5. Issues and strategy response

5.1 Canopy vegetation cover on private land and its influence on landscape character

5.1.1 Overview

The research undertaken for this Strategy to date has identified there has been a 4 per cent loss of canopy trees cover since 1992 and an incremental loss of overall canopy vegetation and greenness in the city. The loss has primarily occurred on private land, while in many cases there has been an increase in canopy tree cover on public land, particularly in public open space. Tree canopy cover loss is also occurring on land reserved for education purposes including public and private schools. This is due to a combination of the expansion of school buildings and facilities, and the sale of former school sites in response to increased urban densities and changing demographics.

The loss of all types of vegetation on private land impacts on the landscape character of the precincts. The loss of the vegetation, including small and large canopy trees, shrubs and green grass has in some precincts changed the greenness and *Garden City Character* referred to in the Municipal Strategic Statement to a more built and urban character. This is most evident where there is a lack of avenue style street tree planting or where the street trees are too small for the scale of the street. In these locations there is a greater reliance on private landscaping and gardens to generate the precinct landscape character. A key issue is the decrease in green and natural surfaces and an increase in urban built form which reduces the opportunities for achieving greening particularly for additional large canopy trees.

5.1.2 Issues and strategy response

Residential land

Incremental loss of canopy vegetation, permeable surfaces and the green and leafy garden character on private land. Detached dwellings are being replaced with unit developments and single dwellings that have a larger building footprint. The original suburban character, where the dwellings are clearly separated from each other by vegetation including trees, significantly contributes to the *Garden City Character*. The increasing coverage of lots with built form and paved surfaces erodes the *Garden City Character*. This is demonstrated in the following figures.

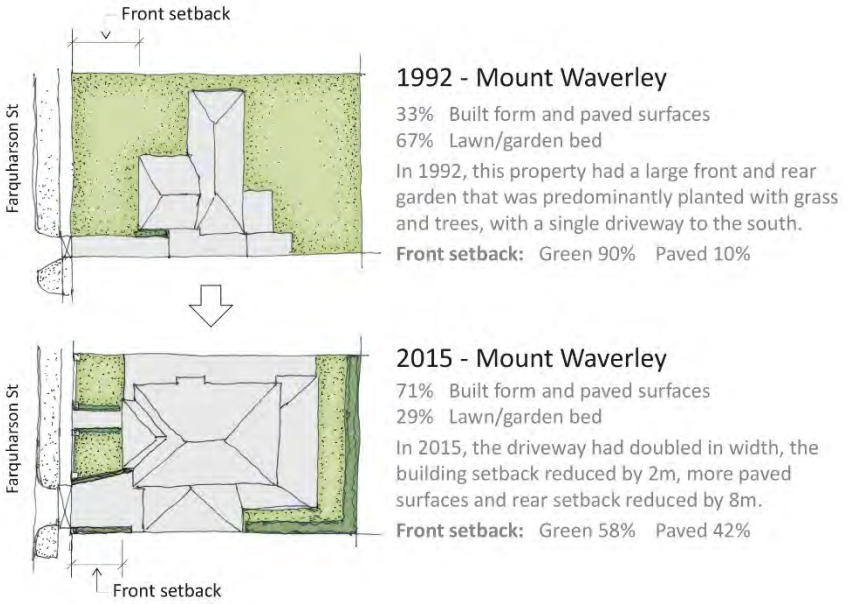


Figure 5A *Example of the change to single dwelling site coverage from 1992 to 2015*

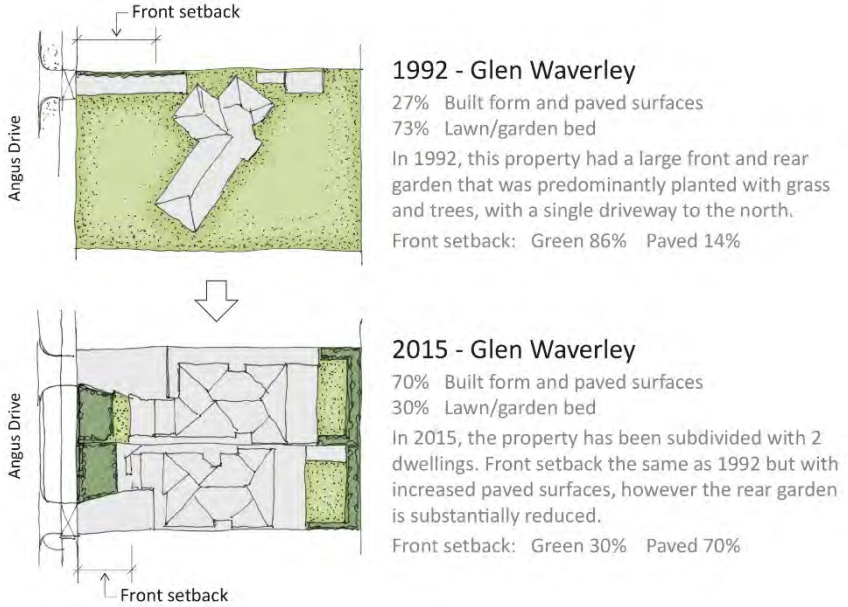
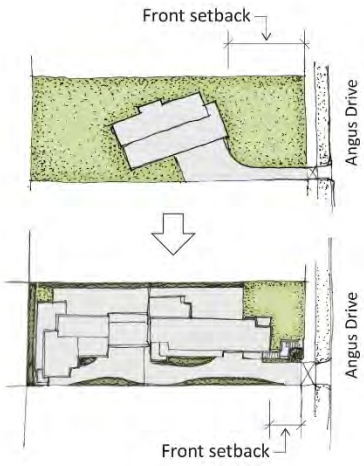


Figure 5B *Example of the change to 2 lot subdivision site coverage from 1992 to 2015*



1992 - Glen Waverley

27% Built form and paved surfaces
73% Lawn/garden bed

In 1992, this property had a large front and rear garden that was predominantly planted with grass and trees, with a single driveway to the south.

Front setback: Green 80% Paved 20%

2015 - Glen Waverley

70% Built form and paved surfaces
30% Lawn/garden bed

In 2015, the property has been subdivided with 2 dwellings. Front setback contains garden and grass with mature tree which provides some urban greenness.

Front setback: Green 66% Paved 34%

Figure 5C *Example of the change to 2 lot subdivision site coverage from 1992 to 2015*

Table 5-1 Issues and strategy response for residential land

Issue	Strategy response
a) The loss of large canopy trees from private land as part of the redevelopment process for units and larger houses. This has decreased the overall tree canopy cover and distributed shading through the suburbs, which is an important factor in mitigating urban heat island effect. Research reviewed as part of this study indicates that large canopy trees are more effective at improving air quality, shade, evapotranspiration, carbon sequestration and habitat provision than smaller trees. Based on the substantial benefits there is a need to promote the retention of large canopy trees particularly as part of creating a more resilient environment in the context of climate change	• Develop suitable guidelines that prioritise retention of existing mature canopy trees on private land over removal. Where some removal is required, prioritise the retention of large, long-lived canopy trees. Refer to Guideline 4, in Section 6.5. • Investigate the potential to prepare a Significant Tree Study for the City of Monash. Refer to Recommendation 7.4.8. • Increase the presence of large canopy trees on private land by developing design guidelines and planning controls that differentiate and emphasise the need to retain large canopy trees and also plant new large canopy trees where feasible. Within the MULCVS, this would include the key performance criteria and suggested potential species palette's suitable in each of the preferred landscape character types. Refer to Guidelines in Section 6. • Protect and retain mature medium and small canopy trees on private land. Refer to Guideline 4 in Section 6.5. • Proposed new canopy vegetation in medium and high density areas is to include large canopy trees to soften and address the scale of the built form, recognising that any building over 16 metres in height is unlikely to have emergent canopy trees above the roofline. Refer to Guidelines in Section 6.3.2.
b) Reduction in permeable surfaces including grassed areas and garden beds. This corresponds in many precincts with an increase in built and paved surfaces. The presence of permeable surfaces that retain	• Develop and update guidelines that maximise the establishment of natural permeable surfaces on private land. This includes promoting the inclusion of garden bed and lawn areas in preference to large undifferentiated paved surfaces. Where natural permeable surfaces are not feasible, encourage canopy shade trees of proposed hard paved

Issue	Strategy response
moisture improves evapotranspiration, which is essential for localised cooling of our neighbourhoods during summer. Reducing the permeable surfaces impacts on the microclimate and liveability of our neighbourhoods.	surfaces to promote the *Garden City Character*. Maximising these will improve the liveability, community health and wellbeing and resilience to climate change. Refer to Guidelines in Section 6.2.
c) The comparative loss of canopy vegetation and greenness within and outside the existing VPO areas between 1992 and 2016, demonstrates that the VPO has not been effective at minimising canopy vegetation loss.	• Review the set of planning controls and consider the introduction of a Local Law to protect canopy trees across the municipality, rather than only within selected overlay areas. Refer to Recommendation 7.3. • Consider removal of the VPO and replacement with an overlay control that promotes planting of appropriate trees and vegetation. Refer to Recommendation 7.1.
d) The limited space in side set backs between the new buildings and side boundary fence and the increased proportion of the side boundary occupied by built form, reduces the opportunity to establish canopy vegetation around and between dwellings. In the original established suburban landscapes side setbacks varied with a smaller proportion of the side boundary occupied by built form. The result of the increased presence of built form along the side boundaries reduces the shading and amount of greenery between and around each dwelling, thereby impacting on this key attribute, i.e. that each dwelling is set in its own garden or landscape setting.	• Develop suitable guidelines that maximise the establishment of green infrastructure and features between dwellings. Preferably this would include space for trees with emergent canopies. As a minimum, design guidelines would require vertical green climbers and shading to boundary fencings and walls. Refer to Guidelines in Section 6.2. • Proposed new canopy vegetation is to be of a suitable size and height which emerges above the roofline of existing and proposed built form of up to 3 storey dwellings. Refer to Guidelines in Section 6.2.
e) While front garden setbacks are retained in many of the single dwelling redevelopments, the front gardens are changing to provide larger hardstand areas for vehicle access and turn around, and in some instances replacement with paved low maintenance courtyards.	• Develop suitable guidelines that maximise the establishment of green surfaces within the front setbacks. This includes promoting the inclusion of garden bed and lawn areas in preference to large paved surfaces. Where natural permeable surfaces are not feasible, encourage use of permeable pavements and canopy trees that shade paved surfaces to promote the *Garden City Character*. Refer to Guidelines in Section 6.2.
f) A key influence on the landscape character is the presence and type of fencing.	• The preferred landscape character types include a planted or low fence treatment so there is excellent integration and visual access between the public and private realm. Refer to Guidelines 1.6 in Section 6.2.
g) Another key influence is the position of the built form on the site. .	• The design guidelines in this Strategy will aim to achieve a minimum of 60 per cent planting/greening to the front setback, and some greening at least to

Issue	Strategy response
	the boundary fences to the side setbacks in order to maintain the garden setting as a core feature of all landscape character types. Refer to Guideline 1.5 in Section 6.2.
h) Incremental change over time has led to only small areas remaining of the original post WWII detached suburban garden style dwellings with the traditional gardens.	• Identify the best remaining examples of the garden suburban detached dwelling style and protect these with appropriate heritage controls to ensure that some examples of this style remain in the longer term. Refer to Recommendation 7.4.9.

Non-residential

Commercial/industrial

There are essentially three types of commercial/industrial land use on private land including:

- Urban commercial/industrial, characterised by the presence of none or very little vegetation on private land or in the streetscapes.
- Suburban commercial/industrial, characterised by narrow landscaped setbacks generally consistent with the required 7.6 metres.
- Garden commercial/industrial, characterised by large landscaped setbacks greater than 7.6 metres and up to 20 metres in width.

Table 5-2 Issues and strategy response for commercial/industrial land use

Issue	Strategy response
a) Urban commercial/industrial precincts have none or very few street trees on public land and no trees on private land. This does not support the health and wellbeing of the worker community, as it creates an uninviting outdoor environment for people to walk and exercise during breaks from work. For the City of Monash to continue to attract industry and business to the municipality, improvements to strengthen and reinforce the greenness and treed character will create a point of difference from the inner urban areas of Melbourne.	• Increase the presence of large canopy street trees and other greening where feasible in the existing urban commercial/industrial precincts. There is an opportunity to incorporate water sensitive urban design into the future street tree planting. • Develop preferred setback landscape guidelines, including promoting greening and moisture absorbing surfaces in these areas for amenity and human comfort, including mitigating urban heat. • Refer to Guidelines in Section 6.3.3.
b) Suburban commercial/industrial precincts have a prevalence of sealed car parking and vehicle turning space within the narrow front setbacks between built form and streetscape.	• Develop landscape guidelines for the minimum 7.6 metre setbacks, including promoting greening and moisture absorbing surfaces in these areas for amenity and human comfort, including mitigating urban heat. • Reduce visible and exposed hardstand areas on private land and increase greening, particularly to the perimeter of the sites adjoining the streetscapes

Issue	Strategy response
	to promote and support the *Garden City Character*. This includes planting canopy trees to shade exposed hardstand areas where feasible. Refer to Guidelines in Section 6.3.2.
c) In the Garden commercial/ industrial precincts the large landscaped setbacks have a focus on visual amenity and are uninviting for the employment community to use them during breaks from work. Forecast growth and change in the Garden commercial/industrial precincts will require proactive guidelines to protect and encourage large canopy trees and associated landscaping on private land to provide suitable shading and canopy vegetation	• Develop guidelines that promote the activation and use of these large landscaped setbacks as the Garden commercial/industrial precincts redevelop in the future. This includes protecting and planting large canopy trees for shade and encouraging an activated frontage with commercial use on the ground floor adjoining the landscape setbacks. Refer to Guidelines in Section 6.3.1

Retail

Retail land use is distributed through the activity centres and local shopping centres throughout the neighbourhoods. The landscape character of the activity centres are typically assessed as part of individual structure plans for the centres, and have therefore not been assessed as part of this Strategy. This Strategy includes guidelines and recommendations that apply across the activity centres to achieve the objectives of promoting a green, resilient and liveable city. The majority of the local shopping centres distributed through the neighbourhoods have a similar landscape character with either none or small standard street trees. As with the activity centres, the Strategy has not assessed these centres individually and incudes overall guidelines that apply to all the centres.

Table 5-3 Issues and strategy response for retail land use

Issue	Strategy response
a) Forecast growth and increased urban densities in activity centres and will require proactive guidelines to protect and encourage large canopy trees and associated landscaping on private land to provide suitable shading and canopy vegetation.	• Develop guidelines that set aside adequate road widths and front setbacks where feasible to allow space to plant large canopy trees to promote increased shade and cooling in the high density precincts. Refer to Guidelines in Section 6.3.4.
b) The majority of smaller retail centres throughout the municipality have been planted with small 'mop top' style trees, which provide limited shade and greening of these retail centres	• Increase the opportunity to improve the shade, character and greening in the small retail strips and centres through the neighbourhoods, in keeping with the preferred landscape character type in the precinct. This includes encouraging greening on private land, whether these are front setbacks, or courtyards etc. Refer to Guidelines in Section 6.3.5.

5.2 Canopy vegetation cover on public land

5.2.1 Street trees

Table 5-4 Issues and strategy response for street trees

Issue	Strategy response
a) Inconsistent street tree planting styles, with a predominance of scattered mixed species do not contribute to the landscape character types or shading and urban greening.	• Opportunity to strengthen the landscape character of precincts by aligning the street tree infill planting species selection with the preferred landscape character precincts in this Strategy. Refer to Guidelines in Section 6.6.3.
b) Small sized street trees planted in wide streets where there is space for larger trees. The small street trees do not provide good shade and canopy cover to the road pavement	• Potential to plant additional medium and large canopy street trees in streets with 2m or greater nature strips to improve canopy cover and reduce the ongoing loss of canopy trees consistent with the *Monash Street Tree Strategy*. Refer to Guidelines in Section 6.6.3.
c) Small sized trees are planted in streets with underground power and at least 2.5m wide nature strips, which could easily support larger trees.	• Opportunity for the street tree infill planting program to promote the use of larger street trees where feasible and space permits. This is a priority where opportunities to plant trees on private land are limited. Refer to Recommendations in Section 7.4.5.
d) Tall Eucalypt style trees are planted directly under overhead powerlines, causing ongoing maintenance costs, along with poor visual and shade outcomes	• Identify opportunities to retain mature trees prior to removal through the implementation of an assessment program that prioritises remedial action over tree removal. Refer to Recommendations in Section 7.4.5.
e) Streets with small or scattered street tree plantings are ineffective at contributing to a leafy, green *Garden City Character*	• Promote planting of new medium and large street trees where appropriate to provide a leadership role in increasing canopy vegetation cover in the city. Refer to Recommendations in Section 7.4.5. • Encourage selection of species that are consistent with the landscape character precincts as described in Section 6.4 of this Strategy.
f) Damage to or removal of street trees tree loss adjacent to sites with major building activity	• Guidelines for appropriate controls to protect street trees during development to prevent incremental loss and damage to trees. Refer to Recommendations in Section 7.4.1.
g) The *Monash Street Tree Strategy* (2016) identifies a long term staged tree renewal program of more than 13,500 trees.	• Consider adding the criteria of the presence of canopy tree cover on adjoining private land to the criteria for prioritising street tree renewals. Refer to Recommendations in Section 7.4.5.
h) The *Monash Street Tree Strategy* refers to the potential for alternative infrastructure such as green walls, facades and roofs where space does not allow for street trees in activity centres. This contradicts need to increase distributed canopy tree cover in higher density precincts	• Identify the importance of retaining existing and planting new large canopy shade trees in medium to high density precincts including activity centres and the Monash National Employment and Innovation Cluster. Refer to Guidelines in Sections 6.5 and 6.6.

Issue	Strategy response
i) The current approach in the implementation of the Street Tree Strategy to promote asymmetrical street tree in Council will limit opportunities for large canopy trees in the streetscapes. This combined with the reduction in large canopy trees across the private land will potentially impact on the *Garden City Character* and liveability in Monash.	• This Strategy identifies the opportunity to promote planting of medium and large street trees where feasible to improve shading and strengthen the green leafy garden character. Refer to Guidelines in Sections 6.5 and 6.6
j) Alternating deciduous and evergreen street trees are part of the distinctive landscape character of the early 1900s and some of the gently undulating precincts around Hughesdale and Oakleigh.	• Strengthen the older style alternating deciduous and evergreen street tree avenues in the Hughesdale and Oakleigh areas. The benefit of this planting style is to retain sunlight access during winter to properties on the south side of east west streets, while maximising the presence of large canopy trees in the streetscapes. Additionally, identify opportunities to introduce this alternating avenue style planting into other precincts where there is a predominance of east west streets. Refer to Guidelines in Section 6.4.4.
k) There are a mix of street tree species present in the streetscapes adjoining waterway corridors.	• Strengthen the preferred indigenous landscape character and biodiversity values adjacent to waterway corridors and bushland reserves by planting large canopy native and indigenous trees, consistent with the objectives of the *Monash Street Tree Strategy*. Refer to Guidelines in Section 6.4.1.
l) A predominance of streetscapes are made up of mixed species which do not positively contribute to the landscape character of some precincts, as identified and described in the Existing and Preferred landscape character types in Appendix A of this Strategy.	• In future street tree species selection for the infill and renewal program, refer to the Preferred landscape character precinct descriptions in Appendix A of this Strategy.

5.2.2 Public open space

Table 5-5 Issues and strategy response for public open space

Issue	Strategy response
a) Lack of large canopy trees in areas of open space where additional trees could benefit the recreational use and strengthening the preferred landscape character of the area. For example, trees to the perimeter of a sports field can provide welcome shade for spectators and players during summer	• Continue to maintain existing mature canopy trees in public open space and maximise their retention as part of any future upgrades to the open space. Refer to Guidelines in Section 6.2.2. • Potential to increase canopy vegetation cover in selected areas of open space, ensuring that the existing and future recreational use of open space is retained and improved with the additional trees. Refer to Guidelines in Section 6.2.2. • To reinforce and strengthen the preferred landscape character type through appropriate species selection for new canopy vegetation, shrub and ground layer planting. Refer to Guidelines in Section 6.4. • Potential to maintain and increase bushland areas where appropriate. Refer to Guidelines in Section 6.2.2. • Encourage other public land management agencies including Melbourne Water and Parks Victoria to increase canopy vegetation where appropriate on their land. Refer to Recommendation 7.4.6.

5.2.3 Other public land

Table 5-6 Issues and strategy response for other public land

Issue	Strategy response
a) Potential loss of canopy trees on other public land, for example Monash University, the DEECD may remove canopy trees for the purposes of expanding the built infrastructure and hard stand areas for education purposes on school land.	• Encourage other public land management agencies to increase canopy vegetation where appropriate on their land. This includes Melbourne Water, DEECD, DHS, Monash University, VicRoads and Public Transport Victoria. Refer to Recommendation 7.4.6.

5.3 Redevelopment sites and areas

5.3.1 Residential use

The City of Monash id Forecasts estimate an additional 22,727 will be living in the City by 2036, meaning that the population is forecast to increase by approximately 12 per cent. Over the corresponding period the change in dwelling numbers is forecast to increase by 14 per cent, or an additional 10,024 dwellings. As a comparison, over the past 20 years there has been a 22 per cent increase in dwelling numbers.

The locations for forecast change have been set out in the *Monash Housing Strategy* (2014) and shown on the Proposed New Zones included in Figure 5D below that form part of the Amendment C125 process. The extent of the proposed new zones in Figure 5D is awaiting approval by the Minister for Planning.

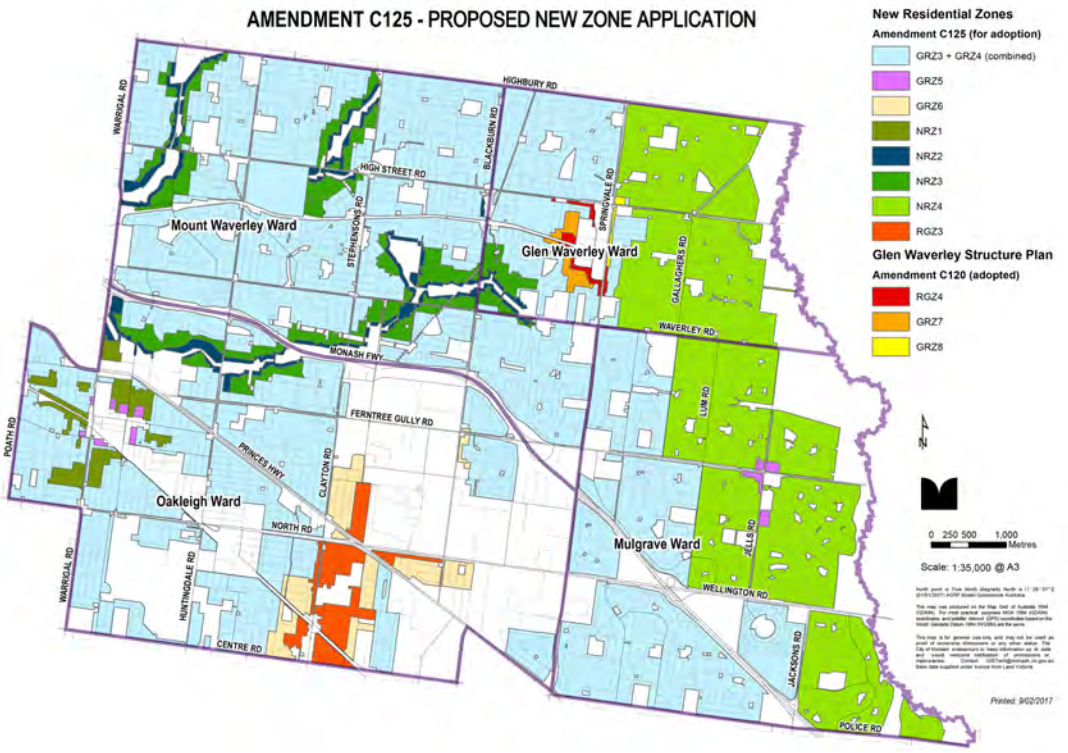


Figure 5D *Proposed Zones, Amendment C125, Awaiting Ministerial Approval dated 28/2/17*

Table 5-7 Issues and strategy response for residential redevelopment sites and areas

Issue	Strategy response
a) The forecast growth and increased urban density will likely impact on the landscape character of precincts that receive the greatest proportion of change. The .id Forecast site illustrates this change to be greatest in Oakleigh, Notting Hill, Clayton, Oakleigh South and	• The Appendix to the Strategy contains descriptions of the preferred character at a sub-precinct level in all precincts across the City. These will provide direction to achieve the preferred future character outcomes in areas where increased urban density is forecast to occur.

Issue	Strategy response
Chadstone. Figure 5d is generally consistent with this.	
b) Substantial redevelopment and change to urban density is likely within the Clayton Activity Centre which forms part of the Monash National Employment and Innovation Cluster.	• The Strategy highlights the importance of tree canopy cover and greening in future high density mixed use and residential precincts. Guidelines will highlight that retention of large canopy trees on public and private land will be a priority in the early stages of future infrastructure and precinct design. Refer to Guidelines in Sections 6.5 and 6.6. • The Guidelines address the importance of urban greening including the inclusion garden beds and grassing along with canopy trees as an essential component of site design.
c) With future incremental change and redevelopment through the residential neighbourhoods there is potential to strengthen the preferred landscape character types through the implementation of the guidelines included in the Strategy.	• The Guidelines include recommended criteria for vegetation types for each of the preferred landscape character types. Adherence to these for future landscape works

5.3.2 Monash National Employment and Innovation Cluster

This is a strategic redevelopment area in the southern part of the municipality that takes in the business and industrial areas around Huntingdale, Clayton, Clayton South, Monash University, Mulgrave, Notting Hill and Springvale (which is located outside the City of Monash). The intent is to build on many innovative world-class institutions which are already located in the Cluster including Monash University, Monash Medical Centre, the CSIRO and the Australian Synchrotron. The Victorian Planning Authority is working with Monash City Council on developing a vision and framework for this area and ultimately planning zones and other controls. The main intent of the precinct is to increase opportunities for jobs growth in the health, education, professional services, retail trade, advanced manufacturing and culture and entertainment. The level crossing removal project and resultant increase in rail capacity to this precinct is identified as a key facilitator of growth by the Victorian Planning Authority.

Table 5-8 Issues and strategy response for the Monash National Employment and Innovation Cluster

Issue	Strategy response
a) The Monash National Employment and Innovation Cluster is forecast to substantially redevelop and accommodate an increased employment and resident population. Council will advocate to promote a garden city setting for the future Monash National Employment and Innovation Cluster.	• This Strategy supports the activation of the landscape setback areas in the commercial/industrial precincts where appropriate, particularly where they are 10.6 metres or more. Activation means to include recreation facilities that can be used by workers during their breaks. This may include a network of paths that are set within the landscape setback (rather than adjacent to the road) to encourage people to use them during breaks. Other facilities that could encourage greater levels of activity include fitness stations, seats, picnic areas, multipurpose courts designed for a range of uses including tennis, basketball, netball

Issue	Strategy response
	and futsal. Additionally, activation encourages the provision of a diverse range of uses in the buildings that directly adjoin the landscape setbacks, such as cafes, restaurants, retail use and cultural event spaces. The landscape setback is to be designed as part of the setting for these uses. Refer to Guidelines in Section 6.3.1 and Recommendation 7.2.1. • Proactively develop or update guidelines and preferred outcomes for landscape character and tree canopy cover in this precinct and present these to the Victorian Planning Authority. Refer to Recommendation 7.2.2.
b) The importance of the native garden commercial/industrial landscape character type to the creating a point of difference between large business and industrial parks in the City of Monash and other adjoining municipalities. The ability for workers to exercise during breaks in a green landscaped setting contributes to a range of improved health and wellbeing outcomes	• The aim is to recognise and make better use of the public realm in the large commercial/industrial precincts, particularly in the context of encouraging sense of place, walkability and personal safety within these areas. Allowing and proactively encouraging diversity of uses so that people who work there do not need to drive during their lunch time, but are encouraged to exercise or relax and unwind during their lunchtime near their workplace. There are examples of this activation already occurring within the commercial/industrial precincts and these recommendations are to promote and encourage this diversification. Refer to Guidelines in Section 6.3.1 and Recommendations in 7.2.1. • Continue to strengthen the preferred native landscape character through appropriate species selection in accordance with the Guidelines in Section 6.4 of this Strategy.

5.4 Resilience to climate change

5.4.1 Severe weather events

Resilient Melbourne (2016) and the *Spatial Vulnerability Analysis (2013)* forecast an increased frequency and more severe weather events. These events will impact on the canopy vegetation and the natural character through issues such as tree health during extended periods of drought, tolerance of trees to withstand storm events including increased wind speeds and changes in rainfall events. These changes have potential to negatively impact on key natural areas that make up the landscape character of the city including public open space, waterways, street trees and private gardens. This can be through physical damage as a result of storm damage or changes made in anticipation of perceived and actual risk.

Table 5-9 Issues and strategy response for resilience to climate change

Issue	Strategy response
a) Landscapes that are made more drought tolerant may not contribute as well to mitigating urban heat island effect and overall liveability outcomes given that evapotranspiration is an important element of effective cooling.	• The Strategy to include a diversity of tree species and vegetation types, including those that require some summer watering to promote passive cooling and evapotranspiration. Refer to Guidelines in Section 6.4.
b) Measures to increase resilience without reverting to the use of drought tolerant species may require higher capital installation costs. For example, redirecting stormwater runoff to passively irrigate street trees is an excellent example of improving resilience and addressing urban heat mitigation, however the costs to install this are a limitation.	• The Strategy to include a diversity of tree species and vegetation types, including those that require some summer watering to promote passive cooling and evapotranspiration. Refer to Guidelines in Section 6.4.
c) Impact of bushfires has resulted in greater controls on the proximity of buildings to natural areas including the waterway corridors (refer to Biodiversity issues in Section 5.5).	• Refer to response in Table 5-11, item (c).
d) Extreme weather events including increased wind, rainfall and dry conditions puts greater stress on the health and structural integrity of existing mature trees, potentially leading to increased loss of canopy cover	• Potential for this Strategy to support measures to develop performance criteria for future canopy trees that have an increased resilience to extreme weather events. Refer to Guidelines in Section 6.6.

5.4.2 Mitigating impacts of urban heat island effect

Monash is vulnerable to urban heat island effect due to a range of factors including ageing population, population growth, increased urban densities and a decline in tree canopy cover. Vegetation cover and presence of moisture absorbing grass and garden bed areas can assist to build resilience to climate change and mitigate urban heat along with other beneficial effects including:

- Reduce urban stormwater runoff with moisture absorbing surfaces.
- Community health and wellbeing benefits.
- Liveability.

The measurements of tree canopy cover undertaken as part of this Strategy not only identified canopy tree loss but also a decline in vegetation cover. On a municipal wide level there has been an 8 per cent decline in grass, garden bed and unsealed surfaces, with a 12 per cent increase in hard surfaces (roofs, concrete and roads).

Table 5-10 Issues and strategy response for mitigating impacts of urban heat island effect

Issue	Strategy response
a) Activity centres and higher density precincts will experience the effects of urban heat build up more strongly that residential areas. Adequate space for canopy trees and evapotranspiration to assist mitigate urban heat island effect will be required	• The Strategy includes guidelines that recommend setting aside adequate space for large canopy trees in higher density precincts on both public and private land. Refer to Guidelines in Section 6.3.
b) Historical loss of canopy vegetation cover in the municipality with a corresponding increase in built form and sealed surfaces.	• Develop guidelines to protect existing mature canopy trees on private and public land and require planting of new canopy trees and canopy vegetation. Refer to Guidelines in Sections 6.2, 6.4 and 6.5.
c) Increased site coverage in residential areas means there are fewer areas in which to plant new large canopy trees, and also to sustainably retain the existing large canopy trees.	• Develop preferred landscape character outcomes and promote urban greening in this Strategy. Refer to Guidelines in Section 6.2.
d) Scattered and poor quality street trees do not support Council initiatives to require additional canopy trees on private land.	• Include a recommendation that highlights the opportunity for Council to take a leadership role regarding best practice tree selection, planting and maintenance of street trees to demonstrate improvement to tree canopy cover in the public realm. Refer to Guidelines in Section 6.6.3.
e) Increased urban densities in activity centres will result in greater concentrations of people living and working in these centres. This will increase the vulnerability of the population to urban heat island effect and means that it is very important that the future activity centres are designed with adequate space and road reserve widths to	• Develop specific guidelines in the Strategy to promote greening including garden bed areas, grassed areas and canopy trees in future higher density precincts including retirement living and activity centres to create more liveable and resilient landscapes in the future. Refer to Guidelines in Section 6.3.4.

Issue	Strategy response
accommodate large canopy trees now and in the future.	
f) Selected recently constructed and older style retirement living facilities have limited canopy trees and green open space.	• Develop specific guidelines in the Strategy to promote greening including garden bed areas, grassed areas and canopy trees in future higher density precincts including retirement living and activity centres to create more liveable and resilient landscapes in the future. Refer to Guidelines in Section 6.3.4.

5.5 Biodiversity values

5.5.1 Overview

The *Environmental Sustainability Strategy* identifies the waterway corridors as the most significant natural environmental areas including the Dandenong Creek Riparian Corridor, Damper Creek, Gardiners Creek, Scotchmans Creek and Valley Reserve. The canopy tree mapping undertaken for this project identifies there has been significant areas of revegetation established along the waterway corridors between 1992 and 2015. The waterway corridors are a key influence on the existing and preferred landscape character types.

A number of open space reserves outside of the waterway corridors have remnant or mature planted indigenous vegetation that strengthens the biodiversity values of the City of Monash including:

- Bogong Reserve, Glen Waverley
- Brickmakers Park, Oakleigh
- Essex Heights Reserve, Mount Waverley
- Hinkler Reserve, Glen Waverley
- Federal Reserve, Mount Waverley
- Reg Harris Reserve, Oakleigh East
- Whalley Drive Reserve, Wheelers Hill

Table 5-11 Issues and strategy response for biodiversity values

Issue	Strategy response
a) Development on adjoining properties potentially impacts on the biodiversity values of the corridor through increased presence of built form and impacts of noise, light spill and vegetation removal. .	• This Strategy defines the preferred character areas inclusive of the properties directly adjoining the waterways to support and improve the biodiversity values of the corridor. This includes encouraging the use of indigenous vegetation and retaining and planting new canopy trees to expand the habitat corridor beyond the public open space, and building setbacks that allow adequate space between built form and the adjoining open space to minimise impacts on the habitat value. Refer to Guidelines in Section 6.4.1.

Issue	Strategy response
b) The waterway corridors significantly influence the landscape character of Monash.	• The preferred landscape character types will protect and improve the function of these including the biodiversity corridor values. Refer to Guidelines in Section 6.4.
c) Bushfire regulations have the potential to impact on landscape character with the requirements for cleared zones between conservation reserves and urban development.	• Consider the need for adequate building setbacks from conservation reserves and waterway corridors to avoid the need to further clear bushland vegetation in the conservation reserves where feasible. Refer to Guidelines in Section 6.4.
d) Minimise the impact of invasive exotic species from adjoining gardens on the conservation reserves and waterway corridors. .	• Preferred landscape character design guidelines for urban development directly adjoining waterway corridors and bushland reserves encourages the use of indigenous and native plants. Refer to Guidelines in Section 6.4.1.

5.6 Cultural landscape heritage values

5.6.1 Overview

Prior to the arrival of Europeans, the *Woi wurrung* occupied an area which extended from inland of the Werribee River in the south west, Mount Macedon in the north west, Mount William in the Great Divide to the north and across to Mount Baw Baw in the east (Clark 1990). Their southern boundary was the watershed of the Great Divide and Bunurong clans. This group of people had common language and social practices, and at the time of contact, was thought to have comprised seven clans, each with their own clan estate. At the time of European settlement, Dandenong Creek north of Dandenong appears to have been the approximate boundary between *Woi wurrung* and *Boon wurrung*

Today, the original natural landscape character of the city is evident along the main waterway corridors, the largest of which is the Dandenong Creek, and the other waterways including Gardiners Creek, Scotchmans Creek and Damper Creek. Evidence of the agricultural history is present in the municipality, mainly through surviving large exotic trees that remain in open space reserves and on private land.

The landscape character is influenced by a combination of the subdivision layout, built form, private gardens, street trees and open space character. Across the different precincts, private gardens vary with the different eras of urban development. The restoration of the natural bushland character of the open space and waterways has a significant influence on the landscape character in the north of the municipality combined with the different eras of exotic and native planting styles in private gardens, street trees and the open space reserves.

There are still many examples of private gardens that represent the late 1940s and 1950s subdivision, however these are progressively changing as the buildings are replaced or renovated to contemporary dwellings. There are some other unique garden styles within the city including the compact manicured style, with neatly trimmed and shaped Conifers, along with productive gardens with fruit trees including citrus.

Table 5-12 Issues and strategy response for cultural landscape heritage values

Issue	Strategy response
a) Incremental change across the garden suburban precincts will potentially lead to the loss of the traditional suburban garden character. .	• Protect and promote examples of the different garden styles to represent the different eras of settlement in Monash, within the context of increased urban densities, changing lifestyles and trends towards low maintenance gardens and climate change. Refer to Appendix A and Guidelines in Section 6.4. • Implement the preferred landscape character precincts included in this Strategy, which has considered the cultural landscape heritage values.
b) The lack of a significant tree register leading to the loss of mature canopy trees as a result of incremental development and change.	• The Strategy includes guidelines to place a higher level of importance regarding the protection of mature canopy trees where feasible. Refer to Guidelines in Section 6.5. • In the longer term support the preparation of a Significant Tree Study or similar for the City of Monash, to assist to protect the cultural heritage values associated with significant trees including as examples of historical land use. Refer to Recommendation 7.4.8.