George Town Street Tree Strategy

Final for Endorsement

GEORGE TOWN COUNCIL
1804

George Town Council acknowledges the palawa people from the litarimirina tribe from Port Dalrymple as the traditional custodians of the land.

We honour and give thanks for the caring of country, seas and skies of kinimathatakinta and surrounds.

We pay respect to the elders past, present and future for they hold the memories, traditions, culture and hope of pakana people in lutruwita.

Document Title: Street Tree Strategy
Client: George Town Council
Date: May 2024
Revision: C
Authors Ben Roberts, Emily Flanagan
Checked/Approved Alaric Hellawell

Document Issue:

Issue for:	Revision:	Date:
Draft Research	A	Jan 2024
Draft Report	B	April 2024
Draft for Endorsement	C	May 2024
Final for Endorsement	D	May 2024
Revised for Endorsement	E	June 2024

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REALM studios

For:

George Town Council
Adopted June 2024
Minute No. 103/24

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1.0 Introduction:

1.1 Purpose & Objectives

This Strategy aims to assess the opportunities to plant trees across a range of street types in George Town. It develops a municipal planting plan, implementation strategy, planting guidelines and maintenance guidelines.

The Strategy provides a planning and design process for the planting of trees, including;

- identifies and prioritises streets that will benefit most from the presence of trees
- identifies typical street types and provides example tree planting solutions
- provides a best practice catalogue of design innovations for reference in creating site specific solutions.

Trees play a crucial role in improving the livability of our neighbourhoods especially amid the challenges posed by climate change. They offer multiple long-term benefits from ecological health, environmental regulation, social amenity and economic resiliance. We need trees in our gardens, parks and reserves, and should be an essential component of all streets.

The design of streets in Geroge Town have overlooked the importance of trees and as a result George Town has a very low number of street trees and canopy cover (as demostrated in figure 2).

George Town Council has begun to address this issue through the planting of trees in high profile locations and along key streets. The success of these projects has highlighted the need for a more strategic approach to the Council's tree planting efforts moving forward. These project also highlighted key challenges in developing healthy tree growth in existing streets.

George Town is experiencing a significant level of development. It is important to re-evaluate future street designs to ensure that healthy trees are accommodated from the start.

By providing targeted solutions, this strategy aims to overcome these challenges and promote the integration of healthy trees into existing and proposed streets.

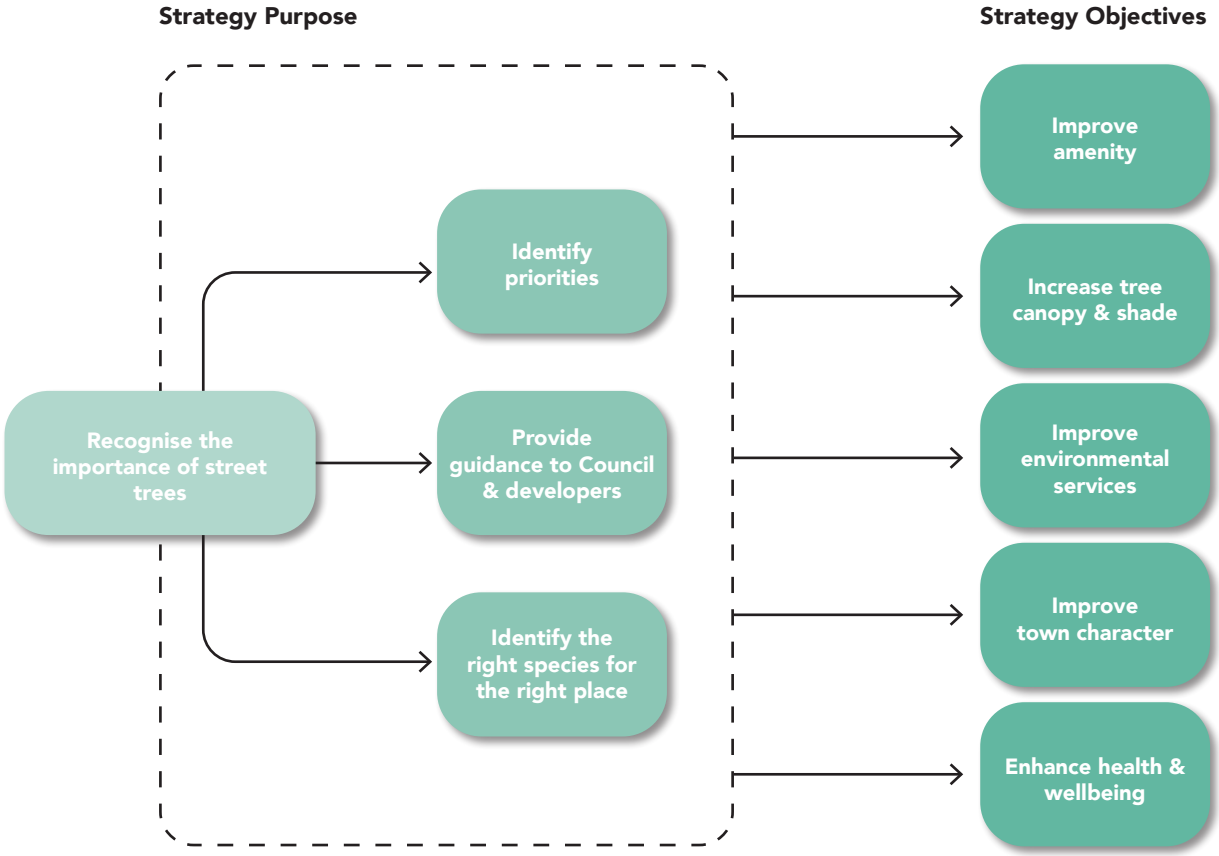


Figure 1. George Town Street Tree Strategy purpose and objectives.
Source: REALMstudios

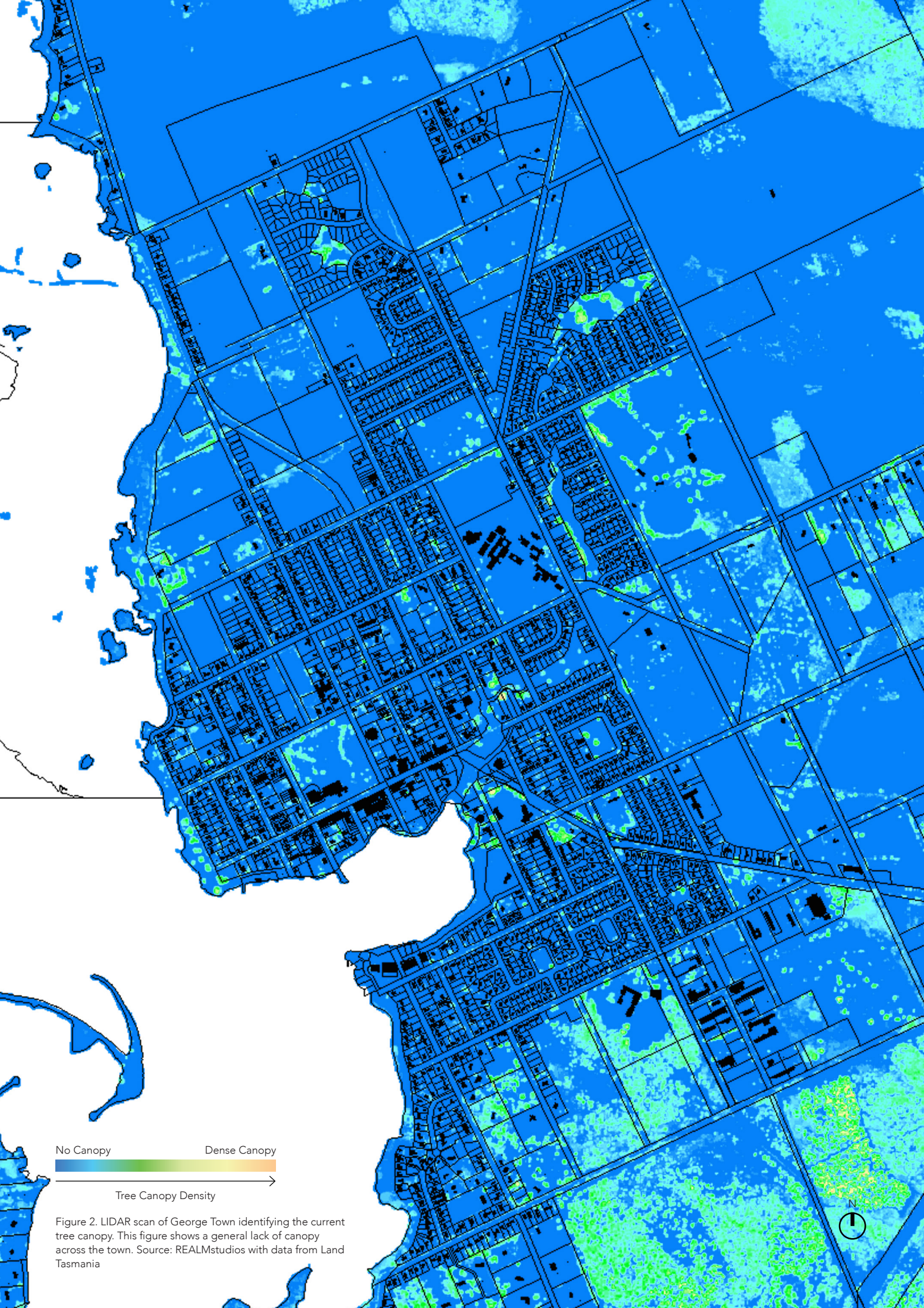


Figure 2. LIDAR scan of George Town identifying the current tree canopy. This figure shows a general lack of canopy across the town. Source: REALMstudios with data from Land Tasmania

1.2 Approach

This Strategy has been developed through a process of on-site analysis, research, and stakeholder engagement.

1. First, baseline research was conducted into both George Town's strategic documents, and successful street tree strategies from other Australian jurisdictions. This strategy responds to an understanding of the past, present, and future context of George Town while drawing on best practice street tree strategies and policies.
2. Site analysis was undertaken in February 2024, using GIS mapping/data to document streets and existing tree conditions. These site visits formed the basis for mapping existing areas of canopy, streetscapes, boulevards, bike paths, gateways, open spaces, community spaces, industrial, commercial, and retail zones, waterways, biodiversity corridors, and conservation zones. This baseline mapping identified broader systems, operations, and performance that subsequently influenced site identification, implementation guidelines, and species selection.
3. Targeted engagement sessions with both George Town Council and key local stakeholders were held to inform an understanding of George Town's past, present and future tree planting as well as any opportunities or challenges to incorporate into the strategy. A workshop was held with Council Officers in February 2024. Another workshop was held with Councillors in April 2024. A series of phone interviews were also conducted with stakeholders throughout the process.
4. The results from the baseline research, site visits, and engagement were used to inform the identification of priority streets and intersections for tree planting. These locations were ranked according to their performance across a range of criteria. The ranking outlines an order in which future tree planting should occur.
5. Next, a series of details and guidelines were developed to outline how to implement and maintain healthy street trees across the different street conditions present in George Town. These address key issues that were identified such as soil irrigation and wind protection.
6. Finally, species selection was developed taking into account how George Town's current tree inventory could be reinforced and supplemented to optimise the benefits of trees and ensure the future sustainability of George Town's trees in the face of climate change.

Figure 3. New street trees planted in a northern subdivision, without typical tree pit details. Source: RealmStudios

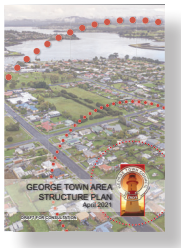
Figure 4. Recent planting of *Pyrus calleryana* Ornamental Pear, near the visitor centre with GreenWell Water Saver reservoirs and mulching. Source: RealmStudios

1.3 Strategic Context

This strategy builds on a number of planning documents. Key themes in the documents include the importance of street tree planting and the need for additional trees in George Town.

George Town Community Strategic Plan 2020-2030

- Identifies a vision for the George Town community. It does not directly refer to street trees, however tree planting could contribute to achieving the aim for:
  - Healthy, active communities
  - Protected local natural landscapes and values
  - Recreational opportunities for all
  - Culture of engagement and participation



George Town Area Structure Plan 2021

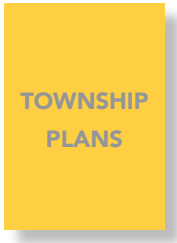
- Acknowledges that street tree planting can support:
  - Sense of place through walkable river and coastal appropriate environments
  - Liveability through integrated walking, cycling, and public transport routes
  - Environmental and sustainable elements through greenbelt and riparian enhancement
- Identifies key street trees including along the foreshore, Wellington Street, and Killara Reserve
- Identifies key areas without street trees including Anne Street
- Recommends that new development and subdivision must include street trees

George Town Sport and Recreation Strategy 2021

- Identifies that street design and street trees contribute to a community's ability and motivation to exercise through improving shade, visual quality, and walkability.
- Notes that there are very few densely treed areas other than in the south. The town has some large native trees in the open spaces and along drainage ways.
- Acknowledges the importance of trees in providing community shade, wind protection, and in identifying precincts.

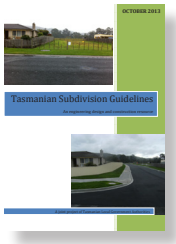
George Town Destination Action Plan 2018-2021

- Plans for tourism development, marketing, and management. Does not directly refer to street trees, however, tree planting could contribute to:
  - Reinforcing the coastal and river setting
  - Identifying and marketing primary attractors



Township Plans 2024-2044

- Provides style guides and tree planting specifications for existing streetscapes and proposed developments
- Proposes street and drainage adaptations to promote positive tree outcomes



Tasmanian Councils Standards for Subdivisions 2013

- Provides minimum requirements for streets and infrastructure works in new subdivisions in Tasmania including underground services, footpaths, and kerbs
- Does not refer to or make allowance for street trees

1.4 Street Tree Benefits

Ecological & Environmental

Street trees have the potential to benefit a wide range of ecological and environmental aspects in George Town. They can contribute to healthier ecosystems, provide habitat, increase resilience in the face of climate change, reduce urban heat island effects, improve water sensitivity, and sequester carbon. These benefits have been summarised into four main ecological and environmental categories outlined below.

Healthy Country

Trees are an important element of Country and give us a direct connection to profound knowledge and understanding that Aboriginal people hold. Trees provide opportunities to draw on both spirit and nature, bringing the depth of Aboriginal culture and custodianship to the fore.

Regulated Temperatures & Wind

Urban areas are often warmer than surrounding landscape areas due to heat retention in hard surfaces. Trees provide shade, reflect sunlight, funnel breezes, and block strong wind. Appropriate tree planting has the opportunity to maximise winter sunlight while blocking sun in the summer.

Enhanced Biodiversity

Half of Australia's threatened native fauna live on the edge of urban areas. By planting trees in our streets and parks, we can provide homes, food, and shelter for native animals. Tree planting plays an important role in biodiversity, genetic diversity and creating habitat for native species.

Carbon Sequestration

By means of photosynthesis, trees absorb CO_2 as they grow, removing it from the air and storing the carbon while releasing oxygen. This is carbon sequestration. By removing emissions from our atmosphere, trees are an effective tool to reduce the severity of climate change.

Social & Economical

Street trees also have the potential to benefit a range of social and economic aspects in George Town. Trees can increase liveability, health, and well-being, encourage activity, improve socialisation, contribute to traffic calming, visual amenity, and sense of place, and lower crime rates. These additional benefits have been summarised into four main social and economic categories below.

Improved Health and Well-being

Canopy cover can improve neighbourhood walkability, increase recreational opportunities such as dog walking, and promote a general sense of well-being. Trees can also lower levels of stress, anxiety, and inactivity. They encourage people to spend time outside and explore their local streets at all times of year.

Economic Return

Strategic tree planting can significantly reduce a building's energy consumption (and lower energy bills) by protecting it from high temperatures and wind pressure. Tree lined streets can also contribute to the appeal of local neighbourhoods, attracting people to linger in retail areas, and increasing the value of properties.

Community Cohesion

Quality outdoor spaces encourage active lifestyles, socialisation, and reinforce communities. By appropriately planting trees, we can improve the appearance and shade cover of our neighbourhoods. We can create opportunities for volunteering via local tree planting events. We have the ability to facilitate a sense of care and pride in local spaces.

Job Creation

The planning, propagation, planting, and maintaining of trees requires significant resources. By increasing tree planting numbers, we can create opportunities for employment in planting and maintenance teams, as well as nurseries. We can engage and train the local community so that they can benefit from the investment.

2.0 Baseline Analysis

2.1 Best Practice

What is street tree best practice?

George Town's street trees should be climate adaptable, water sensitive, developed with infrastructure, and support liveability to bring equal tree canopy for all communities. By following best practice principles, the most appropriate tree species, establishment/maintenance details, and location can be chosen for each street tree. Below is a list of components that contribute to street tree best practice based on a review of street tree strategies for similar municipalities.

Components of tree selection best practice

- **Right tree for the right place:**

  The most appropriate tree species varies according to the location. If the wrong tree is planted it can lead to adverse impacts such as death of the tree, stunted growth, excessive canopy pruning, root damage, cracking of adjacent footpaths, increased bushfire risk, and destruction of native habitats. By choosing the right tree for the right place, the tree's benefits can be maximised. Considerations should include nearby infrastructure and services, neighbourhood character, soil volume, and saturation, sunlight, shade, and winter sun requirements. Engagement with service providers, maintenance teams, and the local community can help to ensure that trees are located correctly and that their benefits are maximised.

- **Tree as biodiversity and habitat:**

  Trees have the potential to provide habitat and food for native animals. Including trees that are native to George Town in the species list will help to link the town to neighbouring forest habitats. On the other hand, if the wrong tree species are used, they have the potential to become weeds, to attract pests, and to cause damage to native habitats. Even if they are used in an urban setting, weed species will spread to nearby forests. Removal and replacement of any current weed species should be a priority.

- **Allergens**

  Some tree species are known to be allergenic, irritating, or poisonous. These species should be avoided to ensure human health, especially because street trees are located close to people's homes, open spaces, and walking routes.

- **Debris and maintenance**

  Some tree species are higher maintenance than others. To reduce ongoing costs and improve their sustainability, higher maintenance trees should be avoided. This includes trees that require active irrigation, cause a large amount of leaf, bark, branch, fruit, and flower litter, or need excessive pruning.

- **Street safety**

  The form and placement of trees should ensure that they do not interfere with the road carriageway, and that they contribute to pedestrian and driver safety, maintain visibility, and slow down traffic where appropriate.

- **Tree succession**

  Street tree planting should be resilient and plan for the future. The City of Hobart, for instance, aims to plant trees that will have a 50–150 year lifespan, that will be resilient in the face of climate change, and that are not prone to disease (City of Hobart Street Tree Strategy, 2017). The City of Sydney explores this idea further, by suggesting infill planting, replacement planting, mixes of species and succession planting to avoid scenarios where all of the trees along a street die at once (City of Sydney Street Tree Master Plan 2023).

Components of tree policy best practice

- **Tree diversity:**

  Species diversity creates a resilient tree population that is less at risk from threats including pests, disease, and changing climate conditions. Both the City of Launceston and the City of Hobart have been inspired by the City of Melbourne's biodiversity targets that ensure that there is no more than 5% of any one species, 10% of any one genus, and 20% of any one family across the municipality's street trees. The City of Hobart acknowledges that these targets are difficult to achieve, especially in relation to trees in the Eucalyptus genus and Myrtaceae family. This would also be the case in George Town. The City of Hobart has consequently set higher maximum targets of 5-10%, 20-30%, and 30-40% respectively. (City of Launceston Urban Greening Strategy 2023-240 and City of Hobart Street Tree Strategy, 2017).

- **Canopy cover target:**

  Tree canopy cover is based on the number of trees as well as the size of their canopy. Canopy cover targets are often used in street tree strategies as a means of creating a tree planting goal while also preferencing tree population health and the preservation of established trees. Both the City of Launceston and the City of Hobart aspire to reach 40% canopy cover in their urban areas. (City of Launceston Urban Greening Strategy 2023-240 and City of Hobart Street Tree Strategy, 2017).

- **Tree data and monitoring:**

  Tree population data can be gathered as a means of measuring the ongoing changes in tree population. It can provide a benchmark for funding, enable assessment of how tree planting and maintenance is going, assist with tree management, and indicate which trees are most successful in George Town and would therefore be best to plant in the future. There are various methods to collect and monitor street tree data that often differ according to the size of the area. Blacktown City Council suggests four indicators, first a record of the street trees that are planted and removed to track increases and decreases in canopy cover, second the street trees that are pruned to track reduction of risk, third the tree requests that are received from the public to monitor budget allocations, and finally the tree permits that are issued and refused to monitor tree preservation controls (Blacktown City Council Tree Management Strategy, 2022).

- **Tree assessment and development:**

  Development sites should retain as many trees as possible. Retaining trees helps to maintain soil profiles, microclimates, spatial definition, wildlife habitat, and local character. It is important to acknowledge that sometimes trees will have to be removed from development sites to make development viable, however this should be restricted, for example the City of Hobart which stipulates that trees must never be removed for site hoardings (City of Hobart Street Tree Strategy, 2017). To enforce tree retention, councils such as Blacktown City Council can require landscape plans to be provided as part of all new developments to indicate the location and species of existing trees and vegetation, the proposed landscaping for the site, and the details of any trees requested to be removed. No trees should be pruned, poisoned, or removed without authorisation and if a tree must be removed it should be replaced (Blacktown City Council Tree Management Strategy, 2022). This ensures that street tree planting aligns with council's objectives.

- **Tree planting and development timelines:**

  It is beneficial to establish street trees at the early stage of development works because they will be more mature and provide more benefits by the time development is complete. Camden Council for instance, requires all street trees to be planted alongside the installation of footpath works and asphalt works, and that this must occur prior to the release of a subdivision certificate for the site. (Camden Council Development Infrastructure Bonds Policy, 2021). Street trees should be maintained by the developer until the development is transferred to the council. Requiring developers to care for trees during their high-maintenance establishment period prevents fluctuations in council's maintenance regimes.

- **Value of street trees, their care and protection:**

  Clear policies around the value of street trees, their care and protection can provide certainty for developers without onerously increasing development costs. A significant tree register can document trees that have a high value to the community and environment. The City of Hobart's street tree strategy also suggests introducing a street tree bond based on the estimated value of the tree, and the cost to replace it with an advanced sized specimen, of an equivalent species, and in line with planting procedures. This places a similar value on street trees as other street infrastructure (City of Hobart Street Tree Strategy, 2017). Camden Council has a similar bond structure in place. Existing street trees are protected under the damages bond, new street trees are protected by a defects and liability bond until development works are complete and maintenance responsibility is transferred to the council.

- **Community engagement:**

  Street tree planting programs can become an opportunity to involve the local community. The community and stakeholders should be informed and consulted about tree removal, planting, and other projects that impact street trees. There is also an opportunity to consider resident requests for tree planting in their streets. Programs could also be developed to educate the community about the benefits of trees, and encourage ongoing involvement particularly in tree care (City of Hobart Street Tree Strategy, 2017).

2.2 Site Analysis

George Town's New Communities

George Town is rapidly changing and the population is projected to significantly increase in the near future. New subdivision developments on the outer fringes, primarily in the north, will accomodate this growth in the community. There are also infill developments occurring across central George Town and expected growth in heavy industry.

Current and future development provides an opportunity to ensure that street trees are effectively established from the beginning. There is also an opportunity to retrofit trees into key connecting streets between the new communities and central George Town.

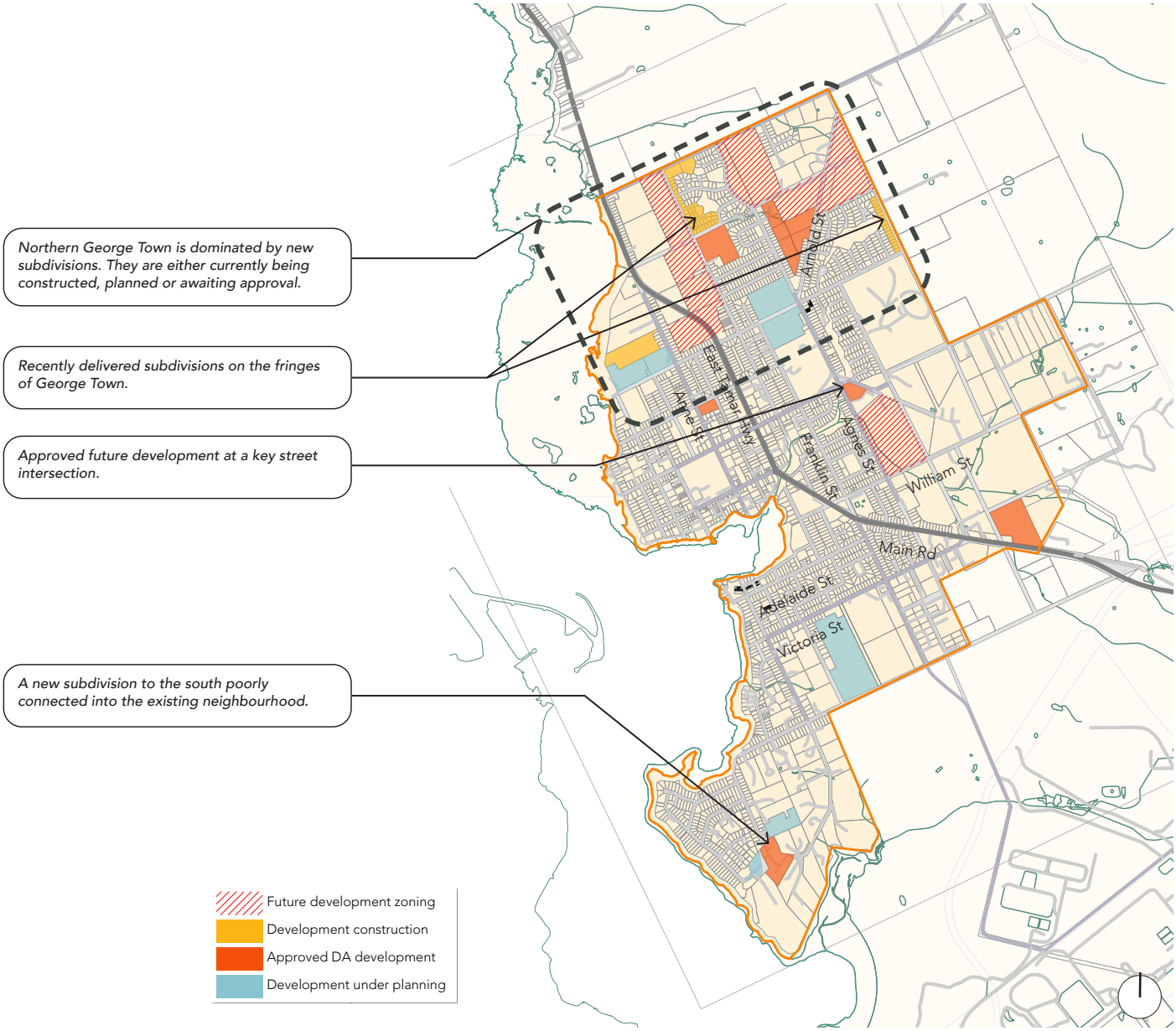


Figure 5. George Town's development sites. Source: RealmStudios

Current Tree Planting and Canopy Inequality

George Town has a number of beautiful tree lined streets and a leafy Regent Square. With a diverse coastal edge and bushland nearby, George Town feels very green. However, in the northern neighbourhoods and urban fringes there is a general lack of trees and an ad hoc approach to tree planting. This has created an inequality of tree canopy across George Town.

In recent years the welcome/entry experience coming into George Town has been dramatically uplifted with the planting of trees along Main Road. It is noted that Pear trees have a fastigated form, which do not offer the same canopy benefits of a larger spreading forms.

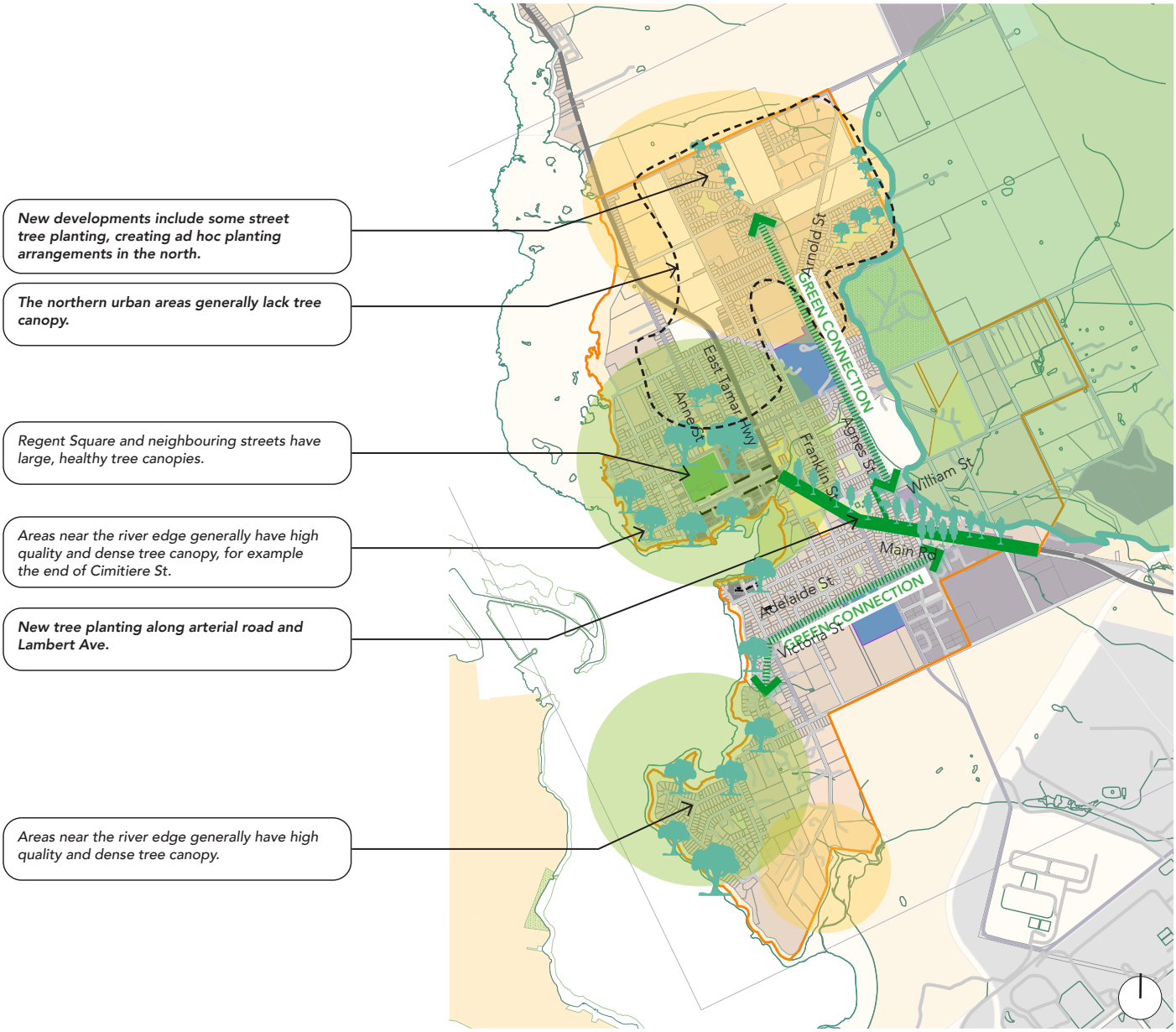


Figure 6. George Town's current tree planting. Source: RealmStudios

Climate and Nature

George Town is centred around York Cove, a protected harbour on the River Tamar. The town is connected to York Cove along the York Creek Reserve which is a partially concealed creek line that runs from the north-east. It has pockets of native planting and holds great opportunity as a blue-green corridor. York Cove is also the beginning of the Kanamaluka Trail, a green edge to the River Tamar that continues all the way north to Low Head and the Bass Strait.

On the fringes of George Town's neighbourhoods, there are remnant patches of Dry Eucalyptus Forest and Coastal Heathland plant communities. These are dominated by *Eucalyptus amygdalina* and *Allocasuarina verticillata* trees. Throughout George Town, there are open reserves which provide the opportunity for these large canopy remnant specimens to thrive. These trees bring habitat and microclimate benefits into George Town's urban areas from the surrounding forests.

The topography has a gradual rise in height towards the north east, tilting these neighbourhoods towards the prevailing wind direction, which is westerly. These winds bring warm, dry conditions from mainland Australia which reduce the water content in soils and increase the stress on trees. It is important that the correct species are selected in exposed locations to ensure healthy trees and to provide wind breaks.

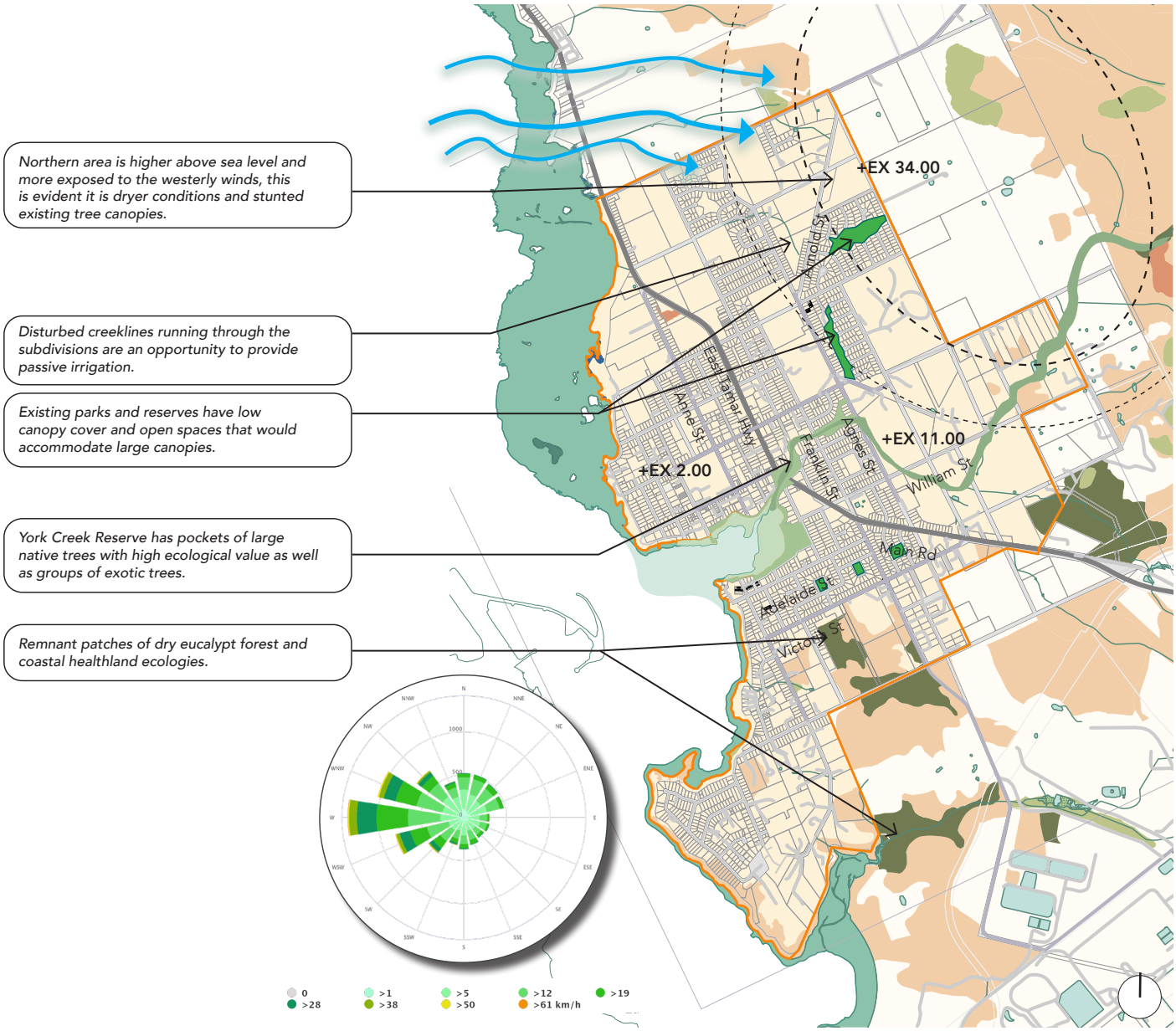


Figure 7. George Town's microclimates and vegetation. Source: RealmStudios

Key Connections

George Town is the main service hub for the region and is connected to the surrounding townships via key arterial roads. This creates important connections entering and departing the town along Main Road/ the East Tamar Highway.

At a more local scale, there are multiple high transit streets that connect community infrastructure and neighbourhoods together. A series of important north-south streets connect the northern neighbourhoods into the town centre with schools, community facilities and open space in between. Whilst, south of the town centre has a more informal street network where the link between Southern George Town Primary School and the aquatic centre is a particularly important consideration.

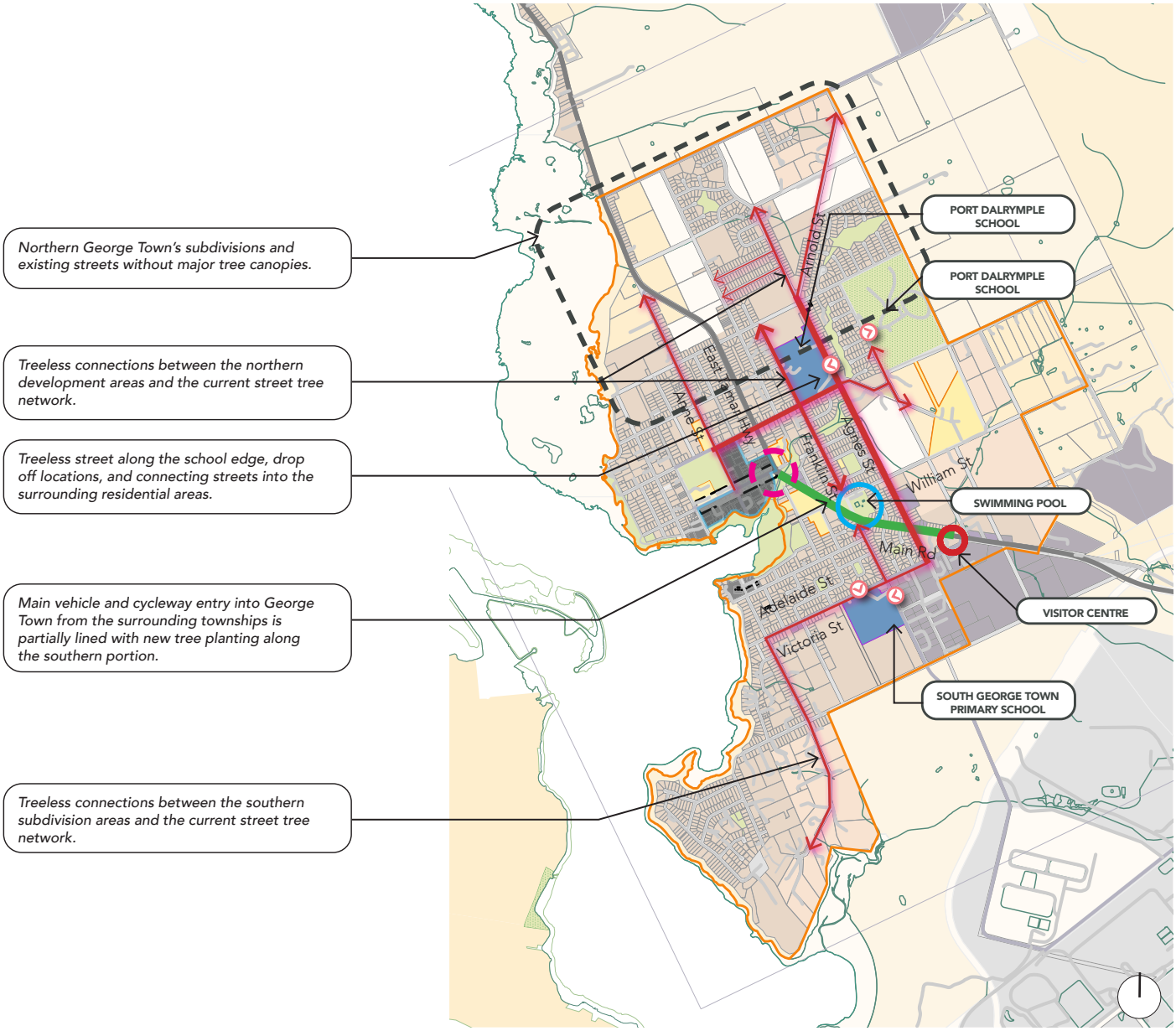


Figure 8. George Town's key connections. Source: RealmStudios

2.3 Engagement Outcomes

Council Workshops

Close consultation with George Town Council and councillors has informed this strategy. During the several meetings key pieces of information were attained. Key insights have been summarised below.

Current Street Tree Operations:

- Planting has been somewhat ad hoc due to not fully considering future infrastructure and overhead power lines.
- Lack of a long-term strategic plan for street tree planting.

Focus Areas:

- Main road into George Town has seen significant planting of Ornamental Pears.
- Low socio-economic streets identified as needing street trees for community, environmental and visual benefits.
- Emphasis on planting trees along streets farther from the main road and town centre.
- Priority on achieving an equitable tree canopy across George Town.

Future Plans:

- Strong desire to continue and expand tree planting throughout George Town.
- Potential budget increases to support an equitable street tree canopy.
- Community voices and requests highlight the need for more street trees.

Stakeholder Interviews

A range of utility providers were interviewed to gain insights into the installation, ongoing maintenance, and operational requirements for underground utilities. This understanding highlighted the challenges street trees face in competing with these utilities. Additionally, consultations with the council's infrastructure and maintenance team provided valuable insights into current practices for managing street trees.

Utility Providers:

- Engaged with utility providers Tas Water and Tas Gas.
- Gained insights into installation, maintenance, and operational needs for underground utilities.
- Improved understanding of the challenges street trees face from utilities.
- TasGAS certified trees planted 1.5 metres from major gasline trenches.
- Typically all street trees to be planted 600-750mm away from any service trench.

Council Infrastructure and Maintenance Team:

- Provided insights into current practices for managing street trees.
- Highlighted differences between developer and council practices for tree management.
- Prefers planting larger trees (1.5-2m) for greater visual impact.
- Considering contracting landscapers for efficient tree installation.
- ELKE standards used for tree planting.

Developer Practices:

- Street trees are included in developers' scope, treated similarly to other infrastructure.
- Developers must install all underground utilities, inspected by council with as-built drawings and 12-month maintenance contract before handover.
- Street trees are planted post-utility installation, with council confirming location and species.
- A 12-month maintenance period follows for all infrastructure, including street trees. Council then continues with tree establishment works.

2.4 Issues & Opportunities

The following issues and opportunities are based on the site analysis findings and the items raised during stakeholder engagement. These issues and opportunities fall into four distinct categories.

Social & Community

- Identify social infrastructure with low canopy as a priority for street tree planting programs with a particular focus on playground locations, schools, drop-off and pick-up zones, and connecting streets with active transport routes.

Urban Conditions

- Identify open spaces with low canopy coverage as a priority for tree planting.
- Identify areas of known high wind to incorporate deep root irrigation and plant suitable species that will tolerate the microclimatic conditions.
- Provide tree planting guidance to the development industry to ensure the establishment of high quality canopy.

Blue & Green Systems

- Improve biodiversity and habitat viability by planting connecting streets to bushland and remnant vegetation with relevant native species.
- Rehabilitate existing creek ecologies through re-vegetation programs.

Access & Movement

- Connect new developments to existing town centre areas through the use of complementary tree species.
- Identify low canopy streets as a priority for street tree planting.

3.0 Prioritisation

3.1 Principles

This strategy identifies key streets in George Town where new tree planting will have the maximum positive benefit. The four planning priorities below summarise the outcomes that George Town aims to achieve from its street tree planting and form a basis for the identification of these streets.

Community & Character

Tree planting will enhance George Town's identity, improve urban legibility, and increase social equity. Trees will be planted in places peple want to be or need them most. Prioritising tree planting in areas that require uplift will develop a George Town where everyone feels safe and proud to be. Trees will create a comfortable and beautiful environment for all.

Conditions & Infrastructure

Tree planting will help integrate new developments into the landscape whilst creating leafy neighbourhoods in established areas. Focus will be given on creating comfortable climate conditions, by mitigating against strong winds in winter and reducing urban heat intensity in summer. This will also help to save residents on heating and cooling bills. The ease of adaptability of existing streets will inform target streets for planting.

Nature & Resiliance

Strategic tree planting and appropriate species selection will reinforce the connection between George Town's developed areas and the surrounding reserves, bushland, and Tamar River. Trees will be prioritised in locations that link isolated habitat areas, improve biodiversity corridors, and increase the urban forests resilience to both pests and climate change.

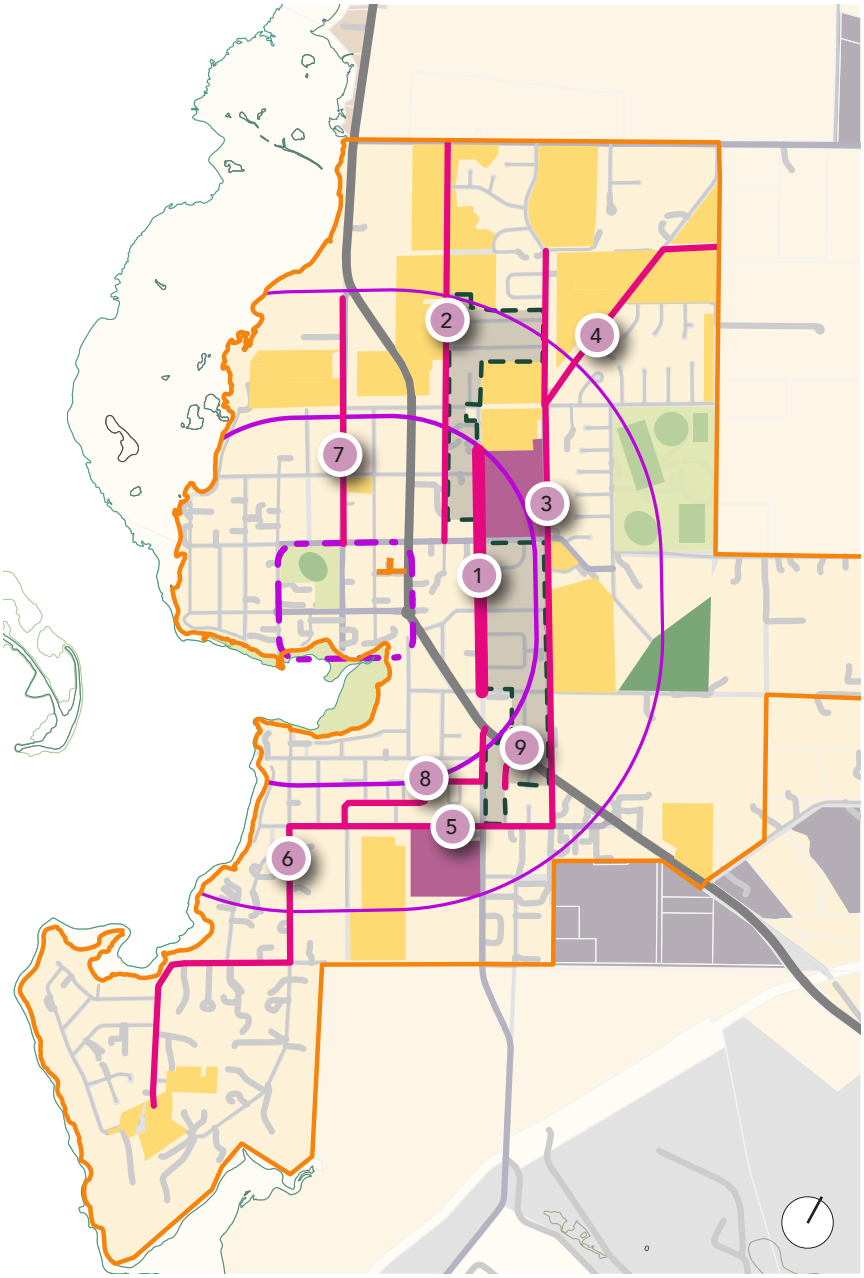
Access & Movement

Tree planting will improve the walkability and cyclability of George Town by providing comfortable and attractive connections. Focus will be given to greening movement corridors to key destinations, shops and businesses, and community infrastructure. Trees will reinforce connections between the inner town and outer residential areas.

3.2 Community & Character

Priorities:

- Plant along streets lower socio-economic areas.
- Plant in streets with limited canopy cover.
- Plant streets near key community locations including public open space, schools, sports facilities, and the town centre.
- Plant in streets at key gateways, intersections and avenues.



Priority Streets

1. Franklin Street
2. Friend Street
3. Agnes Street
4. Arnold Street
5. Victoria Street
6. Mary Street / White Street
7. Anne Street
8. Adams Street
9. Counsell Avenue

Legend

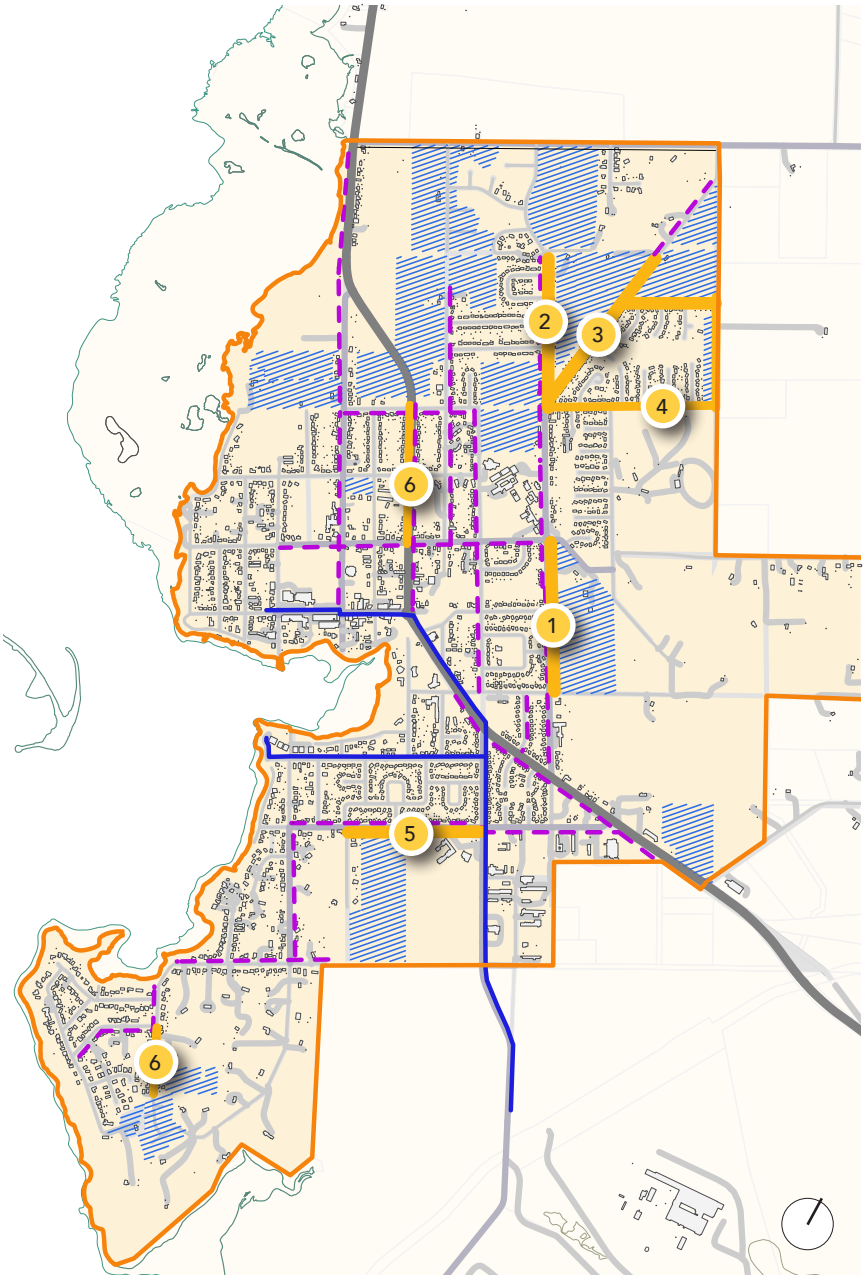
- Priority Social & Community Street
- Public Open Space
- School/ Childcare
- Aged Care
- Sports Facility
- Cemetery
- 1950s Housing
- New Development

Figure 9. Social and community mapping. Source: RealmStudios

3.3 Conditions & Infrastructure

Priorities:

- Avoid conflict with power lines, underground utilities and vehicle visibility.
- Plant streets in all future development areas.
- Plant along streets with proposed footpath connections.
- Plant streets in areas with high winds or explosed aspects.



Priority Streets

1. Agnes Street lower
2. Agnes Street upper
3. Arnold Street
4. Stonehouse St + Davis Street
5. Victoria St (school frontage)
6. White St
6. Goulburn St

Legend

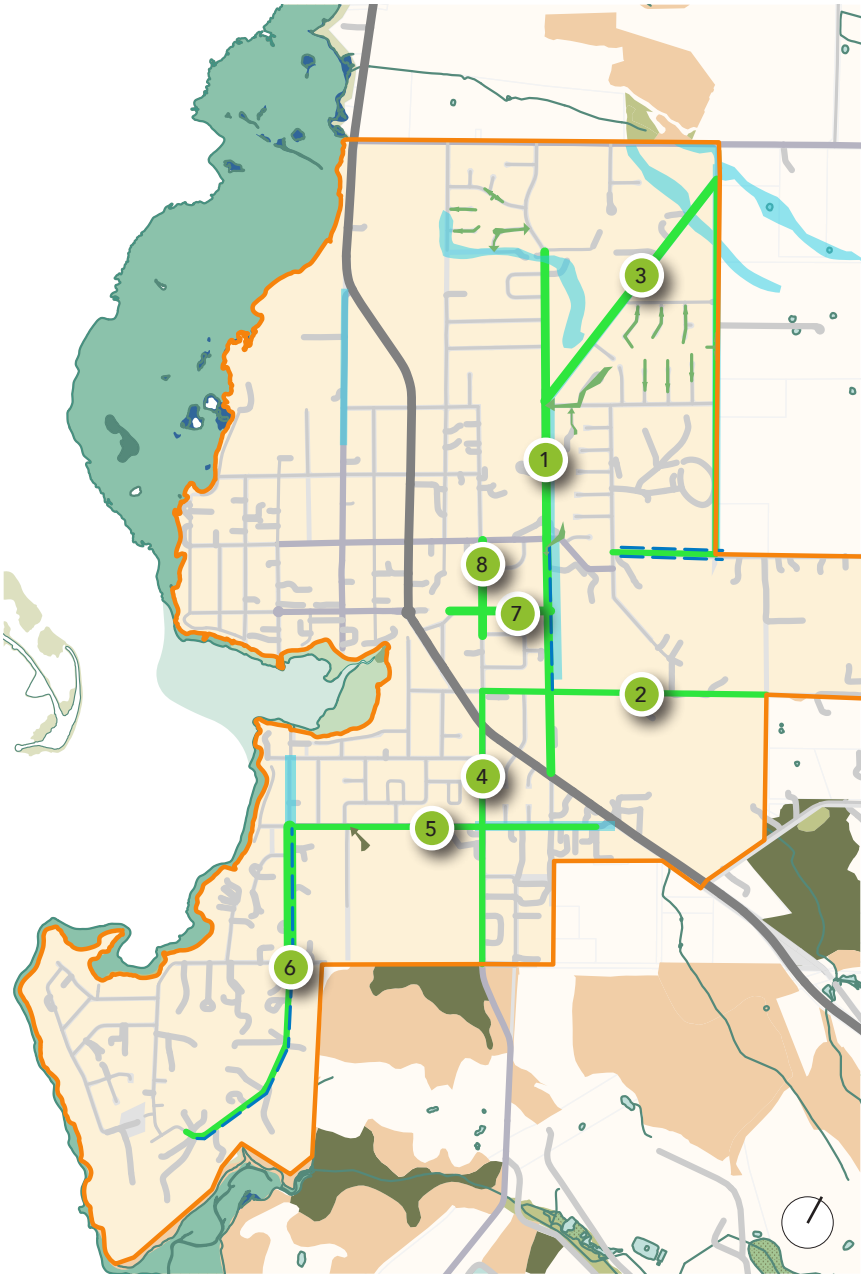
- Priority Street Free of Urban Constraints
- Power lines
- Tas Gas lines 1.5m offset and approvals
- Subdivision assets/infrastructure requiring street tree coordination

Figure 10. Urban conditions mapping. Source: RealmStudios

3.4 Nature & Resiliance

Priorities:

- Plant in streets that connect to feature landscapes and bushland areas.
- Plant native trees that link habitat areas.
- Plant in streets that link public parks creating green connections.
- Plant trees along watercourses and open swales in streets for passive irrigation outcomes and help remove pressure from grey water infrastructure.
- Strict locally native tree planting abutting or close to bushland zones to support ecology and prevent potiental weed spread.



Priority Streets

1. Agnes Street
2. William Street
3. Arnold Street
4. Franklin Street
5. Victoria Street
6. Mary St / Gerzalia Dr
7. Macquarie Street
8. Friend Street

Legend

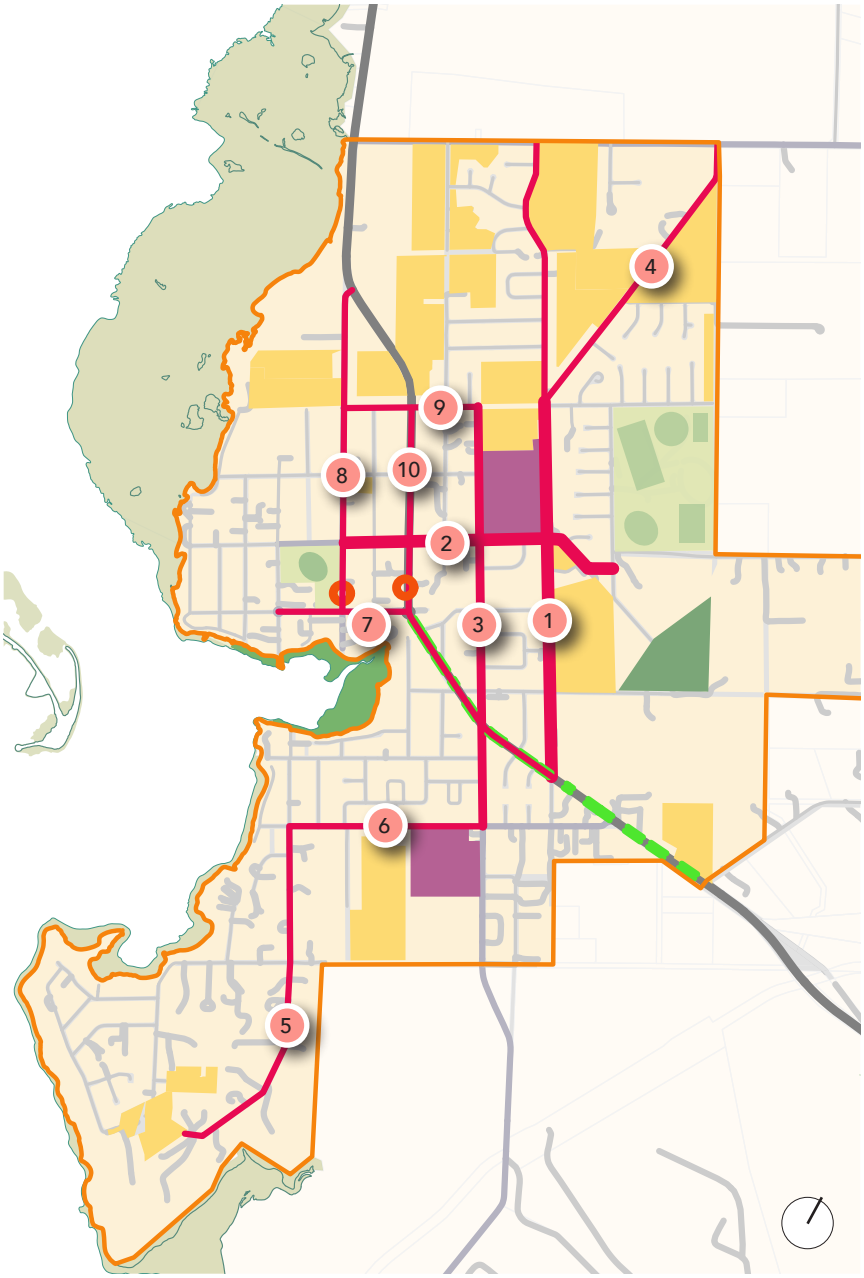
- Priority Blue/ Green Streets
- Public Open Space
- Dry eucalyptus forest and woodland
- Coastal heathland
- Watercourse
- Flood
- Open drains/swales

Figure 11. Blue and green systems mapping. Source: RealmStudios

3.5 Access & Movement

Priorities:

- Plant along shared path routes.
- Plant in streets with proposed footpath connections.
- Plant along streets that connect key locations including public open space, schools, sports facilities, and the town centre.
- Plant in streets that require traffic calming.
- Plant in streets that connect to new development areas.



Priority Streets

1. Agnes Street
2. Cimitiere Street
3. Franklin Street
4. Arnold Street
5. Mary St / Gerzalia Dr
6. Victoria Street
7. Macquarie Street
8. Anne Street
9. Davis Street
10. Goulburn Street

Legend

- Priority Access & Movement
- Public Open Space
- Schools
- Sports Facility
- Town Centre
- New Development
- Bus Stops
- Cycle Infrastructure

Figure 12. Access and movement mapping. Source: RealmStudios

3.6 Priority Streets

Below is a matrix of every street that was identified as a priority for tree planting according to its potential impact on the four principles. The streets have been quantified according to how many different criteria they address, with a possible total score of 4. The streets have then been graded according to their score into high, medium and low priority categories which can be used by George Town Council to direct future tree budgets and planting programs.

	Community & Character	Conditions & Infrastructure	Nature & Resilience	Access & Movement	Total
High Priority					
Agnes Street	●	●	●	●	4
Arnold Street	●	●	●	●	4
Victoria Street	●	●	●	●	4
Franklin Street	●		●	●	3
Medium Priority					
Friend Street	●		●		2
White Street		●		●	2
Mary Street			●	●	2
Davis Street		●		●	2
Anne Street	●			●	2
Macquarie Street			●	●	2
Goulburn Street		●		●	2
Low Priority					
William Street			●		1
Cimitiere Street				●	1
Gerzalia Drive				●	1
Stonehouse Street		●			1
Adams Street	●				1
Counsell Avenue	●				1

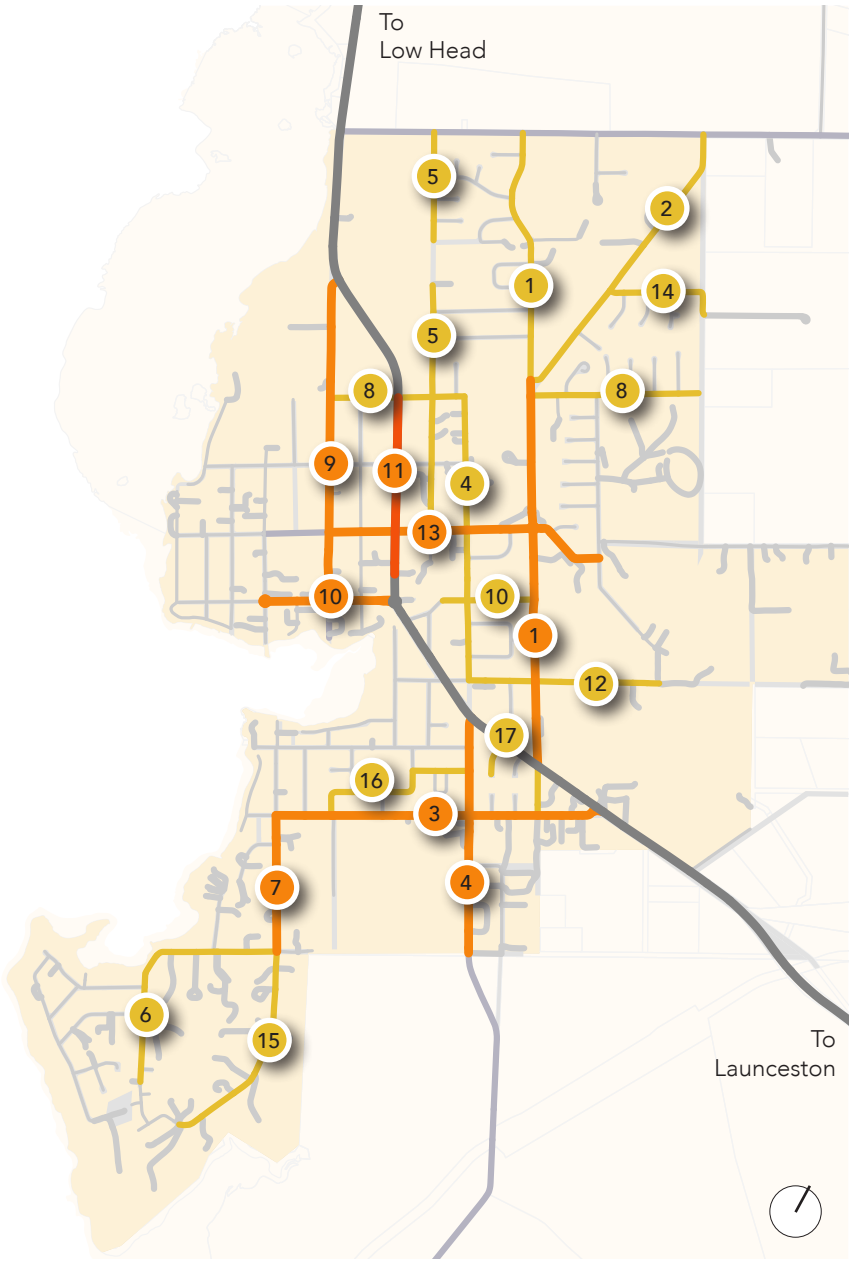
4.0 Implementation

4.1 Street Typologies

George Town has a gridded street network with a main arterial road running north-south through the town, connecting Launceston to Low Head. Collector Roads run both parallel and perpendicular to the main road. These roads service the different neighbourhoods and provide high transit links between community buildings and facilities. The town centre is located along Macquarie and Anne Streets, which are collector roads between the main arterial road and the River Tamar. Residential blocks are located along local roads in a gridded arrangement closer to the town centre, and in cul de sacs at the outer neighbourhoods.

The type of street: Main Arterial Streets, Collector Streets, and Local Streets, impacts the type and arrangement of tree planting through factors such as street width, verge width, and the frequency and speed of traffic.

Collector and local streets have been prioritised due to existing works that has been undertaken on Main Arterial Streets, however these should still be considered for ongoing tree planting works due to its major role in the existing street network.



Priority Streets

1. Agnes Street
2. Arnold Street
3. Victoria Street
4. Franklin Street
5. Friend Street
6. White Street
7. Mary Street
8. Davis Street
9. Anne Street
10. Macquarie Street
11. Goulburn Street
12. William Street
13. Cimitiere Street
14. Gerzalia Drive
15. Stonehouse Street
16. Adams Street
17. Counsell Avenue

Legend

- Main arterial road prioritised for tree planting
- Collector Roads prioritised for tree planting
- Local Streets prioritised for tree planting

Figure 13. Priority street tree planting. Source: RealmStudios

Main Arterial Streets

Connector streets are defined by a carriageway greater than 9 meters, supporting major traffic entering and leaving George Town. Best practices along main roads aim to maximize the benefits of wider verges with larger soil volumes, providing extensive canopy cover and stronger environmental benefits. However, these roads have competing easements and trenches for utilities, as well as increased traffic considerations. The main arterial streets accommodate public transport, private vehicles, cyclists, and pedestrians.

Constraints

- **Intersections and Roundabouts:**
  Ensure compliance with relevant road safety standards to maintain clear sight lines, including visibility of traffic signage. Tree planting locations must adhere to these safety standards.
- **Canopy Clearance:**
  Select tree species that can withstand canopy pruning, including the removal of large limbs that might interfere with vehicular movement, especially for tall vehicles like trucks and buses.
- **Overhead Power lines:**
  Tree selection must account for the mature height of species and their ability to be heavily pruned if necessary. Pruning to leave specimen well-balanced.
- **Underground Utilities:**
  Significant utilities, such as gas lines, run along the main road and must be avoided during tree planting.

Opportunities

- **Wider Verges:**
  Main road widths typically allow for larger verges, which can accommodate large tree specimens with spreading canopies. Select species with broad forms rather than fastigiate or columnar forms.
- **Connected Soil Volumes:**
  Larger soil volumes support the health of large tree specimens and reduce the risk of pavement damage and root heave.
- **Diverse Planting:**
  Increase the diversity of street tree planting to mitigate the risks of diseases and pests.
- **Succession Planting:**
  Implement succession planting for existing mature trees along the main road to ensure a healthy tree population for future generations.

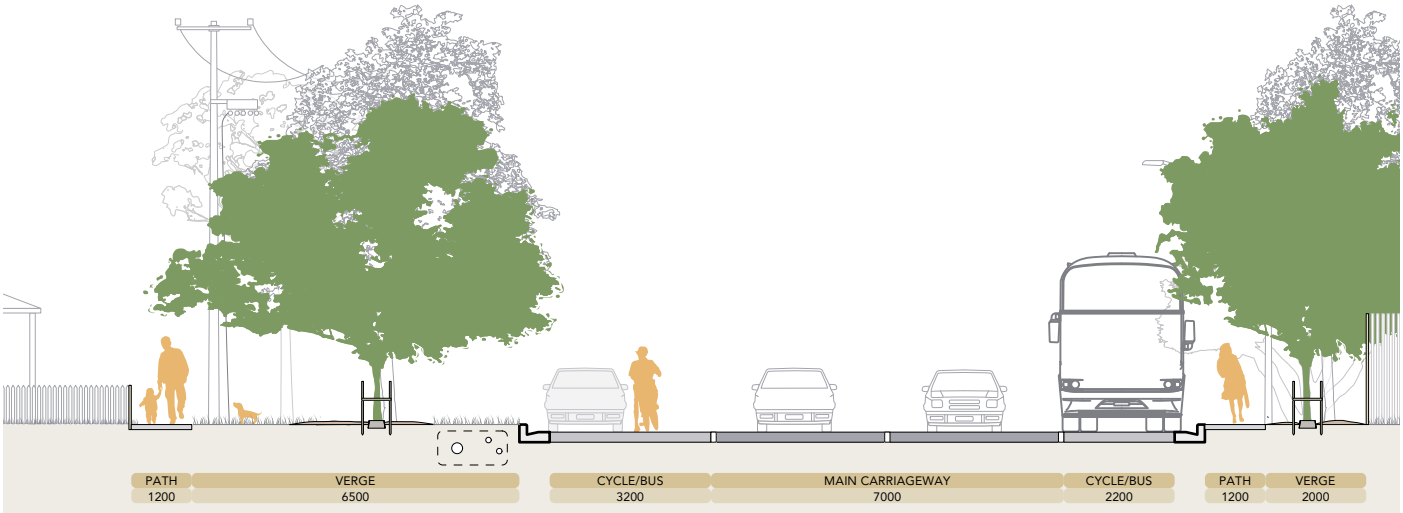


Figure 14. Typical main road section. Source: RealmStudios

Collector Streets

Collector streets are low to moderate capacity roads designed to move traffic from local streets to the main arterial streets. Typically, the carriageways are between 7-9 meters wide. Best practices aim to adapt to various verge conditions and interfaces with private and public spaces. These streets feature multiple profiles with drainage paths that can be integrated into tree planting. Collector roads are commonly used as high transit corridors for pedestrians, cyclists and vehicles.

Constraints

- **Street Safety:**
  Tree planting must not impede the safety of pedestrians, cyclists, or vehicles. Trees can serve as traffic calming measures but must preserve lines of sight.
- **Tripping Hazards:**
  There are risks associated with pedestrian tripping hazards, such as root-damaged pavement. This is particularly important near school frontages. Trees of appropriate size should be selected for the available soil volume.
- **Retrofitting Challenges:**
  Retrofitting street trees into existing verges is challenging and requires coordination with multiple stakeholders to ensure approval.

Opportunities

- **Shade and Amenity:**
  Provide shade and improve the streetscape around schools.
- **Passive Irrigation:**
  Prioritise the use of existing open drains for their passive irrigation qualities, promoting healthy trees.
- **Species Diversity:**
  Existing street tree plantings along these roads should be considered for their character and the need to increase species diversity. Successful existing trees provide insights into species selection and growing conditions.
- **Street Furniture:**
  Consider the inclusion of street furniture to enhance street functionality and livability in key social and community locations.

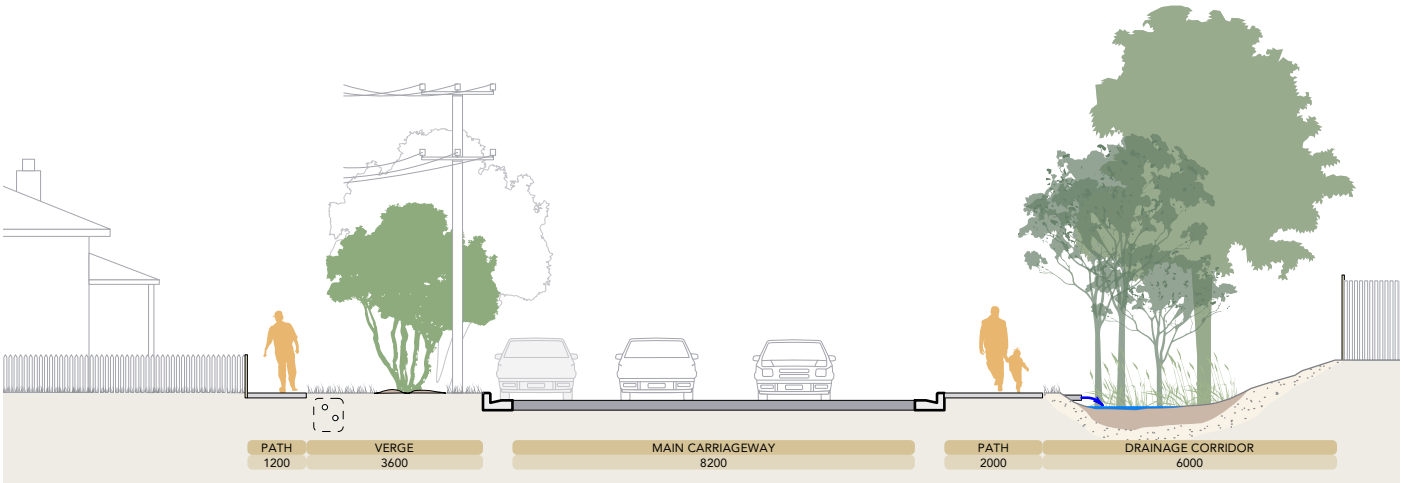


Figure 15. Typical collector and high transit street section. Source: RealmStudios

Local Streets

Local streets are low-capacity roads used to access residential properties, often featuring cul-de-sacs. They are typically 7 meters wide, as per Tasmanian subdivision guidelines. Footpaths on either side are common in new developments, contrasting with the more irregular verge layouts seen in existing streets. Local streets often lack significant tree canopy and offer limited soil volume due to narrower verges.

Constraints

- **New Developments:**
  Many subdivisions in the northern areas of George Town are in planning, under construction, or for sale. These sites are isolated around the fringes of George Town and are typically converted farmland, leading to exposed open sites vulnerable to extreme conditions, including harsh northwest winds.
- **Limited Tree Planting:**
  Tree planting is restricted due to narrow verges and utility arrangements (refer to Figure 25).
- **Vehicle Parking:**
  Parking on verges puts new tree plantings at risk.

Opportunities

- **Coordinated Assets:**
  Coordinate assets to allow for larger soil volumes and a greater number of trees in new subdivision local streets.
- **Hardy Species:**
  Select and grow hardier species that promote deeper roots and climate resilience. Use deep root irrigation during establishment and specify smaller potted tree sizes.
- **Community Engagement:**
  Engage with residents and community groups to understand their needs and aspirations at the local street level. Encourage voluntary participation in the establishment of street trees.
- **Early Planting:**
  Plant trees before new communities move in to provide earlier benefits and an already developed canopy. Developers should install trees as early as possible

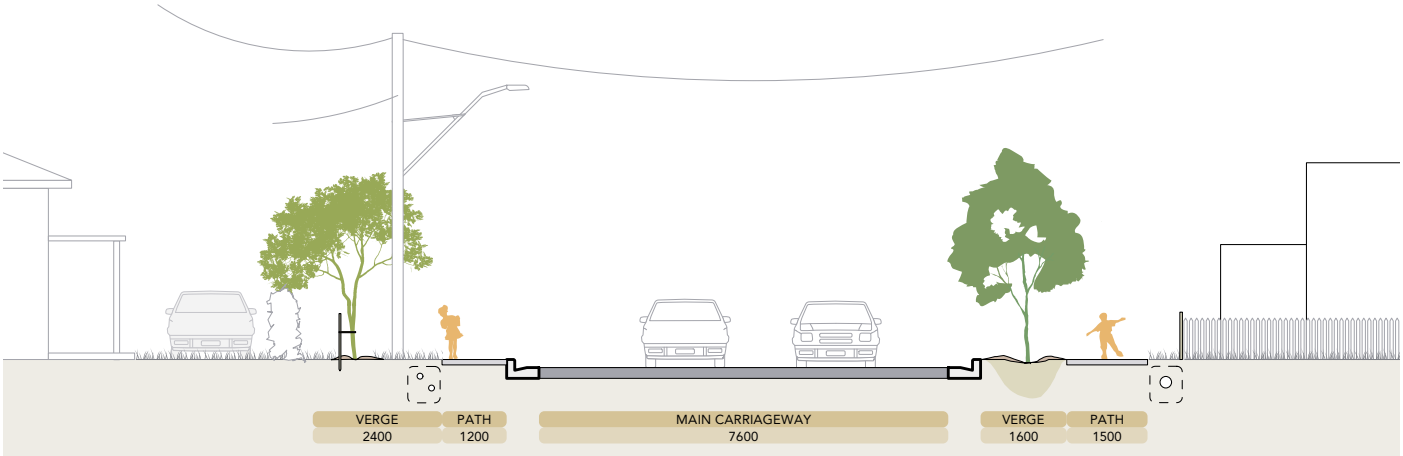


Figure 16. Typical local street and subdivision condition section. Source: RealmStudios

4.2 Soil Requirements

Soil Medium and Volume

The ultimate size of a tree is influenced by the quality and quantity of growing media available for root growth. Root growth is defined by:

- available soil oxygen
- available moisture
- available soil volume and profile
- degree of soil compaction

The selection of tree species must take into account the soil type, both in locality and the geo-region. Some species are adaptable to a range of soil conditions, where others are more particular.

In clay loam soils mature tree roots may extend up to two or three times the spread of the canopy but usually extend no deeper than one metre from surface level. Tree roots are opportunistic and will flourish in favourable soil conditions. This is important as roots are critical for encouraging trees.

Street trees rely on infiltration of natural rainfall to the root zone and growth is limited by the volume and moisture holding capacity of the soil. As a rule of thumb street trees should be provided the following minimum unobstructed soil volumes:

- Between 5 and 15 cubic metres for a small tree
- Between 20 and 40 cubic metres for a medium sized tree
- Between 50 and 80 cubic metres for a large tree.

Root growth is dependant on available soil oxygen which depletes with depth. Therefore soil volume should not extend deeper than one meter with increased lateral soil volume relating to the trees mature size.

Soil volume simulators greatly assist the process of determining the right tree for the right place when space is restricted and tree pit details. Elkeh is a good resource currently being used by George Town Council developed by soil scientist Simon Leake and arborist Elke Haege (https://www.elkeh.com.au/soils/).

Soil Moisture

Optimal soil moisture is required for healthy tree growth and urban cooling and can improve stormwater management outcomes. Considerations:

- Provide sufficient soil volumes for root growth
- Understand the frequency and volume of water provided for irrigation
- Understand potential for tree roots causing moisture differentials and damage to pavements, especially in areas with expansive soils
- Provide free draining soils to ensure appropriate soil moisture levels
- Passively irrigate trees with stormwater where possible, so that trees can grow faster, bigger and live longer overall
- Too dry: connect tree planting with surrounding soils to allow roots access to other moisture sources as it grows
- Too wet: provide aerobic soils for the tree, ensuring the top 400-500 mm of soil is free draining with subsurface drainage if required.

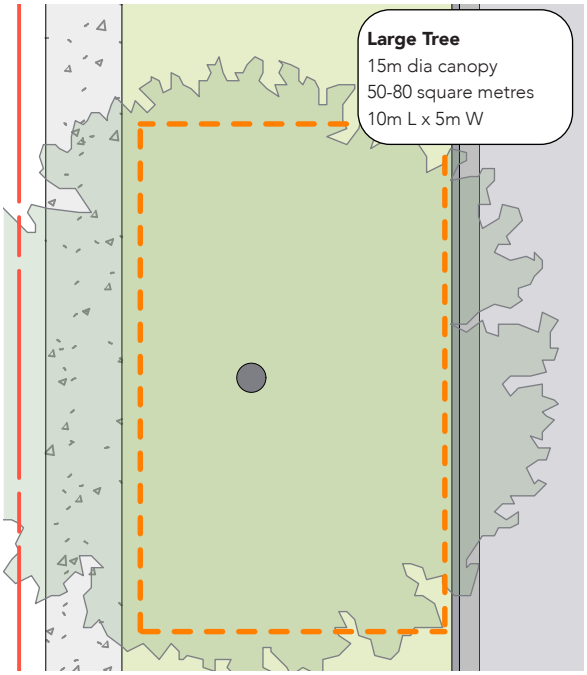


Figure 17. Large tree soil requirement volumes in a wider verge typically found along main roads or collector roads. Source: RealmStudios

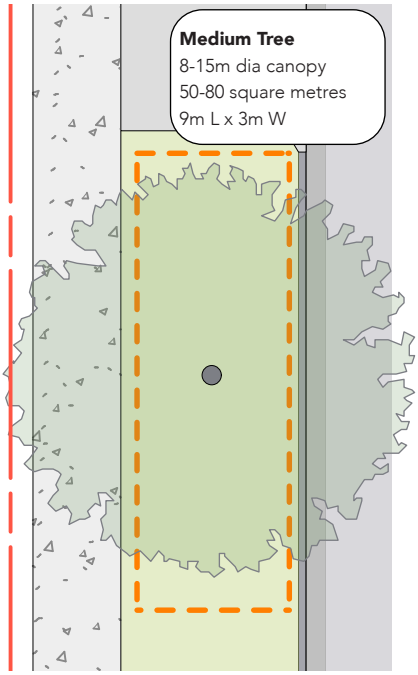


Figure 18. Medium tree soil requirement volumes in a traditional K/C carriage with a footpath. Source: RealmStudios

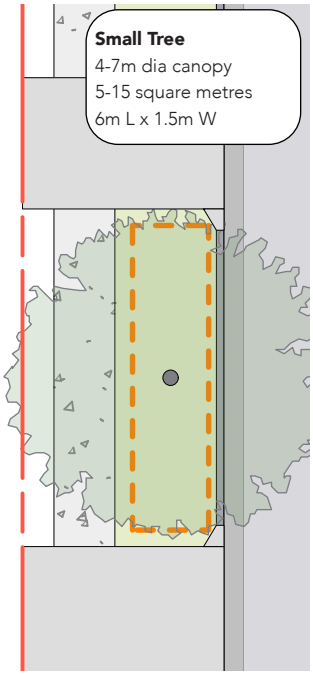


Figure 19. Small tree soil requirement volumes in a restricted local street arrangement with driveways. Source: RealmStudios

4.3 Tree Hardware

Tree Guards

Protect trees from accidental damage or vandalism. Design should allow for easy removal once the tree is of sufficient size. Segmented types that can be disassembled from around the tree are preferable to single piece structures. Minimum intrusion into the ground should also be considered as footing for tree guards can form an obstruction to root growth and displace valuable root volume. Consider in high transit / pick up and drop off zones.

Root Barriers

If adequate soil volume and quality is not achievable for the street tree planting, root heave may be triggered due to the lack of space for the tree to grow critical roots. Therefore, growing under adjacent hardscapes lifting and cracking or entering service trenches. Root barriers may be required adjacent to kerbs, to deflect roots away from structures, hardscapes and service trenches. Root barriers typically include a low density polyethylene (LDPE) plastic barrier 300-600mm high, designed to prevent major root growth in lateral directions. Other more costly measures such as concrete collars can be implemented, however alternatives should be developed prior to consideration. Structural soils provide unmpacted soil volume, preventing root heave, however this also has a significant upfront installation cost.

Plant Stakes & Ties

Best practice is for tree stock not to require staking for support. Trees that become reliant on stakes for support develop weak stems that do not strengthen naturally.

Where stakes are necessary there should be sufficient flexibility in the ties to allow some movement of the stem, which will promote increase in stem calliper and strengthening of the trunk.

Stakes should also be implemented for a visual cue, to ensure small speciemens are not missed during the maintenance and establishment periods. Or prevent the potiential for damage due to lack of visability.

Tree Watering Reservoir Products

Green Well Water Saver product is currently being used in recent street tree plantings. This provides a more efficent watering system that irrigates the tree deeply. Avoiding any run-off, saves watering time and provides protection against potiential street maintenance damage. It is recommended this product is continued to be used or similar watering reservoirs to ensure new street trees establish successful and provide maximum benefits.

Inaddition to these products, tree planting methodologies can provide similar benefits such as using PVC slotted agricultural pipe to deliver water at base of tree pit. This provides deep root irrigation outcomes.

Figure 20. Succession temporary tree guard example in Regent Square. Source: RealmStudios

Figure 21. Green Well Water Savers product. Source: Green Well Water Saver.

Figure 22. Deep root irrigation using slotted watering pipe. Source: Ashfield Council

4.4 Maintenance, Establishment and Procurement

Summary

To ensure the best possible outcomes for future tree canopy and success rate, a high level of maintenance and establishment is required for the first two growing seasons. If a tree dies shortly after planting, the initial amount of time and expense will be largely wasted. Therefore, it is important the tree is in optimal condition when planted and maintenance and estalishment is of high standard. This will include;

- Regular watering
- Monitoring for pests and diseases
- Potential formative pruning

Due to the increasingly high temperatures experienced in George Town and dryer summers, it is recommended that a dedicated team is engaged to manually water trees that are less than 3 years post-planting. Despite signs of establishment such as new growth. Foliage growth does not nessesarily translate to drought tolerance or sucessful establishment as the development of roots are more critical. Street trees less than 3 years old will require supplementary watering a few days prior to extreme temperature days (e.g. days > 30 degrees). Larger scale plantings should have a dedicated team to carry out watering, fertilizing, inspections for the establishment period.

Watering

Passive irrigation should not be relied upon for watering new tree plantings. Supportive watering is critical to tree survival.

Trees need to be watered 50% of the root ball volume immediately upon arrival on site and again after planting, e.g. 100L for 200L trees.

Trees need to be watered daily in the first 2 weeks.

Trees need more water in summer, less in spring / autumn, and less again in winter as shown in the table.

Time of year	Watering Frequency		
	1st month	2nd and 3rd month	Establishment period
Sep-Feb	4 x per week*	3 x per week*	2 x per week*
Mar-May	3 x per week*	2 x per week*	1 x per week*
Jun-Aug	2 x per week*	1 x per week*	1 x per fortnight*

Generally, the larger the tree container size, the longer its watering needs will need to be to achieve establishment.

Container size	Free draining	Heavy/clay
45L	10L	5L
100L	20L	15L
150L	30L	20L
200L	40L	30L
250L	50L	35L
300L	60L	45L
400L	80L	60L
500L	100L	75L

Figure 23. Street tree watering -Benefits of Greenwell Water Savers. Source: Greenwell Water Savers

Tree Inspection Guidance

Throughout the maintenance and establishment period, regular tree inspection is required, to ensure there are no developing problems with the tree stock and free of injury.

Established trees (e.g. >3 years post-planting) may only need two inspections per year, before and after summer.

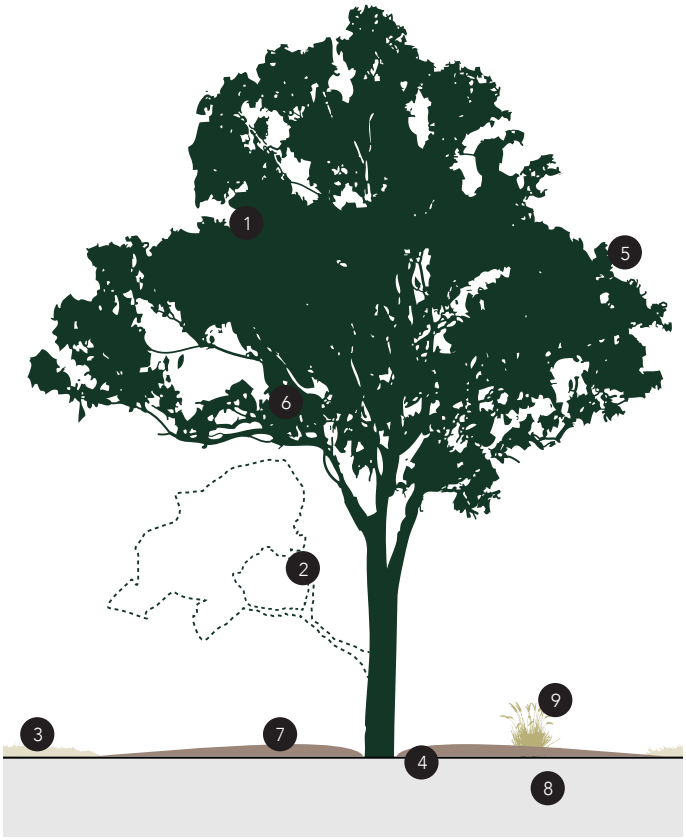


Figure 24. Street tree inspection routine. Source: RealmStudios

1. Pest and disease control - Inspect foliage and branches on a regular basis for disease or pest infestations.
2. Crown lifting - do not remove more than one third of the total tree height
3. Mowing - ensure trunk and roots are not damaged during mowing
4. Watering - refer to 'Watering' section.
5. Tree health - inspect tree on regular basis by qualified arborist
6. Formative pruning - prune where necessary to remove defects in tree structure in accordance with AS 4373:2007. All pruning works to leave specimen well balanced.
7. Replenish mulch every 4-6 months - min 50mm, max 75mm to extent of tree pit or min 500mm radius. Do not place mulch in direct contact with trunk
8. Fertiliser application - apply a balanced N:P:K slow release fertiliser every 4-6 months
9. Weeds - Use non-selective herbicides to control weeds. Protect tree from spray. Do no spray when wind or rain is forecast

Procurement

Beyond the selection of an appropriate species for planting, consideration needs to be given to the availability of plant stock in terms of pot size, quantities and quality.

Tree stock is often grown in containers and sourced from commercial nurseries. Some tree stock is grown in-ground and transplanted to containers prior to delivery. To ensure trees are a suitable size for street conditions pot sizes should range from 45 to 200ltrs.

Limited quantities of trees are grown by nurseries, depending on their popularity and commercial viability. Unusual tree species or large quantities will need to be pre-ordered several years in advance.

Some local tree species may be required to preserve genetic integrity. Where local tree species are required, procurement should be undertaken several years in advance so that seed can be collected and grown on.

Some species in harsher conditions require to be procured in smaller avaliable sizes to ensure the root system grows deep. This is to ensure the tree performs during extended dry conditions and high wind events.

Supplied trees are recommened to meet the requirements of AS 2303.2018 "Tree Stock for Landscape Use". This standard describes the above and below ground features necessary in determining quality tree stock. All procured trees should be free of faults that would cause the tree to fail after planting or at anytime in the future. This will ensure the risk of potiential tree fail is reduced. Another specification for tree stock is the "Guide for assessing the quality of and purchasing landscape trees" by Ross Clark 2003.

It is important tree stock purchased and planted by developers comply with the outline specifications/requirements. To ensure George Town Council is handed over street trees with low risk of failure and optimal performance.

4.5 Tree Pit Details

Summary

A range of tree pits are required for varying potted tree sizes, verge arrangements and tree outcomes. Underground assets, footpaths, paving and microclimate also inform the type of tree pit, dimensions and requiring hardware to ensure the tree is successful. Two common conditions seen across George Town are wide verges (greater than 2 metres) and narrow verges (less than 2 metres).

Technical details have been developed to provide a consistent tree pit accross a variety of street environments. However, it is recommended when planting in more extreme environmental conditions to adapt the typical details. For instance, in dry and exposed conditions affected to George Town's NW winds, it is recommended to install deep root irrigation measures and plant a smaller tree to allow for greater root development. Refer to section 8.5 for tree hardware and consider the correct species for that location.

Tree planting to only occur during suitable weather conditions, projected for 24-48 hours. Trees to be planted generally during cooler months from March to October. Avoid extreme weather events including days warmer than 30 degrees.

Standard Tree Pit Notes

- To promote lateral root growth, the planting hole should be no less than 3 times the diametre of the rootball/pot size. If space restrictions exist, reduce down to 2 times the size. Slope sides of tree pit to 45 degree angles.
- Esnure all labels, wires, twine and nursery stakes are removed prior to planting.
- Water immediately after planting. Sauced to be filled twice at minimum.
- 100mm high saucer shaped basin to be formed around root ball.
- Do not place mulch around base of trunk, maintain seperation between trunk and mulch. This prevents collar rot.
- Top of root ball to be 100mm below abutting surfaces. Planting hole to be 100mm deeper than base of root ball.
- All details to be read in conjunction with any site specific DA conditions or Council issued Contract Documentation.

Soil Specification

Soil specifications recommended to be extracted from the book "Soil for Landscape Development" by Simon Leake and Elke Haege.

Generally, tree pits will require two soil mixes/types:

Soil type A: To be composed of an approved sandy loam topsoil mix designed for tree type requirements.

Soil type B: To be composed of either imported subsoil or amerliorated subgrade if it is able to meet requirements. Imported subsoils to have a 80:20 ration of washed sand to screened soil blends. Generally, this soil is to be low in organic matter (5%) and low P.

Working Around Services

When retrofitting existing streets with tree planting, underground utilities will need to be identified and correctly avoided with specified offsets/buffers. Refer to figure 25 for a standard road service setout. Often works around utilities will require supervision by authories such as Tas Gas and the implementation of root barriers.

However, the delivery of new subdivisions provide the opportunity to put serivces second and trees first. The details in figure 26 and 27 provide the recommend tree pit sizes. These configurations can be set out first, prior to the construction of underground utilities.

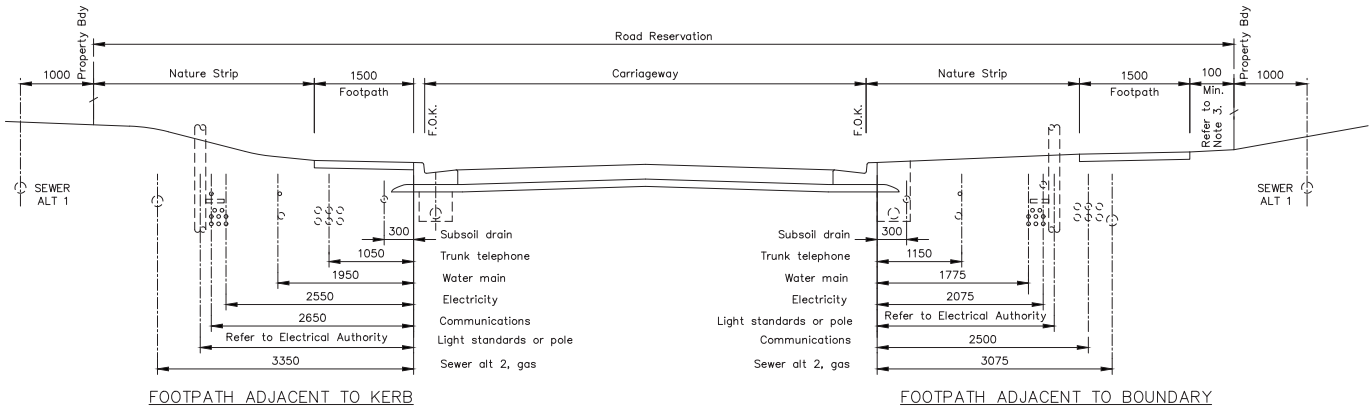


Figure 25. Competing typical service locations. Source: Tas Division Institude of Public Works Engineering Australasia

Street Tree Planting Details

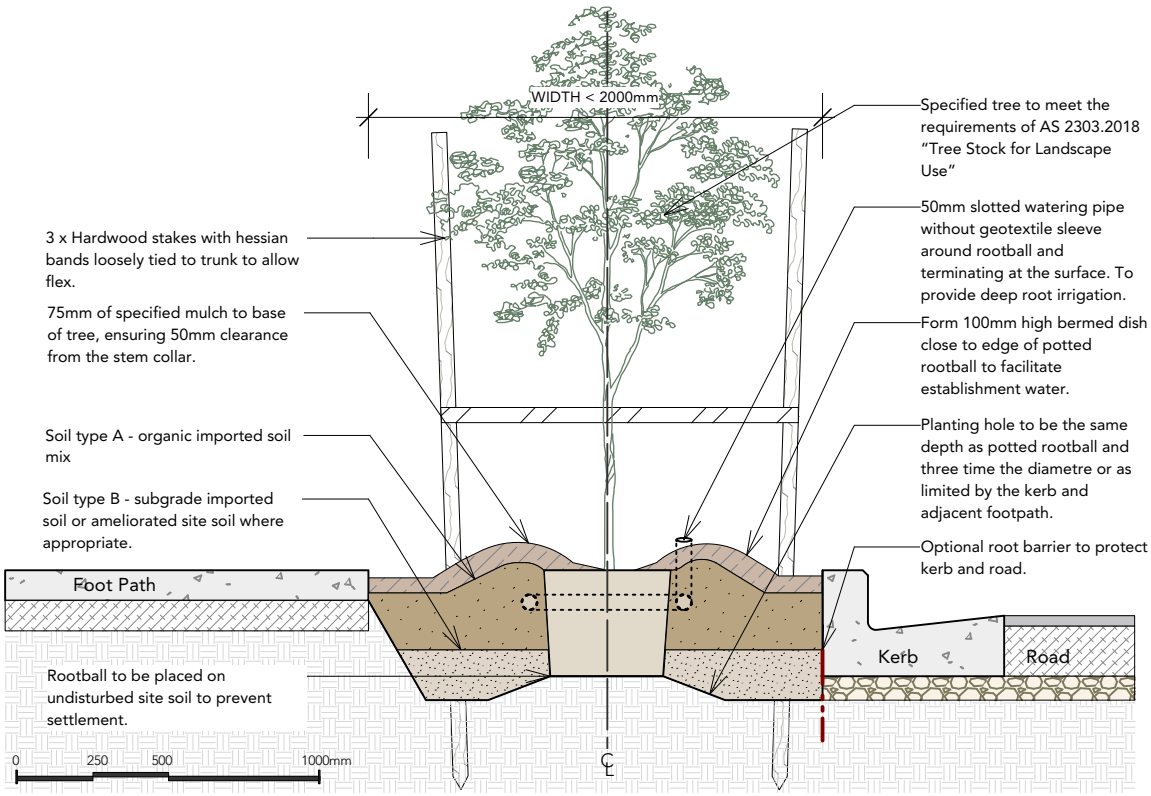


Figure 26. Tree planting in narrow verges along Local streets and subdivisions. Source: RealmStudios

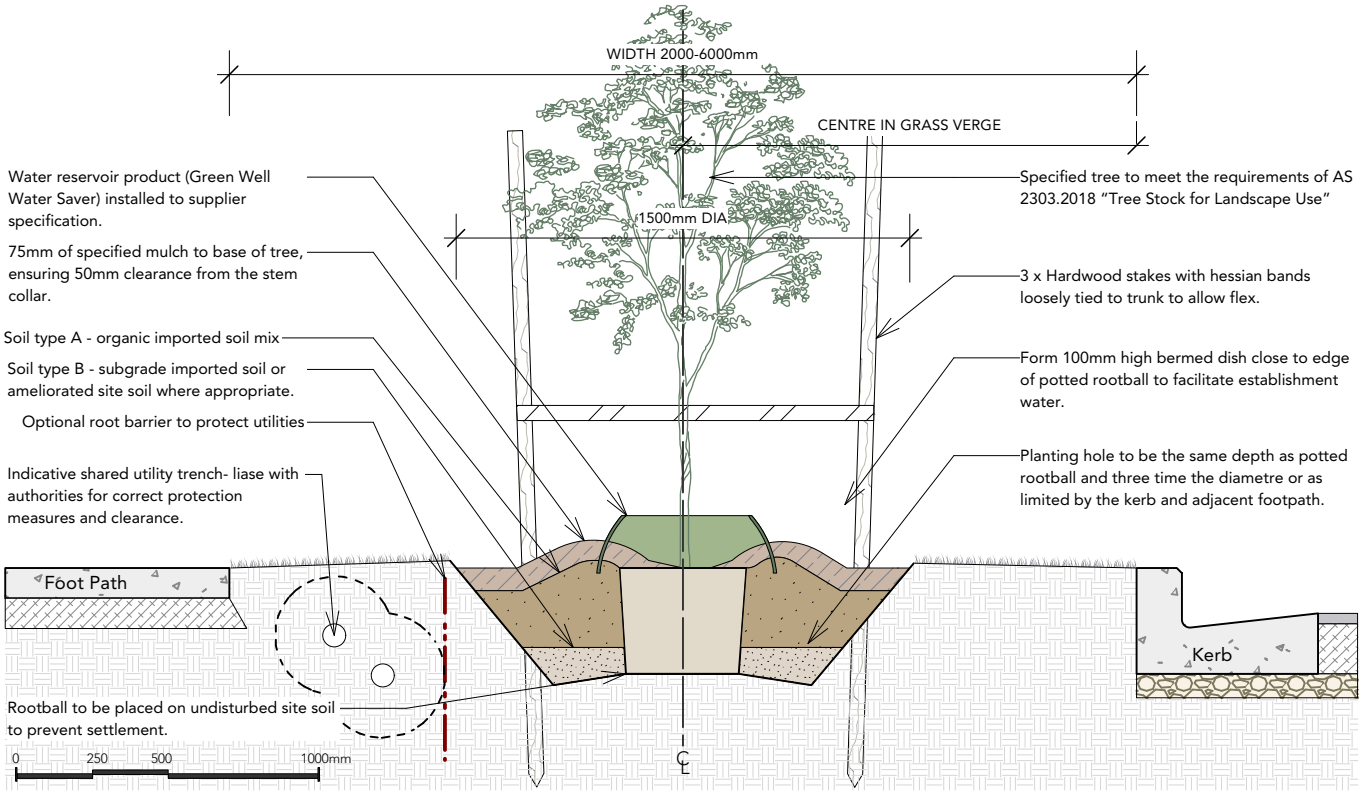


Figure 27. Tree planting in wide verges along Main Rds and Collector Streets. Source: RealmStudios

4.6 Species Selection

To maximise the benefits trees bring across George Town, it is important to deliver larger tree canopies and healthier trees. Ensuring trees reach maturity is vital to delivering the long-term benefits they bring.

To achieve this, design guidelines have been developed that focus on the character, condition, and function of the streets for tree planting. These guidelines include a checklist with corresponding considerations for tree species selection.

A significant challenge is to ensure adequate above and below ground space is provided for healthy tree growth. This requires close work with multiple disciplines and authorities to resolve conflicted space.

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1. Street Safety:

Providing a safe street environment is crucial. Tree planting must not impede on pedestrian, cyclist, or vehicle safety. Tree solutions can be used as traffic calming, however must preserve lines of sight.

Street Safety Checklist:

- ☐ Is the site adjacent to high speed traffic? (Consider tree size and habit)
- ☐ Will trees compromise sight lines? (Consider tree size and habit)
- ☐ How easily can the site be accessed for maintenance? (Consider flood, drought tolerance, evergreen/deciduous)
- ☐ Does the site have high pedestrian or bike traffic? (Consider tree size)
- ☐ Will tree roots affect footpaths? (Consider tree size)

2. Arrangement:

Tree planting should respond to the local context, contribute to a street's character, and enhance its function and liveability. Trees can add beauty and a human scale to streets. Tree planting configurations play an important part in place making. Different arrangements can include:

- Formal Avenues where a single species is symmetrically and evenly spaced along a street.
- Informal Avenues where a single species is asymmetrically arranged along a street.
- Mixed Avenues where multiple species are configured to maximise the benefits that different trees can bring to a street such as smaller trees under power lines.
- Feature Trees in focal points along the street to highlight junctions, entries, and focus points.
- Coppice Groups to mimic natural clumping of trees.

Arrangement Checklist:

- ☐ Which trees are found in the surrounding context and how are they configured?
- ☐ Can trees highlight key routes, intersections, rest points, gathering spaces, or other community features? (Consider formal avenues or feature trees)
- ☐ Can trees provide a visual and/or noise buffer? (Consider size, growth rate, habit)
- ☐ Is the verge space generous? (Consider formal avenues or coppice)

3. Consider the Community:

Tree planting should be considered by inputs from the community to foster their street's identity. A beautiful tree-lined street can create a strong sense of community and civic pride. When developing the planting configuration, each street should be considered individually based on the site constraints and desires of the local community. Listening to community desires will increase pride in and ongoing stewardship of the trees.

Considering the Community Checklist:

- ☐ What are the local community's needs and aspirations? (Consider native/exotic, evergreen/deciduous)
- ☐ Is tree planting compatible with ongoing and future community activities? (Consider size, growth rate, habit)

4. Integrating Infrastructure:

Tree planting around existing infrastructure should provide sufficient space for healthy growth to enhance the benefits that trees bring.

Common infrastructure that may be encountered includes:

- Underground services (water, sewer, gas, electricity, telecommunications)
- Overhead power lines
- Light poles
- Street signs and furniture
- Car parking, footpaths, bike lanes, and driveways

Integrating Infrastructure Checklist:

- ☐ Are there overhead power lines? (Consider tree size, habit, suitability for pruning around power lines)
- ☐ Are there any underground services? (Consider tree size)
- ☐ Can services be accessed without damaging the tree or its roots? (Consider tree size)
- ☐ Can utilities be bundled or relocated?

6. Exotics and Native Tree Selection:

Locally native trees to be selected when abutting or close to existing bushland. This is to provide habitat, sources of food and support threatened species. Exotics to be considered when planting to prevent the potiential spread into bushland and used in more central locations. Also male specimens to be used to prevent fruit bearing trees.

7. Soil Conditions:

The ultimate size of a tree is influenced by the quality and quantity of soil volume available for healthy tree growth. To support tree planting, soil volumes should be a third of projected canopy, with a minimum depth of one metre.

As a rule of thumb, soil volumes should be 1/3 of the projected canopy, with a depth of 1m.

- 5-15m^3 for a small tree
- 20-40m^3 for a medium tree
- 50-80m^3 for a large tree

Soil Conditions Checklist:

- ☐ What is the available or potential soil volume/ depth? (Maximise the tree size as appropriate for the soil volume)
- ☐ What is the existing soil profile and condition? (Maximise the tree size as appropriate for the soil volume)

8. Soil Moisture:

Optimal soil moisture is required for healthy tree growth and urban cooling and can improve storm water management outcomes. Free draining soils help to ensure appropriate moisture levels. Passive irrigation with stormwater runoff allows trees to grow faster, bigger, and live longer. Irrigation maintenance regimes should be avoided where possible. This can be achieved through appropriately resilient species selection and arrangement.

Most trees planted in urban streets need 120-150L of water every few days to thrive. If the conditions are too dry, connect the tree planting with surrounding soils to allow root access to other moisture sources. If the conditions are too wet, provide aerobic soils ensuring that the top 400-500mm of soil is free draining, with subsurface drainage if required.

Soil Moisture Checklist:

- ☐ What is the frequency and volume of water available? (Consider drought and flood tolerance)

9. Sunlight and Shade:

Different tree species provide varying amounts of solar access and shade. Species should be selected and arranged to maximise solar access in winter and shade in summer. They should also be selected to suit George Town's sunlight conditions for tree health, growth, and lifespan.

Sunlight and Shade Checklist:

- ☐ Is the street used for active transport? (Consider using a mix of tree species of different sizes and habit to optimise cooling outcomes)
- ☐ Is the street orientated east-west? (Consider using evergreen trees)
- ☐ Is the street orientated north-south? (Consider using deciduous trees)

10. Debris and Maintenance:

The ground around trees is important to long-term maintenance requirements. Trees, particularly deciduous or flowering trees, cause a large amount of debris. To reduce maintenance requirements, understorey planting can be used to collect a tree's organic matter and allow it to decompose as mulch.

Passive irrigation can also cause the accumulation of street debris, litter, sediment, and organics at the base of trees. In this case, regular street cleaning and maintenance is required.

Debris and Maintenance Checklist:

- ☐ Is the street cleaned regularly? (If not, avoid using deciduous or flowering trees)
- ☐ Can leaf fall be captured? (Consider evergreen trees and understorey planting)

11. Sourcing Alternative Trees:

Final selection of tree stock is dependant on a range of factors such as the nursery avaliability, community feedback and council planting programs. Alternative tree sourcing and selection may be required due to these factors, however the initial considerations made for tree selection should still be factored in.

The most important considerations are selecting the right tree for the right place and suiting the environmental conditions.

Alternative Tree Checklist:

- ☐ Does the alternative species suit the environmental and microclimatic conditions?
- ☐ Does the size and form suit the verge conditions? (Consider tree size)
- ☐ Is there a similar species that can be sourced instead? (Consider another species of that genus)

12. Selecting the Right Tree Size:

The most important factor when sourcing tree stock is that the specimen meets AS 2303.2018 "Tree Stock for Landscape Use" requirements. As healthier tree stock will ensure successful growth and size well into the future. A larger potted tree is prefered with a recommended height between 1.5-2m for greater impact. However, if its in a windy and dry location smaller potted tree sizes should be planted to prioritise initial root development over canopy.

Selecting the Right Tree Size Checklist:

- ☐ Does the street endure harsh wind conditions? (Consider smaller potted size)
- ☐ Is the site typically dry for prolonged periods of time? (Consider smaller potted size)
- ☐ Will the street tree be free from pedestrian and vehicle traffic? (Consider taller potted tree with a single trunk)

Street Tree List

			Tree Information					Suitability for Constraints						
Family	**Botanical Name**	**Common Name**	**Mature Size**	**Growth Rate**	**Form**	**Native/ Exotic**	**Evergreen/ Deciduous**	**Power lines**	**Flood Tolerance**	**Drought Tolerance**	**Wind Tolerance**	**Feature Tree**	**Coppice**	**Formal Avenue**
Mimosaceae	Acacia melanoxylon	Blackwood	M	M	S	N	E		●	●	●			
Mimosaceae	Acacia dealbata	Silver Wattle	S	F	R	N	E	●	●	●				
Sapindaceae	Acer rubrum	Canadian Maple	M	M	R	E	D		●			●		●
Casuarinaceae	Allocasuarina verticillata	Drooping Sheoak	M	S	I	N	E	●		●	●		●	
Myrtaceae	Callistemon viminalis	Bottle Brush	S	S	R	N	E	●	●	●				
Myrtaceae	Corymbia ficifolia	Red Flowering Gum	M	M	S	N	E	●		●	●	●		
Sapindaceae	Dodonaea viscosa	Hop Bush	S	F	H	N	E	●		●	●			
Myrtaceae	Eucalyptus amygdalina	Black Peppermint	L	F	S	N	E			●	●	●		
Myrtaceae	Eucalyptus globulus	Tasmanian Blue Gum	L	F	S	N	E			●	●			●
Myrtaceae	Eucalyptus obliqua	Stringybark	L	F	S	N	E				●			
Myrtaceae	Eucalyptus pauciflora	Snow Gum	M	F	S	N	E		●	●	●	●		
Myrtaceae	Eucalyptus platypus	Moort	S	F	S	N	E	●		●	●			
Myrtaceae	Eucalyptus viminalis	White Gum	L	F	S	N	E		●	●	●			
Ginkgoaceae	Ginkgo biloba	Maidenhair	M	M	F	E	D			●	●			●
Malvaceae	Hibiscus tiliaceus	Sea Hibiscus	M	F	R	N	E		●	●	●			
Lythraceae	Lagerstroemia indica	Crepe Myrtle	S	F	V	E	D	●		●		●	●	●
Myrtaceae	Melaleuca linariifolia	Paper Bark	S	M	R	N	E		●	●	●			●
Myrtaceae	Melaleuca styphelioides	Prickly Leaved Paperbark	M	M	I	N	E		●	●	●		●	
Oleaceae	Olea europaea	Olive Tree	S	M	R	E	E	●		●	●			
Rosaceae	Pyrus calleryana	Callery Pear	M	M	F	E	D					●		●
Fagaceae	Quercus rubra	Red Oak	L	F	S	E	D				●	●		
Rosaceae	Sorbus aucuparia	Mountain Ash	M	M	R	E	D				●	●		
Myrtaceae	Tristaniopsis laurina	Water Gum	M	M	R	N	E	●	●					
Ulmaceae	Zelkova serrata	Green Vase	M	F	V	E	E	●		●	●	●		●

Legend:

Mature Size:
(S) Small <7m tall
(M) Medium >7, <15m tall
(L) Large >15m tall
*Verge dimensions to inform tree size selection.

Growth Rate:
(S) Slow <30cm/year
(M) Medium >30, <60cm/year
(F) Fast >60cm/year

Form:
(F) Fastigiated
(H) Hedge
(I) Irregular
(R) Round
(S) Spreading
(V) Vase

Native/ Exotic:
(N) Native
(E) Exotic

Evergreen/ Deciduous:
(E) Evergreen
(D) Deciduous

5.0 Next Steps

5.1 Recommendations

Street Tree Planning and Policy

This strategy recommonds George Town Council to adopt policies that will guide and implement street tree planting over the next 5-10 years, which includes the priority streets identitied in this strategy. It is also recommended council develops street tree masterplans and prioritises trees in development planning phases rather than post-construction. Trees should be a primary consideration, not an afterthought led by developers. Canopy targets must be set before development. For example, a requirement for street trees to be planted alongside footpath and asphalt works before releasing a subdivision certificate.

Landscape Contractors

Using landscape contractors can expedite tree planting. Ensure contractors follow this strategy and street tree best practices. A comprehensive street tree masterplan is recommended to guide future planting works and avoid ad hoc decisions. Contractors should have experience planting trees around utilities, supervised by relevant authorities. If tree stock procurement is within the contractor's scope, ensure it meets AS 2303.2018 "Tree Stock for Landscape Use" standards.

Shared Utility Trenches

Utilities should be secondary in new subdivision works, with street trees located around recently built infrastructure. Shared utility trenches, which combine multiple utilities within a compact street verge area, can reduce space dedicated to in-ground utilities and maximise street tree planting opportunities. This allows more space for deep soil planting, encouraging a better tree canopy and lowering overall costs, particularly in new subdivisions. Coordination between designers, local councils, and utility providers is crucial to protect and support utility assets while maximizing tree root access to soil.

Equitable Canopy

Prioritise lower socio-economic streets for retrofitting with tree planting to promote healthy, resilient communities through green infrastructure with clear program objectives. The climate is changing and has the biggest impacts on the most vulnerable members of our communities: the elderly, young, and economically disadvantaged. Tree canopy is a proven effective mechanism to lower temperatures and cool streets, often significantly reducing electricity bills. Therefore, these streets should be prioritised for future greening initiatives.

Climate and Weather Resistant Planting

Adopt planting practices that promote healthy trees in harsh environments. Consider planting smaller trees to allow root systems to establish before developing a larger canopy. Promote deeper root growth through specific watering practices. Considering hardier native species over exotics, particularly in the harsher northern development areas.

5.2 Next Steps

Canopy Cover Target:

Set canopy cover targets to create a tree planting goal that also prioritises tree population health and the preservation of established trees. Both the City of Launceston and the City of Hobart aim for 40% canopy cover in urban areas (City of Launceston Urban Greening Strategy 2023-240 and City of Hobart Street Tree Strategy, 2017).

Street Tree Masterplans:

Develop a holistic street tree masterplan that combines developers' subdivision plans with the council's own planting plans. This will streamline efforts and inform a cohesive approach to enhancing the tree canopy in George Town.

Greening George Town:

Implement a street tree program to maintain and expand the urban tree canopy in residential areas. The program could supply trees to residents at no cost, with shared watering and establishment responsibilities between the council and the community. Applications should be required to structure tree planting, allowing council to plan and procure trees accordingly. The City of Bunbury runs similar programs to encourage community participation through winter street tree planting programs. Communities should have the opportunity to influence and inform decision-making for their own local streets and trees.

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