



Document No: 22\_022

16 December 2022

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Dear Expert Panel,

**Re: Planning System Implementation Review**

Thank you for the opportunity to provide feedback on the Planning System Implementation Review, which seeks to conduct an independent review of the *Planning, Development and Infrastructure Act 2016* (PDI Act) and the Planning and Design Code to ensure planning decisions encourage a more liveable, competitive and sustainable long-term growth strategy for Greater Adelaide and the regions.

The Green Adelaide Board (the Board) acknowledges the complexity involved in conducting a review of existing policy settings to ensure planning decisions encourage a more liveable, competitive and sustainable Greater Adelaide. In particular, the Board would like to commend the open and consultative manner in which the Expert Panel is undertaking the review.

A liveable and sustainable Greater Adelaide is consistent with Green Adelaide's vision of 'a cooler, greener, wilder and climate-resilient Adelaide that celebrates our unique culture'. Urban greening and sustainable green infrastructure management is core to achieving this vision and the land use planning system also has a fundamental role to play in helping to deliver this vision. Urban greening delivers substantial benefits to people, economies and nature in cities and there is high market demand to live in green, leafy suburbs. People are happier, healthier, more active, and more connected with their communities in greener cities. Water is cleaner and used as a resource, while storm water management costs and flood risks are reduced. Air quality is better, urban heat is reduced, and microclimates are more comfortable for people. Soil is healthier, carbon is sequestered, emissions reduced, and some climate change risks mitigated. Habitat is available to support biodiversity.

In short, greener cities are more liveable and sustainable, respond better to climate challenges and contribute to a healthier economy.

Cities are also biodiversity hotspots and as you may be aware, Adelaide has recently become the second National Park City (NPC), which is a concept based on improving liveability through a better connection between people and nature. The NPC concept recognises the unique ecology of cities, and the many health, wellbeing, biodiversity and economic outcomes that can be experienced through this.

There are synergies between the intent of the Planning System Implementation Review (to ensure planning decisions encourage a more liveable, competitive and sustainable long-term growth strategy for Greater Adelaide and the regions) and several of the NPC criteria relating to



policies and protection of the ecological and social landscapes and existing planning policies (i.e. State Planning Policies) that apply across Greater Adelaide:

**Criteria 15** – meaningful policies to protect, increase and enhance nature, culture, heritage, the environment and public spaces in the city.

**Criteria 16** – policies in your urban area that further the spirit and values of the National Park City movement.

The review by the Expert Panel on the planning system is timely because new climate projections for risk assessment and planning in South Australia were released this month. The trends of increased average temperatures and a greater frequency of very hot days will continue. This combined with the ongoing loss of tree canopy and green spaces means that Adelaide will be less resilient to climate change and will become less liveable and sustainable. Green Adelaide believe that now is the time to respond to these challenges with a sense of urgency, immediate changes are needed to the planning system to address some of these challenges.

With this in mind, Green Adelaide has reviewed the discussions papers and identified a number of key themes relevant to the Panel's review, these are summarised below with more detail and additional comments provided in **Attachment 1**:

#### Tree requirements

- Strengthen significant and regulated tree protection requirements, including for the protection of species that make a fundamental ecological contribution to Adelaide's urban biodiversity
- Prioritise the retention of existing mature trees and remnant habitat areas in the urban environment as the benefits that these trees provide cannot be replaced – disincentivise their removal
- Assign an appropriate financial value to trees that is commensurate with the ecosystem services, health and wellbeing and other benefits they provide as well as cost for councils to replace
- Support the expansion of the requirement for one tree per dwelling to master planned zones but recommends that new trees be planted in proximity to homes where the home can receive the most benefits

#### Biodiversity in cities

- Integrate biodiversity sensitive urban design into all levels of the planning system – to build biodiversity back into our urban areas
- Consider whether the application of the Native Vegetation Act 1991 should be expanded to include additional areas within metropolitan Adelaide
- Introduce Biodiversity Positive Legislation for new development – create on-sets rather than off-sets

#### Green Open Space

- Provide a strategic approach to the provision of green open space (and its increased quality) across Greater Adelaide



- Undertake a strategic open space planning project for metropolitan Adelaide – to maximise and prioritise government public realm greening expenditure and delivery
- The assessment of open space grants should have a holistic approach that evaluates all the criteria within a strategic framework such as an Open Space Strategy
- Ongoing monitoring of the application of the Planning and Design Code's residential infill development provisions to track the impact of these types of development on the amount of green space and tree canopy cover

#### Climate resilience

- Support facilitating and incentivising different ways of doing infill development better so that it is more sustainable and climate resilient
- Maximise water sensitive urban design outcomes – through the Planning and Design Code
- Use the new urban heat data collected this year to explore how the land use planning system could be used to combat the increasing risk from heat hazard in metropolitan Adelaide

The submission also outlines relevant current and future Green Adelaide initiatives where we are well placed to assist the State Planning Commission and Planning and Land Use Services (PLUS) to achieve better urban greening outcomes through the planning system. These initiatives include:

- Urban heat and tree canopy data recapture and mapping
- Greening Prioritisation pilot
- Urban Biodiversity and Biodiversity Sensitive Urban Design Evidence Base
- Urban Greening Strategy for metropolitan Adelaide.

For further information regarding this matter, please contact Brenton Grear, Green Adelaide Director, via [Brenton.Grear@sa.gov.au](mailto:Brenton.Grear@sa.gov.au) or 8463 7168.

Thank you for the opportunity to provide feedback. We look forward to the outcome of this consultation.

Yours Sincerely

Chris Daniels  
**Presiding Member**  
**Green Adelaide Board**

Att 1: Green Adelaide's submission – Planning System Implementation Review

Att 2: Factsheet – Building biodiversity into our urban landscapes through Biodiversity Sensitive Urban Design

Cc: Tyler Johns, Principal Advisor to the Panel



## Attachment 1: Green Adelaide's submission – Planning System Implementation Review

### Discussion Paper – Planning and Design Code Reform Options

#### Questions for Trees

##### Native Vegetation

#### 1. What are the issues being experienced in the interface between the removal of regulated trees and native vegetation?

There are areas of metropolitan Adelaide and Hills townships where both the regulated and significant tree controls and the *Native Vegetation Act 1991* apply. It is appropriate that this overlap occur because the controls and the requirements are in place for different outcomes. The way the two pieces of legislation interact is clarified in the *Planning, Development and Infrastructure (General) Regulations 2017* (Regulation 3F(4)(d)) which states that a tree which requires clearance consent under the Native Vegetation Act cannot be considered a significant or regulated tree. So, if the proposal involves removing native vegetation the first consideration is whether a clearance consent is required under the Native Vegetation Act or Regulations.

The interaction of the legislation between the two consent processes mean that a native tree can be regulated or not regulated depending on whether exemptions apply under the Native Vegetation Act. This can be difficult for a relevant planning authority to administer because they lack expertise in applying Native Vegetation Act requirements. There would be benefit in clarifying in the legislation what rules apply at any given time as well as preparing advisory material.

#### South Australia's native vegetation is highly valued because:

- it provides critical habitat for South Australia's unique native biodiversity,
- it helps protect our land, coastlines and waterways from erosion, salinity and climatic extremes, mitigating the effects of a changing climate,
- it supports agricultural production through windbreaks, shelter for stock, and habitat for natural pest predators and crop pollinators,
- it improves our health and well-being by providing us with a connection to nature, and
- it is an important element of our state's natural identity.

#### 2. Are there any other issues connecting native vegetation and planning policy?

Green Adelaide is working towards creating a cooler, greener, wilder and climate resilient Adelaide. One of the ways to achieve this (particularly the wilder aspect) is through the protection of existing native vegetation in our urban environment.

It is estimated there is **only 3% of remnant vegetation remaining in metropolitan Adelaide**, some of which is found nowhere else in the region, making it even more critical to conserve. To address habitat loss and biodiversity decline, climate change and maintain a liveable city for all, it is crucial that the native vegetation that remains is



protected and opportunities to restore and regenerate are prioritised. Green Adelaide acknowledges that the land use planning system is not the only tool to deliver these outcomes but considers that it is appropriate for the Panel to consider how regulatory mechanisms can assist and complement other strategies (such as increasing community awareness), to ensure the ongoing protection of urban native vegetation.

The Native Vegetation Act currently applies to a limited number of areas within metropolitan Adelaide. It covers the Hills Face Zone, areas that were previously zoned for the Metropolitan Open Space System and parts or all of some hills and fringe councils. It does not apply across metropolitan Adelaide. In order to better protect the small percentage of remaining remnant native vegetation in metropolitan Adelaide, including scattered trees, Green Adelaide asks the Panel to consider the benefits of expanding the application of the Native Vegetation Act to cover for example all known areas of native vegetation or strategic biodiversity corridors in metropolitan Adelaide.

Protections could also be considered for revegetated areas in recognition of the important contribution they make to urban green cover. Green Adelaide is progressing work on conservation planning for urban biodiversity (see below for more detail on this project), including mapping biodiversity in metropolitan Adelaide, and this will enable Green Adelaide to undertake further scoping of how best to protect biodiversity and native vegetation in the urban context.

#### Significant Environmental Benefit

Green Adelaide considers that any offsetting scheme should be used as a last resort, the default should be tree retention due to the significant ecosystem services, health and wellbeing, amenity and other benefits existing mature trees provide. Under the Native Vegetation Act, approval to clear is offset by a Significant Environmental Benefit (SEB). The methodology used to calculate the SEB means that the value of the native vegetation being cleared is more accurately reflected in the off-set cost.

The off-set provisions under the PDI Act for regulated and significant trees inadequately value trees in the urban environment. Green Adelaide asks the Panel to consider what options there are for an off-set scheme for urban trees that like the Native Vegetation Act achieves a more accurate economic valuation of each tree so as to act as a better deterrent to further clearance.

An urban tree off-set scheme would need to go beyond the SEB methodology, which is based on the habitat value of the vegetation, to incorporate additional values such as improving air quality, shading, health and wellbeing and amenity. Ideally any urban tree off-set scheme would also incorporate a net gain approach. This is discussed further in relation to the questions under the below heading 'Urban Tree Canopy Off-set Scheme'.

#### Urban Biodiversity

Green Adelaide is leading the development of an **Urban Greening Strategy for metropolitan Adelaide**, which aims to increase greening in our neighbourhoods, support urban biodiversity and address the issues around the protection of existing trees (amongst others).



To support this work, Green Adelaide has commissioned the Royal Melbourne Institute of Technology's (RMIT) Interdisciplinary Conservation Science Research Group (ICON Science) to develop an Urban Biodiversity Background Evidence Base.

The Evidence Base will include (amongst other things) a review of the data and trends, consider how to map urban biodiversity (i.e. the revegetated areas and remaining remnant vegetation) in metropolitan Adelaide, provide biodiversity sensitive urban design (BSUD) case studies and identify the ecosystem services provided by metropolitan Adelaide's urban forest (for more information see BSUD factsheet in **attachment 2**).

The urban biodiversity mapping data currently available across metropolitan Adelaide is incomplete and inconsistent. Green Adelaide welcomes the opportunity to work with Planning and Land Use Services (PLUS) to develop more comprehensive and up to date urban biodiversity mapping data and consider how this is reflected in the SA planning system e.g. through the new Regional Plan for Greater Adelaide. It is considered that once a complete dataset is available, it could be used to support the potential expansion of the Native Vegetation Act discussed above to cover additional areas across metropolitan Adelaide that are identified as being remnant native vegetation.

## Tree Canopy

### **3. What are the implications of master planned/greenfield development areas also being required to ensure at least one (1) tree is planted per new dwelling, in addition to the existing provision of public reserves/parks?**

Despite the wide-spread understanding of the significant benefits of trees and the 30-Year Plan for Greater Adelaide's target to increase urban green cover by 20% by 2045, it is likely that Adelaide's urban tree canopy is continuing to decline at an unsustainable rate, in particular through the loss of mature trees whose benefits cannot be replaced by newly planted trees.

Importantly, there is also a high probability that the new trees being planted will not attain the same size of those being lost (through tree species selection). New trees being planted also tend to have less space in which to grow (less soil area to draw water and nutrients to support larger tree/canopies).

## Biodiversity Sensitive Urban Design (BSUD)

Biodiversity Sensitive Urban Design (BSUD) is a framework that aims to create urban areas which have a net benefit to native species and ecological communities through the provision of essential habitat and food resources for native animals and birds.

BSUD links urban design to measurable biodiversity outcomes, providing a flexible framework for developers and planners to consider provision for biodiversity alongside socio-economic considerations, early in the development process. This supports natural ecological processes by providing resources for target species beyond traditional "green infrastructure".



Green Adelaide commends the State Planning Commission, for the inclusion of the Planning and Design Code policies, which require residential development within certain zones to either retain existing trees (where practical) and provide minimum tree planting and soft landscaping. This goes some way to alleviating the issue of a declining urban tree canopy. However, increasing urban greening on residential infill sites presents many challenges, as infill generally increases site coverage and driveway crossovers.

Green Adelaide understands some concerns were raised during consultation on the Planning and Design Code about the potential impact of tree planting on upfront housing affordability (as a result of higher footing costs). However, as stated in the [Option Analysis: Costs and Benefits of Urban Tree Canopy Options for Minor Infill Development in the Planning and Design Code](#):

*"...house footings often will already have to be designed to accommodate the impact of nearby offsite trees, regardless of the tree policy. Usually there is already a street tree and sometimes there is one or more neighbouring site trees within the 'tree effect' zone of the new dwelling.*

*Adding the proposed new tree (to the front garden for example) will often not add an additional footing design cost as the new dwelling would have to already accommodate for a 'single tree effect' or 'group of trees effect' cost. Further, many households already choose to retain existing trees or plant new trees when undertaking infill developments."*

Green Adelaide considers that expanding the requirement for at least one (1) tree to be planted per new dwelling (in addition to the existing provision of public reserves/parks) for master planned/greenfield developments will provide greater support for increasing the urban tree canopy and help implement the Government's target to increase green cover by 20% in metropolitan Adelaide by 2045.

Further, it is unlikely that there would be a material impact on proposed buildings and structures due to the ability of master planned/greenfield development sites to be strategically planned around existing site conditions (including existing valued mature trees) prior to lodgement of a development application or construction.

#### **4. If this policy was introduced, what are your thoughts relating to the potential requirement to plant a tree to the rear of a dwelling site as an option?**

In master planned developments there is greater potential to minimise the impacts of tree planting (i.e. impacts to footings) as well as gain the most benefits (i.e. retain mature trees and plant larger trees) due to the ability to better plan location of dwellings, services, footpaths and driveway crossovers etc. It also allows greening/tree canopy to be better disbursed across the entire site in a strategic manner. For this reason, Green Adelaide does not support the requirement for a tree to be planted exclusively in the rear garden. Rather the tree should be planted in proximity to homes where the home can receive the most benefits, whether this be the front or rear garden.

Master planned/greenfield developments also provide an opportunity to include **Biodiversity Sensitive Urban Design (BSUD)** within the public and private realm to help with the conservation of native flora and fauna and, in turn, mitigate some impacts of climate change.



Evidence shows that connection to 'everyday nature' plays a critical role for the future liveability of cities.

Within master planned/greenfield development sites, BSUD interventions can be undertaken at greater scale within both the public and private realm. BSUD can also be better integrated with stormwater management systems and into the provision of public reserves/parks and street tree planting. Green Adelaide welcomes the opportunity to provide more information on what a policy approach for master planned/greenfield developments could be to ensure the most benefit for the environment and community is achieved.

### **Tree Protections**

- 5. What are the implications of reducing the minimum circumference for regulated and significant tree protections?**
- 6. What are the implications of introducing a height protection threshold, to assist in meeting canopy targets?**
- 7. What are the implications of introducing a crown spread protection, to assist in meeting canopy targets?**
- 8. What are the implications of introducing species-based tree protections?**

The Research Report 'Urban tree protection in Australia' by the Environmental Institute of the University of Adelaide provides a comparison of tree protections in other Australian jurisdictions. The Research Report found that South Australia's laws were markedly less stringent than local governments in New South Wales, Victoria and Western Australia. The Research Report also found that the vast majority of local governments in Australian capital cities have laws designed to protect urban trees more effectively than South Australia's laws. This is in part due to the narrow classification of what is considered to be a protected tree in South Australia. Other jurisdictions with tree protections tend to have measurement requirements that capture a greater number of trees along with a mixture of ways trees are protected.

Green Adelaide agrees that the tree protection regulations should be expanded to include a diverse range of mechanisms for protection, including consideration of minimum circumference, height threshold, crown spread and species-based considerations. It is important to have a mixture of ways trees are being protected in order to capture the variety of trees in the urban environment. Given that this is consistent with workable regulations for tree protections in other jurisdictions such measures could easily be adopted for South Australia. Green Adelaide supports the findings made in the Research Report by the University of Adelaide. In particular, the recommendations to:

- **Reduce circumference protection threshold** – while it is noted that not all of the 101 councils reviewed in the Research Report set a circumference protection, of the councils that do, 38% used a protection threshold of less than 60cm with only four councils using a threshold greater than one metre. Green Adelaide understands the average circumference protection threshold used is 53cm. We therefore support investigating a review of South Australia's current circumference protection threshold. Many of the trees that dominate the remnant vegetation of the Adelaide plains are relatively small,



slow growing and individually do not have a large trunk circumference. This does not mean that they have a low habitat value as individual trees, or, importantly, within a broader urban forest.

For example, native pine, she-oak and many remnant Eucalypts (e.g. Grey Box, Mallee Box) are significant habitats for locally threatened native fauna on the Adelaide plains and the diameter of these trees is frequently less than 0.5m. Protecting these trees, individually and collectively, is fundamental to protecting the ecological contribution that these trees make to the biodiversity of the Adelaide landscape.



Grey Box (*Eucalyptus microcarpa*)

Remnant native vegetation on the Adelaide plains is extremely important for the conservation of native biodiversity, providing unique habitat value to locally threatened fauna. Furthermore, the remaining native vegetation plays a critical role in the maintenance of biodiversity in the broader Mount Lofty Ranges landscape, which in itself is a nationally recognised biodiversity hotspot. However, little remains of the historic remnant vegetation, meaning that these ecological communities, and their habitat values are also under threat. For example, the Southern Cypress Pine (*Callitris gracilis*) (an important plant for food and shelter for many bird species) and



Mallee Box (*Eucalyptus porosa*)

*Allocasuarina spp.* which do not have large trunk circumferences but may be more than 50 years old or the endangered Grey Box (*Eucalyptus microcarpa*). The Grey Box rarely reaches a 3m trunk circumference and comprises the dominant tree of the Grey Box Grassy Woodland ecological community, which is listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.

Some trees in the urban landscape also represent remnants that, if removed, would result in fewer indicators as to the former vegetation associations once contained in the area. These remnant trees have other significant values other than their size that may not always be readily recognisable.

While Green Adelaide believe that the smaller circumference of those trees critical to Adelaide's urban biodiversity provide a strong case for reducing the circumference protection threshold, there is an equally strong case for introducing a new protection category that is based on remnant species. For example, the tree protections could apply



to all endangered Grey Box (*Eucalyptus microcarpa*). This type of species-based tree protection is also discussed in the last dot point below in relation to important habitat trees.

- **Institute an independent height protection threshold** – as taller trees can sometimes provide more habitat for a range of bird species, it seems sensible to protect them based on height. Further, Green Adelaide notes it is common for other jurisdictions nationally to include size-based metrics for tree protection. The inclusion of a height protection threshold will bring South Australia’s laws in line with other states and help protect species.
- **Institute an independent crown spread protection threshold** – inclusion of a crown spread protection threshold will help not only achieve the Government’s urban tree canopy target but also provides more shelter and habitat for wildlife.
- **Provide a tree protection mechanism to promote the biodiversity of the urban forest through the protection of rare or unusual species** – this tree protection mechanism provides an opportunity to protect a range of other native species that may not fall into any of the above categories, especially if they are in decline and/or in lower numbers (e.g. trees that are part of a threatened ecological community or provide habitat remnant significance). This mechanism can also be used for native and exotic species that make a fundamental contribution to urban biodiversity (e.g. as critical habitat for a threatened native species).

Green Adelaide welcomes the opportunity to work with PLUS to identify specific trees that should be protected if they are known to be habitat trees for threatened species for example the tree martins (*Petrochelidon nigricans*), which gather in the exotic Callery pears (*Pyrus calleryana*) in Leigh Street (see image below) or the Aleppo Pines in urban areas, which are a favoured food resource for Yellow-tailed Black Cockatoos that are listed as Vulnerable in SA. Again this provides a strong case for introducing a species type protection category to protect important habitat trees, both native and exotic.

The introduction of a species type protection category for both remnant native trees and important habitat trees would make a significant contribution to ensuring the long-term protection and ongoing survival of urban biodiversity more generally.



*Tree martins roosting in a tree at night on Leigh Street in Adelaide city*

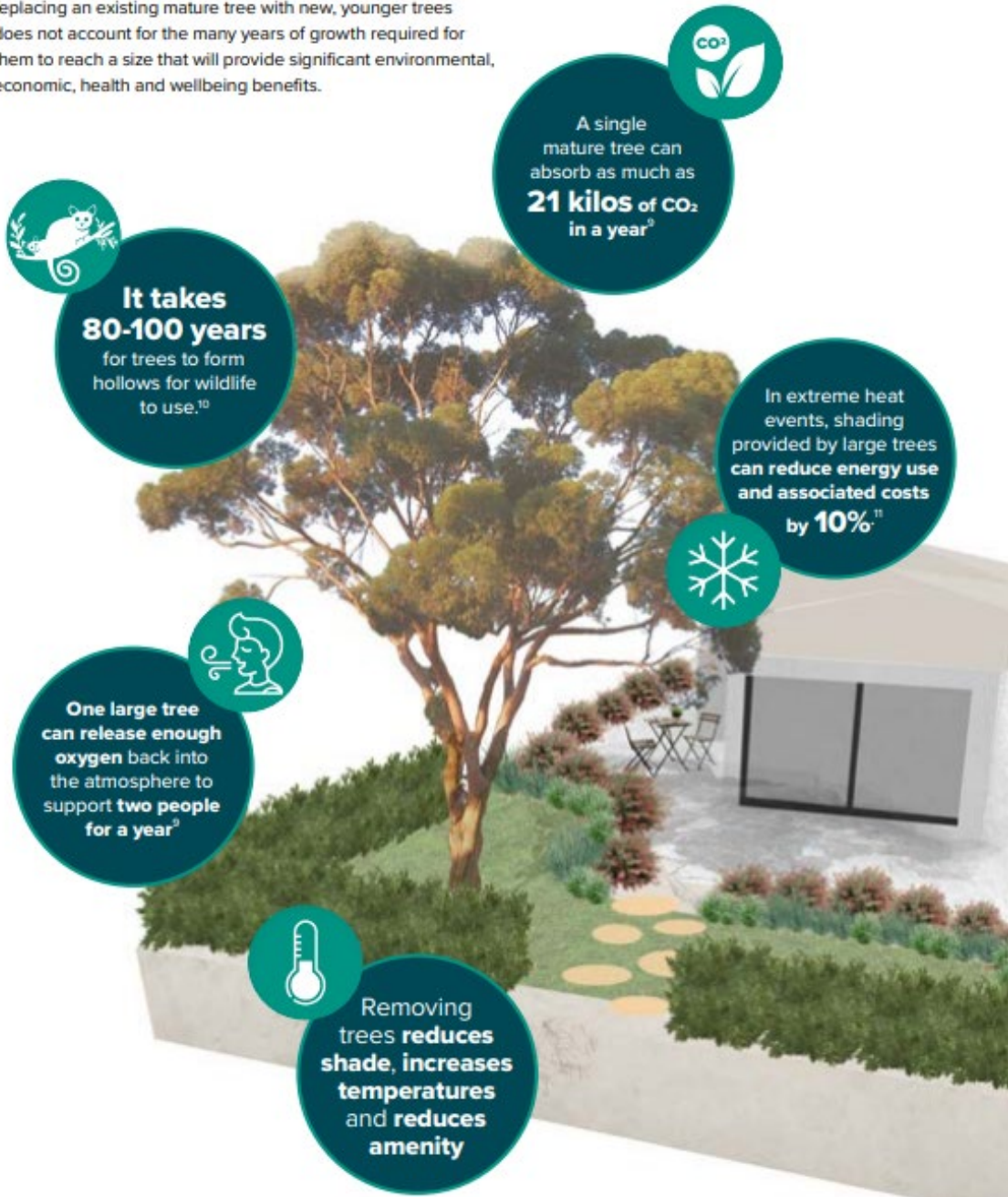
As indicated by the Research Report, there are several positive environmental outcomes to be had through greater protection of trees:

- Greater number of trees reaching full maturity – canopy structure is preserved, maximising the biodiversity, amenity and public health benefits of the urban forest
- Habitat conservation and development of new/different habitats (hollows etc.) for native fauna and protection of threatened ecological communities
- Improved air quality, stormwater retention and carbon sequestration
- Provides greater shade/cooling.

Green Adelaide recommends changes to tree protection so that existing mature trees are retained in the urban environment. There are significant benefits of retaining more mature trees as indicated in the recently published [\*\*\*Adelaide Garden Guide for New Homes\*\*\*](#) (see below graphic).

## Did you know?

Planting new trees and landscaping is essential. However, replacing an existing mature tree with new, younger trees does not account for the many years of growth required for them to reach a size that will provide significant environmental, economic, health and wellbeing benefits.





The Report also raised the idea of using tree bonds to better protect regulated and significant trees on development sites. Generally speaking tree bonds are used as a type of security bond to protect trees from development works, interstate these bonds apply mostly to public trees. Bonds are usually held by council until work is complete and if necessary fees are kept, say where the tree is damaged, and held in a tree fund to plant public trees.

The Research Report recommends using a bond arrangement to protect regulated or significant trees on a development site in order to give developers a stronger financial incentive to protect the tree from deliberate or inadvertent construction impacts. Green Adelaide agrees that this an idea worth further exploration.

Green Adelaide also notes that some Government agencies are exempt from the tree protection regulations and suggests that consideration be given to removing these exemptions.

### **Distance from Development**

**9. Currently you can remove a protected tree (excluding *Agonis flexuosa* (Willow Myrtle) or *Eucalyptus* (any tree of the genus) if it is within ten (10) metres of a dwelling or swimming pool. What are the implications of reducing this distance?**

**10. What are the implications of revising the circumstances when it would be permissible to permit a protected tree to be removed (i.e. not only when it is within the proximity of a major structure, and/or poses a threat to safety and/or infrastructure)?**

Green Adelaide understands that in most cases dwellings and pools are not being negatively impacted by trees that are within 10 metres or closer. Removing the exemption would mean better protection for mature trees. This would then trigger an assessment prior to removal of a regulated or significant tree within 10 metres of a dwelling or pool which would require the appropriate expertise to make an assessment.

Green Adelaide considers an approach where independent experts are called in to determine the appropriateness of the removal of a mature tree is likely to result in the retention of a greater number of trees. Ideally existing mature trees should be incorporated into the design rather than entire sites being cleared to make way for new developments.

Further, Green Adelaide has heard concerns that there is no independent way of determining if a tree assessment, lodged with a development application for example, is accurate. A scheme could be introduced to provide for independent expertise but some kind of accreditation process would be needed to determine who was appropriately qualified and trained to provide the expert advice. There is an accreditation process under the Native Vegetation Act for those people who have the expertise to prepare data reports for native vegetation clearance consent applications. The Panel is asked to investigate the best way of providing independent tree advice (potentially incorporating a tree advisory panel).



## Urban Tree Canopy Off-set Scheme

- 11. What are the implications of increasing the fee for payment into the Off-set scheme?**
- 12. If the fee was increased, what are your thoughts about aligning the fee with the actual cost to a council of delivering (and maintaining) a tree, noting that this would result in differing costs in different locations?**
- 13. What are the implications of increasing the off-set fees for the removal or regulated or significant trees?**

### Fee increase

Green Adelaide supports an increase in the fees for payment into the Urban Tree Canopy Off-set Scheme. In particular, Green Adelaide supports fees increasing to be more commensurate with the actual costs borne by local government to plant and maintain a replacement tree of similar size (i.e. small, medium and large) elsewhere. As mentioned above Green Adelaide considers that the off-set provisions under the PDI Act for regulated and significant trees are inadequate and should be significantly increased.

The increase in fees would support the overall intent of the Urban Tree Canopy Overlay and supporting Off-set Scheme – residential development preserves and enhances urban tree canopy through the planting of new trees and retention of existing mature trees where practicable.

It is noted that since the full operation of the Planning and Design Code (19 March 2021) approximately 5% of eligible applications have elected to pay into the Off-set Scheme. Therefore, it is considered that an increase in fees should not impact the economic viability of development within these areas.

### Off-set calculation method

There are a number of tree valuation systems that could be looked at and adapted to apply to urban trees in metropolitan Adelaide. As discussed earlier the Native Vegetation Act uses SEB calculations based on habitat values while other methods such as the Burnley Method use amenity tree evaluations. Amenity tree evaluations are widely used in Australia by open space managers to value trees. They are used primarily to place a monetary value on the tree so that they can then be recognised as assets.

The City of Melbourne has adopted a tree valuation calculation for public trees based on a number of values: size; species life span; aesthetics; and tree condition. This is then combined with removal costs, ecological services value and reinstatement costs to get an overall figure that would offset the removal of the public tree.

Applying the same philosophy as the SEB off-sets in the urban environment could require a net biodiversity gain on-site, so that habitat is being restored, diversity is being encouraged and soft landscaping is being provided. Please see below for a case study from the new United Kingdom Biodiversity Net Gain legislation.

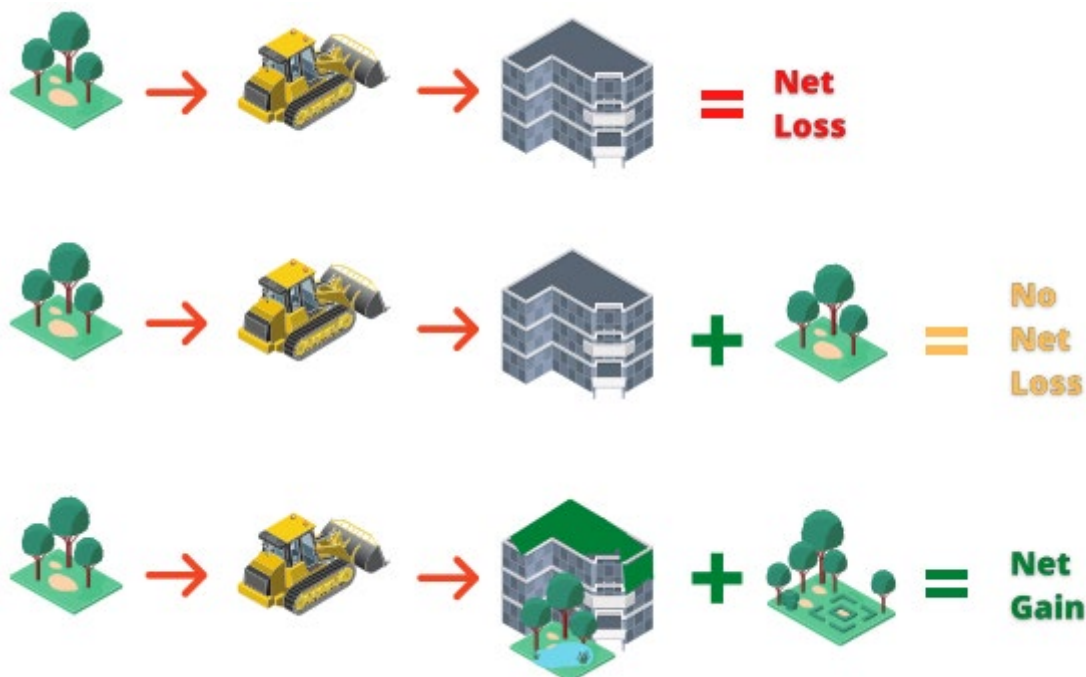
## Case study: Amendments to the United Kingdom's *Environment Act 2021* to support biodiversity net gain

Under the United Kingdom's *Environment Act 2021*, all planning permissions granted in England (with a few exemptions) will have to deliver at least 10% biodiversity net gain (BNG) from an as yet unconfirmed date, expected to be in November 2023. BNG will be measured using Defra's biodiversity metric and habitats will need to be secured for at least 30 years. This sits alongside:

- a strengthened legal duty for public bodies to conserve and enhance biodiversity,
- new biodiversity reporting requirements for local authorities, and
- mandatory spatial strategies for nature: Local Nature Recovery Strategies

BNG is an approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was beforehand. It delivers measurable improvements for biodiversity by creating or enhancing habitats in association with development.

BNG can be achieved on-site, off-site or through a combination of on-site and off-site measures.



Nature England, [https://naturalengland.blog.gov.uk/wp-content/uploads/sites/183/2022/03/BNG-Brochure\\_Final\\_Compressed.pdf](https://naturalengland.blog.gov.uk/wp-content/uploads/sites/183/2022/03/BNG-Brochure_Final_Compressed.pdf)

### Tree valuation

The Research Report states that tree valuation can be a contentious issue and that there is currently no common approach in Australia. The Research Report makes recommendations that a single valuation methodology should be developed specifically for Adelaide's conditions and tree species. The Research Report suggested this is best done by the State Government. As



discussed above there are many tree valuation methods that can be drawn upon to develop a tailored model for Adelaide.

The Research Report also recommends that tree valuations only be undertaken by suitability qualified arborists that have undertaken valuation training. This is to ensure that the valuation process has the right amount of rigour.

Green Adelaide also believes that the cultural value of trees is an important consideration. Adelaide's unique natural environment is a deep and essential part of our identity. Trees have cultural importance for many reasons. First Nation peoples use bark, wood and trees for practical and symbolic purposes, they have a strong connection to trees. More broadly trees across Adelaide have cultural significance to people who live in the city. Trees are important as gathering places, as places for ceremonies or provide a connection to a place, this can be for the broader population or smaller community groups. The Jacaranda tree for example has been enshrined in an Australian Christmas song because when they bloom the summer festive season is near.

Further, it is widely recognised, supported by substantial evidence, that urban greening and trees can improve our health and wellbeing. Quality green spaces not only support natural processes but also provides us with the opportunity to connect with nature through well established, resilient and accessible landscapes creating a sense of place and value for local flora and fauna.

This thinking should be factored into any tree valuation method.

Green Adelaide welcomes further investigation into the best approach for tree valuations for urban trees in metropolitan Adelaide and supports the idea of a tailored tree valuation method for Adelaide. In support of further investigation Green Adelaide would be willing to contribute funds to supports such investigations such as supporting a cost benefit analysis.

## **Public Realm Tree Planting**

### **14. Should the criteria within the Planning and Development Fund application assessment process give greater weighting to the provision of increased tree canopy?**

Green Adelaide understands there are several evaluation criteria that grant applications are assessed against including:

- Creates or revitalises public spaces
- Provides access to high-quality open space
- Promotes unstructured recreation and activity
- Demonstrates innovative and creative design processes to achieve outcomes
- Improves accessibility and safety
- Promotes urban greening and climate change resilience
- Improves open space and neighbourhood connectivity
- Demonstrates community support and consultation
- Demonstrates strategic alignment





While Green Adelaide considers there is merit to the proposal to provide greater weighting to the provision of increased tree canopy, it is considered that a more holistic review of all the evaluation criteria should be undertaken.

Given the diversity of project types (reserves, linear parks and trails, coastal reserves, foreshore and riverfront precincts, town squares and main street precincts) supported by the Open Space Grant Program there is value in some assessment criteria being weighted differently on a case-by-case basis. For example, consideration should be given as to the benefits of increasing tree canopy in a specific location versus increasing biodiversity.

Increasing tree canopy is not necessarily better in all locations. While many urban greening projects may improve habitat, it is also possible to provide increased tree canopy that does not meet wildlife requirements and does not achieve conservation targets.

*Planting diverse vegetation will help future-proof cities in the face of climate change – cooling cities controlling stormwater runoff, providing shelter and even helping with carbon sequestration.*

***Building biodiversity into the urban fabric: A case study in applying BSUD***

To assist in the weighting and assessment of evaluation criteria, projects should be required (through the application process) to define an overall vision and objectives including tree canopy and/or biodiversity outcomes e.g. shrubs and other understorey.

For example, there are several councils which are undertaking small and large-scale redevelopment of public open space areas to provide multifunctional spaces for both human use and conservation of native flora and fauna, helping maintain the health and wellbeing of the community and mitigating some impacts of climate change (see case study examples on the following pages).

Green Adelaide also considers it timely to undertake a complete review of the operation of the open space contribution scheme. In particular, the type of land uses which are required to either provide public open space or make a payment into the Planning and Development Fund.

It is not just residential development that is having an impact on the provision of public open space and urban greening outcomes across Greater Adelaide. Other land uses (such as commercial (i.e. hotels and retail), industrial, public institution and education etc.) also impact on the provision of land for public space and ability to effectively provide urban greening outcomes in these spaces.

While these land uses are not currently required to contribute public open space or a payment in lieu of open space, they may benefit from either the purchase or redevelopment of nearby open space or other public spaces (i.e. main streets and town squares). Green Adelaide asks the Panel to consider how these non-residential land uses can positively contribute to the provision



of public open space and urban greening and climate resilient outcomes across Greater Adelaide.

### ***How can Green Adelaide assist?***

Further, the allocation of grant funding should be supported by an evidence base and regional strategies. As you may be aware, Green Adelaide is developing an Urban Greening Strategy for metropolitan Adelaide to help increase greening in our neighbourhoods and support biodiversity. The Strategy will be supported by several evidence base reports, including on urban tree canopy and heat and urban biodiversity. There is an opportunity for this work be used to support the strategic allocation of grant funding.

Green Adelaide understands that PLUS is considering developing an Open Space Strategy along with reintroducing the Metropolitan Open Space System. Green Adelaide would support the development of a strategic approach to open space planning in Greater Adelaide. Green Adelaide would welcome the opportunity to work with staff from PLUS on the development of a metropolitan wide Open Space Strategy and discuss further how the Greening Prioritisation Pilot Project (discussed below) can be used to support the strategic allocation of grant funding.

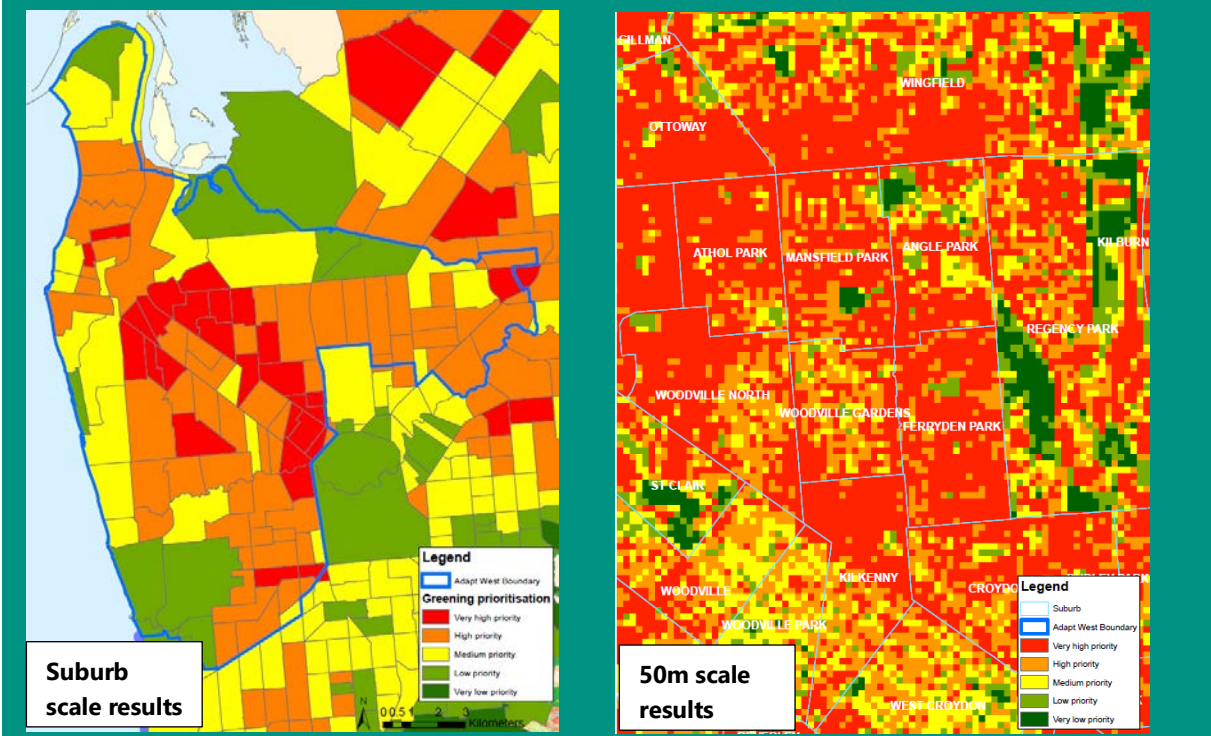
## Green Adelaide's Greening Prioritisation Pilot Project

Green Adelaide has undertaken a pilot project that uses spatial analysis to identify potential priority areas across metropolitan Adelaide for greening investment.

Analysis was undertaken using the following data components:

- **Environmental** (canopy cover, green cover and impermeable surfaces)
- **Thermal** (urban heat hotspots)
- **Social vulnerability** (vulnerable age groups and socio-economic disadvantage)

Once the latest ABS and new tree canopy and urban heat data is available in mid-2023 this analysis will be re-run. This type of information could be used to guide targeted urban greening investment in high priority areas, including to inform project design and delivery (including grant programs such as the Planning and Development Fund).



### Urban heat mapping

Between 2016 and 2018 a number of projects enabled the Adelaide metropolitan area to be mapped for urban heat and tree canopy. Over the summer of 2021/2022 Green Adelaide, in collaboration with state and local government partners, has coordinated a project to recapture key datasets in metropolitan Adelaide and Gawler to build on this previous mapping. This has meant that for the first time a continuous dataset will be available across the entire metropolitan Adelaide region. This project has also established a framework for a coordinated recapture cycle

for these datasets<sup>1</sup> to set a common baseline to make it easier for trends to be tracked over time. The recapture has been completed and analysis of the data is currently underway.

Although the analysis hasn't been complete it is likely that the findings will show a continuing loss of urban tree canopy and overall increases in heat islands and hot spots. There are areas within Adelaide, particularly the west, where tree canopy is already low and risk from urban heat is high. Infill development is compounding this with further tree canopy loss and significant increases in hard surfaces which add to overall heat load. The prevalence of dark roofs is also adding to localised increases in heat across the metropolitan area. Refer below for case study from the [Western Adelaide heat mapping project](#).



**Low density residential**



**Medium density residential**



**High density residential**

### CASE STUDY - Development density impact on surface temperature – Western Adelaide heat mapping project

- Land-use, building and pavement material selection can cause at least a 7°C difference in surface temperature
  - Temps on average 2.8°C lower over green infrastructure with irrigation creating an additional cooling effect of 1.7°C compared with non-irrigated open space
  - Artificial turf is significantly warmer on average surface temperatures (5.5°C) and can be 14°C warmer than irrigated natural turf surfaces
  - Tree lined streets are significantly cooler
- **Red areas** indicate warmer surface temperatures than average, whereas **blue** indicates cooler temperatures than average
- Daytime surface temperatures were collected on 9 February 2017
- Acknowledgment - Seed Consulting Services et al. 2017.

<sup>1</sup> Data projects delivered include: Thermal imagery to map urban heat, LiDAR to map canopy cover and four band multispectral imagery to map vegetation greenness and green spaces.

## Windsor Street Linear Reserve, City of Unley

The Windsor Street Linear Reserve was developed by the City of Unley over five stages (from 2003 to 2006) and provides a scenic corridor from near Fisher Street, Fullarton at its southern end, to Henry Codd Reserve at Parkside, at its northern end.

It is both a native plant corridor as well as a commuter corridor, exercise pathway and passive park environment and features locally indigenous vegetation.

While the key objective of the project was for stormwater management, there was an opportunity to achieve biodiversity outcomes in a way that supports biodiversity and creates local amenity values.

Biodiversity requirements for habitat creation were considered at project concept to allow for strategic, intentional design with biodiversity enhancement in mind. The native plant corridor provides shade and shelter for people as well as enhances and conserves local native plant species and provides a natural passage for local native animals. There are also anecdotal reports of an increase in the number and diversity of native birds.

Key project features:

- Removal of approximately 70 European street trees (mostly ash and elms) to accommodate the new native plant landscape
- Creation of 11,000m<sup>2</sup> of new open space
- Planting of tall canopy trees with diverse groundcovers (< 1m) including grasses, herbs and shrubs.
- 15,000 locally occurring plants comprising of 84 species, including threatened species such as include Grey Box (*Eucalyptus microcarpa*) and other plants that occurred in the original woodlands
- 1km of meandering path over straight culvert with street furniture and interpretive signs
- Recycled stormwater used for irrigation



## Alan E Cousins Reserve, City of Burnside

The ecological restoration of Alan E Cousins Reserve developed organically through informal collaboration with a local resident conservation volunteer and the City of Burnside in 2010 with the key object to regenerate the original vegetation association (Grey Box grassy woodland) and improve aesthetics of the reserve.

Prior to its restoration, the reserve was predominantly cleared irrigated turf with some remnants of the indigenous Grey Box (*Eucalyptus microcarpa*) Woodland and dense woody weeds such as Olives and Italian Buckthorn.

The natural regeneration of the site was prolific, with indigenous colonizing species spreading and gradual reappearance of species from the soil seed bank, including Acacias and *Daviesia ulicifolia*. Other understory species spread when relieved of competition by exotic weeds.

Between 2010 and 2016, other areas within the remainder of the reserve have slowly been regenerated. These areas have been formed as a mosaic throughout the reserve, preserving open space areas for passive recreation and aesthetics, which grouping stands of remnant trees and steeper areas that could not be mowed for replanting with local species. Mulch has been used in these areas while the plantings and it is intended to let this decay and natural groundcover predominate to facilitate both natural regeneration of local plants and also ground fauna to flourish.

A combination of volunteer planting events and planting by the City of Burnside has resulted in a developing landscape representing the original flora, ranging from completely naturalistic in the core volunteer area to slightly more managed in the mosaic plantings in the main part of the reserve. Public appreciation of the area has increased and this is also partly due to the fact the main volunteer has good relations with neighbours and promotes his work and the value of the plantings in the local community.

Key project features:

- Regeneration Program developed organically through informal collaboration with local resident
- Council has also developed and installed interpretational signage on the site.
- Funded under City of Burnside operational budgets with heavy support from volunteers
- Regeneration from the seedbank is ongoing – new species appear often
- Planting under remnant trees





## Questions relating to Infill Policy

### Design Guidelines

**15. Do you think the existing design guidelines for infill development are sufficient? Why or why not?**

**16. Do you think there would be benefit in exploring alternative forms of infill development? If not, why not? If yes, what types of infill development do you think would be suitable in South Australia?**

Although the on-ground impact of infill development approved under the new system hasn't yet been fully realised there is evidence that infill development is contributing to the decline in tree canopy, loss of green space and an up to 90% increase in impermeable surfaces.

Green Adelaide supports exploring ways to do infill better, particularly where it involves increasing the climate resilience of new developments. Facilitating green infrastructure is one way to build in liveability, sustainability and climate resilience to new developments. Green infrastructure has the potential to provide multiple benefits such as water sensitive urban design solutions that not only help to manage stormwater runoff and quality but can also channel stormwater to passively irrigate green spaces – this helps green spaces be more resilient to a hotter climate with less rainfall while also managing peak flows and flood risk. All new developments should be required to consider how green spaces and landscaping will be able to survive in the face of Adelaide's projected hotter and drier climate.

Linked to this is considering how land divisions design can be used to ensure existing mature trees are retained rather than entire sites being cleared ahead of new infill developments. Siting and design for infill development should be undertaken in a way that retains existing trees. It may be that additional flexibility is needed when planning and designing to retain existing mature trees. A system like the exceptions to maximum building height could be applied to land division where existing trees are retained for example a number of smaller allotment sizes could be allowed to maximise the total number of allotments provided that future development of that site doesn't undermine the retention of the tree(s).

Soft landscaping requirements are built into the Planning and Design Code to assist in absorbing heat, provide shade, enable stormwater infiltration and provide urban biodiversity. There are minimum DTS/DPF requirements for a percentage of the site to be set aside for soft landscaping, these percentages vary depending on the size of the development site. Green Adelaide believe there could be benefits to increasing the amount of space for soft landscaping, especially given the work on the *Adelaide Garden Guide for New Homes* showed that even on small infill sites there was room for a larger amount of soft landscaping.

The ongoing health of green spaces and existing mature trees will depend on water. The threat to these areas from reduced rainfall and more extreme wetting and drying events means that an integrated approach to managing stormwater and greening is needed. Stormwater runoff is an underutilised resources that could be harnessed, through water sensitive urban design solutions, to actively and passively water green spaces and trees.

The delivery of this kind of green infrastructure (water sensitive urban design solutions and soft landscaping) occur in both the public and private realm. Currently the PDI Act enables design standards to be developed for the public realm or infrastructure. Green Adelaide asks the Panel to consider whether design standards could be used to facilitate green infrastructure outcomes.

For example, there are examples of WSUD design solutions being incorporated into small-scale infrastructure projects (e.g. median strips, footpaths and the public realm). However, it would be beneficial to illustrate the benefits of integrating landscaping with stormwater runoff management solutions for large-scale infrastructure projects such as major transport corridors.



*Rain garden – Gilbert Street, Adelaide*

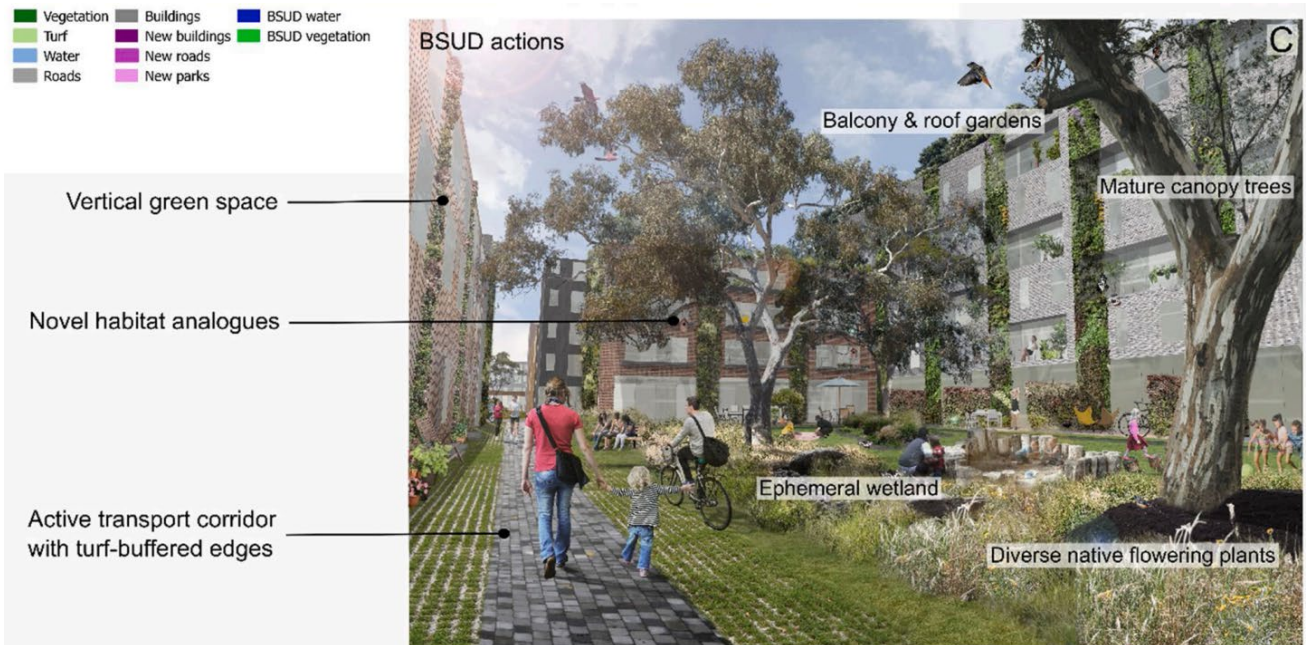


*Native rain garden – Dover Square Reserve, South Brighton*

As mentioned above Green Adelaide is considering opportunities to promote biodiversity sensitive urban design. The tree and soft landscaping provisions in the Code are silent on how to deliver biodiversity outcomes. The best way to promote biodiversity outcomes is to:

- Require the right kind of the tree – a tree that has a chance of establishing successfully in the local climate – taking in to account projected climate change impacts
- Ensure the ongoing survival of the tree – ensure there is enough soil volume and infiltration, a commitment to ongoing maintenance and that trees are planted after construction
- Ensure the tree will shade and ideally a connected habitat
- Require lower storey plantings underneath – plant hardy flowers and shrubs.





Taking this approach to tree selection and soft landscaping would result in better species diversity in the urban area. Species diversity is about having a variety of species present in an ecosystem in relative abundance. Species diversity helps ecosystems be more productive, more sustainable and resilient, provide better ecosystem services like cleaning air and water and supports pollinators.

### How can Green Adelaide assist?

Green Adelaide could prepare an additional chapter to the *Adelaide Garden Guide for New Homes* that demonstrates how to achieve species diversity on a small suburban allotment. Consideration could be given to how promoting biodiversity outcomes through tree selection and soft landscaping could become standard considerations in the delivery of green infrastructure.

Green Adelaide has also identified the need to produce consolidated species and planting guidance within the region, which includes species selection, planting for different outcomes, and planting in different environments. A tool could be developed to build on existing resources like Macquarie University's *Which Plant Where?*, Resilient East's street tree planting guide, SA Power Networks and SA Water approved species lists and the Adelaide Botanic Garden's Plant Selector.

A project such as this could provide guidance for future species choices that are suitable for Adelaide's projected climate, to maximise the chance of thriving green canopies. There would also be opportunity for the project to also combine and standardise council tree inventory data; fill knowledge gaps with new canopy models and local knowledge where possible; and overlay tree resilience knowledge.



## Strategic Planning

### **17. What are the best mechanisms for ensuring good strategic alignment between regional plans and how the policies of the Code are applied spatially?**

Preparing implementation plans/roadmaps for each of the regional plans would help make it clear how priorities will be delivered. Linking regional plans to other strategies may also help. It is understood an Open Space Strategy is likely to be developed for Greater Adelaide, this type of strategy could for example build on the regional plan with more detailed content. Additionally Green Adelaide is working on a Greening Prioritisation tool which may be helpful to identify where spatially urban greening and open space investment is most needed. Please see additional detail as discussed above.

### **18. What should the different roles and responsibilities of State and local government and the private sector be in undertaking strategic planning?**

Setting strategic directions should occur at the State Government level. Strategic matters such as provision of infrastructure and open space that cross administrative boundaries and involve a level of coordination should be managed at the State Government level to ensure best outcomes and efficiencies are achieved.

# Building biodiversity into our urban landscapes through Biodiversity Sensitive Urban Design

Factsheet | December 2022

Cities are increasingly recognised for their role in being home to important biodiversity. **Biodiversity Sensitive Urban Design (BSUD)**<sup>1</sup> aims to create built environments that make a positive, on-site contribution to biodiversity at the same time as providing other urban greening or development outcomes.

BSUD links urban design to measurable biodiversity outcomes, providing a flexible framework for developers and planners to consider provision for biodiversity alongside other considerations early in the development process.

To do this, BSUD initiatives may target individual species, a group of species and/or entire ecosystems. This means that BSUD can be applied across multiple scales and contexts (see **Adelaide examples in Table 1**) from small-scale site redevelopment (e.g., green roof retrofits or streetscapes) to precinct-scale planning for new developments (e.g. [Fisherman's Bend Re-development](#)) or large-scale infrastructure projects (e.g., transport corridors).



## The project

To underpin the Urban Greening Strategy for metropolitan Adelaide, Green Adelaide is working with the Royal Melbourne Institute of Technology's (RMIT) Interdisciplinary Conservation Science Research Group to develop an Urban Biodiversity Background Evidence Base report which will:

- define what urban biodiversity is in an Adelaide context
- identify current urban biodiversity data, trends and mapping (and any gaps)
- provide **case studies of biodiversity sensitive urban design (BSUD) in different contexts and scales across metropolitan Adelaide.**

Additionally, it is intended that this evidence base proves helpful for a range of organisations and stakeholder to progress implementation of BSUD initiatives.

For more information about BSUD and this process please visit: <https://icon-science.org/bsud-home/>



*Biodiversity planting at Fordham Reserve along the Sturt River / Warriparri in Glenelg North (City of*

<sup>1</sup> BSUD has its origins in urban ecology and since 2003 Adelaide has been at the forefront of this space. See 'Adelaide Nature of a City: the Ecology of a Dynamic City from 1836 to 2036' (2005) for more information

## Why is urban biodiversity critical?

Biodiversity within cities is fundamental for human health and well-being and delivers a wide range of critical ecosystem services. Exposure to nature in cities can help reduce stress, reduce mortality, improve cognitive development in children and has also been shown to improve property values, reduce maintenance costs, protect drainage systems and reduce energy consumption.<sup>2</sup>

Nature and biodiversity in cities also contribute to our human sense of place, identity and psychological well-being. Healthy biodiversity plays a fundamental role in the functioning of ecosystems and their ability to deliver long-term ecosystem services.

As the climate continues to warm, the urban heat island effect will be compounded and there will be more intense and frequent extreme weather events. Planting a diversity of vegetation will help future-proof cities in the face of these climate change challenges.

Biodiversity loss is accelerating globally and it is becoming increasingly important for all parts of society to play their role in helping to preserve the diversity we have for future generations.

For these reasons, the conservation, management and enhancement of biodiversity in the urban environment is important.

**South Australia's average temperatures have risen by more than 1.5 degrees since the 1950s. By 2050 another 1 to 2 degrees increase could occur.**



## Urban biodiversity commitments

There are numerous State and local government commitments to increase greening, strengthen climate resilience and identify opportunities to improve biodiversity within our urban areas including:

- Green Adelaide's legislated priorities (**Biodiversity Sensitive and Water Sensitive Urban Design** and **Green Streets and Flourishing Parklands**)
- **State Planning Policy 4: Biodiversity**
- **The 30-Year Plan for Greater Adelaide – Urban Green Cover target**
- Department for Infrastructure and Transport – **Green Infrastructure Commitment**
- **South Australian Government Climate Change Actions** – Focus Area 5: Built and urban environments
- **Healthy Parks Healthy People 2021-26** – Focus Area 6: Green infrastructure in urban settings and Focus Area 7: Biodiversity, conservation and human health.



*Ecological restoration of Alan E Cousins Reserve through volunteer planting (City of Burnside)*

<sup>2</sup> Kirk H, Garrard G, Croeser T, Backstrom A, Berthon K, Furlong C, Hurley J, Thomas F, Webb A, and Bekesy S.A, 'Building biodiversity into the urban fabric: A case study in applying Biodiversity Sensitive Urban Design (BSUD)', Urban Forestry & Urban Greening, 10.1016/j.ufug.2021.127176, 62, (127176), (2021).

## How does BSUD work?

While many urban greening projects may improve habitat, it is also possible to provide greening outcomes that do not meet wildlife requirements or achieve conservation targets.

In order to design spaces or infrastructure that will benefit biodiversity, the critical needs of the species/habitats involved need to be considered, and interventions implemented at different scales, using **five key principles**:

Key BSUD Principles	
1	Enhance habitat and resources
2	Enable natural ecological processes
3	Address threats and disturbances
4	Facilitate positive human-nature interactions
5	Improve connectivity to encourage dispersal

BSUD principles can be applied at any step of the development process (see **Figure 1** overleaf) but are best targeted at early stages of developing project objectives, planning or project design, with co-ordination across development stages. For example, during planning and project initiation, it is important to understand the ecological context of the site and decide on biodiversity objectives. By setting objectives for biodiversity early, designs can be developed and evaluated to support biodiversity as well as other socio-economic and environmental needs during project design, evaluation and construction stages.

The best designs to support biodiversity will vary depending on the scale, land uses, and target ecosystem/species. Many examples of BSUD will be in private developments, but there is significant potential for public areas to provide multifunctional spaces for both human use and wildlife conservation (e.g. transport corridors, Northern Connector, [Moonee Ponds Creek Catchment Collaboration](#)). While many community-led projects may be small in scale, coordination between local landholders can create landscape-scale changes (e.g., Alan E Cousins Reserve, the [Melbourne Pollinator Corridor](#)).

## Development of BSUD case studies

To aid decision makers and implementers with applying the principles of BSUD, Green Adelaide is working with RMIT to prepare case study examples that illustrate what successful BSUD solutions looks like in Adelaide (refer to **Table 1** for the list of sites). The case studies will illustrate how BSUD can be undertaken:

- at different scales (i.e. regionally versus locally),
- at different stages of the development process using different incentives or 'levers' for intervention,
- at different contexts (i.e. on private and public lands, new developments, and retrofits), particularly across a diversity of ecosystems, and
- in ways that address one or more of the five key principles (which are outlined above).



*Yellowish Sedge-skipper reintroduction site (City of Salisbury)*

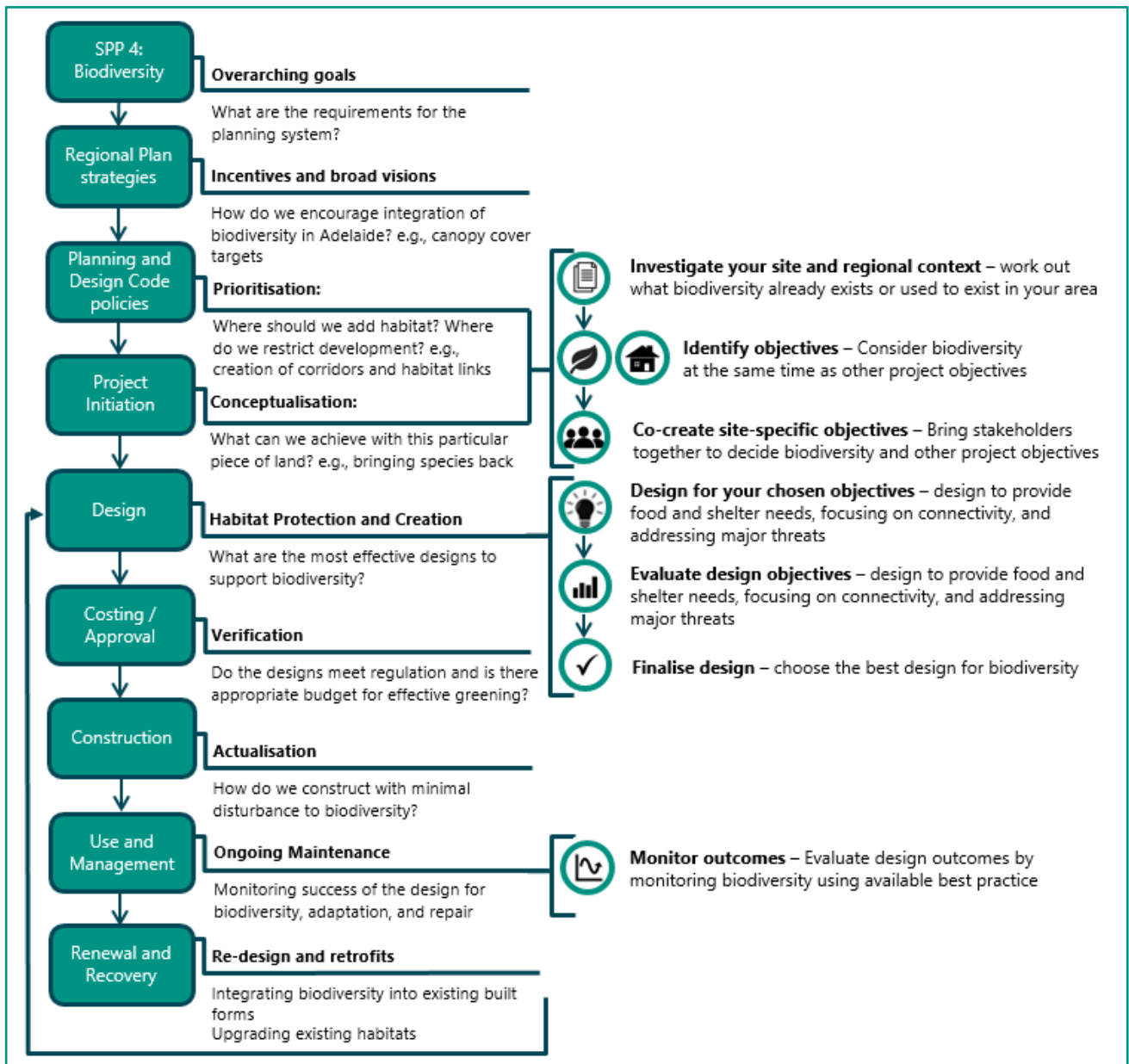


Figure 1: Where BSUD principles can be applied within the development process (modified from [Felson et al. \(2013\)](#) and [Garrard et al. \(2018\)](#))



Biodiverse green roof at Adelaide Zoo



Native planting along Dry Creek Linear Park

**Table 1: Examples of BSUD applied at different scales and contexts**

Context	Case Study Project	Scale
<b>Parks</b> 	Alan E Cousins Reserve (City of Burnside)	Local
	Victoria Park / Pakapakanthi (Park 16) Grasslands (City of Adelaide)	Neighbourhood
	Butterfly Reintroductions (City of Salisbury)	Neighbourhood
	Sturt River / Warriparri Biodiversity Corridor (City of Holdfast)	Local
<b>Linear Corridors</b> 	Sturt River BSUD Plan – Warriparinga Wetlands (City of Marion)	Neighbourhood
	Dry Creek Linear Park – Echidnas and Small Birds (City of Tea Tree Gully)	Neighbourhood
<b>Streetscapes</b> 	Windsor Street Linear Reserve (City of Unley)	Neighbourhood
<b>Small Infrastructure</b> 	Dover Street Raingarden	Site
	Glenelg Wastewater Treatment Plant (SA Water)	Site
	Adelaide Zoo (vertical garden and green roof)	Site
<b>Large Infrastructure</b> 	Breakout Creek Stage 3 (Green Adelaide)	Regional
	Northern Connector (Department of Infrastructure and Transport)	Regional
	Renewal SA development site (City of Prospect)	Neighbourhood

## Next steps

The Urban Biodiversity Background Evidence Base and supporting case studies will underpin the development of the Urban Greening Strategy for metropolitan Adelaide.

## Contact us

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