

# Street Tree Masterplan







Street trees are an increasingly important part of a sustainable and resilient urban life.

# Overview

**Street trees as a combined asset, known also as the local urban forest, represent a large and important investment for the Town of Mosman Park.**

The Town invests around 2.5% of the total annual revenue into the urban forest each year. Expenses relating to the urban forest include planting, pruning, watering, and specialised treatment for the health and growth of these assets. Street trees are time again proven to increase local amenity, provide shade, reduce residual and reflective urban heat, provide habitat opportunities for local fauna, capture and store carbon from the atmosphere, and release life supporting oxygen. Street trees are an increasingly important part of a sustainable and resilient urban life.

Street trees require an initial capital investment, as well as smaller ongoing investments, to preserve and promote their health, ensure public safety, and to maintain function.

A clear and unified vision for the Town's urban forest will ensure the continuity of management and support resource allocation to be rationalised in the most effective way, maximising the benefits to the community and deliver the desired on-ground urban canopy outcomes.

The Town of Mosman Park must face and overcome several emerging challenges to retain, and improve upon, the existing urban forest. These challenges include overcoming the building tension caused by increased living densities and development, the changing climate resulting in increased pressure on individual trees and tree species, the increase in salinity and salt water intrusion into the soil and groundwater between the river and sea, and the ongoing trends of reduced rainfall in the Perth region demanding more resources and expense from the Town to achieve urban forest success.

Street trees are essential in highly urbanised centres, such as Mosman Park. Street trees in urban areas provide numerous direct and indirect benefits and services, inclusive of:

- Reducing air pollution
- Reducing the volume and velocity of stormwater
- Reducing wind pace
- Providing habitat and supporting biodiversity
- Reduction in UV exposure
- Microclimate cooling through evapotranspiration
- Improving sense of place and identity
- Improving mental wellbeing
- Reducing heating and cooling needs (resulting in lower emissions)
- Increasing property values

Quantifying these benefits (financial or otherwise) is an essential part of capturing the true value of street trees and the local urban forest.

Individual challenges and considerations are addressed within this Masterplan with the ultimate aim of better understanding our local urban forest as well as forging a way forward to improve upon what is existing.



# Vision for the Town

**Prior to beginning this journey the Town asked the community, what do you want your streets to look like, and embarked on a comprehensive visioning survey.**

This survey involved measuring responses to written statements and reactions to two dozen photos of various streets scapes from here and across the globe. The intent of the survey was to find out what was most appealing to the community (streetscape values), and what we should aim to capture in the ‘essence’ of the street trees across the Town.

Around 400 people took part in the survey and this helped capture the ‘streetscape vision’ for the Town. Combined with the other factors we as a community need to consider, helps form the foundation of this Masterplan which will guide the Town for decades to come.

The above Venn diagram illustrates how these facets fit together in a board context.

The survey feedback resulted in findings on what is ‘Critical To Quality’ for the community, and is displayed in complete form in appendix 4 & 5.

The assessment of statements delivered the following findings as the top three within our community:

- 1. There is strong support for more trees.
- 2. Australia needs better quality streetscapes when compared to the rest of the world. And
- 3. There is strong support for deciduous trees.

Visually, the top ten factors that respondents found as appealing, to be considered as high priorities (in order) are:

- 1. Large canopy cover.
- 2. Ability to provide shade.
- 3. Consistent and attractive trunk growth.
- 4. Shaped and manicured tree habit.
- 5. Flowering tree species.
- 6. Trees of consistent shape and size.
- 7. Visible leaf drop.
- 8. Consistent spacing and density of tree planting.
- 9. Large tree species. And
- 10. Consistent alignment on the verge.

These factors, when combined, help us determine how we should deliver the street trees, beyond simply the species. This forms the benchmark we will be aiming to deliver for the community and be considerate of in decision making processes.



# Policy Context

**This Street Tree Master Plan is to become a key informing document to translate objectives from the Strategic Community Plan, and is both a product of, and a tool to drive actions in the Corporate Business Plan. How this relates to the Town's business framework is displayed below:**

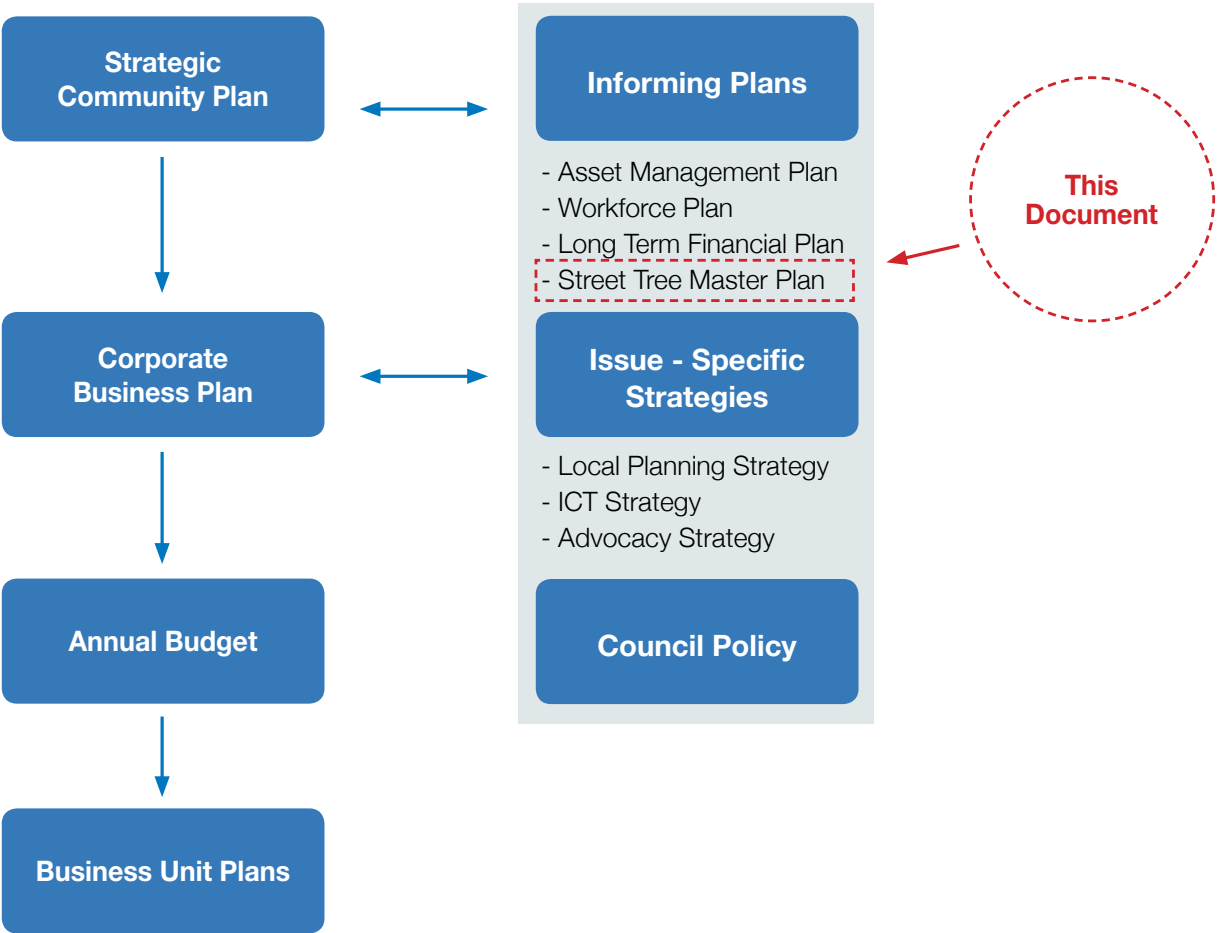
In addition to the Town's context, government (namely State) and non-government organisations have produced a large number of reference materials to support organisations, such as the Town of Mosman Park, in protecting and enhancing their local urban forests. Each document with the general aim to support and promote urban centres, such as Perth, as sustainable, resilient, and liveable cities.

Of relevance to this document, are state policies, strategies and initiatives, such as:

- Our Cities National Urban Policy.
- Planning WA Directions 2031 and Beyond.
- The Urban Forest of Perth and Peel, 2009 and 2014. And
- 2020 Vision.

The following local documents and policies found relevant to the Street Tree Masterplan are:

- Town of Mosman Park Strategic Community Plan.
- Town of Mosman Park Corporate Business Plan.
- Street Tree Policy 2.2.7, Vegetation Policy 2.2.8.
- Town of Mosman Park Local Planning Scheme No. 3. And
- WESROC Greening Plan.



# Financial Investment

**In 2017 and 2018, the Town of Mosman Park engaged a professional arborist to assess and record data on each street tree across the Town. At this snapshot in time, the species, origin, height, canopy spread, value (\$), expected remaining lifespan, suggested management actions, and more, were recorded against 5343 street trees. The Town’s street trees (as a collective asset) was valued at \$12.6 million.**

It was found that 102 species (genus level only) make up the Town’s urban forest. A low 22.5% of species make up a large 85% of the total tree species spread. Only three species make up a large 44.1% of the 85th percentile. Using the projections of the 85th percentile, 76.7% of the Town’s urban forest are Australian native trees. Species prevalence will be explored further in the document.

As well as the known community level environmental, social, and ecological return of street trees, it can be shown that there is a financial return made directly back to the Town. This is important when considering financial resourcing and ongoing support of the urban forest.

The Gross Rental Value (GRV) is based upon the likely rental price that a property may attract annually. The GRV is estimated by a third party; the Valuer Generals Office. Factors that influence the GRV include the size of the block, size of the house (bedrooms and bathrooms), presence of a pool, backyard/garden, surrounding schools, surrounding amenities, surrounding public open space, and more recently density of tree canopy cover and streetscapes.

Leafy streets, with a high percentage of tree canopy cover, is becoming widely accepted as increasing property values, and increasing the desirability of a location in which people choose to live (driving up demand and prices). These findings have emerged globally, with recent studies having taken place in Perth and Brisbane (see references below for further information). The degree in which canopy cover affects property values is often debated and depends on external causal factors such as local climate, energy prices, species, habit of trees, and so on. In addition, there are factors that work against this financial increase such as trees having the ability to block views, create leaf litter and additional maintenance requirements, or

cause damage to surrounding infrastructure. However, a property value increase figure of between 3.5-4.5% (see references below for further information) has been recently proposed and accepted. For the below financial comparison 4% (the median) has been adopted.

An expanded example is provided below for consideration. In Mosman Park, the average house price sits around \$1,300,000, translating into a potential increase of \$45,500 – \$58,500 per property where tree canopy is increased from low to high. As street trees increase house prices, street trees are also expected to increase the GRV by which the rate in the dollar is taken through the annual rating system used by local governments.

Property with low canopy cover			
Rent Weekly	Total GRV	Rate in \$	Rateable amount
\$800	\$41,600	0.066	\$2,745.60
Property with high canopy cover			
Rent Weekly	Total GRV	Rate in \$	Rateable amount
\$832	\$43,264	0.066	\$2,855.42

*In this example of one property, the annual rateable difference back to the Town is \$109.82. Expanded across the Town’s near on 4,000 rateable properties, this would translate into over \$400,000 annually. While this is an example only, and assuming that all street trees (and streetscapes) are of high quality, it serves to show the potential direct returns to the Town.*

*Applying the lifetime costs of a street tree, broken into the initial capital investment, and the additional annual ancillary investments, an investment-return relationship can be proposed with some level of certainty.*

*Note: References see Plant et al. 2016, Escobedo et al, 2015, and others.*

## Capital Investment:

Item	Cost
Purchase	\$75
Labour	\$70
Watering	\$1,650
Additional materials	\$25
SUB TOTAL	\$1,820
New tree attrition weighting 15%	\$273
<b>TOTAL</b>	<b>\$2,093</b>

## Ancillary Investment:

Item	Cost (Total cost to urban forest divide by 5343 to get a per tree cost)
Pruning	\$28.39
Street sweeping	\$1.87
Vandalism	\$0.75
Storm/natural disaster	\$0.75
Green waste disposal	\$0.94
Infrastructure damage and repair	\$3.56
Arboriculture assessment	\$1.97
Insurance levy	\$1
<b>TOTAL</b>	<b>\$39.23</b>

The initial capital investment is \$2,093, and the ancillary annual cost of \$39.23. In a modified urban environment, an expectation may be made that a street tree will have an average lifespan of around 50 years. Therefore, the total cost for the average street tree is \$4,054. Weighting this against the anticipated increased annual rateable return of \$109, which equates to \$5,491 over a 50-year period, an investment return of approximately 35%. This does not factor in inflation, which only serves to improve the return as the majority of the investment lays in the upfront capital costs, with the returns expected to increase. It is also entirely foreseeable that as the value and understanding of the importance of urban trees to their communities increases, so will the influence on house prices and demand for quality trees.

If additional investment returns are to be financially accounted for, such as the additional stamp duty payable for a higher sell price, localised flooding aversion, carbon sequestration, reduction in resident heating and cooling bills, ecological services and so on, the 35% return could likely more than double.

- Recommendation 1:**  
*Retain all mature trees wherever possible.*
- Recommendation 2:** *Where trees cannot be retained and are removed, replacement planting must be compensated at a ratio of at least 3:1.*





# Targets and Outcomes

**Setting future targets and tangible outcomes for the local urban forest is essential to ensure the integrity and performance of the Town as directed by this Street Tree Masterplan. These targets and outcomes are required across many areas to ensure integration and considered management is achieved.**

In 2009, the Department of Planning, Lands and Heritage created and released a document entitled 'The Urban Forest of Perth and Peel'. This document revealed, among other things, the canopy density and distribution of canopy cover across the Perth and Peel region.

From the map below it can be seen that in 2009 the Town of Mosman Park had several pockets of low canopy cover (0-5%, 5-10%), the majority of moderate (15-20%, 20-25%) and a very small amount of high canopy cover (30-40%, 40%+).

In 2014, a review utilising the same methodology was undertaken, suitable for comparison. This revealed that between 2009 and 2014, the Town of Mosman Park remained largely unchanged with the lowest canopy cover remaining in the South-Western portion of town.

Nearly ten years on, the Town has an estimated 14% of tree canopy coverage. When compared with other inner-city local governments, 14% is not a bad starting place.

Mapping vegetation and canopy cover is essential in quality vegetation management approaches because it provides quantifiable data that can be used to interpret what is happening at an on-ground level. Understanding the current density and types of vegetation cover means that more realistic and suitable goals can be set, rather than forming targets on estimations and perceptions of performance. It will also mean that on-going measurement and assessment will be more meaningful and accurate based on real information collected by the Town from individual street trees.

In an attempt to increase the accuracy and validity of canopy coverage, specifically in relation to the Town's streetscapes, specified mapping has occurred to isolate the Town's 'potential' area for canopy cover. This includes road and verge surfaces only (where we want the tree canopy cover). By excluding areas of public open space, private property, commercial property and land anomalies, we can begin to better understand the real opportunities and performance of the Town in these areas.

This technique is based on the following assumption of desire; roads and verges (including footpaths) are to be heavily shaded and minimal overhang to occur over private properties to reduce the volume of requests for tree pruning. Therefore, the area from private property to private property (inclusive of the road and verge) is considered to be the 'potential' area for canopy for the Town's local urban forest.

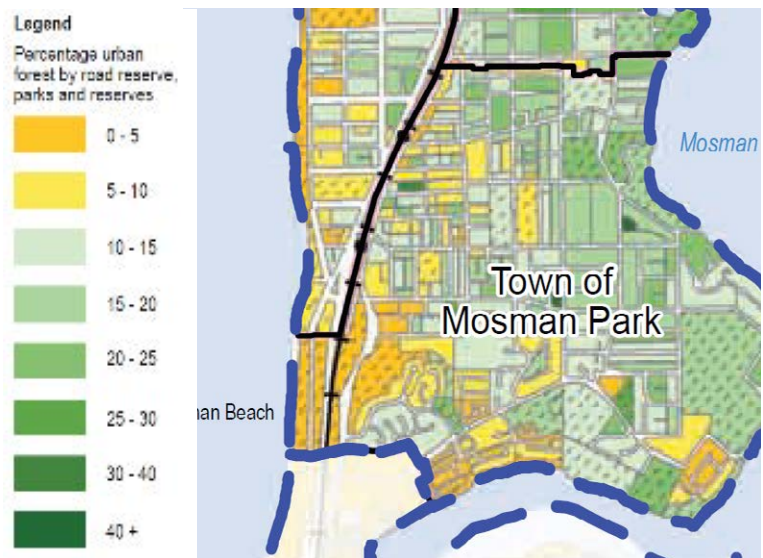
The below images are examples of the potential area for tree canopy cover (within the blue box) and the existing tree canopy within that area (shaded yellow). This first image shows a canopy cover of around 8%, the second image closer to 40%.

*Recommendation 3: Divide the Town into four quadrants to benchmark the current canopy cover percentage.*

*Recommendation 4: Based on the benchmark, prioritise new tree planting programs in quadrants with the lowest canopy cover in the first five years of implementation.*

*Recommendation 5: By 2030, reach a canopy cover percentage of 30% across all four quadrants.*

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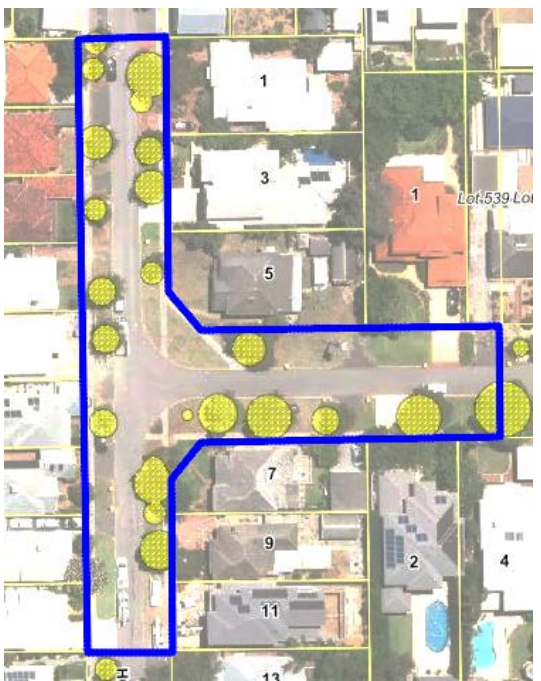
Picture: Courtesy of the 'The Urban Forest of Perth and Peel, 2009'



Picture: Courtesy of the 'The Urban Forest of Perth and Peel, 2014'



Source: Intramaps



Source: Intramaps





# Urban Development

**The Town of Mosman Park, being as established and largely affluent location, is seeing significant amounts of demolition, building, subdivision, and renovation works.**

Recent changes to zoning, via the Local Planning Scheme 3, has seen around one third of the Town re-zoned to achieve higher density living. Higher density living can often result in the diminished ability to support larger shade trees due to the reduced size frontages as well as reduced width of verges. Shade trees within higher density areas are extremely important, perhaps more important than low density, due to the higher proportions of impermeable surfaces, larger surface areas that can reflect and embed heat, and a higher number of people vying for the benefits that trees bring about; mentally, physically, and socially.

Mosman Park, as one of Perth’s most affluent suburbs, shows strong trends whereby properties are renovated, demolished or rebuilt. This process can, and does, result in tree damage, decline, and at times forced removal. This process specifically applies to private vegetation; by which the Town has limited control over.

While the main thrust of this document is concerned with trees on public land that contribute to the local urban forest and are fully within the Town’s care, control, and management; private vegetation makes up around 50% of the urban canopy and as such results in the need for careful strategic protection and planning. This is something the Town needs to allocate time and resources towards to ensure the vegetation loss on private property is controlled and reduced where possible. Using the Town Planning Scheme, and amendments that will arise, incentives and provisions are able to be built in to assist in achieving this.

Many local governments, Mosman Park included, take guidance from several strategic documents, including ‘Liveable Neighbourhoods’. These documents aim to provide a guide towards standards, design, setbacks, and opportunities for inclusion of vegetation. While the guidelines are beneficial on many fronts, it can still be a challenge to plant enough deep-rooted shade trees into narrow road/verge designs to achieve the desirable volume of tree canopy cover.

With respect to tree protection (both public and private vegetation), careful consideration and planning is required. Protection measures include policy, incentives, education, and value adding exercises. Planning measures includes strategy, budget allocation processes, and visioning.

In a highly urbanised environment, it is essential that fauna are given opportunities to move through the suburbs. Trees provide this opportunity, and as such it is of high consideration how, where, and when trees are required to facilitate this movement. Considerations to greenways and ecological linkages are outlined in the WESROC Greening Plan and progress of these linkages should be reviewed in line with this Plan.

*Recommendation 6: Approval of subdivisions must always carry the condition of mature tree retention on public land.*

*Recommendation 7: Develop incentives program for the retention of mature trees within private property.*

*Recommendation 8: Investigate and implement a robust Tree Protection Policy in relation to development sites.*

**Leafy streets, with a high percentage of tree canopy cover, is becoming widely accepted as increasing property values.**



# Climate Change and Biodiversity

The changing (warming) climate presents a big challenge to the management and future planning of the Town’s local urban forest.

In 2017, the Clean Air and Urban Landscapes Hub (a consortium of Australia’s top universities) produced a document titled ‘Risks to Australia’s Urban Forest from Climate Change and Urban Heat’. This document analysed individual tree species used across Australian streetscapes, and the likely effects of the projected climate temperature increase on these species across three conditions; current climatic conditions, a future emissions limited scenario of a 1.3 degree increase by 2040, and a business as usual scenario of a 3 degree increased by 2070.

Each species was rated against a four-point scale; low risk, some risk, moderate risk, and high risk. A summary of the 50 most commonly found street trees in Perth is below.

	Current Climatic Conditions	Emissions Limited Scenario, 2040	Business as Usual Scenario, 2070
Low Risk	18	14	7
Some Risk	12	6	8
Moderate Risk	10	15	12
High Risk	10	15	23

Of relevance to Mosman Park are the 23 species that make up 85% of the Town’s urban forest. These species, their prominence in the Town, and the associated risk rating are shown in the following table:

Species	No.	Proportion of Urban Forest	Current Risk Rating (current scenario)
Peppermint	808	15.12%	High
Box Tree	803	15.03%	Some
Bottle Brush	746	13.96%	Low
Eucalyptus	293	5.48%	Low-High
Olive	238	4.45%	Some
Pear [Orn.]	202	3.78%	High
Melaleuca	197	3.69%	Low-High
Red gum	165	3.09%	Moderate- High
Pines	125	2.34%	Not listed
Flame Tree	119	2.23%	Moderate
Plane Tree	96	1.80%	Moderate
Mop Top	84	1.57%	High
Chinese Tallow	84	1.57%	Low
Rottnest Pine	81	1.52%	Not listed
River Sheoak	75	1.40%	Low
Fig	68	1.27%	Low-Some
Wattle	65	1.22%	Not listed
Citrus	65	1.22%	Not listed
Conifer	56	1.05%	Low
Hibiscus	56	1.05%	Not listed
NZ Xmas Tree	56	1.05%	Not listed
Sweetgum	51	0.95%	Some
Ash	46	0.86%	High



In order to deal with this emerging and intensifying challenge, the Town must diversify the urban forest and consider these implications in all future species selection considerations. Outside of this assessment, it is of great concern that three species make up 44.1% of the 85th percentile. Considering this, the species with the highest prevalence (Agonis) is regarded as high risk in current climate conditions, the use of this species should be reduced in future years to reduce the dominance of this species with the local urban forest. Also of high concern, is that the second most prevalent species (Lophostemon) is no longer actively planted within the Town due to the declining performance in Perth’s hot, dry climate. A strategy is required to determine how this species will be managed as the individual trees meet the end of their useful life.

As with all biota, trees are categorised by family, genus and species. At times, categorisation can proceed on a finer scale into cultivar and sub-species. An industry standard for adequate protection of the urban forest, suggests that trees within the same family should not exceed 30%, trees within the same genus should not exceed 20% and trees within the same species should not exceed 10%.

Through the lens of this standard, the Town of Mosman Park’s urban forest is not adequately protected. An exorbitant 57.42% is made up from the ‘Myrtaceae’ family, which includes a number of species including WA Peppermints and Bottlebrushes (nearly twice the recommended threshold), and the Town’s top three species exceed the threshold of 10% (15.12%, 15.03% and 13.96%).

Diversifying the tree species within the Town’s streetscapes, must be of high priority for the Town in all tree-planting endeavours.

*Recommendation 9: Create a matrix that examines and determines all species suitable for use in Mosman Park for future consideration of planting.*

*Recommendation 10: Diversify street tree species in future planting programs to reduce individual species prevalence to below the 10% threshold.*

*Recommendation 11: Consider future tree vulnerabilities for all new tree species selection processes.*

**In order to deal with this emerging and intensifying challenge, the Town must diversify the urban forest and consider these implications in all future species selection considerations.**

# Population Composition and a Drying Climate

**More people than ever before are moving into urban centres. Current projections suggest that this trend will continue. With the increase of people choosing to live in cities, there is a strong drive towards high density living; arguably somewhat more sustainable than the continuation of urban sprawl. This drive for increased living densities has shaped the way we view and allow for development.**

With higher density living, comes a reduction in backyards, front yards, and an increased demand on public land for the purposes of parking, and recreation. The Town must consider the availability of land and the opportunity for tree planting in urban areas when setting targets for increasing canopy cover.

With the social, environmental, and economic benefits that are derived from urban trees, an attempt must be made by the Town to ensure every effort is made to increase urban trees amidst the challenge of limited public land, particularly within high-density areas.

Along with the changing population composition of our cities, our climate and weather patterns are also changing. Some trends recorded over the last decade include significant reductions in annual rainfall (particularly during winter), an increase in mean temperatures distributed across the year, an increase in heat wave frequency and duration, and other unseasonal weather events (ie. summer storms).

While trees can play a supporting role in the microclimate influence, these trends are being experienced on a much larger scale. On a local level, street trees and the urban forest is essential in the reduction of the urban heat island effect, storm water reduction and intensity reduction, and added protection against large temperature variances. As the climate continues to warm, as predicted to do so, tree canopy cover will continue to increase in value and necessity. This is particularly relevant in highly modified and urbanised areas such as the Town of Mosman Park.

Groundwater resources have declined across Perth, in similar patterns as rainfall. Due to the geology and rock formations below Mosman Park, groundwater security for the Town has reduced drastically over the last few decades. Currently, the Town does not have guaranteed access to the volume of groundwater needed to meet the needs of public open space irrigation and other environmental water requirements. A reduction in groundwater availability, has led to the likely reduction in groundwater allocations in the Perth region. Current projections suggest that water allocations are likely to be reduced by 10% by the year 2028. This has vast implications for the establishment and ability to support a health local urban forest.

The expanded tree species list identifies the water requirements of each tree, which can be used to assist decision-making for the Town in this time of water scarcity.

*Note: References include Alcaraz-Segura et al. 2013, Musco, 2016, and others.*

# Salinity and Salt Water Intrusion

**In the context of the Street Tree Masterplan, the Town of Mosman Park has two issues worthy of consideration; the increasing soil salinity and the increasing groundwater salinity. Salinity often adversely affects trees in both their establishment ability, as well as their performance due to the reduced ability for trees to absorb water, often leading to fatal dehydration.**

## Soil Salinity

Pre-European settlement, what is now known as the ‘Perth Metropolitan’, was a vast network of wetlands with a variety of vegetation complexes, which supported a diverse and dense fauna population. As this land was cleared, and wetlands were filled in to support the development needs of a growing population, the ecological services provided by this vegetation were disrupted, and in many cases devastated. The clearing of these trees and vegetation resulted in the ongoing natural ecological process of salt absorption through the root system and releasing these salts into the air via evapotranspiration was severely disrupted. Rather, the salts in the soils are now left to compound over time.

In addition to salt being naturally present in soils, the application of soil amendments (fertilisers, additives) as well as the reduction in rainfall (reduced ability for soil flushing with fresh rain water) increase the density of salts in the soil profile. As a flow on effect, the higher the salt content in the soil profile, the larger the effects will be on the street tree health and vigour.

## Salt Water Intrusion

Based on a site's geographical makeup (underground rock formations and formation of groundwater bodies) and conditions, proximity of salt water bodies (ocean, river), sea level rise and gross draw of groundwater, a pulling force can be created thus drawing in nearby (salt) water until an equilibrium is found once again. As this process continues, the salt content continues to increase which affects the water drawn for the irrigation of public open spaces, as well as watering of street trees. The higher the salt concentration in the water applied to trees, the more it is going to effect tree health. Additionally, the application of water with a high salt content will contribute to a residual salt content remaining in the soil, which only compounds over time.

While actions can, and are, being taken to manage both the increase soil salinity as well as the effects of salt water intrusion on groundwater resources, it is a risk worthy of consideration for future tree species selection. It is advisable that species that have a mid to high salinity tolerance level are positively weighted for selection to assist in the protection of the Town's urban forest in anticipation of future salinity increases.

Perth has a natural level of salt carrying capacity in soils, particularly those that fringe the coastline. Endemic tree species have evolved over thousands of years to tolerate these conditions, some more effectively than others. Often, exotic tree species are not as well equipped to handle high salinity concentrations in soil or water. There are however, always exceptions to the rule.

*Recommendation 12: Consider the salt tolerances of tree species when making future tree species selections.*

*Recommendation 13: Pursue a target of 10% of total tree species to be tolerant of medium soil salinity densities to assist in the protection of the urban forest in the event of increased salinity.*



# Tree Species Selection

**Street tree species selection is integral to supporting and building a successful urban forest. At a minimum the following considerations must be made:**

- Tree height at maturity.
- Tree canopy spread.
- Verge width.
- Road width.
- Soil conditions.
- Water demand.
- Propensity for limb drop.
- Propensity to cause allergy reactions.
- Pest and disease susceptibility.
- Climate variability.
- Maintenance requirements.
- Root system characteristics.
- Evergreen or deciduous.
- Species prevalence in catchment.
- Infrastructure restrictions.
- Powerline presence.
- Street orientation (East-West, North-South).
- Wind corridors/patterns.
- Surrounding species mix.
- Contribution to greenways and ecological linkages for fauna.
- Resident/community desire. And
- Tolerance of salinity of soils and irrigation.

Each of the above items must be considered when selecting an appropriate tree species. Not all criteria will be equally relevant in all scenarios, a degree of expertise is required within the decision making process.

It is the Town's intention to build upon existing, as well as create new, 'avenues' of street trees, guided by this document. It is the Town's intention to support a single species to be present in each street. This is desirable as species-continuity increases amenity value, allows for ease of maintenance tasks, appeared as highly important in the Town's visioning survey, as well as meets the criteria of those items as outlined above as best as possible.

In short streets where existing established tree species are mixed, there may be a good case to designate these streets as having a 'mixed theme'. It is anticipated that these streets would make up less than 5% of the Town's local urban forest. Separate consultation would be recommended to occur in these scenarios as it appears to contradict the responses received in prior consultation.

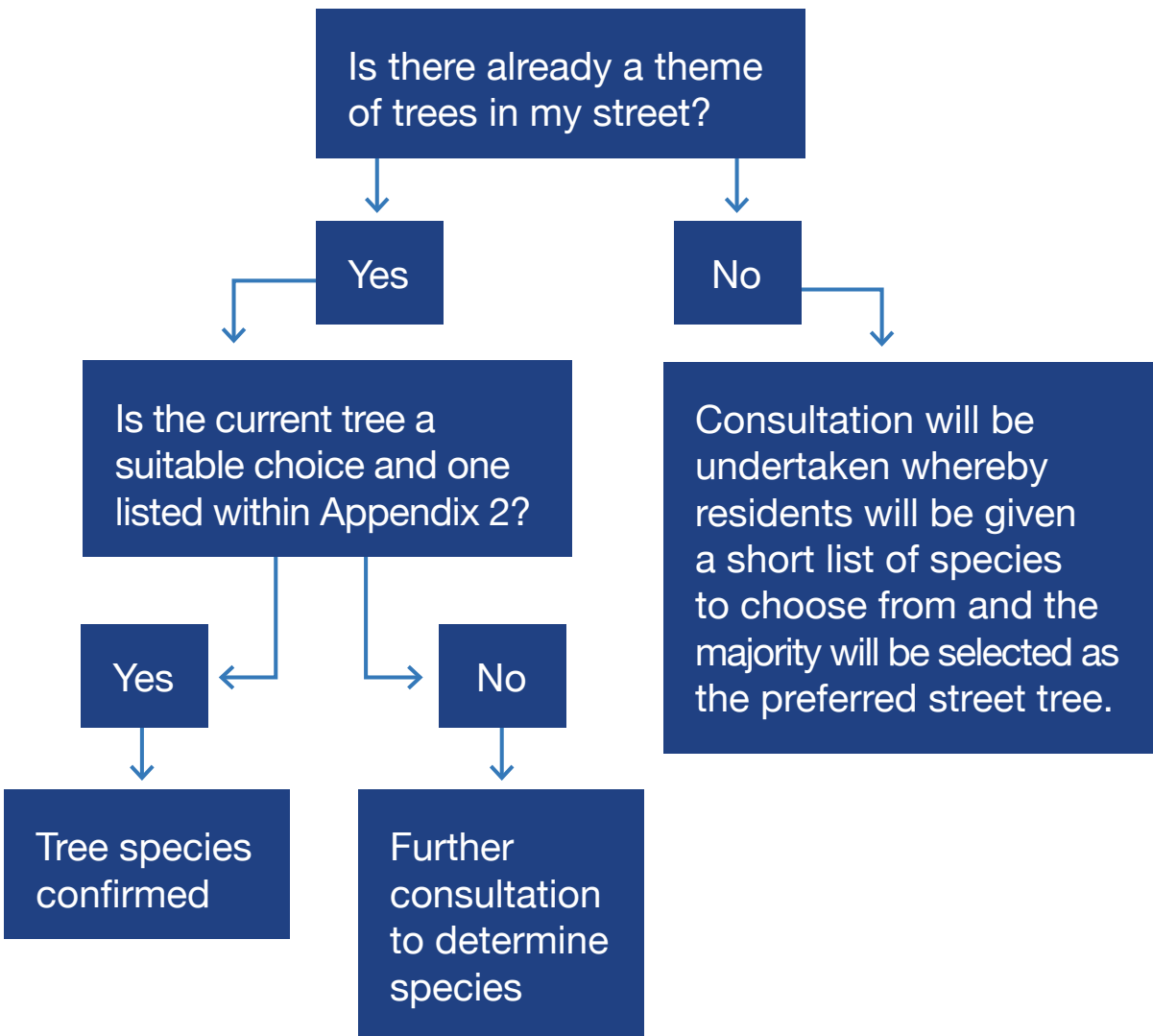
In larger streets where there is a pervasiveness of 20%-30% or more of a single species (except in the cases of Lophostemon) the Town will automatically confirm this species as the designated species for that street. As a one-size fits all rule does not always accommodate every scenario, those streets with afflicting characteristics, a case may be made to undertake further targeted consultation. This is anticipated to occur infrequently.

Streets where there is not a pervasiveness of a single species, the Town will devise a short list of around four to six trees deemed to be suitable using the above listed criteria, and consult the residents within that street, requesting feedback on desired species choice. If a majority is received, that species will be confirmed for that street.

Appendix 1 and Appendix 2 outline the tree species that have been considered and assessed in accordance with the criteria listed above within this section. Appendix 1 shows the initial assessment (168 trees), Appendix 2 shows the shortlisted species (46 trees). Both lists may be amended if new information and considerations emerge.

The diagram below shows the process for the Town's street tree selection based on the information above, as well as those species listed in Appendix 1 and Appendix 2.

# What tree will my street have?





# Community Consultation

**Ongoing engagement with the community in relation to the Town's urban forest, as well as strategising for its protection and enhancement, is paramount to the acceptance and value held for this Street Tree Masterplan. The Town seeks to deliver outcomes congruent with community desires as often and as closely as possible.**

As expressed in tree species selection, where a street does not have a species presenting 30-40% or more saturation of the street, a shortlist will be created by the Town and residents within the street will be presented an opportunity to vote of the preferred species. The reason for this is to increase the ownership and support of residents towards the Town's urban forest/Street tree policies.

The community plays an integral role in streetscapes. The value residents place on trees directly influencing the Town's ability to resource and maintain these assets. Elevating the value placed on street trees is essential for ongoing quality management.

Residents will also be given the chance to provide feedback prior to the adoption of this Street Tree Masterplan, as well as any future iterations, as a means of increasing ownership and inclusivity towards the Street Tree Masterplan.

Community consultation, engagement, and support is paramount for the development and success of a healthy local urban forest. The way in which the community perceives and values trees on their street, and in their neighbourhood, directly influences and impacts upon the Town's ability to develop and deliver a healthy volume of tree canopy for the benefit of all. Over the past few years, the Town has undertaken a considerable amount of consultation to inform the future desires of streetscapes within the Town of Mosman Park, as well as the direction with this document. A summary of these activities are as follows:

1. Strategic Community Plan.
2. Corporate Business Plan.
3. Catalyze survey.
4. Policy revision.
5. Policy creation.
6. 'Visioning Survey'. And
7. Street level consultation.

It is intended that the process for street level consultation will continue where there is not already a strong dominant suitable species, or appears as a priority street as identified by the Town.

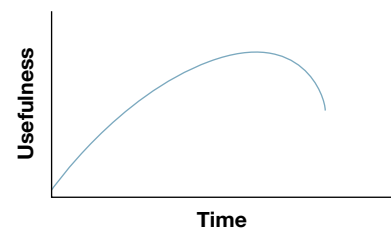
Appendix 3 will serve as an active list and will be updated in line with the confirmation of tree species by street location as they are determined and confirmed via this consultation process. You may refer to Appendix 3 to see the species confirmed for your street post-consultation, or to see an estimated timeframe of when the consultation for your street is likely to occur.





# Urban Forest Lifecycle

Trees, as assets, can be viewed as an expression of usefulness against their lifespan:

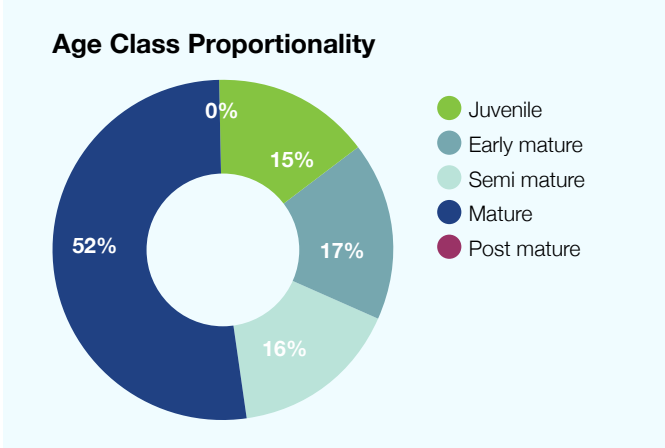


When a tree is pre-establishment, the outputs and services delivered by the tree are low (very strongly correlated to the amount of canopy cover offered by the tree). As the canopy increases, the services and outputs increase, but only to a point where the tree begins to decline, eventually dying. This relationship is expressed in the figure above.

Two factors are important when considering the lifecycle of the Town's urban forest; the 'Age Class' of a tree as well as the 'Safe Useful Life Expectancy' (SULE). The expected lifespan of a tree can vary significantly depending on the species, for this reason it is important to understand the composition of the urban forest in classes (as well as hard figures).

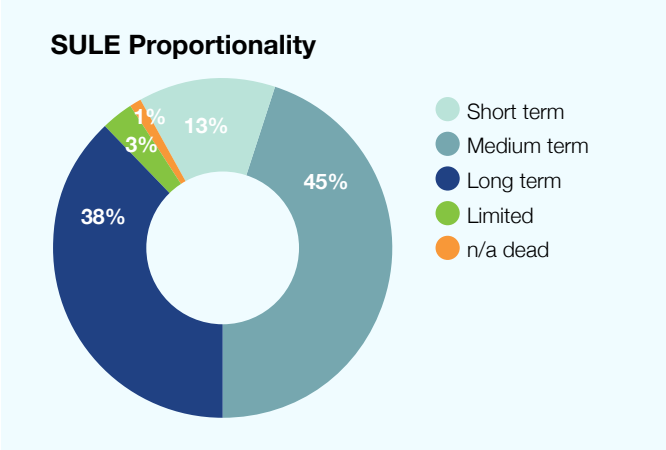
From a management perspective, there is a strong desire for the urban forest to be made up of an equally distributed range of age classes, correlated to the distribution of years in the class to allow for replacement of trees and tree canopy to be seamless therefore reducing ebbs and flows in canopy cover percentage. This ideal distribution is currently not the case for the Town of Mosman Park's urban forest.

The age class proportionality is expressed in the graph below.



In this graph we can see that a large proportion of 52% is of a mature age class. While this proportionality is advantageous in the sense that the services offered by this proportion of trees is higher than if the percentage weighting was disproportioned to other areas. However, the problem will come when this large class of trees moves towards the next phase in the lifecycle; post-mature (decline and death). This will see in a large reduction of canopy cover at a rapid pace if replacement cover is not planned for and invested in prior to the decline and removal providing the chance for canopy to expand.

The SULE proportionality is expressed in the graph below.



Conversely to age class, a heavily weighted distribution to long term and medium term SULE is strongly desired. We can see here that there is a heavy weighting towards medium term and long term expectancy. This is partially explained by the variations of year ranges between these classes, however is showing a desirable spread. While this current proportionality may be suitable for the Town at this time, regular touch points are required in order to maintain a healthy proportionality within these classes.

**Recommendation 14:** Invest heavily in new street stock to assist in balancing out the age class distributions.

**Recommendation 15:** Re-evaluate the Age Class and SULE proportionality every five years to assist in prioritisation of urban forest management actions.



## Rate of Renewal and New Investment

**A formula has been created to determine the annual rate of renewal and new investment required to replace lost tree canopy (either through street tree removal or via natural attrition).**

This formula considers:

- Future tree canopy cover projections and targets divided by years left towards target achievement.
- Rate of canopy loss calculated by each tree removed having an average total canopy coverage of 25m<sup>2</sup> (5m x 5m).
- Anticipated rate of mortality based on Safe Useful Life Expectancy (SULE) of the aggregated urban forest.
- Anticipated attrition of newly planted trees (10%)



# Final Summary, Recommendations and Conclusions

While the Town's local urban forest is existing and prominent within the Town of Mosman Park, emerging threats and challenges have the ability to cause significant, and potentially irreparable damage if not carefully addressed. The Town has reached a critical management point whereby a higher level of management planning, action, and priority must be established to protect these assets and build higher quality streetscapes in the future. A summary of the recommendations found within the plan is tabled below:

While not all challenges can be overcome with the development of a Masterplan of strategic document, it is essential that foundations are set and confirmed in order for a continuous, and sympathetic approach to tree management is established and adhered to.

Trees do not grow overnight, some species taking decades to reach maturity. For this reason, the decisions made now, will provide immediate effect, but more importantly contribute to Mosman Park in the future as the green, leafy, and natural suburb that we love.

For further information on the Town's local urban forest, or for any questions you may have that are not addressed within this Plan, please visit our website at [www.mosmanpark.wa.gov.au](http://www.mosmanpark.wa.gov.au), phone us on **93841633**, or visit us on the corner of Bay View Terrace and Memorial Drive, Mosman Park.

No.	Section	Recommendation	Priority	Timeline	Cost Implications
1	Financial Investment	Retain all mature trees wherever possible.	High	Immediate	Nil
2	Financial Investment	Where trees cannot be retained and are removed, replacement planting must be compensated at a ratio of at least 3:1.	High	Immediate	Nil
3	Targets and Outcomes	Divide the Town into four quadrants to benchmark the current canopy cover percentage.	Medium	Short term	Internal staff hours
4	Targets and Outcomes	Based on the benchmark, prioritise new tree planting programs in quadrants with the lowest canopy cover in the first five years of implementation.	Medium	Short term	Internal staff hours
5	Targets and Outcomes	By 2030, reach a canopy cover percentage of 30% across all four quadrants.	Medium	Medium term	\$115,000 to purchase, plant, water approximately 300 new street trees per year. This figure covered within existing budgets (ie. no increase proposed).

6	Urban Development	Approval of subdivisions must always carry the condition of mature tree retention on public land.	High	Immediate	Nil
7	Urban Development	Develop incentives program for the retention of mature trees within private property.	Medium	Medium term	Internal staff hours
8	Urban Development	Investigate and implement a robust Tree Protection Policy in relation to development sites.	Medium	Medium term	Internal staff hours
9	Climate Change and Biodiversity	Create a matrix that examines and determines all species suitable for use in Mosman Park for future consideration of planting.	Medium	Medium term	Internal staff hours, \$2,000 arborist support
10	Climate Change and Biodiversity	Diversify street tree species in future planting programs to reduce individual species prevalence to below the 10% threshold.	High	Immediate	Nil
11	Climate Change and Biodiversity	Consider future tree vulnerabilities for all new tree species selection processes.	Medium	Medium term	Internal staff hours, \$2,000 arborist support
12	Salinity and Salt Water Intrusion	Consider the salt tolerances of tree species when making future tree species selections.	Medium	Immediate	Nil
13	Salinity and Salt Water Intrusion	Pursue a target of 10% of total tree species to be tolerant of medium soil salinity densities to assist in the protection of the urban forest in the event of increased salinity.	Medium	Medium term	Internal staff hours, \$2,000 arborist support
14	Urban Forest Lifecycle	Invest heavily in new street stock to assist in balancing out the age class distributions.	Medium	Short term	Refer item 5
15	Urban Forest Lifecycle	Re-evaluate the Age Class and SULE proportionality every five years to assist in prioritisation of urban forest management actions.	Medium	Medium to Long term	\$20,000





TOWN OF  
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