BRIGHTON COUNCIL –

DRAFT GREENING BRIGHTON STRATEGY

2024-2033

Contents

Acknowledgements

We acknowledge the traditional owners who once walked this land: the Mumirimina people. The Mumirimina belonged to the Oyster Bay tribe. This was the largest tribe in Lutruwita/Tasmania and covered 8000 square kilometers. kutalayna levee in Brighton was a significant meeting place where hundreds of generations of Aboriginal families hunted, gathered, corroboreed, camped and traded. In the course of colonization, dispossession of the Mumirimina was early, rapid and extensive. We acknowledge the Tasmanian Aboriginal Community today and as the continuing custodians of this land, and pay our respects to Elders past and present. Through our words and actions, we strive to build a community that reflects and respects the history and hopes for all the people of Brighton.

Executive Summary:

In 2016, Brighton Council developed the Greening Brighton Strategy 2016-2021 to provide a coordinated strategic approach to increasing the number of trees in Brighton's streets, parks, and private gardens. This document provides an update on progress from 2016.

Building on the objectives of the original strategy, it outlines key strategies and 65 actions to guide Brighton Council's efforts in increasing tree cover and urban greening in Brighton over the next 10 years. The startegy sets an annual target of a 1% increase in canopy cover to achieve an urban canopy cover of 25% by 2033. The document considers the use of native vegetation, choice of street trees, irrigation infrastructure and the use of vegetation to reduce erosion. It highlights four key areas for greening Brighton.:

- Streetscapes
- Nature Strips
- Parks and Gardens
- Urban and New Development

The document also emphasises the importance of raising community awareness, engagement and involvement.

As Brighton shifts to a dryland climate, integrating the appropriate drought tolerant vegetation will be fundamental in establishing the future tree cover of the municipality. Street tree establishment will be complemented by the introduction of denser understorey vegetation, introducing habitat complexity and aesthetic appeal. Urban greening is rapidly becoming a critical component of green infrastructure for future sustainable development. Increases in vegetation cover within urban areas improve environmental outcomes, beautify landscapes for residents and build community resilience to climate change.

Key recommendations:

- Integrate native tree species into the existing Street Tree Strategy plant list
- Complement tree planting with multi layered dense and diverse understorey plantings
- Transition away from deciduous broad leaf street trees
- Focus on creating green corridors and link existing and future greening work together
- Investment in Brighton's water infrastructure
- Target suburbs of Bridgewater, Herdsmans Cove and Gagebrook
- Encourage residents to plant nature strips
- Increase tree planting in parklands and along park edges
- Construct water sensitive urban design at storm water points and roadsides
- Improve data collection, monitoring and reporting of green cover change

Background

Climate change is having an impact on human health and the environment. Our urban areas are becoming highly exposed to risks from increased temperatures, decreased ecosystem diversity, environmental stress, and reductions in existing green space and tree cover. Lack of greenspace, urban biodiversity and tree cover exacerbate the heat island effect, affecting the quality of life and the health and wellbeing of residents. Utilising green infrastructure such as street trees and increased vegetation cover, integrated with proper green urban planning, will assist in building the resilience of urbanised areas to the impacts of climate change and extreme weather events.

Brighton municipality is located 20km from Hobart on the eastern shore of the Derwent River and forms part of the urban rural boundary of Greater Hobart. The municipality is neighboured by the Derwent Valley, Southern Midlands and Clarence Councils and is the major gateway to the north of the state.

The region contains a diverse assortment of environments from native grasslands and coastal salt marshes to woodlands along the urban peripheries. Local economic development primarily comes from agriculture, industry, and a range of small farm enterprises. The municipality consists of nine suburbs. Dromedary, Honeywood, Pontville, and Tea Tree are predominately rural. Bridgewater, Brighton, Gagebrook, Herdsmans Cove and Old Beach are predominately urban and contain most of the population.

Many parts of the Brighton Local Government Area (LGA) have been identified as having limited tree cover and would greatly benefit from urban planting endeavours. Increasing street trees and other vegetation into the streets, parks, and suburban areas of Brighton will increase resilience to the impacts of climate change.

The Brighton LGA has Tasmania’s highest incidence of asthma –5% higher than the national average (Asthma Australia 2024). Using low allergy native plants, to improve air quality can help reduce irritants that cause allergies and enable people with asthma to participate more actively in community life.

Introduction

In 2016, Brighton Council formulated and commenced the Greening Brighton Strategy 2016-2021 to provide a coordinated strategic approach to increasing the number of trees in Brighton's streets, parks, and private gardens.

The vision for Greening Brighton, is *to significantly increase tree cover in urban areas to create a sustainable and diverse green asset which provides a desirable living environment that supports growth in population, property, and industry, and therefore the lifestyles and health of the area's diverse community ties.*

The 2016 Strategy 2016 outlined a commitment to:

- Increase the tree canopy across Brighton's urban areas through strategic tree plantings.
- To provide a consistent and co-ordinated approach to street tree planting.
- To encourage the local community to embrace the greening of Brighton's urban areas.
- To encourage private developers to improve landscaping practices.
- To improve data collection, monitoring, reporting and communication of Brighton's urban forest.
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The first five years of the strategy were aimed at urban areas with reduced tree cover and low socio-economic profiles. It focused on the areas Bridgewater, Gagebrook and Herdman's Cove. The strategy also flagged the need for greater community engagement through a variety of initiatives.

Through the Greening Brighton Strategy, Brighton Council committed an annual budget of $30,000 for planting street trees. Landscape Architects Inspiring Place were engaged by Brighton Council, to develop a Street Tree plan to assist in identifying appropriate street trees to be planted within the urban areas of the Brighton municipality.

Purpose of the 2024 Greening Brighton Strategy

In 2024, Brighton Council engaged The Derwent Catchment Project to review and evaluate the Greening Brighton Strategy and work with stakeholders to develop an updated strategy.

The aim of the review is to evaluate the effectiveness, achievements, and challenges of the Greening Brighton Strategy 2016-2021 and to assist in identifying opportunities and constraints moving forward and to extend the strategy to cover all urban areas in Brighton LGA.

The new strategy builds on the objectives of the original strategy by incorporating the following:

1. Climate resilience strategies: selection of native tree species that are compatible with a changing climate, exert greater impact on temperature regulation and reductions in the urban heat island effect, increase biodiversity of the Brighton area.

2. Community health and wellbeing: Fostering a sense of place and local identity, improvement in air quality and broader community health.

3. Equal opportunities: Promoting equitable and safe access to green spaces across the Brighton municipality.

4. Raise community awareness, engagement and involvement: Highlight the benefits of green spaces, promoting ownership and pro-environmental behaviours, increase community participation in green spaces, reductions in potential vandalism.

5. Collaboration between council and community: Enhance opportunities and relationships to preserve, plant and maintain urban green spaces in the Brighton municipality.

6. Challenges ahead and how to address them: Expanding, managing, and protecting green spaces.

The aims of this document are to:

1. Provide a comprehensive review on what has been achieved to date from the Greening Brighton Strategy.
2. Identify what work remains to be completed.
3. Prioritise future greening work.
4. Guide how greater integrated greening can be achieved.

Review of Achievements Greening Brighton Strategy 2016-2021

A review of progress against the actions in the 2016 Greening Brighton Strategy was undertaken. The results from this review in located in Table 1. In general good progress has been made on most actions. High priority locations in particular suburbs have been planted with street trees. However, all medium and low priority plantings are still to be completed. Appendix D provides a more detailed update of the progress on the implementation of the 2019 Street Tree Plan. A review of Brighton Councils current species list for tree plantings indicates that not all species will easily adapt to increasing temperatures under climate change.

A more regular monitoring program would have allowed for more accurate assessment of the change in tree canopy coverage. Where relevant outstanding actions have been included in the updated implementation plan on page 47.

Table 1. Progress on actions of the 2016 Greening Brighton Strategy.

Reference	Action	Responsibility	Timing/Priority	Findings of Review
Networking and Marketing	Council becomes a member of the 202020 Vision Network and provides the Network with Council logos to use for promotional material.	Planning	Immediately	Achieved
Strategy A	Engage an expert consultant to determine a suitable species palette for the priority areas.	Planning	Within 3 months	Achieved, provided by landscape architect Inspiring Place. Amendments and recommendations in new strategy
Strategy A	Prepare Detailed Design Plans for each Priority Area and a 5-year planting schedule.	Planning, Engineering & Works	Within 6 months	Achieved, plan provided by landscape architects Inspiring Place
Strategy A	Undertake annual plantings in accordance with detailed design plans and 5-year planting schedule.	Works	Within 6 months and ongoing	Started & progressing, further recommendations in new strategy
Monitoring	Undertake annual i-tree canopy assessments to measure progress for greening Brighton's urban areas.	Planning & Engineering	Within 1 year and ongoing annually	Single assessment in 2024.

Reference	Action	Responsibility	Timing/Priority	Findings of Review
Monitoring	Investigate whether a more accurate assessment of tree canopy can be undertaken using Light Detecting and Ranging (LiDAR) data.	Planning & Engineering	Within 1 year	Not completed, huge potential when readily available.
Monitoring	Setup a data and GIS tool to track the progress of this strategy.	Planning & Engineering	Within 1 year	Not completed
Strategy B	Establish guidelines and processes for a “Trees for New Developments Program”	Planning, Building & Works	Within 1 year	Achieved, Landscaping Policy 2022, Amenity Policy for Industrial Zones 2016
Strategy A	Prepare Landscaping Guidelines for Subdivisions	Planning	Within 1 year	Achieved, Landscape Policy 2022
Strategy B	Prepare landscaping guidelines for new commercial and multi-unit developments	Planning	Within 1 year	Achieved, Landscape Policy 2022, Amenity Policy for Industrial Zones 2021
Strategy B	Investigate introducing landscaping bonds for developments that need landscaping	Planning & Finance	Within 18 months	Not completed
Strategy B	Amend the Planning Scheme to make the landscaping guidelines a regulatory requirement	Planning	Within 2 years	Achieved, Transitioned to, Landscaping Policy 2022.
Strategy C	Identify planting opportunities in critical open space areas and linkages.	Planning, Engineering & Works	Within 2 years	Included in new strategy
Strategy C	Engage the local community to participate in planting and maintaining trees in consultation with experts.	Planning & Community Engagement	Within 2 years	Started & progressing

Analysing Tree Cover in the Brighton Municipality

As part of the 2016 Greening Brighton Strategy an analysis of the tree cover was undertaken for the suburbs of Bridgewater, Gagebrook and Herdsman’s Cove using i-tree canopy. This was used as the basis for a vegetation analysis of tree cover change in the Brighton Municipality, from 2016 to 2024 for these suburbs. In addition, a new baseline survey for tree canopy cover was undertaken for all urban areas in the Brighton Municipality. For details on the methods and new baseline see Appendix F.

Results

Between 2016 to 2024 an i-tree canopy comparison for the urban areas of Bridgewater, Gagebrook and Herdsmans Cove suggest the tree canopy cover has increased by 5.46%, and other impervious surfaces by 1.35%. Areas that have decreased in cover include grass –2.51%, buildings –2.42% and water –2.01% (Table 2). However, these results should be approached with caution (see notes below).

Overall increases in tree canopy cover within the Brighton municipality coupled with declines in building and grass cover suggest there is an increase in tree canopy coverage in grassy areas, suburbs, and parklands. Whilst results indicate that tree cover has increased in the Brighton municipality, some trees that have been planted toward the end of 2021 are still immature and not large enough to register in the i-Tree Canopy analysis yet. Therefore, a complete picture of total canopy cover increase is slightly obscured.

Table. 2. Results of i-Tree Canopy comparison between 2016 and 2024 indicating increases in tree (5.46%), road (.14%) and impervious cover (1.35%).

Category	**2016-2021 Strategy % n = 500**	**2024 Analysis % n = 501**	**Change of percentage**
Tree canopy	12.9	18.36	5.46
Building	10.4	7.98	-2.42
Road	9.64	9.78	.14
Grass	56.2	53.69	-2.51
Impervious (other)	8.63	9.98	1.35
Water	2.21	0.2	-2.01

Note:

Although all effort was made to follow the 2016 methodology we cannot guarantee that the same boundary file was used or that the same classification system was used for each point. The lack of water in the 2024 analysis is of particular concern as this may suggest a variation in classification or boundary. Using the i-tree canopy analysis more annually as recommended in the 2016 strategy would provide a better understanding of the trends through time.

When LIDAR becomes a more easily accessible tool the use of LIDAR analysis of satellite imagery instead of i-tree canopy will enable comparison of the entire area rather than a random subset.

Results from the new baseline analysis encompassing all urban zones indicate a total coverage of 12.4% tree canopy cover, 9.6% building, 8.8% road, 52.6% grass, 15.2 impervious (other) and 1.4% water within the Brighton municipality (Fig. 4, Table 3). This new baseline will allow for Brighton Council to compare future greening over the entire urbanised areas in the municipality.

Table 3. Results of i-Tree Canopy new baseline analysis indicating total percentages of existing cover for trees, buildings, roads, grass, impervious (other) and water across all urban zones in the Brighton municipality 2024.

Category	**Number of points registered in i-Tree Canopy n = 500**	**Whole Brighton Municipality 2024 Analysis % Cover**	**Area (mi²)**
Tree canopy	62	12.40	1.04
Building	48	9.60	0.81
Road	44	8.80	0.74
Grass	263	52.60	4.42
Impervious (other)	76	15.20	1.28
Water	7	1.40	0.12
Total	500	100	8.40

A New Approach

Setting a target

To deliver the maximum benefits to the urban environment, peer reviewed literature recommends an optimum urban land use canopy cover of 40%. At present Brighton's urban canopy cover is estimated to be 12.4%, well below this figure.

It is recommended that Brighton Council aim to increase canopy cover by 1% each year with a goal of a 25 % coverage by 2033. Initially achieving this goal will depend largely on Council providing leadership by planting areas of public land. It is hoped that this will help local residents to recognise the benefits of a green urban environment and inspire them to help contribute by greening their own properties.

In the long term, private landholder participation will be essential if the optimal 40% coverage is to be achieved.

It essential that progress is monitored annually using the best data available, including keeping track of plantings and success rates. This will incorporate information about additional vegetation layers such as grasses and shrubs, that are not currently picked up by using i-tree canopy cover.

Achieving the target

This section of the document outlines key strategies and actions to build on previous work and guide Brighton Council's efforts in increasing tree cover and urban greening in Brighton over the next 10 years in order to reach the 25% target.

Key considerations for building climate change resilience are introduced. Underpinned by the principle of promoting biodiversity by increasing plant density. four categories for Greening Brighton are discussed. Other areas where these principles can be applied are also described along with strategies for increasing community engagement. The document identifies some priorities for action and an implementation plan on page 45.

Climate change considerations

Considering the use of native vegetation, choice of street trees, watering and irrigation requirements and planting to prevent erosion is important for building climate change resilience in the Brighton Municipality.

Native vegetation

Whilst Australia has an enormous amount of flora diversity, many Australian cities prioritize exotic plant species in their treescapes. Urban trees are silent assets within our cityscapes as they provide numerous social, health, economic and environmental benefits. Globally, local governments are increasing investment in urban greening projects. However, little consideration is given as to whether a species being planted will be resilient to the ever-increasing variability in climatic patterns. Advantages of utilizing native plants rather than exotics for use in urban streetscapes include:

- Appropriately adapted to local climate and soil profiles of the Australian landscape
- Aesthetically pleasing as exotic ornamentals tend to require ongoing maintenance and upkeep to maintain condition and vibrancy.
- Reduction in on ground maintenance costs and upkeep (less mowing, pruning, watering)
- Amelioration of local micro-climatic conditions.
- Integrates with the local surrounding vegetation and broader landscape.
- Provide habitat, shelter and food for local wildlife (invertebrates + vertebrates)
- Less likely to spread and become 'invasive'.
- Enhance recreational use as native plants can showcase what a truly remarkable Australian floral palette is available.

NV1 Action – Select native plant species that are adapted to lower precipitation, drier landscapes, have increased flexibility with fluctuating weather extremes and will not become invasive

Utilizing Natives, Grasses & Sedges

Streetscapes are an often-underutilized opportunity to integrate habitats into existing urban landscapes, increasing biodiversity and restoring environmental and ecological connectivity in cities (Tan et al., 2022). Furthermore, streetscapes can play a significant role in the retention and conservation of national and regional biodiversity. Species such as *Austrostipa* (Spear grass) and *Rhytidosperma* (Wallaby grass) have strong tolerances for environmental stressors, making them prime candidates for urban street planting environments. Other grass species such as *Themeda triandra* (Kangaroo grass) may be planted to restore local grassland communities whilst promoting spatial connectivity with remnant patches in the surrounding Brighton area. By integrating these threatened flora, Brighton Council can significantly increase the local awareness and appreciation of these ecologically important species whilst reducing the overall maintenance of street plantings.

Integrating native species along with grasses and sedges into streetscape plantings can reduce the overall maintenance costs for several reasons:

1. **Adaptability to Local Conditions**: Native vegetation is well-adapted to local climate, soil, and the environmental conditions of the Brighton area. As such, they typically require less water, fertilizer, and other inputs compared to non-native species, reducing ongoing maintenance needs.

2. **Low Maintenance Requirements**: Native species such as grasses and sedges often have minimal maintenance requirements once established. They are generally resilient to pests, diseases, and environmental stressors such as heatwaves, thereby reducing the need for intervention to maintain plantings in the long term.

3. **Drought Tolerance**: Many native grasses and sedges have deep root systems that enable them to access moisture deep within the soil profile, making them more drought-tolerant than non-native species. This reduces the need for supplementary watering such as irrigation during dry periods, further lowering maintenance costs.

4. **Naturalized Aesthetic**: Native vegetation contributes to a more naturalized and ecologically diverse streetscape aesthetic. They can provide habitat and food sources for local wildlife, support pollinators, and enhance biodiversity, compared to non-native plantings.

5. **Reduced Pruning Requirements**: Unlike ornamental shrubs or trees, native plantings do not typically require regular pruning or shaping, further reducing maintenance costs of management and upkeep.

6. **Erosion Control**: The extensive root systems of native grasses and sedges help stabilize soil, preventing erosion and reducing dust, particularly in areas prone to runoff, soil disturbance or extended dry periods. This reduces the need for erosion control measures and maintenance activities associated with erosion damage.

7. **Longevity and Durability**: Once established, natives persist and thrive with minimal human intervention, reducing the need for replanting or replacement over time. This can result in long-term cost savings compared to high-maintenance plantings that require frequent renewal or are short lived.

8. **Sustainability and Environmental Benefits**: Using native vegetation in streetscape plantings promotes ecological sustainability and reduces the ecological footprint associated with maintenance activities such as pesticide use, fertilizer application, and irrigation. This aligns with broader goals of environmental stewardship and conservation that the Brighton aims to achieve.

By incorporating native grasses and sedges into streetscape plantings numerous benefits in terms of reduced maintenance costs, ecological sustainability, and aesthetic appeal can be achieved, making them an attractive option for Brighton municipality in seeking to create a more green, vibrant, low-maintenance urban environment.

NV2 Action – Integrate more local grass and sedge species into streetscape and understorey plantings to increase groundcover, expand Brighton's greening footprint and encourage local ecology

NV3 Action – Select plantings to increase local naturalized aesthetic

Use of Tube Stock vs Established Trees

Establishing street trees in urban areas can be an expensive undertaking given the nature of urbanized landscapes. Therefore, improving urban tree performance by providing appropriate site preparation and reducing the trees size at initial planting is vital to support their growth to maturity. This strategy will increase Brighton Councils return on greenspace investment. Investing in quality soil volume and separation from utilities and other built infrastructure does not require new money, but rather the repurposing and re-timing of resources which are typically made available within existing budgets.

Brighton Council currently purchases established street trees in 45L bags for $150. This makes the financial cost of planting a 100m strip at 10m intervals $1500. Alternatively, nursery tube stock purchased for $3.00 can provide 500 plants at the same price, allowing for vegetation to be planted more densely, increasing biodiversity of the plantings and providing greater visual impact (Fig. 1).

Whilst tube stock looks less impressive when initially planted, it is much more robust in the long term. Tube stock suffers less transplant shock and rapidly establishes a healthy root system which facilitates rapid growth. The result is tube stock trees often reach the same height as their more established counterparts within a year or two. Conversely, utilizing established trees for street plantings requires intensive site preparation and increases stress on newly established trees as the plants root system is constrained by large containers. Funding successful tree establishment and eliminating expenditure on maintaining and replacing larger poorly performing trees after planting will significantly increase return on community investment in street trees. The integration of established street trees can still be a viable option for greening Brighton, with a more targeted approach of integrating show case trees, and larger volumes of tube stock plantings.

Vandalism of street trees is a continuous issue that poses a significant barrier to successful tree establishment in parts of the Brighton municipality. The replacement of vandalized street trees incurs a substantial cost to Brighton Council, amounting to $300 per tree ($150 for the tree and $150 for labour). This makes the greening efforts of certain areas prohibitively expensive if trees must be frequently replaced or require extensive protection measures.

Street trees are valuable community assets and integral components of city infrastructure. While protecting established trees from vandalism remains an ongoing challenge, Brighton Council can adopt the following strategies:

- **Reduce Tree Plantings in High-Vandalism Areas:** In areas with high vandalism rates, the extent of established tree plantings can be reduced. Instead, low shrub vegetation can be used as a temporary solution to establish greenery.
- **Install Large Guard Structures:** Erecting large guard structures around selected established trees can protect them until they mature. Once the trees' trunks have thickened and they have gained height, these guard structures can be repurposed for other trees.
- **Increase Shrub Planting Densities:** Enhancing the density of shrub plantings around protected trees can provide an additional layer of defence and improve the overall aesthetic and ecological value of the area.
- **Adapt Planting Positions:** Strategically positioning plantings to create a vegetative barrier can help protect established street trees from vandalism.

NV4 Action – Reduce purchase of larger established trees and integrate with smaller tree tube stock, decreasing transplant shock and increasing establishment success

NV5 Action –Plant feature trees with higher densities of tube stock understorey and ground cover diversity

Figure 1 A newly planted streetscape in Melbourne efficiently utilising limited space with tube stock plants and incorporating species diversity and density when establishing. Image source: https://www.melbourne.vic.gov.au/community/greening-the-city/urban-nature/streetscape-biodiversity/Pages/streetscape-biodiversity.aspx)

Heatwaves and Unsuitable Trees

Urban landscapes are harsh environments and the groundwork undertaken by Brighton Council is to be commended for successfully establishing street trees in these urbanized areas. Current street tree plantings have greatly assisted with the overall greening of Brighton, increased aesthetic appeal, and have received positive public feedback.

Whilst current street tree plantings have been largely successful, due to the current and forecasted impacts of climate change, a longer-term alternative to adaptive street tree planting is needed. This will require a transition to mostly native vegetation for street tree plantings.

Heatwaves are increasing in frequency and intensity globally. Climatic modelling indicates that this trend will continue throughout the 21st century, with heat waves occurrences doubling by 2020 and quadrupling by 2040 (Percival, 2023; Teskey et al., 2015). These hotter, longer, and more frequent heatwaves will require selecting more climate resilient street tree species (Marchin et al., 2022).

Leaves of certain tree species are more susceptible to higher temperatures than others, largely due to leaf thickness (Marchin et al., 2022). Tree species that are more vulnerable to heatwaves and high evaporation rates lose leaves as a defence mechanism to reduce water loss in more critical structures of the plant (Sanusi & Livesley, 2020). This is known as a survival mechanism or avoidance strategy.

Studies by Sanusi & Livesley (2020), indicated that London plane trees (*Platanus x acerifolia*), when exposed to four consecutive days of consistently high temperatures (41°C) in Melbourne, shed 30-50% of their canopy leaves. Canopy shedding reduces tree's ability to modulate microclimates and to maintain pedestrian thermal comfort throughout the summer period (Sanusi & Livesley, 2020). Additionally, studies by Marchin (2022) & Pollastrini (2019) concluded that a similar physiological strategy occurs in some oak (*Quercus*) and maple (*Acer*) species. The probability of significant canopy loss is only reduced by the availability of soil moisture. This presents a significant problem as Brighton shifts to a drier, more arid climate.

Whilst current work from Brighton Council has been significant in greening urban areas and to a high standard, the current list of tree species suggested in the 2019 Street Tree Plan is not going to be appropriate with the forecasted climate modelling for Brighton. Plantings should be transitioned away from vulnerable species to allow for greater adaptive capacity in the selection and planting of trees.

London, oak and some maples in the existing street tree species list are unlikely to be adaptive enough for urban planting under the University of Melbourne's climatic modelling (Kendal et al. 2017). It is important to note that large cities, such as Melbourne and Sydney, which do have extensive plane tree cover are now actively replacing them (Bowring 2023, Davey 2019). Importantly, Brighton Councils' statement in its 2050 vision: *"Embedding climate change awareness into decision making"* needs to be encouraged when selecting street trees.

The viability of the current Street tree Strategy 2019 tree species list under projected climate change modelling is listed in Appendix A.

Whilst street tree planting is an important component in urban greening, the expansion and installation of more diverse understorey assemblages beneath street trees, should be considered of fundamental importance to the longer-term goals of greening Brighton. Trees reduce urban temperatures via solar radiation interception and by providing shade to buildings and footpaths. However, below canopy microclimates also impact urban cooling as much tree canopies alone (Martini et al., 2017). The number and density of plantings underneath street tree canopies has the potential to exert greater influence on microclimate, as well as on the cooling effect, than a single row of urban trees, in some cases by up to 70% (Martini et al., 2017). By utilising all the different morphological characteristics each plant possesses, such as shape, size, density, and leaf structure, the greatest net benefit can be achieved from a multispecies planting in urban streetscapes (Rahman et al., 2018). Naturalistic or more diverse streetscape plantings have gained significant traction to increase and improve vegetation diversity in streets, without requiring additional land or maintenance funding (Babington et al., 2023).

ST1 Action – Transition new native tree list into the existing Street Tree Planting Strategy 2019

ST2 Action – Expand and install more diverse understorey assemblages beneath street trees

ST3 Action – Remove and replace struggling broad leaf deciduous trees and integrate native species

ST4 Action – Increase density of street tree plantings to reduce canopy gaps

ST5 Action – Develop a framework for selecting species to alternate or mix street trees to promote tree diversity and conservation

Current Water Usage and Irrigation Infrastructure

As of Oct 2023, Brighton council currently uses 106.91 kilo litres per day across 23 sites to irrigate street trees, streetscapes and parks (Brighton Council 2024).

Currently, street trees and native plantings receiving irrigation from dripper systems are along the East Derwent Highway into Bridgewater, Scotts Road and the Brighton Bowls Club. However, information provided by Brighton Council indicates that this irrigation method is not currently measured to see how deep water moves through substrate profiles. Therefore, how effective, or efficient this method is for watering is currently unknown. To determine the effectiveness and efficiency of a specific watering method, it's essential that Brighton Council conduct thorough monitoring and evaluation of the existing watering systems. This includes assessing water usage, tree health, soil moisture levels, and overall landscape performance over time. Considering local environmental conditions, regulatory requirements, and resource availability is crucial in optimizing watering practices for current and future green landscaping and streetscape management.

Dealing with future uncertainty is increasingly recognized as a key challenge for the design and management of water infrastructure. It is strongly recommended that Brighton Council evaluate budgeting for at least one new connection point annually or at least biannually from its annual $30,000 budget.

Whilst new connections for irrigation are expensive, with TasWater charging $10,000 for each new connection point, this is the most cost-effective approach moving forward in the development of long-term irrigation infrastructure and in building future water resilience for the Brighton municipality. Additional irrigation options for street tree plantings once water points are installed include:

- using 40mm line then T section off to street trees with 13mm dripper line when long gaps between trees exists.
- For trees that are closer together or streetscape plantings 13mm dripper line may be used for the entire planting.
- On average if the dripper line is looped around each tree, then every plant should receive four or five drippers.

Current irrigation methods utilized by Brighton Council involve the application of 50L tree gator bags to irrigate some of the street tree plantings. These bags, whilst useful, are expensive ($50-$65 each) and require additional input costs with anti-theft cabling and the employment of two ground crew and a truck to refill them every week in the peak of summer. This watering method takes a full day at a cost of roughly $1500 a day, every week. Additionally, tree gator bags whilst useful are inefficient in the long term for sustainable street tree maintenance. Brighton Council should phase out this irrigation method to reduce operations and maintenance costs of street tree plantings. Returns from the reduction in tree gator bag purchase and associated upkeep can be spent on targeted, longer term, water resilient infrastructural development such as new connection points and street irrigation.

Incorporation and Utilisation of Preexisting Water Infrastructure in Future Greening Efforts

The effective incorporation and utilisation of pre-existing water infrastructure is a critical consideration for Brighton Council when planning for all future projects. This will help build the municipalities water resilience. Leveraging existing water resources can significantly reduce the initial costs associated with installing new water connection points and minimize the need for additional infrastructure.

Key Locations with Potential for Enhanced Water Utilisation

Several parks in Brighton currently have pre-existing water infrastructure that is either underutilised or not effectively integrated into parkland upgrades. These are missed opportunities for increasing long-term water efficiency and the success of tree establishment. These areas include:

1. **Cris Fitzpatrick Community Park**
    - **Existing Infrastructure:** A water pipeline runs along the southern boundary of the park.
    - **Opportunities:** Recent upgrade works could have included extending this pipeline to support new plantings along the eastern and northern perimeter of the park. This would have enhanced the irrigation efficiency and reduced the reliance on manual watering methods.
2. **Swan Park**
    - **Existing Infrastructure:** A water connection point is located at the Calvert Crescent roadside boundary.
    - **Opportunities:** Installing a dripper line from this connection point could provide an efficient irrigation solution for new plantings. At a cost of $1 per meter, the dripper line is more economical compared to the current use of gator bags and the associated labour for maintenance.
3. **Bridgewater Parkland Stage 2**
    - **Existing Infrastructure:** A water connection point is available at the back of the toilet block.
    - **Opportunities:** This connection could be utilised to maintain grass cover or irrigate new plantings by installing sprinklers around the pump track. Such an approach would ensure more effective use of water resources and enhance the sustainability of the park’s landscaping efforts.

By strategically incorporating existing water infrastructure into greening projects, Brighton Council can optimize resource use, reduce costs and improve plant establishment and survival in its public spaces.

II1 Action – Assess current watering methods and measure water penetration and irrigation efficiency

II2 Action – Evaluate best locations to install water connection points to irrigate future planned streetscapes

II3 Action – Make better use of existing infrastructure by requiring all projects that involve greening to identify all existing assets (such as water connection points, water pipelines) and incorporate them at the beginning of the project.

II4 Action – Install a water connection point annually or bi-annually to build Brighton's water infrastructure and increase the municipality's water resilience

II5 Action – Streetscape plantings to be initially concentrated around water connection points, gradually expanding outwards from connection point as vegetation/tree planting density increases

II6 Action – Expand existing irrigation lines to encompass longer and wider belts of vegetation

Erosion

Increasing risks of inundation and subsequent erosion are occurring across three sites within the Brighton Municipality. Sunrise Avenue - Dromedary, Riverside Drive – Bridgewater and Old Beach. As the impacts of climate change in conjunction with urban intensification are increasing the risks of exposure to erosion and inundation, Brighton Council should consider heavily targeting these locations with dense tree and understorey plantings. Thereby reducing sediment mobility and associated damages to the urban environment and key infrastructure.

It is well documented that plant roots and rhizomes assist in strengthening soil structures, alleviating erosion. However, some species of plants strengthen and bind soil better than others. Studies by Layt, 2007, demonstrated that by carefully selecting understorey species, a significant reduction in overall erosion can be achieved, compared to selecting other plant species. Results of this study are shown in Table 4.

Table. 4. Results of erosion control studies by Layt (2007), species selection and soil holding potential.

Trade name	Botanical name	% increase potential of soil binding capacity vs bare soil
King Alfred	*Dianella caerulea* 'John 316'	752%
Nyalla	*Lomandra longifolia* 'LM400'	328%
Katrinus Deluxe	*Lomandra longifolia* 'Katrinus Deluxe'	366%
Tanika	*Lomandra longifolia* 'LM300'	250%
Tasred	*Dianella tasmanica* 'TR20'	250%
Carex appressa	*Carex appressa*	176%
Kangaroo paw	*Anigozanthos flavidus*	113%
Dusky coral pea	*Kennedia rubicunda*	115%

ER1 Action – Construct water sensitive urban design storm water points, plant densely with reeds, sedge and aquatic species at key run off locations

ER2 Action – Create layered vegetative buffers from the coastline where high erosion potential has been identified. This will mitigate run off, sediment movement and damage to infrastructure

ER3 Action – Review and monitor water concentration points for maintenance and vegetation condition

Categories of Greening

For this review, urban greening has been broken down into four keys areas: streetscapes, nature strip plantings, parks & gardens, urban and new development. For greater greening in Brighton, all four categories need to complement each other and integrate within Brighton's existing greenspaces. Two principles underlying these four key areas are the promotion of biodiversity through the utilisation of plant density.

Biodiversity

Biodiversity encompasses all forms of life that interact with one another within an ecosystem. These interactions are a fundamental component of ecosystem function and provide numerous direct and in direct benefits through ecosystems services. Ecosystem services include pollination, clean air and water filtration, climate regulation and nutrient cycling. It also has intrinsic value, contributing to the beauty and spectacle of where we live.

Biodiversity and urban design are interconnected aspects of sustainable urban planning that influence the quality of urban environments, human well-being, and ecological resilience in the face of climate change and growing urbanisation. Incorporating greater levels of biodiversity within cityscapes include creating and preserving green spaces, implementing ecologically based landscaping practices, restoring native habitats, and promoting wildlife-friendly urban planning.

Density

An important component of sustainable urban planning is density. Density and biodiversity are interconnected, and understanding their relationship is crucial for sustainable development and ecosystem health. Planting densely optimises land use in urban areas and allows for the efficient use of limited space. It also means more vegetation can be incorporated into parks, green spaces and urban gardens, even in small or narrow areas.

Whilst urban areas are harsh environments for plants to initially establish, it has been shown that increasing planting density improves the overall success rate of plant establishment in many urban areas. Maximizing planting density creates different layers of vegetation, from ground covers to shrubs and trees, increasing plant complexity and habitat for insects, birds and small animals. This increased biodiversity contributes to ecological health, function and resilience in urban environments.

Overall, recognizing the relationship between density and biodiversity when establishing new plantings is essential for the greening of Brighton, some challenges must be considered to ensure successful plant establishment.

Streetscape

Streetscapes can be defined as how buildings, gardens, pathways and roads work together to create the 'look and feel' of a street and/or place.

Underutilized public spaces such as streetscapes offer substantial opportunities for Brighton Council to integrate plantings that increase biodiversity into existing urban landscapes, creating more ecologically connected cities and an enjoyable, atheistically pleasing place for people to live.

Streetscapes are challenging environments for plant growth and are more complex than a parkland environment for establishing vegetation. Often, streetscapes are highly disturbed landscapes hostile to plant establishment and performance. Streetscapes need to benefit the movement requirements of vehicles, cyclists and pedestrians, facilitate access to adjacent properties and carry infrastructure services and amenities.

Adverse barriers that can inhibit plant establishment in streetscapes include:

- soils with altered chemistry and physical properties
- compaction and permeability of substrate profiles
- reduced soil volumes for planting
- low maintenance and resource availability
- traffic management to perform upkeep
- constrained by the placement of services and adjoining infrastructure

Failure to recognize the harsh realities of a streetscape often results in poorly performing or unattractive plantings and even death of plants. This exacerbates an existing negative perception of urban vegetation, requiring increased maintenance inputs, replacement of plants, and creates poor quality, unattractive and unsustainable urban landscape plantings.

SS1 Action –Assess potential barriers to plant establishment, amend accordingly or alter species selection for difficult sites

Establishing successful & biodiverse streetscapes

To maximize the chances of successful plant establishment and creating an attractive, biodiverse streetscape, it is fundamental that the Brighton Council consider the following:

1. Adequate analysis of site

Establishing a streetscape is influenced by various factors such as soil type, aspect, drainage, shade, sunlight exposure, existing vegetation, surrounding infrastructure and potential for irrigation. The priority for initial site analysis should be focused on determining what can be realistically changed to promote the success of planting and ensuring that appropriate plants are selected to tolerate the locations environmental, physical and maintenance limitations. In some cases, retrofitting a streetscape site for planting may be impractical due to contamination, high weed pressure in existing soil and the costs of excavation and disposal.

SS2 Action - Prioritise sites that can require less preparation and can be planted densely

2. Prepare the site for planting

Site preparation for streetscape planting is different to standard specifications that councils generally follow such as trees, nature strips or uniform traffic plantings. The goal is to ensure that the conditions and soils are most favourable to the indigenous or native planting mix being planted. Consideration of available maintenance inputs and costs should be considered during plant establishment and over the lifetime of the project not just for plant establishment.

SS3 Action – Prepare site conditions appropriately to ensure soils are most favourable to the native planting mix

3. Select plants using clear criteria and design

Carefully selecting the arrangement and assemblages of plants is critical to establishing and sustaining long term streetscape plantings. Suitable plant combinations need to be arranged to complement form, function, comparable growth habits and overall vigour. This is fundamental for success (Fig. 2).

Many low maintenance urban plantings are readily dominated by prostrate species and ground covers. Visually this works well when large blocks of the same plant are being used but is often unsuccessful when greater plant diversity is desired. This is largely due to slower growing and more delicate plants becoming dominated by vigorous groundcovers that have increased growth rates, compared to the other plant species in the planting assemblage. However, careful combination selection to match complementary plant traits will avoid this problem.

Supporting biodiversity through streetscapes involves selecting a variety of species that flower at separate times of the year. These plantings will supply a year-round food source of pollen, nectar, fruit and seeds for local vertebrates and invertebrates. Additionally, increasing the diversity in plantings will sustain the aesthetics for extended periods and increase the appeal to the public.

SS4 Action – Choose plants that are compatible with each other and share similar growth habits, form and function

4. Develop an appropriate maintenance plan

A fundamental pillar of establishing streetscape plantings is maintenance and must be prioritized from the project's inception. Maintenance inputs and longer-term management considerations will impact the feasibility of the planting design and how maintenance regimes are implemented. This is critical when diverse plantings contain a variety of species and habitats that can be more costly to maintain than a monoculture of groundcovers. Examples may include pruning or watering regimes varying for each species and multiple site visits a year may be required.

Whilst general maintenance procedures such as hand weeding, deadheading and seed removal of weed species, rubbish collection and infill planting (when necessary) will still be required for native streetscape plantings, ecologically sensitive, post-planting maintenance regimes should include:

- Encouraging natural recruitment of plantings through consistent weed and pest management practices.
- Reduction in the frequency of pruning so invertebrate habitat is retained.
- Only weed species in open areas or along edges of the plantings are spot sprayed to reduce likelihood of off-target damage.
- Limited leaf litter removal except when it is detrimental to existing plant or presents a hazard.

Overall, streetscape plantings should require less weed maintenance as they mature. One method of achieving this goal is through complete canopy closure from ground covers, usually within a 24 to 36 months period post planting. In some streetscape biodiversity plantings, this closure may not be attainable depending on local site factors. Therefore, higher recurrent maintenance will be required to manage weeds long-term until greater planting density is achieved.

SS5 Action – Monitor plantings regularly to ensure plant health is optimal and in fill where appropriate to prevent the formation of vegetation gaps

5. Consider integrating additional habitat features

Attaining biodiversity in streetscapes means more than just plants. Public expectations and perceptions of risk often lead to the detrimental removal of woody debris, leaf litter and other organic material found in streetscape plantings, thereby ecologically sanitizing public landscapes of this biodiversity. Developing innovative and creative ways of incorporating these ecological resources into streetscapes will enable and encourage a larger volume of fauna species to inhabit and persist in the surrounding urban landscape.

SS6 Action – Incorporate woody debris, rocks and small logs into larger streetscape plantings increasing potential ecological niches and habitat

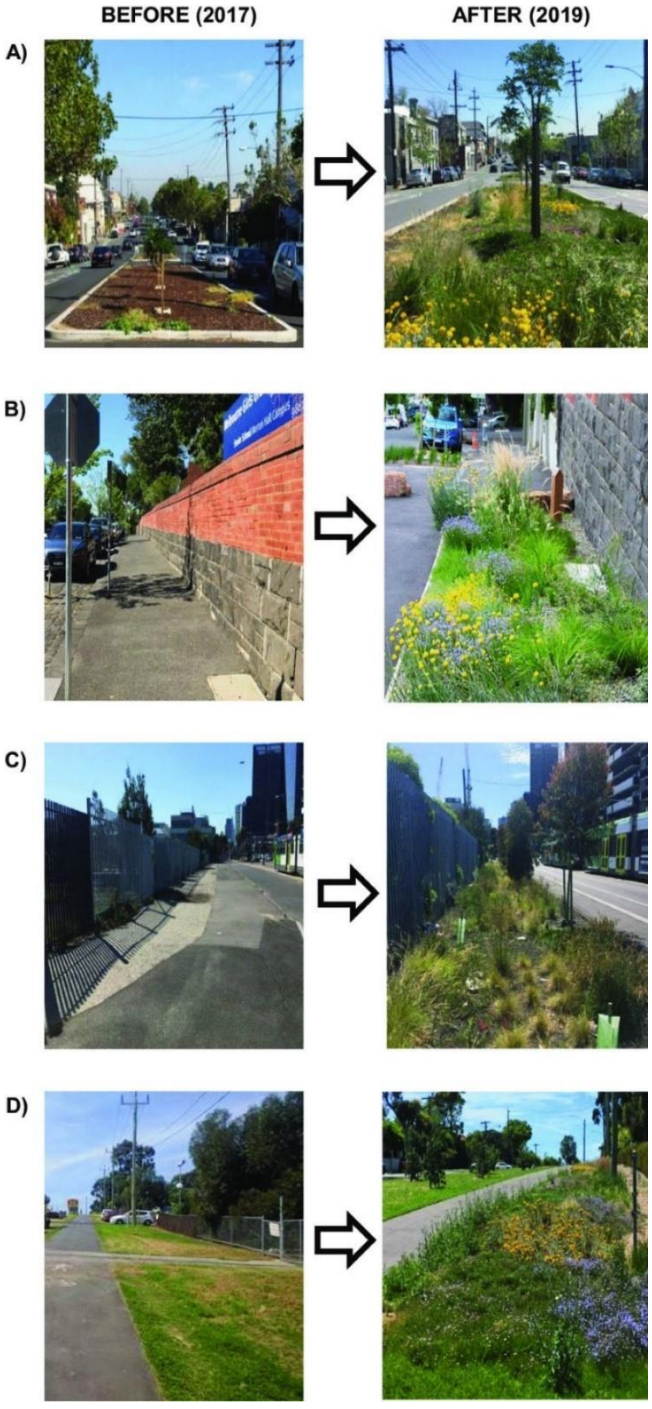

Figure 2 A well-planned and established streetscape in the City of Melbourne. *Image source: https://www.melbourne.vic.gov.au/community/greening-the-city/urban-nature/streetscape-biodiversity/Pages/streetscape-biodiversity.aspx*

Nature Strip Planting

Existing urban streetscapes of the Brighton area have significant UV loads, with minimal vegetation covering adjacent to footpaths or roads. This lack of vegetation exacerbates the heat island effect, whilst reducing the appeal of the surrounding urban landscape. Furthermore, the connectivity of larger parklands to smaller urban green spaces is significantly reduced due to the surrounding pavement effectively acting as a vegetative barrier. An innovative and important action to take in addressing heat island effects, spatial connectivity, along with community health and wellbeing in the GBS is the promotion of revegetating urban nature strips. This can be achieved at low cost and provides immediate, high impact vegetation cover within urbanized landscapes.

A nature strip can be defined as a piece of public land located between the pedestrian footpath and the back of the street curb, between the footpath and property boundary or between the road edge and curb side. Often these reserves contain services such as power poles, water and electricity infrastructure. Standard council protocols for nature strips are covered with ubiquitous lawn and, whilst owned by council, are the property owner's responsibility to maintain.

Nature strips or greenspace within road easements can account for over a third (36.7%) of a city's public greenspace, with most of that greenspace being contained within nature strips (Marshall et al., 2019). Due to the significant contribution nature strips provide to public greenspaces, they should be regarded as having considerable potential to contribute, complement and increase the greening of Brighton. The vegetation of road easements is often structurally simplistic and typically encompasses monocultures of lawn and singular street trees (Marshall et al., 2020). A significant way to alter this ubiquitous lawn phenomenon is by encouraging residents to undertake verge gardening.

Verge gardening is a citizen-led initiative of public urban greening, where residents may plant and maintain understory vegetation and tree species in the road easement. By local governments actively promoting and encouraging verge gardening activities, residents can make nature strips more complex, structurally and floristically diverse and mitigate urban heat island effects (Marshall et al., 2020). Revegetating urban nature strips is an often led by community, which means that transformative urban green scaping can occur with little financial cost to council or government if done appropriately. Local government can facilitate verge gardening through education, providing advice, and by reorienting existing guidelines to encourage residents to revegetate nature strips.

It is well known that growing conditions for plants in streetscapes are often much harsher than in remnant habitats or urban park settings (Tan et al., 2022). Therefore, careful consideration should be given to species selection, hardiness, drought and pollutant tolerance, size and placement. Additionally, nature strip plantings should complement the broader greening strategies of Brighton council and not inhibit roadside collection services or create ongoing maintenance (Fig. 3). It is important when considering nature strip plantings that the following recommendations are followed:

1. **Choose Native Plants**: Native plants are adapted to the local climate, soil, and ecosystem, making them less likely to become invasive. They also provide habitat and food for local wildlife.

2. **Research Local Species**: Consult with local nurseries, councils, or conservation organizations to identify native plant species that are suitable for your region. They can provide valuable information about which plants are indigenous and non-invasive. Alternatively, refer to attached Appendix D for recommended species selection.

3. **Consider Growth Habits**: Look for plants that have controlled growth habits, such as clumping grasses or slow-spreading ground covers, rather than aggressive spreaders like some invasive grasses, climbers or plants that produces runners.

4. **Avoid known invasive species**: Stay away from plants that are known to be invasive in your area or similar climates. Check with local authorities or invasive species organizations for lists of plants to avoid.

5. **Avoid plants that exacerbate allergies**: Carefully choose plants that don't produce copious amounts of pollen or irritant materials, this can exacerbate allergies and increase the level of discomfort for others in the community.

6. **Select non-weedy species**: Choose plants that are known for their non-weedy characteristics, such as limited seed dispersal, low growth rates, or lack of aggressive root systems.

7. **Promote diversity**: Create a diverse plant community on nature strips by selecting a variety of species with different growth forms, heights, and flowering times. This can help prevent any one species from dominating the area.

8. **Consider Maintenance Needs**: Choose plants that require minimal maintenance to thrive, reducing the risk of unintentional spread through garden waste or neglect.

9. **Consider safety and lines of sight**: Select plants that are low in growth habit and have an open structure, allowing for clear lines of sight for passive surveillance and maintains sight lines for safe vehicle and pedestrian movement**.**

10. **Monitor and Manage**: Regularly monitor the nature strip for any signs of invasive spread or weed establishment. Promptly remove any plants that show signs of becoming invasive to prevent further spread.

By carefully selecting native, non-invasive plant species and managing them appropriately, members of the community can create a beautiful and ecologically beneficial nature strip without contributing to the spread of environmental weeds. Furthermore, by selecting appropriate native species that are highly adaptive to a changing climate, increases the likelihood of the available habitat remaining climatically suitable in the future, thereby creating longer term climate refugia whilst promoting broader landscape connectivity throughout the Brighton municipality.

A recommended species list for residents to plant in nature strips that complement the GBS are attached in Appendix C.

NS1 Action – Reorientate existing guidelines to encourage residents to plant nature strips through updated guidelines for nature strip plantings and a public facing brochure, publish species selection list to the public

NS2 Action – Plant nature strips with areas of high foot traffic adjacent to parklands and schools

NS3 Action – Incorporate strip plantings into areas with street trees and grassed islands

NS4 Action – Connect nature strip planting with larger streetscape installations

Figure 3 A well-designed street garden, fully covering the nature strip, whilst allowing pedestrian access to cars, council access to roadside collection and utilizing native plant species

Image source: https://theconversation.com/our-land-abounds-in-nature-strips-surely-we-can-do-more-than-mow-a-third-of-urban-green-space-124781, https://shadylanes.com.au/listings/gayles-nature-strip/).

Parks and Gardens

Whilst increasing biodiversity focused plantings provides extensive positive outcomes in urban areas, expanding the extent of habitat patches by forming a network of greening corridors is the most effect approach in maintaining high levels of urban greenery and transferring these direct and indirect benefits to local residents (Beninde et al., 2015). Brighton municipality contains numerous parklands and greenspaces for integration into the larger greening of Brighton vison, with strong potential of creating an expansive green corridor through or adjacent to urbanized areas. Green corridors should be strategically planned to connect the surrounding natural areas, parks, and other green spaces with one another inside the urbanized environment as best as possible.

Some parks already have master plans and are in different stages of implementation. Where possible these plantings should be in line with the GBS. For suggested tree plantings see Appendix B.

PG1 Action – Assess which parklands have the highest potential of connectivity with existing bushland and other green spaces in Brighton

Larger Parks:

The continuation of tree planting within the larger green spaces of Brighton such as Green Point, and the Foreshore and Jordan River Trail Network, would significantly increase the greening footprint of Brighton. These trail networks provide pathways that the public readily access, overlap areas of suburbs and bushland, and link the surrounding environment with Brighton's urban area.

Larger parks provide important recreational opportunities for people in cities, and harbor much higher levels of biodiversity than in the surrounding urban landscape. These parklands also provide important opportunities to reestablish larger, longer-lived tree species that have been removed from the urbanized landscape.

Planting of larger tree species within sizeable parklands is ideal as plantings aren't constrained by infrastructure or height restrictions. When undertaking large tree plantings, combining dense understorey assemblages with large logs and woody debris helps develop a more naturalised look of the planting and build habitat complexity over time. This style of planting will encourage a higher quality of greenspace planting, whilst creating an aesthetically pleasing park for the public.

PG2 Action – Undertake tree planting in large parks that can accommodate large, long lived tree species

PG3 Action – Plant dense understorey species through layered vegetation plantings and incorporate woody debris to create habitat complexity and a more naturalized look of completed works

Smaller parks:

Many of Brighton's constituents receive direct connection and exposure to nature through parks and gardens. Loss of greenspace quantity such as large parks in urban areas can be offset by increases in greenspace quality (Haaland & van den Bosch, 2015). Smaller parklands surrounded by dense urban environments often lack habitat complexity and quality of vegetation, often containing singular trees and extensive lawn cover. Restoring this complexity can be done through mixed plantings of trees, shrubs and understorey vegetation to integrate parks and gardens with the surrounding streetscapes and provide park plantings of a higher quality and increase aesthetic appeal to residents. Incorporating well planned tree plantings along smaller park boundaries generates visual interest, frames views of the park and provides shade onto the adjoining footpath.

PG4 Action – Plant at greater densities and diversity to increase planting quality rather than quantity in smaller parks.

PG5 Action – Establish greater tree numbers along park edges

Backyards:

Many of Brighton's constituents receive direct connection and exposure to nature through parks rather than backyards. The promotion of tree planting, streetscapes and nature strips in urban areas, surrounding existing parkland is another mechanism to further link greening

projects from the urban zone to the existing parkland. This connective strategy immerses public streets and private property with one another and provides greater wellbeing and sense of place to residents.

PG6 Action –Incorporate tree and understorey plantings in grassed corridors running to and from existing parklands to urban streets

Urban and New Development

Long term sustainability in urban and new developments is directly related to how they are designed and how they form (Haaland & van den Bosch, 2015). Urban populations experience the multiple health and well-being benefits of nature predominantly through urban green infrastructure. Inappropriately designed developments, that do not incorporate higher percentages of green connectivity are exposed to significant long-term risks that impact their suitability, liveability and sustainability.

Demand on urban planners to increase the level of green infrastructure when considering new developments is becoming critical in the face of climate change, landscape fragmentation, declining ecosystem health and reduction in the quality of urbanised life for residents.

New urban expansion and development in the Brighton Municipality presents a pivotal opportunity for Brighton Council to effectively integrate greater greening into all new urban expansion and development projects.

Key considerations and strategies for effectively integrating greater greenspace and tree planting in urban and new developments include:

1. **Early Planning and Design**: Include denser tree planting and streetscape designs into the initial stages of the development planning process. This ensures that the increased greening elements that Brighton Council want in developments, are included into the overall design of the project rather than added later.
2. **Green Infrastructure**: Treat trees and streetscapes as part of the green infrastructure requirement of the development. Green infrastructure helps manage stormwater, improves air quality, reduces urban heat island effect, and enhances biodiversity in urbanised areas.
3. **Native and Climate Adaptive Species**: Select native tree species that are well-adapted to the local conditions and are capable of tolerance to projected climatic changes for Brighton. This will involve incorporating mainland native tree species into the street tree planting mix.
4. **Greening Management Plan**: Develop a comprehensive management plan that outlines strategies for preserving existing trees and maintains habitat integrity within the development.

5. **Integration with Pedestrian and Cycling Infrastructure**: Design streetscapes that prioritize pedestrian and cycling infrastructure, such as wider footpaths and nature strips, bicycle lanes, and pedestrian-friendly amenities. Integrate and connect street trees and green spaces along these routes to enhance connectivity, aesthetics and improve the walkability of residents. Developing a template for developers to follow will assist in this design process.
6. **Street Tree Planting Standards**: Establish standardised protocols for street tree planting, including spacing, species selection, and where vegetation can connect with other plantings. Consider factors such as canopy size, root growth patterns, and maintenance requirements when selecting tree species and planting locations.
7. **Community Engagement**: Involve local residents and stakeholders in the planning and design process to ensure that the streetscape design meets the needs and preferences of the community. Consider hosting public meetings, workshops, or surveys to gather input and feedback for what residents want to see in a new greenspace and what street tree preferences they may have.
8. **Multi-Functional Streetscapes**: Design streetscapes that serve multiple functions, such as providing shade, reducing noise pollution, enhancing aesthetics, and promote opportunities for social interaction. Incorporate amenities such as seating areas, public art, and outdoor gathering spaces to immerse the public with the streetscape.
9. **Long-Term Maintenance and Management**: Develop a long-term maintenance and management plan for trees and streetscapes within new developments. This may include where irrigation is installed, pruning, in filling of plants and tidying regimes.
10. **Monitoring and Evaluation**: Continuously monitor and evaluate the performance of the trees and streetscapes over time. Track metrics such as tree survival rates, canopy cover, air quality improvements, and community satisfaction to assess the effectiveness of the integration efforts and identify areas for improvement.

By incorporating these strategies into future planning and development, Brighton Council can steer developers to create urban and new developments that are greener, have higher environmental and ecological connectivity and build community resilience.

Whilst Brighton Council have existing requirements for greening in new and urban development's some existing policies could be modified to include:

- Increasing the existing planting cover requirement for development applications of no less than 5% to a 10% minimum if feasible (Landscaping policy 2022)

- Reduce the distance between street trees for new road and street frontage from 15m per tree to 10m (Landscaping policy 2022)
- Modify the existing selection of trees for planting in new developments from the Brighton Council Street Tree Strategy to incorporate the species listed in Appendix B & C (Landscaping policy 2022)
- Modify development applications for a use and/or development to provide necessary documentation of species chosen from planting list provided in Appendix B&C and placement (Amenity Policy for Industrial Zones 2014)

UD1 Action -Amend planning policies to require denser planting of tree and streetscape installations and increase required percentage of vegetation cover for new projects in the initial stages of the development planning process

UD2 Action – Develop a management plan and protocol that outlines strategies for preserving existing trees and habitat within new developments

UD3 Action – Create a template for developers to follow to assist them in ecologically minded urban design by integrating trees, streetscapes and parks with public infrastructure in the initial stages of the design

UD4 Action – Provide an appropriate plant species list to include as a condition of planning permits and incorporate planting list as an appendix in Landscape Policy 2022.

UD5 Action – Monitor and evaluate the performance of trees and streetscapes over time. Track metrics such as tree survival rates, canopy cover, air quality improvements, and community satisfaction to assess the effectiveness of the integration efforts and identify areas for improvement.

Water Sensitive Urban Design in New Development

An opportunity for increases in the levels of vegetation cover and the associated benefits, is through the integration of water sensitive urban design along new urban and development roadways (Fig. 4 & 5).

Figure 4 Storm water drains along Riviera Drive.

Urban drainage infrastructure is primarily based around rapidly moving stormwater away from the urban landscape, to reduce the flood risk created by the impervious surface covering of roads and footpaths (Coutts et al., 2013). This creates a water deficit that then requires importing high volumes of drinkable water for street tree irrigation. Rain gardens provide a soaking point for water in an urban landscape that priorities removing it.

It is recommended the storm water drainage channels alongside Riveria Drive could be planted with either rain garden plant species (reeds, sedges, aquatic plants) or street trees. Given the proximity to the road consideration must be given to native plant species but this should not deter Brighton Council from investing in non-irrigated rain gardens within drainage channels. Research has shown that vegetated drain lines increase urban green cover and reduce the speed of water flow, inhibiting its erosive potential whilst filtering nutrient runoff and pollutants (Coutts et al., 2013).

UD6 Action – Plan and construct rain gardens on roadsides and storm water drainage points

Figure 5 Two different concepts of storm water management utilising rain gardens.

Image sources: https://gardendrum.com/2012/09/10/make-a-rain-garden/, https://www.flowstobay.org/data-resources/plans/sustainable-streets-master-plan/burlingame-donnelly-avenue- rain-garden/

Challenge of Greenspace and New Development:

Due to ongoing compliance issues with developers completing approved landscaping works, it is strongly recommended that Brighton Council adopt a landscape bond protocol for new developments (commercial and public open space). Landscape bonds are a positive financial incentive for developers to plant trees, beautify constructions, ensure public open green spaces are appropriately maintained and integrate cohesively with the GBS.

Example from other Council:

Clarence City Council has already adopted this planning process model and has been doing landscape bonds since 1982 (42 years). After receiving feedback from Clarence Council compliance officers, the following is recommended regarding landscape bonds for new developments, street trees and public open space:

1. Compared to other councils where landscape bonds are not used, there are more trees overall in the developed areas of the Clarence Council municipality.

2. The landscape bond system works well if it is appropriately resourced.

3. Developers will resist landscape bonds so the more council can fall back onto its clear vision/strategy the better it is for the officer and compliance.

4. Need to be clear it is a bond and that developers can get it back.

5. The council charges a financial bond 1.5x the cost of the entire project before it commences, so they can undertake any uncompleted works if the developer fails to do so. However, logistically this is difficult to do.

6. Developers can use bond systems to buy their way out of doing greenspace work and acquire titles if compliance isn't adequately resourced (refer to point 3).

7. Another compliance officer to ensure plantings are maintained or when trees die, they are replaced. Officer can be on a .6 wage and get 80% follow up compliance completed.

ND1 Action – Establish landscaping bonds for new developments and to enforce greening policies of Brighton

Implementation and Priority suggestions

Streetscapes

Targeting areas for streetscapes involves identifying and prioritizing locations within urban areas where streetscape improvements can have the greatest impact.
This includes areas of high pedestrian activity, transportation nodes, commercial and retail zones and historic districts.

High priority should be given to the following areas to incorporate streetscape plantings:

- Green Point Road outside JRLF school – 55 Eddington St, Bridgewater (needs approval from Dept of Education)
- East Derwent Highway to Cove Hill Road entry front KFC (Extend the existing pathway and plant along the boundary)
- Fouche Avenue roundabout (four corners) in Old Beach (Several requests from community)
- Lennox Park (plant in accordance with the Lennox Park and oval master plan)
- JRLF – 2 Lampril Circle, Herdsmans Cove (plant along Lampril Circle opposite the community centre, opportunity to plant between the IGA and the school).
- Andrew Street (Good opportunity to plant)
- Brighton bowl club on Brighton Road (Plant around Brighton bowls club)
- Fronting 2 Jordan Downs Drive (An opportunity exists to plant some trees)
- Pontville Park (Glen Lea Road main entrance, plant trees 10-15m wide)
- Gunn St & Old Main Road (In accordance with the Brighton Bridgewater Bridge Waterfront Master Plan)
- Along Weily Park Road (near council owned Weily Park)

Foreshore

Current predications of climate change and its likely impact on coastal zones, requires increased efforts from Brighton Council to maintain and protect Brighton's foreshore. This area is highly utilised by the public and has received much attention from community groups, private contractors and is a significant environmental asset for greening Brighton.

Previous recommendations given by the Derwent Catchment Project (Brighton Foreshore Management Plan 2022) have indicated areas along the foreshore that Brighton Council should regard as a high priority for weed management and restoration work. Extensive progress has been achieved to date and this work should continue as a high priority.

Recommendations below are additions to current foreshore greening efforts and will complement the existing Brighton Foreshore Management Plan 2022 and Greening Brighton Strategy 2016.

Recommendations for areas to target and actions to take include:

FS1 Action – Extend revegetation sites along the Bridgewater and Old Beach Foreshore Trail where weed management and plantings have been taking place

FS2 Action - Plant tree and understorey vegetation on grassed urban land adjacent to the Material Institute and Cheswick Crescent

FS3 Action - Densley plant the coastal area at the end of Jetty Road that is increasingly at risk of erosion

FS4 Action – Integrate water sensitive urban design at the three stormwater points at Old Beach

FS5 Action – Continue planting efforts along foreshore where native vegetation has been damaged to create a BMX trail at Old Beach

FS6 Action – Design and build additional BMX features at the skate/bike park on Jetty Rd to prevent further vegetation damage

FS7 Action – Engage community on revegetation work along foreshore and register interested properties for revegetation

Suburbs

When managed appropriately, streetscape plantings are noticeably preferred to non-vegetated streetscapes by residents (Bonthoux et al., 2019). Typically, through the amenities they provide and the sense of place they cultivate. Well-designed streetscapes foster strong senses of connection to place, community identity and integrate nature into people's daily activities. Highly attractive and functional streetscapes also increase residents' quality of life, social connectivity, mental and physical health and wellbeing. Elements such as trees, shrubs, wildflowers and native understory species enhance urban fabric and encourage pedestrian immersion and activity, which in turn can reinforce positive social interaction and indirectly boost casual surveillance of the street, thereby reducing crime and vandalism. (Lin et al., 2021).

This review recommends that Brighton Council continue to target the suburbs of Gagebrook, Herdsmans Cove and Bridgewater as a high priority. These suburbs have little street vegetation, extensive areas of grass cover (particularly in areas which can be easily vegetated) compared with the other suburbs in the municipality. The current lack of vegetation in the inner suburbs of Bridgewater, Hersmans Cove and Gagebrook, exacerbate the heat island effect for residents of those communities. Furthermore, as these suburbs contain larger open park lands, adjoining grass corridors and connective streetways they stand the most to gain from greening Brighton in contrast to areas with preexisting higher levels of vegetation cover.

Previous recommendations have suggested Bridgewater, Herdsmans Cove and Gagebrook be treated as a high priority for urban greening projects. Whilst limited progress has been made due to a variety of factors, these two suburbs remain a high priority for the overall greening of Brighton.

Figure 6 This grassed island is one example of an area in the suburbs that can be easily planted.

S1 Action –Plant large sections of street rather than little sections at a time, starting on the periphery of suburbs and work way into the centre of the suburb

S2 Action - Plant on the edges of schools, parks with high pedestrian traffic, grassed islands in roads and in grassed cul-de-sacs to circumvent plant loss

S3 Action – Plant in grassed corridors linking parklands with low lying shrubs and vegetation to increase greening connectivity whilst maintaining public safety

S4 Action – Integrate understorey plantings with existing remnant trees, building understorey diversity and cover

Potential streets to target for promoting greenspace connectivity, tree planting, streetscapes and nature strips include:

Bridgewater:

- Improve landscaping of parklands in western Bridgewater where they are to be retained

- The connective corridor bet McShane Road and Croydon Place
- Corner of Bisdee Road and Taylor Crescent
- Grassed island on Taylor Crescent
- New Bridgewater Bridge interchange

Figure 7 Under vegetated grassed corridor between Croydon Place & McShane Road, Bridgewater

Gagebrook and Herdsmans Cove:

- Briar Crescent to Boronia Place
- Cove Creek sports ground along Tottenham Road
- Parkland edge between Acacia Crescent, Viola Crescent, Veronica Crescent and Telopea Crescent
- Pathway from Lot 1 Viola Crescent to Sattler Street
- Sattler street joining to Deak Street and Correa Place
- Streets surrounding Lamprill Circle

Figure 8 Parkland connecting multiple streets and displaying significant connective greening potential, Herdsmans Cove.

Figure 9 Parkland connecting four streets with streetscaping potential, Gagebrook.

Highway planting

Roadside greening can provide numerous benefits such as improving aesthetics, enhancing biodiversity, mitigating erosion, and reducing noise and air pollution. Often, roadside plantings are not prioritized due to overwhelming concerns for the safety of motorists, cyclists and pedestrians (Fig. 10). However, with proper planning and planting design, roadsides can contribute significantly to Brighton's urban green infrastructure. High priority areas such as the East Derwent Highway (EDHW) linking Bridgewater to Gagebrook and

Herdsmans Cove can be planted with taller species further away from the road to avoid obstructing visibility and use lower-growing prostrate species near the roadside edge.

By selecting vegetation that does not obstruct visibility for motorists or impede the movement of pedestrians and cyclists along the EDHW, Brighton council can integrate the surrounding areas of Bridgewater, Gagebrook and Herdsmans Cove more effectively with one another. Increased planting efforts along the EDHW to Cove Hill Road and along the Midland Highway is also recommended.

HW1 Action – Continue planting East Derwent Highway toward Cove Hill Road and Midland Highway

HW2 Action – Establish dense plantings of shrubs along pedestrian and bike paths, protecting users from the highway and screening adjacent houses and fence lines, whilst ensuring vegetation structure is open for passive surveillance and safety

HW3 Action – Plant low lying ground covers, sedges and wildflowers on traffic island leaving lines of sight for vehicles

HW4 Action – Incorporate large landmark trees into plantings further back from the road and along Midland Highway toward industrial area

Figure 10 Utilize locations along the East Derwent Highway (EDHW) that are a sufficient distance from the road to not obstruct vision to motorists. Planting along the EDHW will reduce noise pollution for the adjacent suburbs whilst increasing aesthetic values for pedestrian access along the bike path.

Raising Community Awareness, Engagement and Involvement:

Communication, education and engagement are fundamental in the process of developing successful strategies for community led restoration and revitalization of urban landscapes (Saunders, 1990). Furthermore, the overall success of revegetating urbanized areas is correlated with the levels of public support for and engagement with urban tree projects (Kendal et al., 2022).

A key strategy for fostering community ownership, engagement and environmentally positive behaviours can be through the direct participation of local schools, service groups and community centres. Brighton Council can provide schools with all the required propagation material (seeds, plants, trays, soil etc.) and the schools can raise the vegetation for the streetscapes themselves.

Once the plants are ready Brighton Council can work with the community to plant out verges or sections of the street (these can be medium or low priority streets as per Brighton's Street Tree Strategy). Community planting events can take the form of:

- Planting directly adjacent to and around schools and community centres. This should be completed during school hours to increase participation and engagement.
- Planting nature strips outside people's houses who participated in the project.
- Walkways between streets or where streets meet urban parks.
- On high foot traffic corners with large sections of lawn

This strategy not only creates direct engagement but generates a sense of ownership/custodianship over the plantings, thereby reducing the likelihood of vandalism as the community now has a human story that goes with the creation of that streetscape. It assists in generating a sentiment within the community that they want to see those plants succeed, they want to see them in the landscape. Additionally, community plantings can create reduced rates of vandalism as communal monitoring and surveillance of new green areas is increased. Signs may also be erected highlighting the community achievements and why they did it, what they did and who was involved.

In areas where antisocial behaviour or vandalism have been a recurring barrier to vegetation establishment, planting should begin on the periphery, with a strategy of gradually advancing toward the neighbourhood's centre. This allows for potential reductions in rates of vandalism as the trees are located closer to busier streets with more foot traffic. Furthermore, if street plantings are done well and appropriately managed, as the vegetation matures, admiration from the public for what greening in Brighton will look and feel like is nurtured.

C1 Action - Foster community ownership, engagement and environmentally positive behaviours through direct community participation in the greening of Brighton

C2 Action –Engage local schools, service groups and community centres to raise seedlings and plant outside related buildings and/or "adopt a patch"

C3 Action – Erect signs highlighting planting work with the community groups and named individuals involved

Landcare groups:

Community-led Landcare or "friends of" groups can play a key role in looking after natural areas, tackling weeds and replanting areas to help green Brighton. Brighton Council supports Landcare groups at Bridgewater and Old Beach as well as Threatened Plants Tasmania who have been working in the Jordan Nature Reserve. Other community members have expressed an interest in working along the Jordan River. It is important to continue to support and facilitate community involvement and leadership of these and other emerging groups, as natural areas provide important green linkages within the urban landscape.

C4 Action – Increase advertisement of community-led Landcare events

C5 Action – Provide transport services such as shuttle buses to and from Landcare events

Employment Programs:

Work experience and jobs programs provide an opportunity for community members to gain experience in working outdoors in the environment, controlling weeds, planning and undertaking planting activities. Increasing skills and understanding of landscaping and conservation & land management can help build community interest and capacity to lead and implement greening strategies.

Program participants can help target sites, designing and undertaking plantings, as well as developing and/or implementing maintenance regimes.

If groups can design and work on their own project, there is a greater chance of success, and of ownership and interest in the ongoing maintenance of the site.

C6 Action – Continue to build relationships with indigenous employment programs

C7 Action – Allocate appropriate resources for training and upskilling to recruit a larger workforce to maintain and expand the greening of Brighton

Implementation Plan

ACTION #	ACTION	TIMING	RESONSIBILITY	PRIORITY
NATIVE VEGETATION				
NV1	Select native plant species that are adaptive to lower precipitation, drier landscapes, have increased flexibility with fluctuating weather extremes and will not become invasive	H	Planning	H
NV2	Integrate more local grass and sedge species into streetscape and understorey plantings to increase groundcover, expand Brighton's greening footprint and encourage local ecology	H	Works	H
NV3	Select plantings to increase local naturalized aesthetic	M	Planning & Engineering	M
NV4	Reduce purchase of larger established trees and substitute with smaller tree tube stock, decreasing transplant shock and increasing establishment success	M	Planning, Engineering & Works	M
NV5	Plant feature trees with higher densities of tube stock understorey and ground cover diversity	H	Works	H
STREET TREES				
ST1	Transition new native tree list into the existing Street Tree Planting Strategy 2019	H	Planning	H
ST2	Expand and install more diverse understorey assemblages beneath street trees	M	Works	M

ACTION #	ACTION	TIMING	RESONSIBILITY	PRIORITY
ST3	Remove and replace senescent or struggling broad leaf deciduous trees and integrate native species	M	Works	L
ST4	Increase density of street tree plantings to reduce canopy gaps	H	Works	H
ST5	Develop framework for selecting species to alternate or mix street trees to promote tree diversity and conservation	M	Planning & Engineering	M
IRRIGATION INFRASTRUCTURE				
II1	Assess current watering methods and measure water penetration and irrigation efficiency	M	Planning, Engineering & Works	M
II2	Evaluate best locations to install water connection points to irrigate future planned streetscapes	M	Planning, & Engineering	M
II3	Make better use of existing infrastructure by requiring all projects that involve greening to identify all existing assets (such as water connection points, water pipelines) and incorporate them at the beginning of the project.	H	Planning & Engineering	H
II4	Install a water connection point annually or bi-annually to build Brighton's water infrastructure and increase the municipality's water resilience	L	Planning, & Engineering	H
II5	Streetscape plantings to be initially concentrated around water connection points, gradually expanding outwards from connection point as vegetation/tree planting density increases	L	Planning & Works	M

ACTION #	ACTION	TIMING	RESONSIBILITY	PRIORITY
II6	Expand existing irrigation lines to encompass longer and wider belts of vegetation	L	Planning & Works	M
EROSION				
ER1	Construct water sensitive urban design storm water points, plant densely with reeds, sedge and aquatic species at key run off locations	M	Engineering & Planning	M
ER2	Create layered vegetative buffers from the coastline where high erosion potential has been identified. This will mitigate run off, sediment movement and damage to infrastructure	M	Planning & Works	M
ER3	Review and monitor water concentration points for maintenance and vegetation condition	L	Planning & Engineering	M
STREETSCAPES				
SS1	Assess potential barriers to plant establishment, amend accordingly or alter species selection for difficult sites	H	Planning	M
SS2	Prioritise sites that can require less preparation and can be planted densely	H	Planning	H
SS3	Prepare site conditions appropriately to ensure soils are most favourable to the native planting mix	H	Works	M
SS4	Choose plants that are compatible with each other and share similar growth habits, form and function	H	Planning & Works	H

ACTION #	ACTION	TIMING	RESONSIBILITY	PRIORITY
SS5	Monitor plantings regularly to ensure plant health is optimal and in fill where appropriate to prevent the formation of vegetation gaps	L	Planning & Works	H
SS6	Incorporate woody debris, rocks and small logs into larger streetscape plantings increasing potential ecological niches and habitat	M	Works	M
NATURE STRIPS				
NS1	Reorientate existing guidelines to encourage residents to plant nature strips through updated guidelines for nature strip plantings and a public facing brochure, publish species selection list to the public	H	Planning & Engineering	H
NS2	Plant nature strips with areas of high foot traffic adjacent to parklands and schools	H	Works	H
NS3	Incorporate strip plantings into areas with street trees and grassed islands	H	Planning & Works	M
NS4	Connect nature strip planting with larger streetscape installations	M	Planning & Works	M
PARKS & GARDENS				
PG1	Assess which parklands have the highest potential of connectivity with existing bushland and other green spaces in Brighton	M	Planning, Engineering & Works	M
PG2	Undertake tree planting in large parks that can accommodate large, long lived tree species	H	Works	H

ACTION #	ACTION	TIMING	RESONSIBILITY	PRIORITY
PG3	Plant dense understorey species through layered vegetation plantings and incorporate woody debris to create habitat complexity and a more naturalized look of completed works	M	Works	H
PG4	Plant at greater densities and diversity to increase planting quality rather than quantity in smaller parks	H	Works	H
PG5	Establish greater tree numbers along park edges	M	Works	M
PG6	Incorporate tree and understorey plantings in grassed corridors running to and from existing parklands to urban streets	M	Works	M
URBAN DEVELOPMENT				
UD1	Amend planning policies to require denser tree plantings, streetscape installation and connective corridors to parklands in the initial stages of the development planning process	M	Planning & Building	M
UD2	Develop management plan that outlines strategies for preserving existing trees and maintains integrity of existing habitat within the new developments	M	Planning	M/L
UD3	Create a template for developers to follow to assist them in where Council wants to integrate trees, streetscapes and parks with public infrastructure and urban development	M	Planning & Building	M/L
UD4	Provide an appropriate plant species list to include as a condition of planning permits and incorporate planting list as an appendix in Landscape Policy 2022**.**	M	Planning & Engineering	M

ACTION #	ACTION	TIMING	RESONSIBILITY	PRIORITY
UD5	Monitor and evaluate the performance of trees and streetscapes over time. Track metrics to assess the effectiveness of the integration efforts and identify areas for improvement	L	Planning, Engineering & Works	H
UD6	Plan and construct rain gardens on roadsides and storm water drainage points	M	Planning & Works	M
NEW DEVELOPMENT				
ND1	Establish landscaping bonds for new developments and to enforce greening policies of Brighton	M	Planning & Finance	H
FORESHORE				
FS1	Extend revegetation sites along the Bridgewater and Old Beach Foreshore Trail where weed management and plantings have been taking place	H	Works	H
FS2	Plant tree and understorey vegetation on grassed urban land adjacent to the Material Institute and Cheswick Crescent	M	Works	M
FS3	Densley plant the coastal area at the end of jetty Road that is increasingly at risk of erosion	M	Works	M
FS4	Integrate water sensitive urban design at the three stormwater points at Old Beach	M	Planning, Engineering & Works	M
FS5	Continue planting efforts along foreshore where native vegetation has been damaged to create a BMX trail	H	Works	H

ACTION #	ACTION	TIMING	RESONSIBILITY	PRIORITY
FS6	Design and build additional BMX features at the skate/bike park on Jetty Rd to prevent further vegetation damage	M	Planning & Building	M
FS7	Engage community on revegetation work along foreshore and register interested properties for revegetation	M	Planning & Community Engagement	M
SUBURBS				
SB1	Plant large sections of street rather than little sections at a time, starting on the periphery of suburbs and work way into the centre	M	Planning & Works	M
SB2	Plant on the edges of schools, parks with high pedestrian traffic, grassed islands in roads and in grassed cul-de-sacs to circumvent plant loss	H	Works	H
SB3	Plant in grassed corridors linking parklands with low lying shrubs and vegetation to increase greening connectivity whilst maintaining public safety	M	Works	H
SB4	Integrate understorey plantings with existing remnant trees, building understorey diversity and cover	M	Works	H
HIGHWAY				
HW1	Continue planting East Derwent Highway toward Cove Hill Road and Midland Highway	M	Works	M
HW2	Establish dense plantings of shrubs along pedestrian and bike paths, protecting users from the highway and screening adjacent houses	M	Planning & Works	H

ACTION #	ACTION	TIMING	RESONSIBILITY	PRIORITY
	and fence lines, whilst ensuring vegetation structure is open for passive surveillance and safety			
HW3	Plant low lying ground covers, sedges and wildflowers on traffic island leaving lines of sight for vehicles	H	Works	M
HW4	Incorporate large landmark trees into plantings further back from the road and along Midland Highway toward industrial area	M	Works	M
COMMUNITY AWARENESS, ENGAGEMENT & INVOLVEMENT				
C1	Foster community ownership, engagement, and environmentally positive behaviours through direct community participation in the greening of Brighton	L	Community Engagement	H
C2	Engage local schools, service groups and community centres to raise seedlings and plant outside related buildings and/or “adopt a patch”	M	Planning & Community Engagement	H
C3	Erect signs highlighting planting work with the community groups and named individuals involved	M	Planning & Community Engagement	M
C4	Increase advertisement of community-led Landcare events	M	Community Engagement	M
C5	Provide transport services such as shuttle buses to and from Landcare events	M	Planning & Community Engagement	M

ACTION #	ACTION	TIMING	RESONSIBILITY	PRIORITY
C6	Continue to build relationships with indigenous employment programs	M	Community Engagement	M
C7	Allocate appropriate resources for training and upskilling to recruit a larger workforce to maintain and expand the greening of Brighton	M	Planning & Finance	L
REVIEW & EVALUATION				
RE1	Review the recommendations and implementation plan after 5 years (2029) and undertake complete review of the updated Greening Brighton Strategy in 2033	2029 and 2033	BC, consultant	Med/Low
RE2	Create a standardized protocol and method for measuring tree cover to be undertaken every one to two years	H	Planning & Engineering	H

Type of priorities:

Low (L), Medium (M), High (H)

Timing of priorities:

High: 1-2 years, Medium: 2-5 years, Low: 5-10 years

Community Feedback

The feedback from the community in this strategy should be regarded as only initial with another round of consultation to be undertaken by Brighton Council.

Limited community consultation was undertaken as part of the review process. It included opportunistic feedback received while out in the community. An article in the Brighton Nature News email was distributed to various community members and groups (many of these were people interested in the natural environment but also service groups and other community groups and individuals). Relevant phone conversations and emails received during the project were noted and a quick review of relevant comments and feedback collected through Council's customer request system was undertaken.

While visiting some of the sites identified in the previous strategy, three residents of Bridgewater East were asked about the street tree plantings. Their comments included *"I don't understand why the council has chosen the trees they have. They're nice but they are out of place with the area. I would prefer native species* (they didn't mind if they are mainland species or Tasmanian), *but don't want plants that get too big. Since those trees over the road have grown above the streetlights, crime has been happening. What's the point of having security cameras on that building, if all you can see is the inside of a bush?"*

A new resident contacted council expressing a desire to plant out a roadside area near where she was living *"I need some trees or gardens or shrubs and green space...How can we improve our public amenities, cool the suburb and mitigate against climate change? Let's plant this space out!"*

In a Brighton Nature News email readers were invited to consider and provide feedback to the following questions about street trees and planting in Brighton.

7 community members provided feedback. All supported more trees and the use of drought tolerant species particularly native plants. A selection of responses to the questions put forward to the community are included in Appendix E.

Other comments

The Brighton LGA has the highest prevalence of asthma in the state, and I am looking at some exciting new ways that we can build community capacity to support people living with asthma. A particular theme is seasonal allergies and asthma, and just how difficult it is for people to live freely when surrounded by matter in the air – particularly pollens. I'd be keen to connect with you to discuss how tree plantings –

particular species – can be detrimental for people with asthma. Perhaps there's something exciting we can do to propel both our interests?

A brief review of Council's Customer Request system identified the following concerns regarding trees and plantings in the Brighton landscape.

- Dangerous, damaged or fallen trees, branches and debris
- Over-grown trees and over-hanging limbs
- Vegetation obscuring vision and/or access

These issues made up most of the customer requests reviewed. While storm damage is likely to increase with climate change, careful choice of plants and planting locations will be important to help reduce the associated risks and issues.

A few concerns about the health of trees and vandalism were raised and there was at least one resident who contacted the council to express appreciation of the nature strip plantings.

Love the trees planted on nature strip in Tivoli Road, would like to know if we plan to do all of Gagebrook.

Review and Evaluation

The updated Greening of Brighton Strategy will be reviewed at the end of the 10-year period (2033). To maintain relevance of the recommendations and implementation plan, a review and update involving key stakeholders will be carried out after five years (2029).

As outlined in the streetscape section, ongoing maintenance and monitoring of works e.g. street tree/streetscape maintenance and vegetation condition, should be undertaken by the relevant land manager

Formulation of a standardised protocol and method should be established to monitor the percentage of greenspace change. This should be undertaken every two years by the responsible organisation or consultant.

RE1 Action – Review the recommendations and implementation plan after 5 years (2029) and undertake complete review of the updated Greening Brighton Strategy in 2033

RE1 Action – Create a standardized protocol and method for measuring tree cover to be undertaken every one to two years

Links to Other Plans

Brighton Council has a range of plans and strategies that tie in with the Greening Brighton Strategy

Brighton Council Strategy 2023-2033

Goal 1 – Inspire a proud community that enjoys a comfortable life at every age.

1.1 Engage with and enable our community
1.2 Build resilience and opportunity
1.3 Ensure attractive local areas that provide social, recreational and economic opportunities
1.4 Encourage a sense of pride, local identity and engaging activities

Goal 2 Ensure a sustainable environment.

2.1 Acknowledge and respond to the climate change and biodiversity emergency

2.2 Encourage respect and enjoyment of the natural environment

2.3 Demonstrate strong environmental stewardship and leadership

2.4 Ensure strategic planning and management of assets has a long term-sustainability and evidence-based approach

Goal 3 Manage infrastructure and growth effectively.

3.2 Infrastructure development and service delivery are guided by strategic planning to cater for the needs of a growing and changing population

Goal 4 Ensure a progressive, efficient and caring council

4.4 Ensure financial and risk sustainability

Street Tree Plan 2019

Landscape Architects Inspiring Place were engaged by Brighton Council, to develop a Street Tree plan to assist in identifying appropriate street trees to be planted within the urban areas of the Brighton municipality. A review of this plan was undertaken in the development of this document.

Brighton's Natural Resource Management Strategy 2022

2.1 Improve or maintain the condition of freshwater, estuarine and coastal ecosystems

4.1 Maintain and/or improve the condition of native habitats for flora and fauna

4.3 Improve and maintain connectivity of habitat for flora and fauna species

5.1 Incorporate regional community wellbeing into agricultural and natural area management programs to improve resilience

5.2 Facilitate increased community participation in and awareness

Foreshore Management Plan

In May 2023 Brighton Council endorsed the Brighton Foreshore Management Plan. This plan is aimed to provide a practical guide for the collaborative management of areas along the Brighton foreshore. The plan initially concentrated on three areas in Bridgewater, Herdsmans Cove and Old Beach.

Goals

Restore foreshore vegetation and habitat.

Promote environmental awareness.

Maintain green spaces and promote pride in the area.

Climate Change and Resilience strategy November 2019

To provide and demonstrate leadership to the community by implementing sustainability initiatives.

To integrate sustainability principles into all Council functions to achieve a healthy and sustainable environment.

To reduce costs associated with resource consumption across Council assets and activities.

SI.5 Build a resilient community and environmentally sustainable future

S2.2: Education/Capability Build

S4.4: Long-term thinking & evidence-based

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Appendix A Current tree species list for Greening Brighton Strategy:

Unsuitable Vulnerable Viable

Size	Tree Species (non-native)	Common Name	Temperate Vulnerability		
			Current temp	Moderate (0.8 -1.6 °C)	Extreme (3°C)
L	*Acer rubrum 'Autumn Red'*	Canadian Maple	Hardy	Moderately vulnerable	Moderately vulnerable
L	*Acer x freemanii*	Autumn blaze maple	Very vulnerable	Very vulnerable	Very vulnerable
L	*Fraxinus pennsylvanica*	Cimmaron Ash (good drought resistance, not hardy)	Moderately vulnerable	Moderately vulnerable	Very vulnerable
L	*Fraxinus oxycarpa 'Raywoodii'*	Claret Ash	Moderately vulnerable	Very vulnerable	Very vulnerable
L	*Fraxinus pennsylvanica 'Aerial*	Aerial Ash	Moderately vulnerable	Moderately vulnerable	Very vulnerable
L	*Ginkgo biloba*	Maidenhair Tree	Hardy	Moderately vulnerable	Moderately vulnerable
L	*Gleditsia triacanthos var. inermis 'Sunburst'*	Golden Honey Locust	Hardy	Hardy	Moderately vulnerable
L	*Nyssa sylvatica*	Tupelo	Hardy	Hardy	Moderately vulnerable
L	*Platanus acerifolia*	London Plane	Vulnerable	Very vulnerable	Very vulnerable
L	*Pyrus ussuriensis*	Manchurian Pear	Moderately vulnerable	Moderately vulnerable	Very vulnerable
L	*Quercus coccinea*	Scarlet Oak	Very vulnerable	Very vulnerable	Very vulnerable
L	*Quercus robur*	English Oak	Very vulnerable	Very vulnerable	Very vulnerable
L	*Quercus palustris*	Pin Oak	Very vulnerable	Very vulnerable	Very vulnerable
L	*Quercus rubra*	Red Oak	Very vulnerable	Very vulnerable	Very vulnerable
L	*Quercus cerris*	Turkey Oak	Very vulnerable	Very vulnerable	Very vulnerable
L	*Tilia cordata*	Linden Tree	Very vulnerable	Very vulnerable	Very vulnerable
L	*Ulmus glabra 'Lutescens*	Golden Elm	Very vulnerable	Very vulnerable	Very vulnerable
S	*Acer palmatum 'Sango Kaku'*	Coral Bark Maple	Moderately vulnerable	Moderately vulnerable	Very vulnerable
S	*Fraxinus excelsior 'Aurea'*	Golden Ash (Hardy)	Very vulnerable	Very vulnerable	Very vulnerable

Size	Tree Species (non-native)	Common Name	Temperate Vulnerability		
			Current temp	Moderate (0.8 -1.6 °C)	Extreme (3°C)
S	*Koelreuteria paniculata*	Golden Rain Tree	Hardy	Hardy	Hardy
S	*Malus ioensis 'plena'*	Iowa Crab Apple	Hardy	Moderately vulnerable	Very vulnerable
S	*Olea europaea 'Correggiola*	Olive Tree	Hardy	Hardy	Moderately vulnerable
S	*Parrotia persica*	Persian Witch Hazel	Very vulnerable	Very vulnerable	Very vulnerable
S	*Pyrus nivalis*	Snow Pear	Very vulnerable	Very vulnerable	Very vulnerable
S	*Liquidambar styraciflua 'Worplesdon'*	Worplesdon Liquidambar	Hardy	Hardy	Hardy
S	*Gleditsia triacanthos var. inermis 'Shademaster'*	Green Honey Locust	Hardy	Hardy	Moderately vulnerable
S	*Aesculus hippocastanum*	White Horse Chestnut	Very vulnerable	Very vulnerable	Very vulnerable
S	*Robinia pseudocacacia 'Frisia*	Golden Robinia	Moderately vulnerable	Moderately vulnerable	Very vulnerable
F	*Ginkgo biloba 'Princeton Sentry*	Princeton Sentry Gingko	Hardy	Moderately vulnerable	Moderately vulnerable
F	*Pyrus calleryana 'Capital'*	Ornamental Pear	Hardy	Hardy	Moderately vulnerable
F	*Quercus palustris 'Pringreen'*	Green Pillar Oak	Very vulnerable	Very vulnerable	Very vulnerable
F	*Quercus robur 'fastigiata'*	Fastigiate English Oak	Very vulnerable	Very vulnerable	Very vulnerable
F	*Liriodendron tulipifera 'Fastigiata'*	Fastigiate Tulip	Moderately vulnerable	Moderately vulnerable	Very vulnerable
F	*Malus tschonoskii*	Upright Crab Apple	Very vulnerable	Very vulnerable	Very vulnerable
LM	*Eucalyptus globulus*	Tasmanian Blue Gum	Hardy	Hardy	Moderately vulnerable
LM	*Eucalyptus amygdalina*	Black Peppermint	Very vulnerable	Very vulnerable	Very vulnerable
LM	*Eucalyptus obliqua*	Stringybark	Moderately vulnerable	Moderately vulnerable	Very vulnerable
LM	*Eucalyptus viminalis*	White Gum	Hardy	Moderately vulnerable	Very vulnerable
LM	*Eucalyptus sieberi*	Black Peppermint	Hardy	Moderately vulnerable	Very vulnerable
LN	*Eucalyptus pauciflora*	Cabbage Gum	Hardy	Moderately vulnerable	Very vulnerable
LN	*Eucalyptus pulchella*	White Peppermint	Moderately vulnerable	Moderately vulnerable	Very vulnerable

L – LARGE S- SMALL F- FASTIGATE LM – LARMARK LN – LARGE NATIVE

Out of the 41 tree species selected for planting, 11 (26.8%) will be viable based on projected climate modelling within urban streetscapes*. Species highlighted in green indicate the strongest likelihood of persistence in the face of increasing temperatures of up to 3 degrees. Any species with a very vulnerable rating were excluded. Temperature vulnerability ratings were collected from research by the University of Melbourne, for the City of Melbourne's Future Urban Forest 'Identifying vulnerability to future temperatures' report 2016. *Note if the moderately vulnerable rating is included in the tree species list, under moderate warming scenarios, with extreme forecasts excluded, then 23 (56%) tree species are suitable out of the 41.

Information sourced: https://nespurban.edu.au/wpcontent/uploads/2018/11/CAULRR02_CoMFutureUrbanForest_Nov2016.pdf)

Appendix B Recommended Tree and Plant Species List

Native Street Tree Species for Brighton (non-eucalypt)				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Acacia implexa	Lightwood wattle	5-15m	4-10m	
Acacia melanoxylon	Blackwood	6-8m (in urban areas)	3-6m	
Acacia pendula	Weeping myall	5-13m	4-5m	
Acacia mucronata	Narrow-leaf wattle	1-15m	.5-5m	
Agonis flexuosa	Weeping myrtle	8-10m	8-10m	
Allocasuarina littoralis	Black sheoak	6-8m	3-4m	
Allocasuarina verticillata	Drooping sheoak	8-10m	4-6m	
Banksia integrifolia	Coast banksia	5-10m	3-6mm	
Banksia marginata	Silver banksia	1-12m	2-12m	
Banskia spinulosa	Hairpin banksia	1-2m	1-2m	
Casuarina glauca	Swamp sheoak	6-20m	3-6m	
Callistemon Dawson	River weeper	3-5m	3-5m	
Dodonea viscosa	Hop bush	2-3m	2-3m	
Grevillea robusta	Silky oak	15-20m	6-8m	
Lophostemon confertus	Brush box	10-15m	6-12m	
Melaleuca lanceolata	Black paperbark	3-6m	3-6m	
Melaleuca quinquenervia	Swamp paperbark	8-15m	5-10m	
Callistemon viminalis	Red cascade	6-9m	3-4.5m	

Native Shrub Species				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Acacia glaucoptera	Flat wattle	1-2m	1-2.5m	

Native Shrub Species				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Atriplex cinerea	Saltbushg	.5-1m	1-2m	
Correa backhousianna	Australian fuschia	1m	1m	
Correa decumbens	Spreading correa	.5-1m	1-3m	
Correa reflexa	Native fuchsia	.5-1.2m	.5-1m	
Hakea francisiana	Emu tree	3-8m	2-4m	Upright shrub to narrow tree
Hakea laurina	Pincushion hakea	3-6m	3-5m	Large shrub to small tree
Hakea multilineata	Grass-Leaved hakea	3-5m	2-4m	Upright shrub
Leptospermum laevigatum	Coast tea tree	2-3m	1.5-2.5m	
Leucophyta brownii	Silver cushion bush	.5-1m	.5-1m	Compact shrub
Melaleuca viminalis	“little john”	0.9-1m	1.5m	Dense evergreen shrub
Westringia spp	Native westringia	.5-1.5	1.3-1.5	

Native herbs for understorey and streetscapes				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Bossiaea prostrata	Creeping bossiaea	5-10cm	0.5-1.5m	
Chrysocephalum apiculatum	Common everlasting	30cm	50cm	
Chrysocephalum semipapposum	Clustered everlasting	60cm	60cm	
Calocephalus citreus	Lemon beauty heads	15-60cm	30-60cm	
Calothamnus quadrifidus	One-sided bottlebrush	1.5-2m	1.5-2m	
Conostylis candicans	Grey cottonheads	30cm	50cm	

Native herbs for understorey and streetscapes				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Helichrysum spp	Everlasting, strawflower	30cm-1m	30cm-1m	
Xerochrysum bracteatum	Golden everlasting	1m	.5-1m	

Native Ground Covers				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Carpobrotus rossii	Native pigface	40cm	1-3m	Effective weed deterrent over larger areas
Casuarina glauca (prostrate form)	Swamp sheoak	100-300mm	1-1.5m	Effective weed suppressant over larger areas
Disphyma crassifolioum	Round leaved pigface	30cm	100cm	
Kennedia prostrata	Running postman	10cm	2-3m	
Lasiopetalum macrophyllum (prostrate form)	Slender velvet bush	30-60cm	1-2m	Tolerates light frosts, drought hardy
Myoporum ellipticum	Boobialla	30-50cm	1-2m	Fast growing, good gap filler, rockeries and weed suppression
Myoporum insulare (prostrate form)	Boobialla	30-50cm	1-2m	Fast growing, good gap filler, rockeries and weed suppression
Myoporum parvifolium	Creeping boobialla	0.3	2-3m	Dense foliage, good weed suppressant
Rhagodia spinescens	Spiny saltbush	0.6	1-3m	Medium, hardy shrub/ground cover, attractive foliage

Native Grasses, Lilies & Sedge species				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Austrostipa spp	Spear grass	60-90cm	90cm	
Carex appressa	Tall sedge	0.8-1m	1m	

Native Grasses, Lilies & Sedge species				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Dianella tasmanica	Blue flax-lilly	50-80cm	50-80cm	
Ficinia nodosa	Nobby clubrush	80cm-1m	60-90cm	
Lomandra longifolia + other nursery cultivars	Many cultivars	40cm-1.2m	40cm-1m	
Poa labillaedierei	Common tussock grass	Up to 1.5m	0.5m	Larger tussock over time and will need maintenance
Poa rodwayi	Velvet tussock grass	60cm	30cm	Better to plant in initial plantings as more compact than labillaedierei
Rhytidosperma caespitosa	Ringed wallaby grass	20-90cm	30-90cm	
Themeda triandra	Kangaroo grass	60cm-1.5m	30-60cm	Key species in a national threatened ecological community

Smaller Eucalyptus Trees for Street Planting				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Angophora hispida	Dwarf apple	2-6m	2-6m	Grows well on sites with limited root space
Corymbia ficifolia	Red flowering gum	2-12m	5-10m	Excellent shade tree, round & compact
Eucalyptus cneorifolia	Kangaroo island narrow leaved mallee	4-10m	5-8m	Excellent screening or shelter, grows well on coastal sites
Eucalyptus cosmophylla	Cup gum	2-6m	4-8m	Excellent street tree for under utility wires, good shade tree
Eucalyptus crenulata	Buxton gum	4-8m	8-10m	Good street tree for under utility wires, fast growing, prefers cool, wet sites
Eucalyptus gregsoniana	Dwarf snow gum	2-4m	3-6m	Shrub for landscape planting, dense rounded canopy, very cold

Smaller Eucalyptus Trees for Street Planting				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
				tolerant, excellent for screening and low shelter
Eucalyptus. kitsoniana	Gippsland mallee	5-8m	3-4m	Fast growing, shelter and screening, general landscape tree, tolerates wide soil types.
Eucalyptus macrandra	Long flowered marlock	4-10m	3-6m	Screening, ornamental small tree
Eucalyptus pulverulenta	Silver leaved mountain gum	3-7m	3-5m	Non-competitive rots, suitable for underplanting with other plants, ornamental, cold tolerant
Eucalyptus Risdonii	Risdon peppermint	3-10m	5-8m	Ornamental street tree or mallee, fast growing, good street tree, very drought tolerant
Eucalyptus stoatei	Scarlet pear gum	5-8m	2-5	Ornamental small tree, fast growing and flowers when young, screening
Eucalyptus verrucata	Mount Abrupt stringybark	1-5m	2-4m	Dense crowned shrub or small tree, fast growing, shelter and screening
Eucalyptus viridis	Green mallee	4-10m	3-4m	Provides dappled shade, drought tolerant

Larger Trees for Parks, Developments, Highways, Landmark Species				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Angophora costata	Smooth barked apple	6-20m	16-19m	Grows well on rocky sites with limited root space, ornamental, good shade tree
Angophora floribunda	Rough barked apple	10-25m	10-20m	Excellent shade tree, screening, non-shedding bark
Corymbia citridora	Lemon scented gum	16-30m	20-24m	Excellent landscape planting tree, fast growing, tolerant of most soils and conditions
Corymbia maculata	Spotted gum	18-35m	10-15m	Fast growing, large stately tree, structurally

Larger Trees for Parks, Developments, Highways, Landmark Species				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
				sound, good shade, tolerant of most soils and conditions
Eucalyptus accedens	Powderbark wandoo	8-20m	6-8m	Seasonally colourful bark, screening, compact crown of blue-green foliage
Eucalyptus botryoides	Woolybutt	8-30m	10-15m	Fast growing, spreading shady crown, grows well on coast
Eucalyptus camaldulensis	River red gum	8-35m	10-15m	Excellent habitat and shade tree
Euclyptus cinerea	Argyle apple	6-18m	6-12m	Highly ornamental, non-shedding stringy bark, tall screening & shelter, floriculture
Eucalyptus crebra	Narrow leaved ironbark	7-25m	8-12m	General landscaping tree, non-shedding bark, tolerant of most soils and conditions
Eucalyptus globulus	Tasmanian blue gum	5-60m	15-22m	Very fast growing, tolerant of cold temperatures, excellent parkland feature tree
Eucalyptus leucoxylon	Yellow gum	4-12m	7-15m	Moderately fast growing, good shade tree, shelter and screening, tolerant of most soils and conditions
Eucalyptus mannifera	Red spotted gum	5-18m	8-12m	Highly ornamental, excellent landscape planting, moderately cold tolerant
Eucalyptus megacornuta	Warty yate	6-12m	8-12m	Fast growing, dense crowned tree, smooth shiny bark, rapid, short to medium-term screening and shelter
Eucalyptus melliodora	Yellow box	10-30m	15-25m	Tolerant of most soils and conditions, moderately drought tolerant, general landscape planting

Larger Trees for Parks, Developments, Highways, Landmark Species				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Eucalyptus nicholii	Willow Peppermint	6-18m	8-12m	Ornamental street tree, compact crown, shade, shelter & screening
Eucalyptus pauciflora	Cabbage gum	4-20m	4-10m	Good ornamental street tree, fast growing, extremely cold tolerant
Eucalyptus petiolaris	Eyre Peninsula blue gum	8-14m	5-12m	Ornamental landscaping tree, provides dappled shade, tolerant of moderately saline soils
Eucalyptus polyanthemos	Red box	6-25m	5-15m	General landscaping tree, tolerant of most soils and conditions, moderately drought tolerant
Eucalyptus populnea	Bimble box	6-15m	9-12m	Non-shedding bark, good shade tree, excellent street tree, tolerant of most soils and conditions, highly drought tolerant
Eucalyptus pulchella	White peppermint	8-20m	10-15m	Ornamental landscaping tree of graceful form, fast growing, good street tree in cooler regions
Eucalyptus rossii	Inland scribbly gum	8-18m	12-15m	Excellent tree for landscape planting, provides dappled shade, non-competitive roots (suitable for under-planting)
Eucalyptus sideroxylon	Red ironbark	8-25m	8-15m	General landscaping tree, contrasting foliage with black bark, tolerant of most soils and conditions, moderately drought tolerant
Eucalyptus viminalis	Manna gum	10-50m	8-15m	Variable forms, from woodland tree to tall forest tree, very fast growing, tolerates infertile sandy soils

Larger Trees for Parks, Developments, Highways, Landmark Species				
Botanical name	**Common name**	**Height**	**Width**	**Notes**
Eucalyptus wandoo	Wandoo	8-18m	5-8m	Taller screening, shelter and shade, smooth pale bark

Native species listed above are the recommendations for the street tree planting in response to climate change for the Brighton municipality. Species were chosen based on potential distribution range, tolerance to soil type, salt, air temp and UV levels that are within the predicted climatic shifts for Brighton municipality. Information sourced: Nicolle, D. (2016) Smaller Eucalypts for Planting in Australia, Their Selection, Cultivation and Management) & Nicolle, D. (2016) Larger Eucalypts for Planting in Australia, Their Selection, Cultivation and Management.

Species listed in **Appendix C** can also be integrated with the **Appendix B** species list for the greening of Brighton.

Appendix C Nature strip planting options for public

RECOMMENDED NATURE STRIP PLANTS			
NATIVE PLANTS			
Species	**Common name/s**	**Height**	**Width**
Anigozanthus spp	Kangaroo paw	40cm-1.2m	40cm-1.2m
Arthropodium strictum	Chocolate lily	80cm	80cm
Astroloma humifusum	Native cranberry heath	30-40cm	30-40cm
Atriplex semibaccata	Berry saltbush	10-40cm	1-2m
Austrostipa spp	Spear grass	70-90cm	1m
Banksia spp *small species	Birthday Candles (example), many varieties available	50cm	1m
Brachyscome multifidia	'Break O Day' cut leaf daisy	30cm	50cm
Bulbine bulbosa	Bulbine lily	80cm	50cm
*Callistemon spp *small species*	'Little John' (example)	60cm-1.2m	60-90cm
Calocephalus citreus	Lemon beauty-heads	15-60cm	30-60cm
Calocephalus lacteus	Milky beauty-heads	15-30cm	10-30cm
Carpobrotus spp	Pigface	15-30cm	1m
Chenopodium spinescens	Creeping saltbush	30-50cm	1m
Chrysocephalum apiculatum	Common everlasting, yellow buttons	30cm	50cm
Chrysocephalum semipapposum	Clustered everlasting	60cm	60cm
Convolvulus erubescens	Australian bindweed	30cm	2m
*Correa sp.** small/prostrate forms	*Correa alba* (example), many varieties available	50cm	1.5m
Crowea saligna	Crowea	1m	1m
Dianella brevicaulis	Short-stem flax lily	30-60cm	60cm-1m
Dianella revoluta	Blue flax-lily	50-80cm	50-80cm
Dianella tasmanica	Tasman flax-lily	50-80cm	50-80cm
Dichondra repens	Kidney weed	10cm	1m
Diplarrena moraea	Butterfly flag, white iris	70cm	70cm
Disphyma crassifolium	Roundleaf pigface	15-30cm	1m
Disphyma crassifolium ssp. clavellatum	Round-leaf pigface, rounded noon flower, karkalla	2-30cm	1-2m
Species	**Common name/s**	**Height**	**Width**

RECOMMENDED NATURE STRIP PLANTS			
NATIVE PLANTS			
Einadia nutans	Climbing saltbush	15-30cm	60cm-1m
Enchylaena tomentosa	Ruby saltbush	60cm	1m
Eremophila spp	Emu bush, tar bush	1-1.5m	1-1.5m
Euryomyrtus ramosissima	Rosy baeckea	1m	1.5m
*Eutaxia microphylla *prostrate form*	Small leaved eutaxia	10-15cm	1.5m
Ficinia nodosa	Knobby club rush	80cm-1m	60cm
Geranium solandri var. solandri	Austral crane's bill	10-20cm	60cm-1.5m
*Goodenia ovata *prostrate form*	Hop goodenia	30cm	1m
Grevillea spp *prostrate forms	*Grevillea australis* (example), many varieties available	30cm	1.5m
Hibbertia procumbens	Spreading guinea flower	15cm	1m
Hibbertia riparia	Erect guinea flower	50cm	1m
Kennedia prostrata	Running postman	15cm	3m
Leptospermum lanigerum prostrate form	'Petal point spread' woolly tea tree	40cm	1.5m
Leucophyta brownii	Cushion bush	1.2m	1.2m
Linum marginale	Native flax	60cm	30cm
Lissanthe strigosa	Peach heath	1m	1m
Lomandra nana	Dwarf mat-rush	50cm	50cm
Microlaena stipoides	Weeping grass	70cm	70cm
Myoporum parvifolium	Creeping boobialla	30cm	2m
Patersonia occidentalis	Purple flag	50cm	50cm
Pelargonium australe	Wild geranium, southern storksbill	50cm	50cm
Pimelea humilis	Common rice flower	10-50cm	30cm-1m
Poa labillardieri	Silver tussock-grass	1m	50cm
Pultenaea pedunculata	Matted bush-pea	60cm	1m
Pycnosorus globosus	Billy buttons	30cm	30cm
Rhodanthe anthemoides	Chamomile sunray	30cm	60cm
Rytidosperma spp	Wallaby grass	20-90cm	30cm
Scaevola calendulacea	Coastal fan flower, dune fan flower	40cm	2m
Species	**Common name/s**	**Height**	**Width**

RECOMMENDED NATURE STRIP PLANTS			
NATIVE PLANTS			
Stylidium graminifolium	Grass trigger plant	50cm	40cm
Styphelia adscendens	Golden heath	60cm	50cm
Tetragonia implexicoma	Bower spinach	50cm	2m
Themeda triandra	Kangaroo grass	40cm	50cm
Viola hederacea	Native violet	20cm	1m
Wahlenbergia stricta	Native bluebell	40cm	40cm
Westringia spp *small/prostrate forms	Westringia	40cm-1.5m	40cm-1.3m
Xerochrysum bracteatum	Golden everlasting	60cm	1m
Xerochrysum viscosum	Sticky everlasting	20-80cm	30-80cm

Appendix D Update on works from Brighton Council Street Tree Strategy 2019

All work in the Street Tree Strategy (STS) is regarded as either high priority (HP), medium priority (MP) or low priority (LP).

Original document found on Brighton Council website: https://www.brighton.tas.gov.au/wp-content/uploads/2019/05/FINAL_Brighton-Street-Tree-Strategy.pdf

L01 Brighton East

No progress has been made to report on L01 Brighton east. Limiting factors for this suburb for tree establishment are powerline infrastructure and access for council to provide services. However, small trees and shrubs that can be planted along these sections as recommended in Appendix B. Planting this section of Brighton would provide urban greening connectivity with Brighton Road that has been extensively planted, well established, and maintained.

L02 Brighton West

HP street tree plantings have taken place along Menin Drive, Haskell Road, Hollington Street with some HP plantings along Racecourse Road. Streetscape plantings have also been established along Menin Drive and are well established. Other MP to LP plantings have not taken place.

L03 Industrial Estate

The Industrial Estate is progressing positively. Most if not all HP plantings have taken place within the estate along Glenstone Road. Most native trees (*E pulchella, viminalis, pauciflora)* look healthy and are establishing well. High density planting has been undertaken along large banks of a water way which cuts through a section of the estate. MP to LP plantings is still to take place.

Figure 11 Establishing native trees along Greenbanks Road & Lukaarlia Drive, Brighton Industrial Estate.

L04 Old Beach

No progress has been made to report on L04 Old Beach. Limiting factors for this suburb for tree establishment is powerline infrastructure. However, small trees can be planted along these sections as recommended in Appendix B. Streets up on Grevillea Avenue have good levels of native vegetation with future street tree plantings being incorporated easily.

L05 Tivoli Green

Tivoli Green being a newer urban area has received some street tree and incorporated streetscape planting. HP planting along Riveria Drive at the entrance to Tivoli Green and further along toward Maritimo Way has been completed but more street trees can be planted. Streetscape plantings are establishing well on the corners of Lottie Mews, Arbie Lane, Elodie Drive and Marlowe Drive. Community feedback on this planting has been positive.

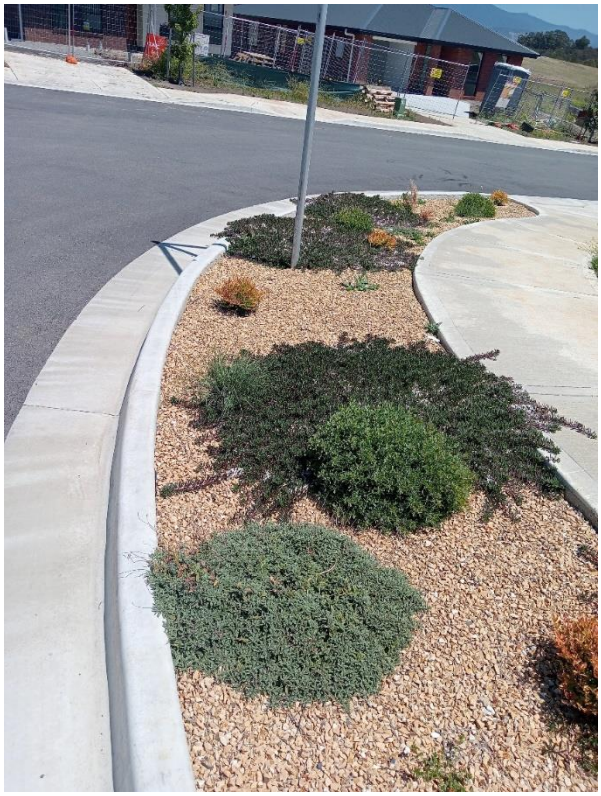

Figure 12 Establishing streetscape on Lottie Mews, Tivoli Green.

L06 Herdsman Cove

HP street tree plantings have been undertaken on the turn off from the East Derwent Highway to Lamprill Circle and the turn off to Gage Road. Some remnant native vegetation remains at these turnoffs and should be incorporated into future planting. No other HP or LP plantings have taken place within Herdsman Cove. Barriers to tree establishment could be overcome with a school engagement program that target establishing vegetation around the JRLF Herdsmans Cove Primary School.

L07 Gagebrook

Gagebrook has had HP street trees planted along Gage Road and Briggs Road. There is strong potential for further street tree establishment along Tottenham Road, Plymouth Road and around the JRLF Gagebrook Primary School. Targeted street tree and streetscape planting along the borders of the Local Government Reserve located within the denser urban areas of Gagebrook would complement any future greening in this suburb.

L08 Gagebrook North

No progress has been made to report on L08 Gagebrook North. This suburb has significant potential for street tree establishment and greater urban greening. Priorities should be given to bare urban grass islands that can be easily vegetated. This will reduce maintenance and start the greening process.

L09 Bridgewater East

No progress has been made to report on L09 Bridgewater East. This suburb has strong potential for street tree and streetscape planting given it has no overhead powerlines, large,

grassed corners along roadsides and wide nature strips. It is recommended that Brighton Council increase efforts to target this suburb for the greater greening of Brighton strategy.

L10 Bridgewater West

HP street plantings have been commenced along Greenpoint Road, Gunn St and Eddington Road bordering the Bridgewater Parkland. Eddington Road plantings have had barriers to establishment due to vandalism but are overall healthy. Given that Bridgewater West has preexisting reasonably well vegetated parklands some of the HP and MP have not been completed. Finishing planting along all HP and MP roads will provide habitat connectivity to these existing parklands and school grounds and assist with the broader urban greening goals of the GBS.

Figure 13 Established vegetation on Gunn St, Bridgewater West.

Appendix E Community feedback

Do you think there are enough street trees in Brighton?

- *There's a few along the main road, but it would be great to see more in the residential streets, where space allows.*
- *There are never enough trees! People cut them down, or destroy them faster than we can get some old growth back into the landscape.*
- *Trees look nice - love the greenery and having plants around.*
- *Brighton requires a lot more trees and shrubs especially in pockets, (ie small patches of land on street corners etc) build up a bed with a variety of plants - trees, shrubs with good soil and mulch…..rather than individual trees along side street paths.*

Would you like more trees?

- *Plant now, plant native and plant many!*
- *More trees are always a welcomed sight.*
- *Yes, I want more trees. Many, many more trees. For cooling the landscape, to prevent weather erosion and baking of our soils, for the wildlife, to shade us when we walk (and I want walking tracks, that are shaded!!), to make soil, to make rain.*

Considering climate change, should plants be heat and drought-tolerant?

- *Yes, trees that are heat and drought-tolerant are better in the long run, particularly when considering the costs of maintenance.*
- *I believe we should plant drought-tolerant native trees and shrubs.*
- *We need to choose species that are going to be drought tolerant and provide a cooling system for the soil.*

Should they be native or non-native?

- *While some non-native trees are beautiful additions to the area, native trees are much more adapted to drier conditions and create a food and habitat source for our native wildlife.*
- *I think we need both native and non-native. In urban environments (which, let's face it, are non-native) I would favour non-native trees: those that will provide a cool leafy canopy (think Ash, Oak, Elm), beautiful colours in Autumn, and when the leaves fall, they will create soil. There're also less likely to burn in a bushfire. An oak tree is tremendous at surviving drought as it has a deep tap root. Wildlife have also adapted to using these trees.*
- *Drought tolerant native trees and shrubs*.

If you prefer natives, should they be from Tasmania or include species from the mainland?

- *Tasmanian natives first, ideally, but if mainland species are to be considered it should be ensured they do not have "weedy tendencies" that could cause problems later down the track.*
- *Prefer local natives.*

Is it important to provide trees and plants that provide habitat for birds and other animals?

- *Like habitat trees for birds - ones that attract birds – it's nice to hear the birds in urban areas where there is so much other noise - I love the sound of birds.*

Do you support community-led nature strip plantings to green up Brighton?

- *Big yes!*
- *I'm very supportive of any effort to use nature strips, and roadside verges for vegetation planting.*
- *Support planting nature strips - need to be hardy and drought tolerant*
- *I know in small towns in Italy, people sponsor a tree-plant in a certain location in the town...we purchase and plant the tree in that location - it becomes our tree in Brighton! We do as much as we can to keep the tree alive, protection from wildlife, watering in early days etc.*

Are you in favour of more plantings in open spaces including trees and understorey grasses and shrubs?

- *Another big yes! I'd love to see more plantings, particularly native grasses, and other understorey plants around Brighton.*
- *We also know where there is some land where you chaps could plant and grow as many trees and shrubs as much as you like! Tehe ….Not to mention there is a large parcel of agricultural land owned by State Growth, totally wasted growing weeds next to our property.*

Is there enough shade for pedestrians using footpaths and walkways in summer?

- *Not really. I feel as though I am unable to walk my dog on most summer days as the pavement becomes too hot (although, the new dog park is a welcome addition!)*
- *If you plant deciduous non-native trees along walkways, then people will have filtered-to-full sunlight in winter, and shade in summer when you need it.*

Is there too much shade for pedestrians using footpaths and walkways in winter?

- *I have not found this to be the case.*

Should plantings be used to beautify tracks and walkways and the paths that connect them?

- Absolutely! It would not only help to beautify tracks, but also create habitat.

Do you think new developers can play an important role in greening Brighton? Should they be encouraged to play a bigger role in greening Brighton?

- With so much development taking place in Brighton currently, ensuring Developers play their part and leave sites in a better state than when they found them, would be beneficial to the community.
- Developers should not be allowed to create high density housing developments without inclusion of at least 10-15% open green space for recreation use, and community gardening.

Appendix F – Methods for canopy analysis and new baseline

Methods

Analysis of tree cover assessment for the Brighton municipality was undertaken utilising *i-Tree Canopy* software (Fig. 1). *i-Tree Canopy* employs the most up to date satellite imagery from Google Maps as a base layer for random sampling. The new analysis utilised satellite imagery from Google Maps April 2024, which were taken in summer 2023. CAD files were of the urban boundaries were provided by Brighton Council.

Comparisons between the GBS 2016-2021 and 2024 were then analysed. The General Industrial Zone and any urban area not in Bridgewater, Herdsmans Cove or Gagebrook were excluded for this comparison to match existing Brighton Council data. 501 data points were analysed according to the methods used in the Greening Brighton Strategy 2016-2021:

- Tree canopy – Anything that looks like a tree from above.
- Buildings – Any built structure i.e. houses, sheds, warehouses etc.
- Road – all public roads
- Grass – cleared roadsides, industrial estates, lawns, pasture, scrub, sites cleared for development and sporting grounds.
- Impervious (other) – Car parks, footpaths and train lines, not including buildings
- Water – creeks, rivers, dams and rocky coastlines

New baseline

A new baseline analysis was undertaken utilising the provided urban zone information from Brighton Council with *i-Tree Canopy* software. This was to encompass the rate of greening over the all the urban zones within the Brighton municipality. A 500-point analysis was run in *i-Tree Canopy* (Fig. 3) according to the methods in the GBS 2016-2021, with the exception that the industrial estates were classified as impervious (other) rather than grass. The data points were saved as an i-tree canopy file and a shape file of the urban area boundary used will allow for future comparisons.