•	•		•		•					
<i>Eucalyptus torquata</i>	Coral Gum	6-10m	5-8m	S		•	•	•		•		•				
<i>Eucalyptus victrix</i>	Dwarf ghost gum	2-10m	2-6m	S		•	•					•				
<i>Eucalyptus thozetiana</i>	Thozet's Box	7-20m	4-10m	M	•	•	•		•	•		•				
<i>Hakea divaricata</i>	Fork-leaved Corkwood	4-7m	2-4m	S	•	•		•		•						
<i>Hakea lorea</i>	Long-leaved Corkwood	6m	5m	S	•	•				•						
<i>Melaleuca bracteata</i>	Black teatree	4-8m	3-5m	S		•	•	•	•		•					
<i>Melaleuca dissitiflora</i>	Paperbark	3m	2-4m	S	•	•	•			•	•					
<i>Melaleuca glomerata</i>	Inland Tea-tree	2-5m	3-5m	S	•	•	•		•		•			•		
<i>Myoporum montanum</i>	Boobialla	2-4m	1-3m	S	•	•	•		•	•	•					
<i>Pittosporum angustifolium</i>	Native apricot	10m	4m	M		•	•				•					

Tree Species

Widened Edge

Recommended tree mix

- 50% large canopy
- 30% medium canopy
- 20% small canopy

Street Tree List

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Unimpeded spaces	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Acacia anuera</i>	Mulga	4-10m	2-6m	S		•	•		•		•					•
<i>Acacia cyperophylla</i>	Red Mulga	3-12m	3-8m	M		•	•		•	•	•					
<i>Acacia estrophiolata</i>	Ironwood	4-16m	5-10m	L		•	•				•					
<i>Acacia pendula</i>	Weeping Myall	4-9m	4-6m	S		•	•		•	•	•					
<i>Acacia pruinocarpa</i>	Black Gidgee	4-10m	2-6m	S		•	•		•		•					
<i>Acacia sericophylla</i>	Dogwood	3-10m	3-5m	S		•	•		•	•	•					
<i>Atalaya hemiglauca</i>	Whitewood	3-9m	2-4m	S		•	•	•		•	•					
<i>Callitris glaucophylla</i>	White Cypress Pine	4-10m	3-8m	S		•	•		•	•	•					
<i>Corymbia aparrerinja</i>	Ghost gum	8-18m	4-10m	L	•	•	•	•		•	•					•
<i>Corymbia opaca</i>	Desert bloodwood	15m	8m	M	•	•	•	•			•					•
<i>Eucalyptus camaldulensis 'wiluna'</i>	Wiluna River Red Gum - dwarf form	12-15m	4-6m	L	•	•	•	•	•		•			•		•
<i>Eucalyptus coolabah ssp. arida</i>	Coolibah	6-15m	5-10m	L	•	•	•	•	•		•			•		
<i>Eucalyptus intertexta</i>	Bastard Coolibah	6-18m	5-12m	L	•	•	•	•	•		•					
<i>Eucalyptus leucophloea</i>	Migum	3-10m	2-6m	S		•	•					•				
<i>Eucalyptus torquata</i>	Coral Gum	6-10m	5-8m	S		•	•	•		•		•				
<i>Eucalyptus victrix</i>	Dwarf ghost gum	2-10m	2-6m	S		•	•					•				
<i>Eucalyptust thozetiana</i>	Thozet's Box	7-20m	4-10m	M	•	•	•		•	•		•				
<i>Melaleuca bracteata</i>	Black teatree	4-8m	3-5m	S		•	•	•			•					
<i>Pittosporum angustifolium</i>	Native apricot	10m	4m	M		•	•				•					

Tree Species

CBD

Recommended tree mix

- 30% large canopy
- 40% medium canopy
- 30% small canopy

Street Tree List

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Unimpeded spaces	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Atalaya hemiglauca</i>	Whitewood	3-9m	2-4m	S		•	•	•		•	•					
<i>Brachychiton acerifolius</i>	Flame tree	15m	5-8m	M	•			•				•				
<i>Brachychiton gregorii</i>	Desert Kurrajong	4-8m	2-4m	S		•	•	•	•	•	•					•
<i>Brachychiton rupestris</i>	Queensland Bottle Tree	6-15m	5-10m	M		•	•	•		•		•				
<i>Callitris glaucophylla</i>	White Cypress Pine	4-10m	3-8m	S		•	•		•	•	•					
<i>Corymbia aparrerinja</i>	Ghost gum	8-18m	4-10m	L	•	•	•	•		•	•					•
<i>Corymbia opaca</i>	Desert bloodwood	15m	8m	M	•	•	•	•			•					•
<i>Eucalyptus coolabah ssp. arida</i>	Coolibah	6-15m	5-10m	L	•	•	•	•	•		•			•		
<i>Eucalyptus intertexta</i>	Bastard Coolibah	6-18m	5-12m	L	•	•	•	•	•		•					
<i>Eucalyptus leucophloea</i>	Migum	3-10m	2-6m	S		•	•					•				
<i>Eucalyptus torquata</i>	Coral Gum	6-10m	5-8m	S		•	•	•		•		•				
<i>Eucalyptus victrix</i>	Dwarf ghost gum	2-10m	2-6m	S		•	•					•				
<i>Eucalyptus thozetiana</i>	Thozet's Box	7-20m	4-10m	M	•	•	•		•	•		•				
<i>Grevillea robusta</i>	Silky Oak	5-25m	6-15m	L	•	•	•	•		•		•				
<i>Grevillea striata</i>	Beefwood	6-15m	3-6m	M			•			•	•				•	
<i>Melaleuca bracteata</i>	Black teatree	4-8m	3-5m	S		•	•	•			•					
<i>Pittosporum angustifolium</i>	Native apricot	10m	4m	M		•	•				•					
Exotic species																
<i>Melia azedarach</i> 'Elite	Seedless White Cedar	16m	8-12m	L	•		•	•	•		•		•			
<i>Phoenix canariensis</i>	Canary Island Date Palm	20m	6-10m	L	•			•			•			•		
<i>Schinus molle</i>	Peppercorn Tree	18m	8-12m	L	•			•	•		•			•		

Street Tree List - Under Powerlines

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Suitable Under powerlines	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Callistemon 'Harkness'</i>	Bottlebrush	3-7m	3-6m	S	•	•	•			•		•				
<i>Callistemon 'Kings Park Special'</i>	Bottlebrush	2-5m	2-4m	S	•	•	•			•		•				
<i>Eremophila bignoniiflora</i>	Emu bush	5m	5m	S	•	•	•			•	•					
<i>Hakea divaricata</i>	Fork-leaved Corkwood	4-7m	2-4m	S	•	•		•		•						
<i>Hakea lorea</i>	Long-leaved Corkwood	6m	5m	S	•	•				•						
<i>Melaleuca (Callistemon) viminalis</i>	Weeping bottlebrush	4-8m	3-6m	S	•	•	•	•		•		•				
<i>Myoporum montanum</i>	Boobialla	2-4m	1-3m	S	•	•	•		•	•	•					

Tree Species

Suburbs/Industrial

Recommended tree mix

- 30% large canopy
- 40% medium canopy
- 30% small canopy

Street Tree List

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Unimpeded spaces	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Acacia anuera</i>	Mulga	4-10m	2-6m	S		•	•		•		•					•
<i>Acacia cyperophylla</i>	Red Mulga	3-12m	3-8m	M		•	•		•	•	•					
<i>Acacia estrophiolata</i>	Ironwood	4-16m	5-10m	L		•	•				•					
<i>Acacia pendula</i>	Weeping Myall	4-9m	4-6m	S		•	•		•	•	•					
<i>Acacia pruinocarpa</i>	Black Gidgee	4-10m	2-6m	S		•	•		•		•					
<i>Acacia sericophylla</i>	Dogwood	3-10m	3-5m	S		•	•		•	•	•					
<i>Atalaya hemiglauca</i>	Whitewood	3-9m	2-4m	S		•	•	•		•	•					
<i>Brachychiton acerifolius</i>	Flame tree	15m	5-8m	M	•			•				•				
<i>Brachychiton gregorii</i>	Desert Kurrajong	4-8m	2-4m	S		•	•	•	•	•	•					•
<i>Brachychiton rupestris</i>	Queensland Bottle Tree	6-15m	5-10m	M		•	•	•		•		•				
<i>Callitris glaucophylla</i>	White Cypress Pine	4-10m	3-8m	S		•	•		•	•	•					
<i>Corymbia aparrerinja</i>	Ghost gum	8-18m	4-10m	L	•	•	•	•		•	•					•
<i>Corymbia opaca</i>	Desert bloodwood	15m	8m	M	•	•	•	•			•					•
<i>Eucalyptus coolabah ssp. arida</i>	Coolibah	6-15m	5-10m	L	•	•	•	•	•		•			•		
<i>Eucalyptus intertexta</i>	Bastard Coolibah	6-18m	5-12m	L	•	•	•	•	•		•					
<i>Eucalyptus leucophloea</i>	Migum	3-10m	2-6m	S		•	•					•				
<i>Eucalyptus torquata</i>	Coral Gum	6-10m	5-8m	S		•	•	•		•		•				
<i>Eucalyptus victrix</i>	Dwarf ghost gum	2-10m	2-6m	S		•	•					•				
<i>Eucalyptust thozetiana</i>	Thozet's Box	7-20m	4-10m	M	•	•	•		•	•		•				
<i>Grevillea robusta</i>	Silky Oak	5-25m	6-15m	L	•	•	•	•		•		•				
<i>Grevillea striata</i>	Beefwood	6-15m	3-6m	M			•			•	•				•	
<i>Melaleuca bracteata</i>	Black teatree	4-8m	3-5m	S		•	•	•			•					
<i>Pittosporum angustifolium</i>	Native apricot	10m	4m	M		•	•				•					
Exotic species																
<i>Melia azedarach 'Elite'</i>	Seedless White Cedar	16m	8-12m	L	•		•	•	•		•		•			

Street Tree List - Under Powerlines

Botanical name	Common name	Mature Height	Mature Crown Spread	Tree Category (L,M,S)	Suitable Under powerlines	Habitat Value	Suitable for Arid Climate	Provide Shade	Frost	Aesthetic	Locally endemic native species	Australian Species	Exotic Species	Salinity	Sandy well drained	Iconic species
<i>Callistemon 'Harkness'</i>	Bottlebrush	3-7m	3-6m	S	•	•	•			•		•				
<i>Callistemon 'Kings Park Special'</i>	Bottlebrush	2-5m	2-4m	S	•	•	•			•		•				
<i>Eremophila bignoniiflora</i>	Emu bush	5m	5m	S	•	•	•			•	•					
<i>Eucalyptus gamophylla</i>	Blue Mallee	6-8m	4-6m	S	•	•	•			•	•				•	
<i>Eucalyptus gillenii</i>	Mallee Red Gum	3-7m	2-6m	S	•	•	•		•		•					
<i>Eucalyptus kruseana</i>	Book-leaf Mallee	2-5m	3-5m	S	•	•	•		•	•						
<i>Eucalyptus lucens</i>	Shiny-leaved Mallee	2-5m	2-3m	S	•	•	•		•	•	•					
<i>Eucalyptus minniritchi</i>	Round-leaved Mallee	1.5-6m	2-5m	S	•	•	•		•	•	•					
<i>Eucalyptus oxymitra</i>	Sharp-capped Mallee	6m	2-5m	S	•	•	•								•	
<i>Eucalyptus pachyphylla</i>	Red-bud Mallee	1.5-4m	3-5m	S	•	•	•		•	•	•					
<i>Eucalyptus sargentii</i>	Salt River Mallee	5-10m	4-7m	M	•	•	•		•					•		
<i>Eucalyptus socialis ssp. eucentrica</i>	Red Mallee	3-12m	4-8m	S	•	•	•		•		•					
<i>Hakea divaricata</i>	Fork-leaved Corkwood	4-7m	2-4m	S	•	•		•		•						
<i>Hakea lorea</i>	Long-leaved Corkwood	6m	5m	S	•	•				•						
<i>Melaleuca (Callistemon) viminalis</i>	Weeping bottlebrush	4-8m	3-6m	S	•	•	•	•		•		•				
<i>Melaleuca dissitiflora</i>	Paperbark	3m	2-4m	S	•	•	•			•	•					
<i>Melaleuca glomerata</i>	Inland Tea-tree	2-5m	3-5m	S	•	•	•		•		•			•		
<i>Myoporum montanum</i>	Boobialla	2-4m	1-3m	S	•	•	•		•	•	•					

Appendix C - Costings

COOL SCHOOL ROUTES - EXAMPLE

Method 1

Stage 1

Trees per year (min 1 tree per lot within 250m radius of the school on allocated routes =111 trees x 8 school sites
\$220 per tree (25L tree, supply, install)
Establishment (13 weeks, \$1800 per week and Maintenance 39 weeks, \$500 per week)
Sub-total Stage 1

Stage 2

Trees per year (min 1 tree per lot within 250m - 500m radius of the school on allocated routes) = 213 trees x 8 school sites
\$220 per tree (25L tree, supply, install)
Establishment (13 weeks, \$3000 per week and Maintenance 39 weeks, \$900 per week)
Sub-total Stage 2

Stage 3

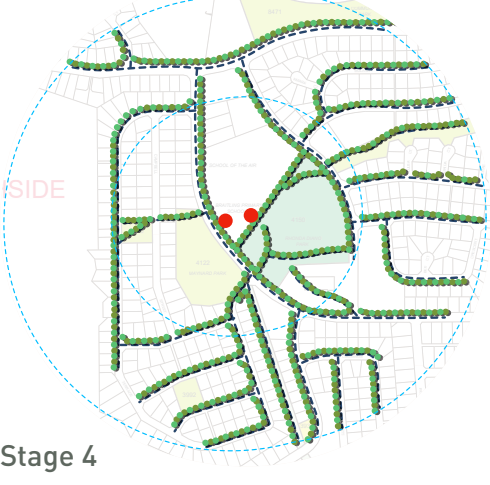
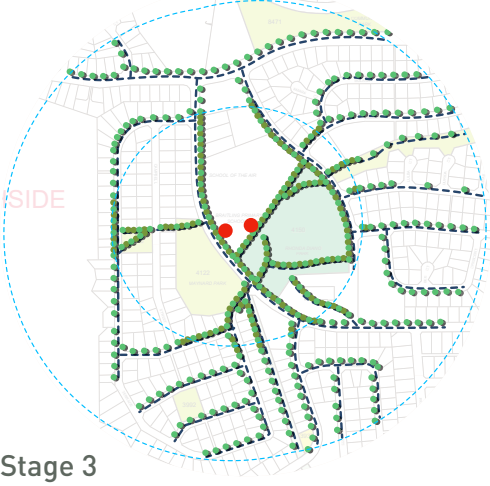
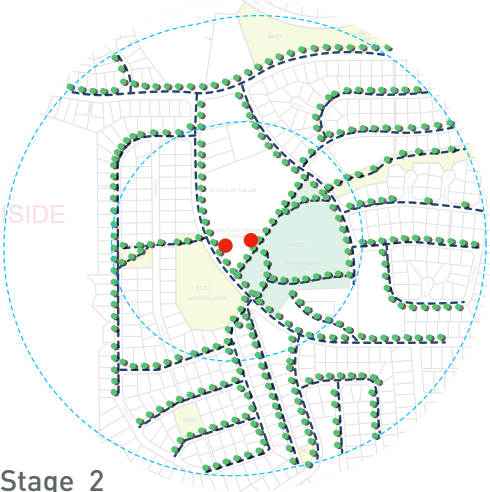
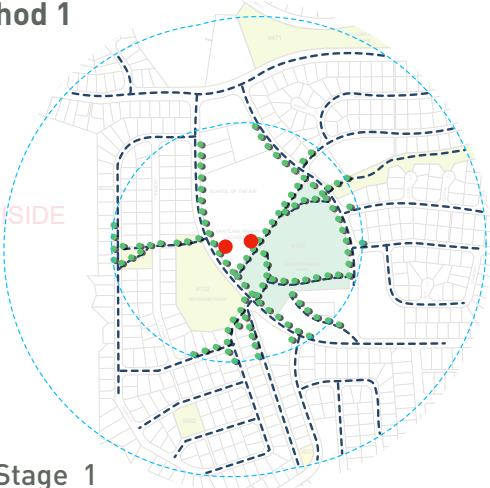
Trees per year (LOCC within 250m radius of the school on allocated routes) = 114 trees x 8 school sites
\$220 per tree (25L tree, supply, install)
Establishment (13 weeks, \$1800 per week and Maintenance 39 weeks, \$500 per week)
Sub-total Stage 3

Stage 4

Trees per year (LOCC within 250m - 500m radius of the school on allocated routes = 208 trees x 8 school sites
\$220 per tree (25L tree, supply, install)
Establishment (13 weeks, \$3000 per week and Maintenance 39 weeks, \$900 per week)
Sub-total Stage 4

Total Stages - over 7 Years

Method 1



Example School

Method 1

Stage 1 (minimum service provision of 1 tree per lot) on the side of the street with a path

1. Infill to achieve 1 tree per lot along all routes within 250m of school gate
2. Infill to achieve 1 tree per lot along all routes within 500m of school gate
3. Infill remaining opportunities for planting within 250m of school gate
4. Infill remaining opportunities for planting within 500m of school gate

Advantages:

- Equitable increase in canopy cover across the school sites

Disadvantages:

- Higher maintenance costs due to maintaining across a wider zone and having to return to zones for LOCC

Method 2 - (based on achieving LOCC immediately within each zone) on the side of the street with a path

1. Infill plant to achieve 100% infill up to 200m from school gates
2. Infill plant to achieve 100% infill up to 300m from school gates
3. Infill plant to achieve 100% infill up to 400m from school gates
4. Infill plant to achieve 100% infill up to 500m from school gates

Advantages:

- Lower maintenance costs due to intensive maintenance zone

Disadvantages:

- Minimum service levels and full canopy is achieved quicker in areas closer to the school

NOTE:

- The summary costings page applies a multiplier to achieve costings for 60% infill over Stages 1-2 and then achieving 100% in stages 3 & 4.

Method 2

Stage 1

Trees per year (LOCC within 200m radius of the school on allocated routes = 112 trees x 8 school sites

\$220 per tree (25L tree, supply, install)

Establishment (13 weeks, \$1800 per week and

Maintenance 39 weeks, \$500 per week)

Sub-total per year

Stage 2

Trees per year (LOCC within 200-300m radius of the school on allocated routes = 165 trees x 8 school sites

\$220 per tree (25L tree, supply, install)

Establishment (13 weeks, \$2600 per week and

Maintenance 39 weeks, \$700 per week)

Sub-total per year

Stage 3

Trees per year (LOCC within 300-400m radius of the school on allocated routes = 191 trees x 8 school sites

\$220 per tree (25L tree, supply, install)

Establishment (13 weeks, \$2900 per week and

Maintenance 39 weeks, \$800 per week)

Sub-total per year

Stage 4

Trees per year (LOCC within 400-500m radius of the school on allocated routes = 178 trees x 8 school sites

\$220 per tree (25L tree, supply, install)

Establishment (13 weeks, \$2700 per week and

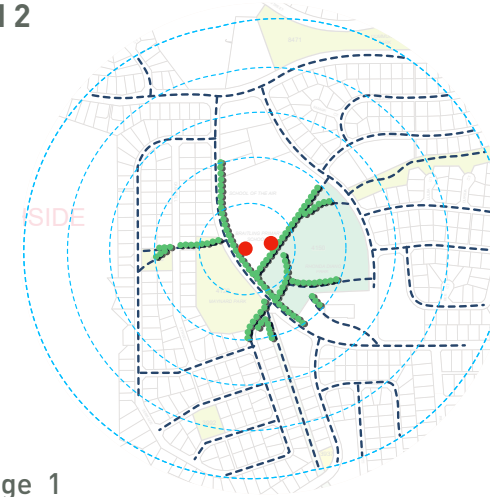
Maintenance 39 weeks, \$750 per week)

Sub-total per year

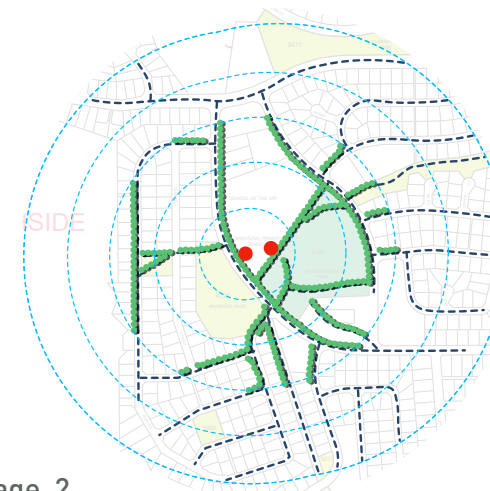
Total Stages - over 7 Years

Method 2

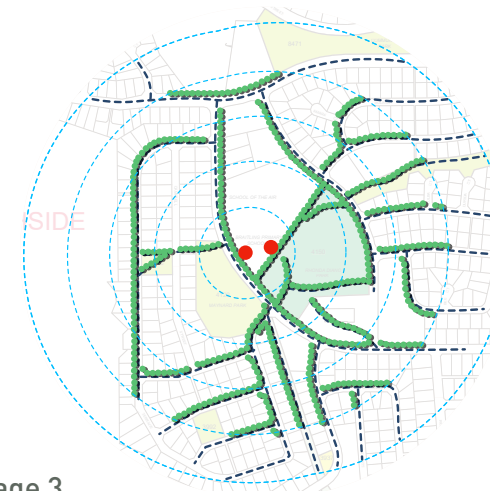
Stage 1



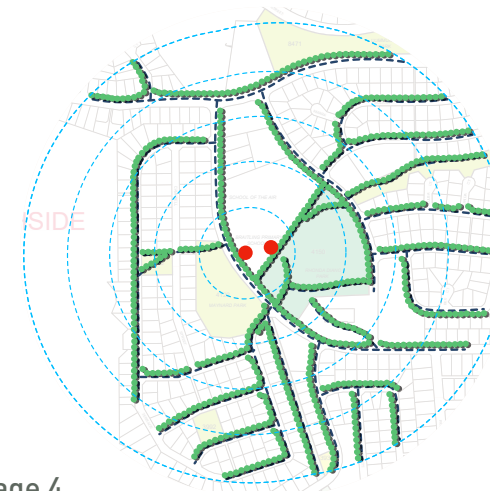
Stage 2



Stage 3



Stage 4



Example School

Method 2 - (based on achieving LOCC immediately within each zone) on the side of the street with a path

1. Infill plant to achieve 100% infill up to 200m from school gates
2. Infill plant to achieve 100% infill up to 300m from school gates
3. Infill plant to achieve 100% infill up to 400m from school gates
4. Infill plant to achieve 100% infill up to 500m from school gates

Advantages:

- Lower maintenance costs due to intensive maintenance zone

Disadvantages:

- Minimum service levels and full canopy is achieved quicker in areas closer to the school

NOTE:

- The costings shown left are for 100% infill.

PILOT PROJECT - POCKET PARK - KILGARIFF

Scenario
30 Pocket Parks (not including the Pilot park)
(Delivery of 30 parks over Years 3 - 10 = 3.75 parks per year)

Stage 1 - per park			Amount	
Stock Size	Price	Qty	Total	
Large Trees - 400L - \$1500 per tree (supply & install)	\$ 1,500.00	1	\$	1,500.00
Medium Trees - 100L - \$350 per tree (supply & install)	\$ 350.00	4	\$	1,400.00
Small Trees - 25L	\$ 220.00	30	\$	6,600.00
Total cost for supply & install			\$	9,500.00
Maintenance				
\$450 per park, per week (Establish 13 weeks)	\$ 450	13	\$	5,850.00
\$150 per park, per week (Maintain 40 weeks)	\$ 150	39	\$	5,850.00
Total cost for establishment and maintenance			\$	11,700.00
Total per year per park			\$	21,200.00

Year		Total Trees	Amount	
	1 - Pilot Park	35	\$	21,200.00
	2	0	\$	-
	3	131	\$	79,500.00
	4	131	\$	79,500.00
	5	131	\$	79,500.00
	6	131	\$	79,500.00
	7	131	\$	79,500.00
	8	131	\$	79,500.00
	9	131	\$	79,500.00
	10	131	\$	79,500.00
	Total		\$	657,200.00

RESIDENTIAL STREETSCAPE LOT INFILL

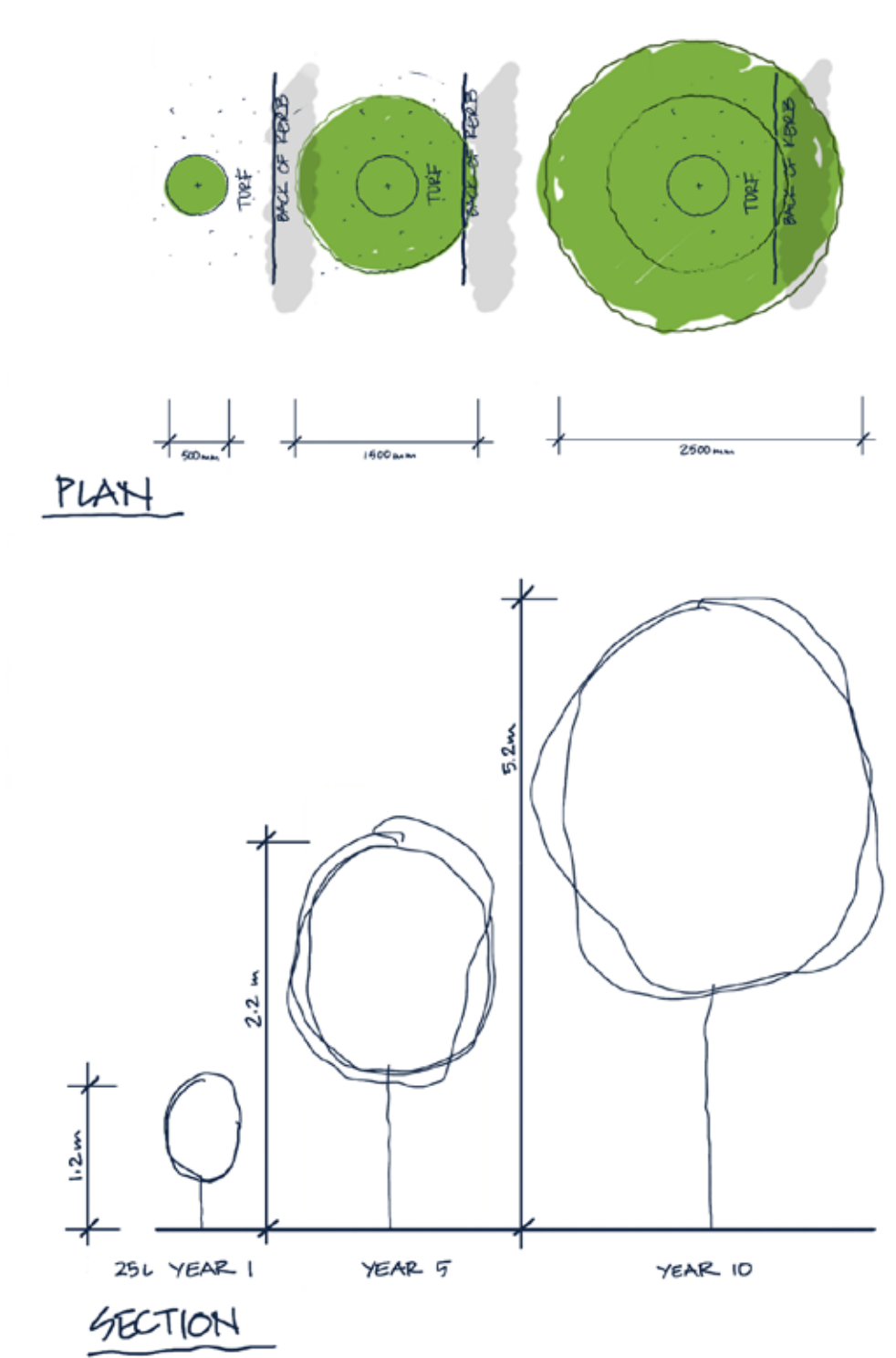
Method 1

Stage 1	Amount	Year	Amount	Total trees
Trees per year (60 trees (per 100 houses) x 5.47 groups per year). Total trees 5.47 x 60	328	1	\$ 68,000	120
\$220 per tree (25L tree, supply, install)	\$ 72,204	2	\$ -	0
Establishment (13 weeks, \$900 per week and Maintenance 39 weeks, \$250 per week) x 5.47 groups	\$ 113,776	3	\$ -	0
Sub-total per year for 5.47 groups	\$ 185,980	4	\$ -	0
Stage 1 Total (over 15 years)	\$ 2,789,700	5	\$ -	0
		6	\$ -	0
		7	\$ -	0
Stage 2				
Trees per year (60 trees (per 100 houses) x 5.47 groups per year	328	8	\$ 185,980	328
\$220 per tree (25L tree, supply, install)	\$ 72,204	9	\$ 185,980	328
Establishment (13 weeks, \$900 per week and Maintenance 39 weeks, \$250 per week) x 5.47 groups	\$ 113,776	10	\$ 185,980	328
Sub-total per year	\$ 185,980	11	\$ 185,980	328
Stage 2 Total (over 15 years, starting year 7)	\$ 2,789,700	12	\$ 371,960	656
		13	\$ 371,960	656
		14	\$ 371,960	656
		15	\$ 371,960	656
		16	\$ 371,960	656
		17	\$ 371,960	656
		18	\$ 371,960	656
		19	\$ 371,960	656
		20	\$ 371,960	656
		21	\$ 371,960	656
		22	\$ 371,960	656
		23	\$ 185,980	328
		24	\$ 185,980	328
		25	\$ 185,980	328
		26	\$ 185,980	328
			\$ 5,647,400	9966
Total Stage 1 & 2 (over 26 years in total)	\$ 5,579,400			

Method 2

Stage 1 (each year is a stage)		Year	Amount	Total trees
Trees per year (120 trees (per 100 houses) x 5.47				
groups per year	656	1	\$ 68,000	120
\$220 per tree (25L tree, supply, install)	\$ 144,408	2	\$ -	0
Establishment (13 weeks, \$1800 per week and				
Maintenance 39 weeks, \$500 per week) x 5.47				
groups	\$ 227,552	3	\$ -	0
Sub-total per year	\$ 371,960	4	\$ -	0
		5	\$ -	0
Total Stages 1 - 17 years	\$ 5,579,400	6	\$ -	0
		7	\$ -	0
		8	\$ 371,960	656
		9	\$ 371,960	656
		10	\$ 371,960	656
		11	\$ 371,960	656
		12	\$ 371,960	656
		13	\$ 371,960	656
		14	\$ 371,960	656
		15	\$ 371,960	656
		16	\$ 371,960	656
		17	\$ 371,960	656
		18	\$ 371,960	656
		19	\$ 371,960	656
		20	\$ 371,960	656
		21	\$ 371,960	656
		22	\$ 371,960	656
			\$ 5,647,400	9966

Appendix D - Canopy Growth Assumptions and Projections



Tree canopy growth calculations

Appendix E - Online Survey Comments - Practitioner Survey No. 1

Online Survey Comments - General Public Survey No. 1

Alice Springs Town Council Greening Strategy - Key stakeholders

Alice Springs Town Council Greening Strategy

#2

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, October 12, 2023 2:21:21 PM
Last Modified: Thursday, October 12, 2023 2:30:41 PM
Time Spent: 00:09:20
IP Address: [REDACTED]

Page 1

Q1 Yes

Are you aware that Alice Springs Town Council is currently developing a Greening Strategy for Alice Springs?

Q2

Can you describe your favourite tree in Alice Springs, including what you value about it?

Large gum tree on Sturt Terrace near Schwarz Crescent river crossing, overhanging the street. It is majestic - old, a very wide canopy and beautiful, providing an entry portal over the road to the end of Sturt Terrace where I swing around right to my home on Gosse St. It should be protected.

Q3

If you are aware of any non-local government programs/strategies or plans that may effect or be relevant to this Strategy please provide a list.

Menzies 'Air in Alice' project research could feed in.

Q4

Can you list any barriers that you are aware of from any perspective to increasing canopy cover in Alice Springs

Protecting existing large trees from buffel grass should be #1 priority. Planting trees with a long life is very important. Native trees best.

Q5 Yes

Are you interested in being part of the community consultation workshops being held in November regarding reducing the effects of Heat in Alice Springs through planting more trees?

Q6 Yes

Are you interested in being involved in this project outside of the bounds of this survey and the upcoming consultation events?

#1

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, October 19, 2023 10:22:46 AM
Last Modified: Thursday, October 19, 2023 10:25:02 AM
Time Spent: 00:02:16
IP Address: [REDACTED]

Page 1

Q1 No

Are you aware that Alice Springs Town Council is currently developing a Greening Strategy for Alice Springs?

Q2

Can you describe your favourite tree in Alice Springs, including what you value about it?

Ghost gum in Todd Mall. It feels like a fitting tree for the centre of town. It provides lots of shade and brings people towards it. It breaks up the infrastructure.

Q3

Can you describe an area or street in Alice Springs that you think needs more shade from tree canopy cover?

All the inner-CBD streets.

Q4 Extremely important

How important is it to you that we reduce the effects of Heat in Alice Springs with more tree canopy cover?

Q5

Are you interested in being part of the community consultation workshops being held in November regarding reducing the effects of Heat in Alice Springs through planting more trees? If so please enter your contact information.

Appendix E - Online Survey Comments - Practitioner Survey No. 2

Alice Springs Town Council Greening Strategy: Practitioner Survey

Q2 Tree species list

Answered: 5 Skipped: 1

#	RESPONSES	DATE
1	I think that Jacaranda and Pionciana have good shade qualities for Alice Springs. They grow well here and I haven't seen any examples of badly shaped trees of these species.	5/7/2024 9:46 AM
2	ensure you utilise endemic species adapted to local climatic conditions , as in the past the use of non endemic species has resulted in ill adapted plantings resluting in tree death during extended dry hotter periods	4/22/2024 10:00 AM
3	Well researched comprehensive list provided, appropriate for AS	4/19/2024 11:20 AM
4	This is wise to include a tree planting list that is suitable for verges beneath power lines. Could there possibly be a business case put forward to the NTG/PWC for undergrounding overhead powerlines at least within 500m of schools? Additionally, in summer mornings or afternoons the low sun can still penetrate depending on the side of road you walk. It may make sense to walk on the east side of the road compared with the west depending on where the shade falls.	4/17/2024 12:53 PM
5	The tree species list is well rounded, but not all exotic species will grow here due to the soil type and water quality.	4/12/2024 8:57 AM

Alice Springs Town Council Greening Strategy: Practitioner Survey

Q3 Governance Structure

Answered: 4 Skipped: 2

#	RESPONSES	DATE
1	Having met the current tree crew I think that a specific group would need to be employed to plant and maintain the Nursery and trees. People that are passionate about planting, and preferably Indigenous people.	5/7/2024 9:46 AM
2	sounds good however things always fall by the wayside in he longer term even with governance strategies in place	4/22/2024 10:00 AM
3	appropriate	4/19/2024 11:20 AM
4	Consider including in governance structure a representative from customer and supplier. Ensure governance is unambiguously defined, especially with respect to who can make which decisions, how risk is allocated, and what happens in the case of non-performance.	4/17/2024 12:53 PM

Online Survey Comments - General Public Survey No. 2

Greening Strategy Consultation -Alice Springs Town Council

Q3 Tree species listAre there any trees not on the list you think should be included? If so, please explain why.

Answered: 9 Skipped: 18

#	RESPONSES	DATE
1	No	4/27/2024 4:56 PM
2	All of the exotic species. We have such a great selection of local natives, there is no need to resort to exotics. I would also omit White Cedar (which is native, just not to Central Australia).	4/24/2024 3:32 PM
3	ALL local NATIVE trees. Not Australian trees from other regions. Must be local native flora. This will ensure an authentic look for the town and maximise the chances of survival of the plants.	4/24/2024 3:28 PM
4	Not my area of expertise but flowers that attract birds.	4/22/2024 9:54 AM
5	Native to the region	4/22/2024 9:30 AM
6	Species list looks good, excited for all the flowering trees for birds	4/19/2024 12:14 PM
7	read the names but not sure what they are be cool if some of the trees gave fruit so kids could have a nibble whilst walking to school and give bees a home	4/18/2024 11:16 PM
8	Please be aware of the shallow root systems and branches that fall off during storms	4/18/2024 8:59 PM
9	I think any trees that are native especially to this area are the best bet.	4/18/2024 10:28 AM

Greening Strategy Consultation -Alice Springs Town Council

Q6 Would you be willing to take part in this project and what motivate you to do that?

Answered: 18 Skipped: 9

#	RESPONSES	DATE
1	Yes I think it's a great idea. And would be a good way to connect the street.	4/27/2024 4:56 PM
2	Yes, Council providing the trees and good advice around care, watering and maintenance.	4/24/2024 3:32 PM
3	Yes. I want Alice to be as green as possible. My motivation is to be as responsible as possible to do my bit against global warming. Plant LOTS of LOCAL trees. Recycle, reduce, re-use and re-create instead of buying.	4/24/2024 3:28 PM
4	I would be extremely willing to be involved in this project. I manage the Nursery at Bunnings and have planted out the carpark. I am also planting trees at Blatherskite Park.	4/22/2024 10:07 PM
5	n/a	4/22/2024 12:49 PM
6	Local for many years retired now	4/22/2024 9:30 AM
7	I'm very interested in the Adopt a Tree program. I believe in the importance of cooling towns and cities using greening strategies and future proofing. It would aid in the beautification of the town.	4/22/2024 8:35 AM
8	Need trees and shade on my street	4/20/2024 11:10 PM
9	No. Property faces wrong way.	4/20/2024 10:45 PM
10	The love of trees	4/20/2024 9:16 AM

Prepared For



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Alice Springs Town Council

Prepared By



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With



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An electronic copy of this report is available on the Alice Springs Town Council website at: <https://alicesprings.nt.gov.au/>

Contributors

This report was produced by O2 Landscape Architecture in conjunction with Heritage Tree Care for the Alice Springs Town Council.

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- David Albrecht, Senior Botanist, NT Herbarium, Alice Springs
- Geoff Miers, local Alice Springs resident, Arborist