“Someone’s sitting in the shade today because someone planted a tree a long time ago.”
~ Warren Buffett ~
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The City of Unley recognises the important contribution trees and vegetation make to its community.

Such assets provide environmental benefits by way of supporting flora and fauna, addressing the negative impacts of climate change while creating a living environment that adds character to the streetscape and economic value to properties.

The City of Unley commits significant resources to ensure it has the best possible streetscape and park environments through the effective management of its trees and understory planting whilst encouraging its community to play an important role. The management of the City's trees is an important function of Council and as community expectations and demands continually rise, managing these important assets is becoming increasingly more difficult and complex.

Cities around the world now regard trees as critical urban infrastructure – as important to how a city functions as roads or public transport. Furthermore, trees are seen as particularly vital to the health and wellbeing of communities. The benefits of urban forests span environmental, economic, cultural and political domains. These benefits are interrelated, with each cumulatively feeding into the creation of resilient sustainable urban landscapes.

Given the pressure on governments to plan for greater populations, increased urban density and climate change adaptation, there is a clear opportunity to communicate the importance and benefits of urban forests in creating resilient, sustainable cities that provide healthy and enjoyable places for people to live, work and play.

This City of Unley Tree Strategy provides the foundation of how Council will continue to enrich and enliven our neighbourhood’s character and amenity through the continued management of one of our most valuable assets, now and for future generations. The document sets out an ambitious vision for improving sustainability in Unley. This Tree Strategy is an integral part of Council’s Environmental Sustainability Strategy (in development).

The strategy recognises the achievements of previous elected members, administration and field base practitioners who have all played an important part in the establishment of a diverse urban forest. Acknowledging this solid foundation an opportunity exists to build, maintain and enhance this important asset within the City by providing a visionary yet practical approach for future tree managers.

Council will engage the community on this draft Strategy, evaluate feedback and then finalise the document prior to implementation. Once the Strategy has been finalised it is not intended to further consult with the community on every aspect, rather inform the community on specific initiatives as they are implemented.
About This Strategy
The purpose of this Strategy is to provide a framework that will facilitate the regeneration of the Urban Forest in the City of Unley and provide sustainability for the City moving forward. Furthermore, the purpose is to align the Strategy with the overall objectives of the Unley Strategic Plan as described in a series of tiered strategies, in particular the Environmental Sustainable Strategy.

This document builds on the significant works already undertaken and currently underway within the City of Unley.

Unley City Council currently has approximately 26,000 Council owned trees within the local government area of 14 square kilometres. Trees constitute an important element of the rich cultural heritage of Unley and are a considerable asset to the community on many levels. They complement the environment, enhance our enjoyment of streets and open spaces by making them more comfortable and pleasant, and just as importantly they provide a wide range of other benefits such as shade, cooling and habitat for wildlife.

Conversely, trees constitute a potential risk to the community and to property on a number of levels, ranging from interference with underground or above ground services to risk to property and personal safety through such events as limb drop or lifting of paved walking surfaces. Like other assets, such as buildings, trees require effective and coordinated management to maximise their benefits to the community and the environment and minimise risks, such as damage to property or personal injury.
Council is committed to nurturing, preserving and developing these important community resources.

This Strategy uses a hierarchy of; pathways and objectives, initiatives, indicators and targets. The Strategy seeks to provide an appropriate level of guidance and framework and in some situations recommend developing a more detailed supporting plan or establishing a program to focus efforts.

The Urban Forest
PUTTING TREES IN CONTEXT

Urban forestry is broadly defined as the management of trees, shrubs and other vegetation in urban areas. It focusses on the ‘forest’ or larger population of trees rather than individual trees along streets, in parks and open spaces and within commercial, industrial and residential properties. Trees in cities are a major component of the green infrastructure, the natural resources upon which the City relies. Healthy, resilient and liveable towns and cities that can sustain growing populations in 21st century Australia will feature viable and vibrant urban forests.

The City's urban forest consists of all trees and vegetation located throughout the local government area; irrespective of the tree species origin (native, exotic), location (street, park, garden, school) or ownership (public, private, institutional). As distinct from arboriculture and horticulture, urban forestry considers the cumulative benefits of an entire tree population across a town or city. Looking holistically at the urban forest and its associated ecosystem allows for consideration of the broader issues of climate change, urban heat island effects and population growth that can be influenced by and which can affect an urban forest.

The urban forest, measured as a canopy cover percentage of the total land area, is recognised as a primary component of the urban ecosystem. It is one component of a complex built environment that includes roads, car parks, footpaths, underground services, buildings and other structures. Urban forests mean different things to different people, yet they contribute positively to the way we see our towns and cities and how we use them.
Urban forestry can be described as the science and art of managing trees, forests and natural ecosystems in and around urban communities to maximise the physiological, sociological, economic and aesthetic benefits that trees provide society (Schwab, 2008).

Trees are the largest elements in the urban forest. They are such an important and critical part of our urban fabric and support the basic elements that sustain life: the air we breathe, the water we drink and shelter from the wind in winter and sun in summer.

All components of the urban forest allow those living in our towns and cities to connect to the natural landscape. The urban forest can thrive alongside the hard infrastructure associated with urbanisation.

Urban forests play a vital role in the health, social framework and economic sustainability of a city. Trees are working 24 hours a day, every day, improving our environment and quality of life.

The key messages in marketing the Urban Forest to support the goals of this strategy are as follows:

- urban forests provide essential benefits we cannot live without;
- a healthy and safe urban forest doesn’t happen by chance – it is the result of proper planning, management, and community investment;
- healthy urban forests can assist with many community problems;
- urban forests and natural areas are connected; good management of one helps the other.

For an urban forest to be sustainable there must be a wide age-distribution of trees to create a continuous cycle of succession.

Apart from ensuring that there is a new generation of trees to take the place of trees which must be removed for health or structural reasons, the most expensive stages of a tree’s life are in the very early stages and in old age or senescence. Hence a mix of ages is more financially sustainable and assists Council spread the risk.

Having a diverse mix of species – both native and exotic - reduces the risk of loss should one species be susceptible to a new pest or disease. Diversity of tree species also provides benefits for biodiversity, aesthetic reasons, improves resilience and the provision of summer shade and winter sun (Sydney University, 2008).
UNLEY’S URBAN FOREST

Trees play an important role in the environmental and aesthetic context within Unley adding social, economic and environmental value to the City.

Many street boulevards were established by environmental pioneers in the early 1900s. The majestic Plane Trees of Victoria Avenue and Northgate Street in Unley Park owe their existence to the early arborists and City Planners who pre-empted and delivered a vision for the City. Many of the trees existing along the major boulevards of the City date back nearly one hundred years. These early plantings have been complemented by a Council decision in the late 1970s to plant every street that can be planted with street trees.

The City’s streetscape is supported by numerous natural park and open space trees many of which pre-date European settlement. While Unley is restricted to 3% open space, many large remnant trees remain to support a diverse urban forest. These park trees are further complemented by private land owner tree plantings many of which also date back to the early 1900s.

The City is fortunate that property sizes within much of Unley are large, enabling trees of a significant size and canopy to have been planted and managed within the private realm. These trees along with those in Council ownership contribute significantly to the aesthetic and environmental ‘feel’ of the City.

THE UNLEY CONTEXT

THE DEMOGRAPHICS OF COUNCIL’S STREET TREES

Funding was provided during the 2014/15 financial year for Council to undertake a detailed audit of the street tree asset.

The audit involved a street by street assessment of the street trees from a range of pre-determined criteria, and has been designed to provide reliable up to date data on the street tree population to ensure tree succession planning is based on good current information. Furthermore, the audit provides supporting evidence for the establishment of a programmed approach to succession tree planting throughout the City.

The collection of tree status data, analysis and translation of this data are important measures in proactive tree management and planning.

The primary stage of the audit grouped the tree assets in segments covering between 1 to 15 trees per group. Approximately 2,300 asset groups were detailed within the primary stage data collection of the project.
The street tree data was collected between December 2014 and June 2015. The data collected indicates that the City of Unley currently manages 22,426 street trees within approximately 450 streets. The detail below from the City Overview Report provides the range of street tree species.

From the above graph it is clear that two species (Jacaranda mimosifolia (Jacranda) and Lophostemon confertus (Queensland Box)) represent over 42% of the street tree population.
USEFUL LIFE EXPECTANCY (ULE) OF THE STREET TREE ASSET

An analysis of the age of the street tree asset and the Useful Life Expectancy (ULE) becomes critical in assisting the succession planning process. The data collected and taken from the audit below indicates that 53% of the street tree asset has a ULE greater than twenty years. Conversely this indicates that 47% of the trees have a ULE less than twenty years. A tree’s ULE is determined using several factors observed during the tree assessment including the tree’s age, health and structural condition as well as its aesthetic and environmental contribution to the local area.

It should also be noted that while 74% (16,671) of the tree population within the City is mature, over half of the population has a ULE that exceeds twenty years with 20% (4,485) of the tree asset expected to require replacement within the coming five to ten years. The data reveals that 7% or 1,570 trees will require replacement within the next five years.

The age range for the tree population is moderately distributed and ranges between young and senescent. The following graphs show the number of trees within each of the age ranges collected as well as the remaining Useful Life Expectancy estimated for these trees.
The Tree Strategy will directly support the outcomes of the Environmental Sustainability Strategy and the Greening goal in the Community Plan as outlined in the flowchart below.

The Tree Strategy also links to the delivery of a number of other lead strategies and plans, specifically the Living Well Public Health Plan (Priority 3 - Preparing for Climate Change), the Open Space Strategy (in development) and the Active Ageing Strategy (in development).

The development of this Strategy is underpinned by principles which are reflected through the vision, objectives, strategies, indicators and targets. The City of Unley has developed a set of guiding principles to ensure assets throughout Unley are developed and managed for the needs of the community. Trees within the City of Unley are classified as an asset and managed in a manner consistent with other Council owned assets.

Council has developed a set of guiding principles to ensure assets throughout the city are developed and managed in a responsible, systematic manner to meet the needs of the community:

1. **EQUITY ACROSS THE COMMUNITY**

   A balanced approach is taken ensuring that residents across the community have equal opportunities for required services.
   - Council recognises that trees are an integral part of the environment and add aesthetic quality to life across the City, and will be treated as an asset.
   - Street tree plantings or removal will be based on a holistic City wide themed approach promoting the orderly planning of each area.
   - Design landscapes to reflect the cultural integrity, identity and character of Unley and its neighbourhoods.
2. SUSTAINABLE ASSETS
Assets are designed & maintained in a manner cognisant of a triple bottom line outcome (financial, environmental, social) and utilising a life cycle approach.

• Council has a responsibility for the planning, establishment, maintenance and removal of all trees located within the City’s streetscapes and open space (parks, reserves, streets, medians and nature strips).
• Trees are considered to be community assets that contribute to the wellbeing of the community and to the natural environment.
• Council recognises and values the significance of trees within the urban setting in that they create functional and aesthetic streetscapes, provide natural habitat and natural shade.
• Council will ensure a diversity of tree species and ages to maximise resilience against pest and diseases and weather extremes.

3. RISK SENSITIVE
Asset based decisions are made in a manner where risks are identified, understood and managed (WHS, Environment, Public Safety, Community).

• Tree assessments are undertaken within a risk framework consistent with the industry standards and demonstrate reasonable care.
• Council is committed to protecting and maintaining trees within the municipality whilst meeting its obligation to provide a safe environment.
• Council aims to preserve and protect the City’s Regulated trees both on Council owned and private land in line with the legislative controls outlined in the Development Act 1993.

4. STRATEGIC CONSISTENCY
Assets related to services are planned and maintained within an integrated planning framework

• The Tree Strategy complements other relevant strategies and plans including the Environmental Sustainability Strategy, Living Well Plan and Open Space Strategy, to ensure an integrated approach across Council.
• The on-ground delivery of the Tree Strategy through programs and projects will be planned and maintained through annual business planning.
5. **FUNCTIONAL & SERVICE LEVEL**
Assets are designed and maintained to ensure they are fit for purpose and meet the agreed level of service.
- Council commits to enhancing existing biodiversity sites and establishing new biodiversity sites through tree management and additional local provenance tree plantings.
- Trees will be selected and maintained in a manner consistent with the desired/targeted service level for each specific site.

6. **COMPLIANT**
Assets are designed and maintained to meet compliance requirements at a minimum.
- All new street tree plantings are required to be compliant with relevant legislative requirements.
- Accessibility and walkability are key functions of the Age Friendly City streetscape and it is incumbent on Council to ensure that wherever possible a balance is reached whereby streets, parks and other public land is accessible to all.
- Property owners within Unley have a responsibility to manage trees within the boundary of their properties.

7. **INNOVATION & IMPROVEMENT FOCUSED**
Alternative methods of providing services/assets are regularly examined & improvements considered, to ensure “best value” options are applied.
- Trees will be managed in a manner that recognises and finds a careful balance between the historical character of Unley’s inner-city urban environment and new expressions of social, environmental and aesthetic values in streetscape renewal programs.
- Council commits to promote the use of innovative techniques for water sensitive urban design to support tree growing solutions in streets and Council owned open space.
- Continue to support an urban forest that can tolerate and continue to thrive in climatic extremes.
- Continue to identify opportunities to plant trees within our City/streets to enhance streetscapes.
Issues and Challenges
Ageing tree population

Many of the City’s trees, including those in streets and parks, are well over 50 years old (74% of street trees are mature) and reaching the end of their useful life.

The City of Unley manages the population of ageing trees through regular assessments to determine which trees need to be treated or removed, and by planning when, how and with what trees they will be replaced. Managing ageing trees requires careful consideration. Urban tree renewal is not simply a question of replacing dying trees, but is also one of identifying the most resilient and appropriate replacement plan and engaging in a meaningful dialogue with a broad range of stakeholders and community members.

The City of Unley’s key challenges in terms of ageing trees are:

- An ageing tree population requires increasing resources to manage and sustain. Over time, the environmental value of urban trees diminishes and they become hazardous to people using the City’s public spaces. A high proportion of over-mature trees carries an element of public risk (and cost) and must be managed accordingly.
- Uniform, symmetrical avenues create wonderful vistas along our avenues and main streets, and in the City of Unley these are largely synonymous with broad-canopied deciduous trees such as cedars and planes.

Trees like us have a finite life. There needs to be community recognition that they start small move through maturity and eventually die. Source: Google Images
Water & soil moisture

To achieve these aesthetics, it is desirable to plant identically aged trees that will maintain the visual consistency of the avenues. However, this can pose challenges for the community when confronted with large numbers of trees requiring replacement at the same time.

While community engagement is important in managing an ageing tree population, particularly in relation to tree removals, there are times when Council will be required to make decisions against the wishes of some of the local community. When arboricultural assessment identifies unacceptable risk concerns with trees, the Council’s decision to remove them may over-ride the community’s wish for the trees to be retained. In these instances, the appropriate level of information will be provided to the local community.

Water is the primary element needed for vegetation growth. The recent extended drought and water restrictions severely damaged the health of the City of Unley’s urban forest, resulting in an increase in tree mortality. The most recent useful life expectancy mapping that has been undertaken shows that about 74% of our trees are mature and potentially could reach the end of their useful lives within a similar period. Much of this is due to long term effects of low water availability.

Mature trees help to ameliorate the urban heat island effect both through shading of urban surfaces and atmospheric cooling through evapotranspiration. Maximising the potential for vegetation to cool the city through evapotranspiration is another important reason to maintain soil moisture.

Adequate available soil moisture is critical for healthy vegetation. Extended years of drought have left soil moisture levels morbidly low, affecting tree health throughout the municipality. In particular, trees in traditionally irrigated landscapes were affected by a combination of low rainfall and decreased irrigation due to watering restrictions.

TreeNet inlets capturing stormwater from the watertable and utilising the water to support tree growth.

Source: Google Images
While recent seasonal rains have been valuable, soil moisture remains depleted and this poses an ongoing threat to tree health. A number of active and passive approaches are currently undertaken to replenish soil moisture and ensure it is maintained at levels to provide healthy growth. Changes to irrigation practices, mulching, water well installation, soil injection, water barrier and tanker watering have preserved the health of many trees. Tree health monitoring and measurement of soil moisture provide strategic guidance to direct resources and will be vital in ensuring the health of the future forest.

With an expected long-term low water future and the desired move away from reliance on costly potable water, alternative water sources are needed to ensure healthy vegetation growth. The capture and reuse of stormwater is an important way to decrease reliance on potable water, particularly given the great quantity of stormwater flowing along creeks through the City. The City that has traditionally shed water needs to capture, store and reuse it. However, this presents challenges as well as opportunities. In particular storing stormwater for reuse in dry periods is challenging in densely-built urban areas, but can be supported by wetlands, underground tanks and water sensitive urban design.

The City of Unley is committed to a journey towards becoming a water sensitive city. In doing so, it will create a more liveable, resilient and sustainable city for future generations. The implementation of Water Sensitive Design (WSUD) techniques integrated into traditional work programs is one such approach which will contribute to achieving this outcome.

The development of integrated WSUD strategies into Council works programs is one way to focus on delivering urban greening, enhanced streetscapes and mitigated urban heat load for future generations. The concept of liveability within the urban environment in the context of this strategy seeks to improve microclimate benefits which will stem from enhanced tree health and shade across the city.

While larger scale water sensitive urban design opportunities may not always exist in a highly urbanised Council like Unley, there are always smaller scale micro initiatives that can be trialled and implemented. The reduction of footpath widths to provide wider nature strips, tree stormwater inlet and waterwell installations and Second Tier Greening of nature strips are just a few initiatives trialled and pursued to support water retention within the City. Innovation in water retention and re-use need to be continually researched, explored and trialled to ensure water availability to support tree growth.

These initiatives enable the improved retention of soil moisture and ultimately facilitate a broader palette of tree species which can be planted in the street tree network.
Climate Change

The Australian Government’s most recent report on climate change, the Critical Decade, states unequivocally that it is ‘beyond doubt’ that climate change is occurring. The primary cause of the observed warming and associated changes since the mid-20th century—human emissions of greenhouse gases—is also understood with a high level of confidence.

Whilst the effects of climate change are just becoming discernible, they will become increasingly prominent. The effects over coming decades will include warmer average temperatures, heat waves, more extreme storm events and lower average annual rainfall. We have already observed the damage caused by extreme heat and floods in Australia in recent years, and it is likely that these events will become more prevalent.

The risks to cities of more severe weather conditions will increase, bringing with them high economic, social and environmental risks and costs. Specifically in relation to trees, the impacts of climate change will include:

- The susceptibility of vegetation to increasing and emerging pests and diseases will challenge the urban forest’s ability to withstand and recover from these outbreaks. Recent observations in NSW pine plantations have found that drought-stressed trees are suffering increased incidence of attack from insect stem borers, bark beetles and fungi. Changes in climate can affect pests’ life cycles. Warmer summers can increase insects’ development rate and reproductive potential, while warmer winters can increase over-winter survival. Many pests and diseases may have extended geographical ranges as warmer temperatures affect flight behaviour and vector spread. Introduced pests may also find conditions more favourable for population growth. Forests not previously at risk could become vulnerable as pests and disease ranges change.

- Extreme weather events directly affect vegetation health, generally leading to a reduction in canopy cover and overall decline. Heat extremes can lead to foliage and trunk scorch and canopy desiccation. Storms can shred foliage, break branches and uproot trees.

- Lower rainfall will result in increasing frequency of tree death in many species and overall forest health decline in response to frequent and severe drought.

- Inundation can lead to soil erosion, salinity, tree instability, tree mortality and damage to infrastructure. In southern Australia, more frequent extremes of wet and dry periods may increase the incidence of the root rot pathogen *Phytophthora cinnamomi*. Trees weakened by this disease have a reduced capacity to survive drought.

In the Unley context, it is increasingly important to research and develop appropriate tree palette species, both native and exotic, for use in streets and parks that will adapt to climate change moving forward. Increasing the diversity of species used will assist Council adapt and maintain a healthy, environmentally sustainable and resilient tree population.
Urban Heat Island & Extreme Heat

The urban heat island effect is common worldwide as cities become warmer than nearby suburban and regional areas, particularly at night. After a hot day, parts of the city can be four to seven degrees hotter than surrounding rural areas. This phenomenon occurs all year round, but it becomes a problem during hot weather.

In periods of prolonged heat, the urban heat island effect increases pressure on the city. It exacerbates heat stress, particularly for vulnerable people such as the elderly, the very young, and those with pre-existing medical conditions. Heat waves already kill more Australians than any other natural disasters and have led to many deaths in nationally over the past 50 years. Victoria’s Chief Health Officer found that the heat wave preceding the 2009 Black Saturday fires contributed to an increase above normal of 374 deaths in inner Melbourne — almost double those who died as a result of the fires. People living in high-density areas are at greater risk during heat events as a result of the urban heat island effect (Reference: City of Melbourne Urban Forest Strategy).

This heat also contributes to the decline of certain tree species. Extreme heat, particularly if combined with low soil moisture, causes the foliage and even the bark of some trees to scorch, which can lead to tree decline.

The urban heat island effect has three main causes:

• **Impervious hard surfaces:** Buildings and pavements are typically impervious and have high heat absorption capabilities. Asphalt and concrete trap and store heat from the sun, while solar radiation is reflected of building surfaces along street canyons, causing greater absorption of solar energy and a reduction in the reflective power of these surfaces.

• **Human activity:** Motorised transport is a major contributor to increased greenhouse gas emissions. In hot weather, the use of air conditioners increases, generating more waste heat.

• **Low vegetation coverage:** With less vegetation, cities receive less natural cooling from shade and evapotranspiration. Urban forests have proven to be one of the most effective methods for mitigating heat retention in urban areas, particularly central business districts. However, there are several challenges we face in tackling the urban heat island, including:
  • The current urban heat island effect will be exacerbated by predicted climate changes.
  • The existing tree canopy cumulatively covers 26.1% of Unley’s public streets and park areas. This leaves a large proportion of Unley’s streets and parks without natural shade.
  • It can take 20 years for a tree to grow to a size that will effectively assist in mitigating the urban heat island effect.
  • Vegetation cover must be primarily composed of species that are able to survive and remain healthy under hotter conditions.
  • Mitigating the urban heat island effect may require increased water use during dry periods to maintain tree health and maximise evapotranspiration.

The use of Green Infrastructure, including trees, increases the resilience of the City of Unley to climate change. Street trees, green corridors and well-designed parks contribute towards a reduction in the urban heat island by providing shaded places that are also safe, sustainable and attractive.
As well as having ecological value, old trees or established vegetation add character and heritage value to an area. Unfortunately, they are often casualties of infill housing construction. Loss of individual trees, particularly along boundaries, can reduce the privacy of existing houses, and the amenity value and character of a City. Over a broader area, the effects of the loss can accumulate, as important parts of the area’s ecology are lost, and wildlife corridors dislocated, affecting birdlife and seed distribution.

“Loss of individual trees, particularly along boundaries, can reduce the privacy of existing houses, and the amenity value and character of a City,”

Increased development densities often result in greater site coverage by buildings and pavements, resulting in:

- Reductions in the extent of vegetation on private land, especially large canopy trees.
- Reduction of permeable ground surfaces that allow for the infiltration of rainwater into the soil.
- Increased shading of streets by buildings, potentially to the extent that tree growth suffers due to the lack of sunlight.
- Increased pressure on public spaces to accommodate more uses – whether for recreation in parks or for traffic and parking in streets – which can result in direct competition with plantings for space as well as making more demanding growth conditions due to more extensive hard or compacted surfaces.

Canopy trees need room to grow and the competition for the physical space to grow mature trees (above and below ground) is rapidly increasing.

In servicing the population density increase, the urban forest has been gradually reduced as the existing trees make way for development or other land usage. In many instances, the opportunity to replace the trees and open spaces has been lost forever. Private property allotment sizes vary throughout the city of Unley, but, most residential allotments are becoming increasingly smaller and the commercial sites have maximised their built form to extend to property boundaries. Trees are competing with off-street parking, rear studio apartments and swimming pools and in some instances, the desire for ‘maintenance free’ yards.

A Perth example showing the loss of vegetation through urban infill
Community Expectations & Resistance to Change

The City of Unley has a wide and varied population of residents, living in apartments, terrace houses, small and large lot suburban housing. Our residents have different perspectives and interaction with trees and the urban forest. The community as a whole also includes business owners and employees who may visit and engage with the City and its trees every day. As such, the City encompasses many people with an extremely diverse range of interests and attitudes toward trees. These are often influenced by an equally diverse range of factors such as age, income, education, cultural background and exposure to natural environments. At the extreme there is often the irrational fear of trees, even though statistically there is far greater chance of being killed by lightening than dying due to a tree failure.

Appropriate maintenance and pruning can often alleviate concerns, and appropriate repair or redesign of infrastructure can also be undertaken with little impact to the tree and the tree can continue its valuable contribution for many decades to come.

It is also important that people recognise and are informed about the need for change. Trees are living organisms and as such will grow, mature and eventually die.

As trees age they will require maintenance and then eventually require removal and replacement. In a natural ecosystem this happens gradually and with little fanfare or impact on people. In an urban environment an ageing or hazardous tree cannot usually be left until it completely falls apart.

Tree removal can be traumatic and emotional. Often trees have been in place for many decades prior and people have grown up with them and become attached to their presence, their size and their aesthetic appeal. The trees may also represent associations, memories and links to past events and historical places. For these and many other reasons, some parts of the community often have expectations of trees being retained for very long periods and beyond their useful life expectancy. They may even entertain retaining a tree no matter what the costs or risks. There will come a time, however, when the benefit of keeping an individual tree is far outweighed by the hazard to life or property and the monetary cost of maintaining it. As with all assets, a tree will need to be replaced with the next generation, as painful as this may be. When managing and establishing an urban forest the needs of the many may often have to outweigh the preferences of the few.
A significant challenge faced by Council is the fact that many boulevard and specimen trees are reaching the end of their natural life. Coupled with the effects of drought, increasing intensity of heat during summer, and water restrictions, this decline has been accelerated and in many cases is irreversible. The opportunity now exists to transform our street tree assets into a healthy, diverse, resilient and well-designed forest that will enable our City to adapt to a changing climate, mitigate urban heat island effects and provide protection and wellbeing to the community.

Tree succession planting is applied on a whole-of-street basis. By its nature, it involves the process of tree removal. It is in practice a difficult task to accurately judge the life expectancy of any individual tree when making a decision to remove it. The first principle must always be that if the tree cannot be maintained to an acceptable level of risk or amenity then it should be removed. Criteria for tree removal, as part of succession planning, must therefore be clear and consistent, so that all parties affected by the strategy are well informed. The information supporting priorities for succession renewal planting should also be based on sound arboricultural knowledge.

A significant target from this Tree Strategy will be the creation of a Street Tree Succession Plan. The purpose of the Succession Plan will be to provide a street tree succession renewal framework that will facilitate the regeneration of the Urban Forest in the City of Unley and provide sustainability for the City moving forward. The Succession Plan is also aimed at ensuring that the City of Unley continues to have tree lined streets that will provide solid, sustainable environmental foundations for the future communities of the City while retaining the aesthetic qualities of our streetscapes.
Age Friendly City

“Ageing is a cause for celebration in the City of Unley - our people are living longer and healthier. The City of Unley has a key role to play in helping our community to get the most out of their lives. We need to ensure that our City is accessible for everyone, promotes health and wellbeing and provides opportunities for connection, inclusion and contribution. We want our people to live fulfilled lives throughout their lifetime and never feel like they need to leave the City of Unley.”

The above summary quotation from the current City of Unley Active Ageing Strategy provides streetscape design challenges for the future. The City promotes that within the municipality; every street that can be planted with street trees has and will continue to be planted. Our community expects tree-lined streets with a height and canopy that provides shade and scope to an otherwise harsh streetscape.

As an urbanised inner city municipality, many of the streets are narrow from property boundary to kerb. Trees require space to grow, mature and survive. Within limited space they often come into conflict with the street hard infrastructure. They potentially impact on the accessible width of a footpath carriageway and regularly lift the pavement as they mature. This provides challenges as we strive to reach the goal of creating an environment that is pleasant, safe and accessible through Age Friendly pathways.

A balanced approach will be required in reaching the Age Friendly goals with the community potentially being asked to accept a modified streetscape with smaller less intrusive trees or more innovative solutions are explored such as narrowing roadways to provide more space for trees.

Street tree in Mary Street, Unley. The challenge is to decide if the tree remains or the need for an legislative age friendly footpath takes priority.
TO REGENERATING UNLEY’S TREE ASSET

The City of Unley’s tree vision is to create a resilient, healthy and diverse urban forest that will provide solid, sustainable environmental foundations for the future communities of Unley.

The City of Unley’s urban forest contributes greatly to the City’s character and is integral to ensuring Unley is a green city. A healthy urban forest can provide cleaner air, filtered stormwater and lower city temperatures.

Trees create important habitat for mammals, birds, insects and reptiles and make beautiful city streets. Streets filled with trees and landscaping can also have psychological benefits in reducing stress and providing spaces for relaxation and contact with nature.
The longevity of trees can span decades and even centuries. These trees may persist as monuments to human intervention or management of the landscape longer than the labours of any other human endeavour. They are part of our heritage, and are a living link between the present generation and those which have preceded and those which will follow.

The City of Unley recognises the economic, social and environmental value of trees and is committed to maintaining and enhancing trees across the City of Unley in parks, reserves, open space and streets to ‘green’ the City, contribute to a liveable City, strengthen habitat and biodiversity. Trees are a valued asset and contribute strongly toward the Urban Forest and Green Infrastructure of the City.

**PATHWAYS**

The control and management of trees within the City of Unley urban environment can be classified within 3 key pathways:

**Pathway 1 - Street Trees**

Street trees in the City of Unley have an important function and role to improve the micro-climate and liveability of the City, and contribute to its diverse inner urban, heritage, environmental and social character. This will be achieved by improving the design, management and sustainable maintenance of new and existing streetscapes which recognise the layers of natural and constructed history of Unley. An increased range of tree species will be used to reflect changes in the local neighbourhood character, the City’s open space character and to improve biodiversity.

**Pathway 2 - Park Trees**

As the urban population grows and private green space becomes less available, public open space increases in social and community value. The City of Unley has significantly less open space than most local government authorities within metropolitan Adelaide. Furthermore, within this open space are significant parcels of remnant vegetation including trees which pre-date European settlement. There is a responsibility that these remnant and other important trees within the City are managed and enhanced for today and future generations.

**Pathway 3 - Private Trees (Regulated and Significant)**

It is well recognised that many of the largest and most significant trees within the City are located within the boundaries of private properties.

Growing and maintaining large canopy trees is a worthwhile investment and a cornerstone of today’s movement toward sustainable communities. The City of Unley contains numerous remarkable trees; trees with historic, cultural, social, aesthetic and botanic value. Many are at threat from development, urban infill, pests and diseases, pollution and other factors.

Trees take many years to grow. As we already have an established urban forest, it makes sense that the City should implement strategies and actions to retain trees that are healthy and in good condition. Specifically, Regulated Trees are usually the larger trees within the City and have been found to be more valuable (providing between 4 to 8 times the benefit) than small trees (Portland, 2004). Therefore, the City recognises it needs to promote the maintenance and protection of these assets.
OBJECTIVE:
Encourage attractive, healthy and appropriate street trees for the benefit of the community which contribute to the:

- liveability and wellbeing of our City
- environment and sustainability both now and in the future.
INITIATIVES

1. SELECTION AND LOCATION
1.1 Ensure tree species selection and associated guidelines are in line with site specific locations taking into account:
   • Age Friendly requirements;
   • transport functions;
   • open space needs;
   • utilities and service provisions;
   • food security considerations; and
   • Environmental Sustainable Strategy outcomes.
1.2 Develop a palette of species suitable for street tree planting which considers varying infrastructure location situations, service requirements and takes into account the impact of pedestrian egress and Climate Change.
1.3 Proactively support Council resource sharing initiatives to propagate, develop and establish new street tree species. Actively support trial planting opportunities.

2 PLANTING AND ESTABLISHMENT
2.1 Develop and implement site establishment protocols and guidelines to ensure the long term viability of trees selected in streets.
2.2 Develop formative pruning guidelines and programs for early establishment of trees to maximise canopy potential.
2.3 Develop site preparation guidelines to ensure sustainable planting conditions for new trees ensuring maximum canopy potential, including below ground spaces and water infiltration. Examine the suitability of incorporating waterwell installations within replacement planting programs.
2.4 Develop and maintain sustainable tree planting programs and schedules to ensure new sapling trees are provided with the best development potential.
2.5 Develop and ensure watering programs and schedules meet new tree requirements during establishment phase.
2.6 Research and consider contemporary trials to determine the value and impact of growth fertilisers, water retention initiatives and other environmental sustainable treatments.

3 MAINTENANCE
3.1 City of Unley adopt a proactive approach to managing the risks in existing street trees.
3.2 Undertake tree maintenance to meet site specific expectations in line with Australian Standards.
3.3 Ensure City of Unley tree maintenance staff and contractors are capable of delivering in line with competency and capacity standards.
3.4 Council will encourage the development of staff skills in arboriculture and recruit suitably qualified staff.

4 REMOVAL OF TREES
4.1 Develop and implement a Second Generation Tree Strategy and program which prioritises streets for tree renewal, is based on sound sustainability principles, is funded and is aligned to the Unley Community Plan. (The 2014/15 street tree audit identified that there are 16,671 mature street trees in the City. This figure represents 74% of the total number of trees.) From an asset management perspective this raises a concern that many of the mature trees could reach the end of their useful life expectancy and require replacement at a similar period in time.
4.2 Remove individual trees as requested or identified ensuring appropriate Visual Tree Assessment and approval processes are followed.
4.3 Ensure weed species trees are not planted and where necessary are removed from inappropriate locations.

5 REPLACEMENT
5.1 Ensure that a diverse and sustainable range of species is utilised through street tree planting and replacement across the City. The 2014/15 street tree audit identified that two species of tree (Jacaranda mimosifolia – 5,386 and Lophostemon confertus-Queensland Box – 4,112) constituted 42.4% (9,498 of 22,426) of Council’s street tree asset. A reliance on a dominant species leaves the City vulnerable to pest and disease and potential loss of the street tree asset.
5.2 Develop and implement plant procurement specifications in line with the Street Tree Succession Plan and individual tree replanting requirements.
5.3 Develop and implement protocols for nursery stock selection in line with relevant Australian Standards.
5.4 Explore opportunities to develop supplier relationships and pre-order processes and standards in advance.
6 RESIDENT RELATED

6.1 Council will consult and engage the community and affected landowners (in line with Council’s Community Engagement Process) where large scale plantings, street tree renewals and tree removal works are to occur. Council will appropriately inform and involve the community in tree management through community engagement and encouraging the community to be involved in adopting and supporting tree planting and follow up watering.

6.2 Establish clear protocols and guidelines in relation to the Local Government Act (Section 221) as they relate to trees.

### STREET TREES

**INDICATORS AND TARGETS:**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indicator 1</strong></td>
<td>An annual tree succession program which identifies streets for renewal based on identified criteria and funded at sustainable levels.</td>
</tr>
<tr>
<td><strong>Target 1</strong></td>
<td>City of Unley Street Tree Succession Plan developed in Year 1 (2015).</td>
</tr>
<tr>
<td><strong>Indicator 2</strong></td>
<td>Through street tree succession planning, the City of Unley will have a mixed age class distribution of street trees across the City.</td>
</tr>
<tr>
<td><strong>Target 2</strong></td>
<td>A street tree renewal target of 2,000 trees planted over the next 5 years (2015-19).</td>
</tr>
<tr>
<td><strong>Indicator 3</strong></td>
<td>Work toward a long-term goal to increase the species diversity of street trees within the City. The City move toward a more healthy, environmentally sustainable, resilient tree population.</td>
</tr>
<tr>
<td><strong>Target 3</strong></td>
<td>A street tree diversity reduction from 42.4% to 40.5% (415 trees) of tree species <em>Jacaranda mimosifolia</em> (Jacaranda) and <em>Lophostemon confertus</em> (Queensland Box) over the next 5 years (2015-19).</td>
</tr>
<tr>
<td><strong>Indicator 4</strong></td>
<td>Newly planted trees are maintained to ensure their short and long-term survival.</td>
</tr>
<tr>
<td><strong>Target 4</strong></td>
<td>Annual survival and health achievement target of 90% in first 12 months of the tree’s life.</td>
</tr>
<tr>
<td><strong>Indicator 5</strong></td>
<td>The percentage of maintenance program pruning will meet the tree Level of Service requirements to ensure the long-term sustainability of the street tree asset.</td>
</tr>
<tr>
<td><strong>Target 5</strong></td>
<td>95% of trees meet the prescribed Level of Service requirements in annual condition assessment.</td>
</tr>
</tbody>
</table>
OBJECTIVE:
Ensure park and open space trees are resilient, safe, healthy, sustainable, diverse and positively contribute to:

• the health and wellbeing of our City
• supporting Unley as a liveable City.
INITIATIVES

1. SELECTION AND LOCATION

1.1 Ensure tree species selection and guidelines are in line with park and open space site specific situations taking into account:

- age friendly needs;
- open space strategy requirements;
- shade and shelter requirements;
- environmental sustainable considerations;
- existing infrastructure, including current and proposed use;
- long term viability, maintenance and risk considerations;
- food security considerations; and
- impact on recreational use by park users.

1.2 Develop a diverse palette of species suitable for park and open space tree planting that considers:

- environmental contribution;
- varying infrastructure location situations;
- Climate Change;
- seasonal change requirements ie deciduous/evergreen;
- size and scale;
- adherence to CPTED (Crime Prevention Through Environmental Design) principles;
- heritage and memorial considerations; and
- food security opportunities.

2 PLANTING AND ESTABLISHMENT

2.1 Develop and implement site establishment protocols and guidelines to ensure the long term viability of trees selected in parks.

2.2 Develop formative pruning guidelines and programs to guarantee the viable early establishment of trees to ensure the “best chance” to maximise canopy potential.

2.3 Develop site preparation guidelines to ensure sustainable planting conditions for new trees ensuring maximum canopy potential, including below ground spaces and water infiltration.

2.4 Develop and maintain sustainable tree planting programs and schedules to ensure new sapling trees are provided with the best development potential.

2.5 Develop and ensure watering programs and schedules meet new tree requirements during establishment phase. Where possible utilise recycled water options including those available through the Managed Aquifer Recharge network.

2.6 Research and consider contemporary trials to determine the value and impact of growth fertilisers, water retention initiatives and other environmental sustainable treatments.

3 MAINTENANCE

3.1 Council adopt a proactive approach to managing the risks in existing park and open space trees.

3.2 Develop auditing and maintenance condition assessment protocols to reduce risk and ensure Unley’s parks provide a safe experience for park users.

3.3 Undertake tree maintenance to meet site specific expectations in line with Australian Standards.

3.4 Ensure City of Unley tree maintenance staff and contractors engaged by Council are capable of delivering in line with competency and capacity standards.

3.5 Council will encourage the development of staff skills in arboriculture and recruit suitably qualified staff.

4 Removal of Trees

4.1 Develop park tree removal protocols that consider and balance:

- habitat retention;
- nature play;
- tree aesthetics;
- veteran tree management;
- risk and safety to park users;
- inappropriate and/or weed species;
- potential damage to park infrastructure; and
- park development needs.

4.2 Remove individual trees as requested or identified ensuring appropriate Visual Tree Assessment and approval processes are followed.

5 REPLACEMENT

5.1 Develop and implement plant procurement specifications in line with Second Generation programs and individual tree replanting requirements.

5.2 Develop and implement protocols for nursery stock selection in line with relevant Australian Standards.

5.3 Explore opportunities to develop supplier relationships and pre-order processes and standards in advance.
6 RESIDENT RELATED

6.1 Council will consult and engage the community and affected landowners (in line with Council’s Community Engagement Process) where large scale plantings, park tree renewals and tree removal works are to take place. Council will appropriately inform and involve the community in tree management through community engagement and encouraging the community to be involved in adopting and supporting tree planting.

6.2 Council will consider removal of resident planted trees in parks which do not conform to an approved park management plan or are deemed an inappropriate species.

PARK TREES
INDICATORS AND TARGETS:

<table>
<thead>
<tr>
<th>Indicator 1</th>
<th>Through park and open space tree succession planning, the City of Unley will have a mixed age class distribution of trees with the potential to reach Regulated size across the City.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target 1</td>
<td>Renewal target of 250 trees with the potential to reach Regulated size upon maturity over the next 5 years (2015-19) within Council’s parks, reserves and open space.</td>
</tr>
<tr>
<td>Indicator 2</td>
<td>Supporting Council’s vision of encouraging food security throughout the City by ensuring, a selection of fruit and nut trees are available for selection and planting in Unley’s parks where appropriate.</td>
</tr>
<tr>
<td>Target 2</td>
<td>Renewal target to plant 100 fruit and nut trees over the next 5 years (2015-19) within Council’s parks, reserves and open space.</td>
</tr>
<tr>
<td>Indicator 3</td>
<td>Newly planted trees as part of park and open space succession planting are maintained to ensure their short and long-term survival.</td>
</tr>
<tr>
<td>Target 3</td>
<td>Annual survival and health achievement target of 90% in first 12 months of the tree’s life.</td>
</tr>
<tr>
<td>Indicator 4</td>
<td>Work toward a long-term goal to increase the species diversity of park trees within the City.</td>
</tr>
<tr>
<td>Target 4</td>
<td>Move towards a park and open space tree composition of no more than 5% of one tree species, nor more than 10% of one genus and no more than 20% of any one family (matches City of Melbourne target).</td>
</tr>
</tbody>
</table>
OBJECTIVE:
Ensure private Regulated and Significant trees within the municipality are protected in line with The Development Act 1993 in balance with Council’s commitment to encourage sensitive and sustainable development.
**INITIATIVES**

1 **FACILITATOR**

1.1 Examine opportunities through a review of Unley Council’s Development Plan to retain Regulated and Significant trees within private properties.

1.2 Council will provide incentives for the community to become engaged in the planting and ownership of trees within private properties to adapt to the impacts of Urban Infill and assist in preserving the Urban Forest.

1.3 Review, update and maintain Unley’s Council’s Significant Tree list (included within Council’s Development Plan).

1.4 Develop a palette of trees appropriate for planting within construction sites to assist developers and new property owners maintain Unley’s urban forest. Examine the possibility of trialling trees identified within the palette to act as a source for developers and the wider Unley community.

1.5 Investigate the feasibility of auditing and/or mapping Council’s listed Significant and remnant trees. Potential for data to be stored as a GIS layer for Council and community reference.

2 **DEVELOPMENT PROTECTION**

2.1 Develop and establish clear procedural protocols for dealing with Development Applications which include Regulated and Significant trees within a development site to assist with the delivery of Council’s Environmental Sustainable Strategy.

2.2 Develop and establish clear procedural protocols for dealing with Development Applications involving the removal of Regulated and Significant trees.

2.3 Define relevant tree policy protocols within Council’s Development Plan (Objectives 60 & 61) to ensure Council is optimising its ability to protect and retain Significant and Regulated trees.

2.4 Develop a pro-forma or set of questions to assist and guide developers in addressing relevant Development Plan tree environmental criteria to enable Council administration to make informed assessment decisions.

3 **MONITORING/COMPLIANCE**

3.1 Develop and establish clear procedural protection protocols for monitoring and ensuring compliance for Development Applications that include Regulated and Significant trees within a development site.

**PRIVATE TREES**

**INDICATORS AND TARGETS**

<table>
<thead>
<tr>
<th>Indicator 1</th>
<th>With an aim to retain more Regulated and Significant trees on private property throughout the City, establish clear, consistent, rigorous and agreed policy interpretations of objectives and principles of development control within Council’s Development Plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target 1</td>
<td>Review and establish agreed Development Plan policy and objective interpretations in Year 1 of this strategy.</td>
</tr>
<tr>
<td>Indicator 2</td>
<td>Encourage and support the planting of appropriate trees on development sites to ensure the long-term sustainability of the urban forest.</td>
</tr>
<tr>
<td>Target 2</td>
<td>In the life of this strategy develop a ‘Places and Spaces Tree Palette Guide’ to be made available and promoted to developers and property owners within developed sites.</td>
</tr>
</tbody>
</table>
City of Burnside: Tree Management Strategy – Our Next Generation: Burnside’s Urban Forest
City of Melbourne: Urban Forest Strategy – Making a Great City Greener – 2012 – 2032
University of Technology Sydney: Institute for Sustainable Futures – Benchmarking Australia’s Urban Tree Canopy
City of Marion: Tree Management Policy
Burwood Council: Street Tree Management Strategy
City of Yarra: Yarra Environment Strategy
National Urban Forest Alliance: July 2014 – Australian Partnership Plan 2014-2020
City of Unley: Age Friendly Strategy
City of Darebin: GreenStreets Streetscape Strategy – 2012-2020
Curtin University: Cool Communities: Urban Trees, Climate and Health
Ecological Associates: Independent Inquiry Into Management of Trees on Public Land
City of Sydney: Urban Forest Strategy