

22 March 2021

At the conclusion of the Corporate, Finance, Properties
and Tenders Committee

Environment Committee

Agenda

- 1. Disclosures of Interest**
- 2. Public Exhibition - Greening Sydney Strategy**
- 3. Project Scope - Bike Network Connections in Erskineville, Alexandria and Waterloo**
- 4. Ad Hoc Grant - 2021 Australasian Emissions Reduction Summit Sponsorship**

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2. Check the recommendation in the Committee report before speaking, as it may address your concerns so that you just need to indicate your support for the recommendation.
3. Note that there is a three minute time limit for each speaker (with a warning bell at two minutes) and prepare your presentation to cover your major points within that time.
4. Avoid repeating what previous speakers have said and focus on issues and information that the Committee may not already know.
5. If there is a large number of people interested in the same item as you, try to nominate three representatives to speak on your behalf and to indicate how many people they are representing.

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Item 1.**Disclosures of Interest**

Pursuant to the provisions of the City of Sydney Code of Meeting Practice and the City of Sydney Code of Conduct, Councillors are required to disclose pecuniary interests in any matter on the agenda for this meeting.

Councillors are also required to disclose any non-pecuniary interests in any matter on the agenda for this meeting.

This will include receipt of reportable political donations over the previous four years.

In both cases, the nature of the interest must be disclosed.

Item 2.

Public Exhibition - Greening Sydney Strategy

File No: X025479

Summary

This report recommends that Council endorse the draft Greening Sydney Strategy to be placed on public exhibition for community comment. The draft Greening Sydney Strategy (the Strategy) sets the directions, targets, and actions for all aspects of greening within the City of Sydney.

The Strategy aims for a greener Sydney that will help improve our health and wellbeing, reduce urban heat impacts, and bring nature into the city. The commitment to green living focuses on providing all of the community with equitable access to quality green spaces.

The Strategy recognises the importance of trees and other vegetation for the numerous environmental, social and economic benefits they provide to the community. It also acknowledges the potential to support diverse ecosystems in an urban environment and the important benefits biodiversity can bring.

The previous Greening Sydney Plan was unanimously adopted in May 2012 and has underpinned the City's greening program. This has led to significant greening achievements including a 24 per cent increase in canopy cover since 2008, a 13 per cent increase in parks and green spaces since 2009, a 180 per cent increase in the expansion and restoration of native bushland since 2014 and the establishment of 20 community gardens

The recommended new Strategy for public exhibition supports further work on greening the City. This update reflects changes over that time, documents our achievements and incorporates the latest research and data that supports the future strategic direction.

The Strategy outlines six directions, and 20 supporting actions that will contribute to a cool, calm and resilient city:

- Direction 1 – Turn grey to green
- Direction 2 – Greening for all
- Direction 3 – Cool and calm spaces
- Direction 4 – Greener buildings
- Direction 5 – Nature in the city
- Direction 6 - Greening together

The Strategy is to be delivered by the City in partnership with residents, local businesses, developers and volunteer groups. This will be achieved through services and projects delivered by the City, support provided to resident and community groups and new policies which will facilitate greening on private property by numerous stakeholders.

This report recommends that Council endorse the draft Greening Sydney Strategy for public exhibition. Following the exhibition period, all public comments will be considered, and the Strategy will be presented to Council, with any required changes, for adoption.

Recommendation

It is resolved that:

- (A) Council approve the draft Greening Sydney Strategy (the Strategy), as shown at Attachment A to the subject report, for public exhibition; and
- (B) authority be delegated to the Chief Executive Officer to undertake minor editorial amendments prior to the exhibition of the draft Greening Sydney Strategy.

Attachments

Attachment A. Draft Greening Sydney Strategy

Background

1. Green infrastructure plays a vital role for the future of Sydney. It is a city's natural life support system, essential for all functions. It provides multiple social, environmental and economic benefits. Our society relies on these benefits every day, making green infrastructure essential infrastructure.
2. Cities around the world, including the City of Sydney, are embracing tree canopy and urban greening as a solution to address the climate and health challenges that our cities are facing. There is growing research and community recognition that trees and greening are essential infrastructure.
3. Community health, climate change and urban heat, and biodiversity and nature have been identified as the key risks to our city. Green infrastructure mitigates these risks. Whether it is for managing heat or mental health issues, happiness, physical activity or reduced incidence of disease and illness, an increase in our canopy cover, green space, and nature provides multiple benefits to the community.
4. As Sydney's density increases and the climate changes, increased and equitably accessible greening is essential to the liveability and efficient functioning of the city.
5. The Sustainable Sydney 2030 strategy commits the City to becoming green, global and connected. Our target was to increase our overall canopy cover to 23 per cent by 2030 and to 27 per cent by 2050 (from the 2008 baseline of 15.5 per cent).
6. This Strategy builds on the progress made over the last eight years and keeps us moving toward this target. The City is one of only a few councils in Australia that has consistently increased canopy cover, and is the only capital city to do so.
7. The Strategy also responds to the community's expressed need for more greening across the city, especially greener buildings. In the Sustainable Sydney 2050 community survey, 85 per cent of respondents said they want buildings covered with plants and that incorporate nature into their design. In addition, 77 per cent of respondents want a green city with parks, trees and nature.
8. Further, the recent survey undertaken as part of the City's Recovery Plan indicated an increase in the community's need for greening to be prioritised. Greening, and the health benefits it brings, is now well understood, recognised and highly valued across the community.
9. This Strategy updates and will supersede the City's Greening Sydney Plan, adopted by Council in May 2012.

Greening Sydney Strategy 2020-2030

10. The Strategy outlines the benefits, opportunities and obstacles to greening in our city and how we plan to implement and provide a cool, calm, beautiful and resilient place to live, work and visit.
11. The Strategy outlines six directions, and 20 supporting actions, to make Sydney greener:
 - (a) Direction 1 – Turn grey to green. Our target is to increase overall green cover to 40 per cent across the local area, including a minimum of 27 per cent tree canopy by 2050.

- (b) Direction 2 – Greening for all. In a just and fair city, it is vital that we distribute quality greening fairly across the city so that everyone shares the benefits provided by greening.
 - (c) Direction 3 – Cool and calm spaces. Addresses the two key issues facing most of the city’s residents relating to high urban heat and impacts to physical and mental health.
 - (d) Direction 4 – Greener buildings. Outlines three actions to ensure properties, which represents the largest proportion of land use across the local government area, provide their share of the greening and canopy cover required. This includes the development of a new Green Factor Score, which evaluates and quantifies the amount and quality of urban greening that a project provides.
 - (e) Direction 5 – Nature in the city. Outlines actions on how we will recognise and support Indigenous knowledge, and design and implement our greening strategies to maximise habitat potential and nature in the city.
 - (f) Direction 6 - Greening together. The community is one of the greatest resources for greening Sydney. The Strategy outlines how we will continue to provide, and increase, opportunities for active participation in greening activities. It includes the development of a new Greening Sydney Fund, where the City uses compensation received from the removal of our tree assets (during development works) towards a community grants program.
12. The Strategy includes a number of actions under each of the strategic directions, designed to collectively create the conditions to progress towards the vision and targets. The City will prioritise greening initiatives to address any inequities, to provide the greatest benefit, and to assist our most vulnerable communities.
13. The Strategy has been developed by City staff, with input from all divisions that have an opportunity to influence or physically green the City’s urban environment. Cross divisional teams will implement and promote the Strategy to ensure the City’s greening efforts and activities make Sydney a truly green City by 2050.

Key Implications

Strategic Alignment - Sustainable Sydney 2030

14. Sustainable Sydney 2030 is a vision for the sustainable development of the City to 2030 and beyond. It includes 10 strategic directions to guide the future of the City, as well as 10 targets against which to measure progress. This report is aligned with the following strategic directions and objectives:
- (a) Direction 1 - A Globally Competitive and Innovative City - Globally competitive cities are attractive places to live and are easy to get around in, to help businesses attract mobile global talent, and to increase opportunities for direct face-to-face connections. Sydney has consistently performed strongly in global rankings over the past decade. A challenge for the future is providing sufficient high quality greening to manage heat and health impacts.

- (b) Direction 2 provides a road map for the City to become A Leading Environmental Performer - the Strategy builds on the existing canopy cover targets (23 per cent by 2030, and 27 per cent by 2050) and includes a new greening target. The new target is to increase overall green cover to 40 per cent across the local area, including a minimum of 27 per cent tree canopy by 2050. The City is currently on track to meet these targets, with consistent increases in canopy cover since 2008 rising from 15.5 per cent to 19.2 per cent in 2020.
- (c) Direction 4 - A City for Walking and Cycling - the Strategy supports this Direction by ensuring the City's network of streets and open spaces are shaded to provide thermal comfort, and support active transport all year round.
- (d) Direction 5 - A Lively and Engaging City Centre - successful cities are alive and inviting during both day and night. They offer art, design, culture and entertainment, attractive public spaces and workplaces, great shopping experiences and easy access. A greener city is part of creating a better environment, that is visually appealing and encouraging exploration of the city and its diverse retail and entertainment offerings. Research has found that greener places result in higher commercial returns, as people spend more time, and money, in green spaces.
- (e) Direction 6 - Vibrant Local Communities and Economies - recognises and seeks to build on the City's diverse communities, lifestyles, interests and needs. The Strategy supports this through the ongoing recognition and support for our community and volunteer programs, such as community gardens and the City Farm. The Strategy also recommends an action to review how these programs are offered to ensure the City is able to meet the increased demand from the community wanting to connect with nature, and each other.
- (f) Direction 8 - Housing for a Diverse Population - reviewing how the city prioritises space for vehicles, instead of greening, can make housing more affordable for the 39 per cent of City of Sydney households that are car free. A greener city, combined with active and public transport, enables more households to become car free, making them able to redirect around an extra fifth of their income to rent or mortgage repayments.
- (g) Direction 9 - Sustainable Development, Renewal and Design - responds to sustainability and environmental imperatives facing our cities. How well a dense area functions depends on the availability and efficiency of a range of infrastructure, including green infrastructure. The Strategy aims to better capture the potential of laneways, streets and parks in public life and improve design excellence in buildings and properties overall. Greater dedication of space for greening and community uses improves the amenity, liveability, and health of the city.
- (h) Direction 10 - Implementation through Effective Governance and Partnerships - by taking an evidence-based approach to strategy development and actions, the City shows leadership and is able to influence other councils and agencies to be more successful at achieving access, health and environmental outcomes.

Organisational Impact

15. In developing the Strategy, consultation was undertaken with relevant City staff. Actions and projects are being proposed in the budgets and business plans of responsible units..
16. Implementing the Strategy will require a multi-disciplinary approach to ensure each portfolio (streets, parks, and properties), delivers their allocated share of the greening and canopy targets.
17. The time frame for implementing the majority of the Strategy will largely occur over a 10-year period and be completed by 2031. The inroad tree planting program will be delivered over a 20-year period and be completed by 2041.

Social / Cultural / Community

18. The Strategy will have significant benefits for the community, including providing significant physical and mental health benefits. Compelling research proves that:
 - (a) in neighbourhoods with a tree canopy of 30 per cent or more, adults had a lower likelihood of developing:
 - (i) psychological distress (by 31 per cent);
 - (ii) diabetes by (31 per cent);
 - (iii) cardiovascular disease (by 21 per cent);
 - (iv) cardio hypertension (by 21 per cent); and
 - (v) rating their general health as fair or poor over six years (by 33 per cent); and
 - (b) connecting with nature for as little as a couple of hours can reduce blood pressure, lower stress, improve cardio vascular and metabolic health, improve concentration, memory and attentiveness, lift feelings of depression, improve pain thresholds, improve feelings of energy, boost immune systems by increasing the count of the body's natural killer cells, increase anti-cancer protein production and help people lose weight.
19. The Strategy also provides opportunities for building social capital through community empowerment projects, such as community gardens, LandCare groups, planting days and specific projects, such as the City Farm.

Environmental

20. The United Nations describes climate change as the defining issue of our time. In June 2019, the City of Sydney declared that climate change poses a serious risk to the people of Sydney and should be treated as a national emergency. Our city must adapt to the changing climate and increase its resilience to the likely impacts.

21. Heatwaves are Australia's deadliest natural hazard. They now arrive earlier, are hotter, and last longer. Urban temperature extremes can present us with life-or-death situations. Urban heat mitigation through greening can significantly reduce human heat related morbidity and mortality. Research has found that:
 - (a) Individual trees can make a valuable difference to air temperatures, by as much as 10°C.
 - (b) At the local scale, temperatures at ground level also vary significantly. One study showed the difference was 10°C cooler in the street that had 30 percent canopy cover, compared to a street with just 10 percent canopy cover.
 - (c) At the precinct scale, groups of trees that combine to provide greater than 40 per cent canopy cover at the scale of a city block have been found to reduce local ambient air temperature by more than 1.3°C.
22. The Strategy outlines the opportunities to accelerate our action in the areas of canopy cover, greening and biodiversity. These actions help us in cooling local streets, reducing heat absorption, reducing energy needs, improving storm water quality, reducing storm water runoff, reducing dust and air pollution, sequestering carbon, and improving the diversity of the City's urban ecology.
23. The Strategy's responses to urban ecology – greening to provide habitat and enhance biodiversity in our urban area - will be critical in addressing research that has found Australia's urban areas contain disproportionately more threatened species than non-urban areas. Recent research shows that 30 per cent of Australia's threatened species (370 species) come from within our cities and towns. This reinforces the significance of planning and managing our landscapes to conserve and enhance biodiversity.

Economic

24. The Strategy will deliver economic benefits to the city. Research in other cities has shown that green urban environments increase property values, improve commercial activity in retail centres and are an attraction for employers to recruit and retain quality staff.
25. Greening, in particular canopy cover, is the most cost-efficient method of addressing urban heat. As greening also provides a multitude of environmental, social and economic benefits, every dollar invested provides a higher return.

Financial Implications

26. The draft Strategy includes actions that have capital and operational funding implications. A number of these actions are already incorporated into the City's approved Long Term Financial Plan.
27. However, the delivery of all of the City's actions in the Strategy require substantial additional capital works and operational expenditure funds to be allocated within future iterations of the 10-year Long Term Financial Plan, subject to Council approval. Additional funding will also be required outside the current 10-year financial planning horizon.

Relevant Legislation

- 28. Local Government Act 1993.
- 29. Environmental Planning and Assessment Act 1979.
- 30. State Environment Planning Policy (SEPP) Vegetation in Non-Rural Areas 2017.
- 31. Sydney Local Environmental Plan 2012.
- 32. Sydney Development Control Plan 2012.

Critical Dates / Time Frames

- | | |
|---|------------|
| 33. Start of public exhibition | April 2021 |
| 34. End of public exhibition | May 2021 |
| 35. Final Strategy submitted to Council for endorsement | mid-2021 |

Options

- 36. An option is to deliver the full Strategy planting program within 10 years. This would require additional capital funding of \$3.5M per annum, to be brought forward, potentially impacting the delivery of other City programs in the Long Term Financial Plan.
- 37. An option is to reduce the canopy and greening targets and minimise the extent of programs outlined in the Strategy. This option is not recommended, as the City's targets (i.e. 27 per cent canopy cover) are slightly under the level that research has found to be most beneficial (i.e. 30 per cent canopy cover). Further reductions in targets will impact on community health and wellbeing, and on providing a cooler city.
- 38. Not proceeding with the Strategy impacts the city in the short, medium and long term. This includes detrimental impacts regarding urban heat mitigation and community health and wellbeing.

Public Consultation

- 39. Following endorsement by Council, the draft Strategy will be placed on public exhibition for four weeks.
- 40. Public exhibition will be undertaken through the Sydney Your Say web page and advertised via the City's communication channels.
- 41. Notice of the exhibition will be published on the City's website.

VERONICA LEE

Director City Services

Karen Sweeney, Urban Forest Manager

Attachment A

Draft Greening Sydney Strategy

Greening Sydney Strategy (Draft)



Table of contents

Acknowledgement	4
Executive Summary	5
Cool, calm and resilient	5
Our focus for action	6
Why we need to green our city	11
Benefits of greening	11
Climate emergency	15
Urban heat mitigation	17
Community health and wellbeing	19
Biodiversity and habitat	21
A zero carbon city	22
Our city	23
Greening in the city	24
Sustainable Sydney 2050	25
Policy context	26
Our green achievements	27
Challenges and opportunities	28
Water – The blue green connection	30
Competition for space	31
Changing climate, and pests and disease	32
Land tenure and change	33
Management and funding	34
Collaboration with government and other agency stakeholders	34
Our greening strategy	35
Direction 1 – Turn grey to green	36
Our green targets	36
Action 1 – Achieve the green and canopy cover targets	37
Action 2 – Green our laneways	41
Action 3 – Harness innovation, technology and inspiration	42
Direction 2 – Greening for all	43
A just and fair city	43
Action 4 – Distribute greening equitably	43
Action 5 – Provide fair access to quality green spaces	47

Action 6 – Adapt for climate.....	47
Action 7 – Grow food locally	48
Direction 3 – Cool and calm spaces.....	49
Action 8 – Cool the hot spots.....	50
Action 9 – Calm green spaces.....	50
Action 10 – Celebrate water	51
Direction 4 – Greener buildings.....	52
Action 11 – Develop a green factor score	53
Action 12 – Increase green roofs and walls	54
Action 13 – Planning ahead.....	55
Direction 5 – Nature in the city	56
Action 14 – Recognise and support Aboriginal ecological knowledge.....	56
Action 15 – Strengthen urban nature protection measures	57
Action 16 – Perform an urban ecology health check.....	58
Action 17 - Reconnect with nature	58
Direction 6 - Greening together	59
Action 18 – Support community participation.....	60
Action 19 – Develop a greening Sydney fund	61
Action 20 – Increase our community engagement.....	61
Our green future	62
Attachment 1 – Review, implementation and action plan	63
Attachment 2 – Target methods	66
Introduction	66
Street method.....	67
Park method.....	69
Property method.....	69
Achieving these targets	70
References	71

Acknowledgement

The City of Sydney acknowledges Aboriginal and Torres Strait Islander peoples as the First People and traditional custodians of the land and waters of this place we now call Sydney.

Aboriginal peoples continue to show great resilience and generosity of spirit towards other peoples with whom they now share their land and waters. We recognise that, by acknowledging our shared past, we are laying the groundwork for a future which embraces all Australians, a future based on mutual respect and shared responsibility for our land.

Cities are much altered landscapes, but traditional wisdom and knowledge in land management may assist in framing solutions to the challenges posed by a changing climate.

To be resilient Sydney needs a future based on mutual respect and shared responsibility, where everyone and all living things can thrive. If we care for Country, it will care for us.



Aboriginal and Torres Strait Islander People performing traditional ceremony.

Photo: Katherine Griffiths

Executive Summary

This Greening Sydney Strategy outlines how we will be a cool, calm and resilient city. We will increase greening and share its benefits with the entire community.

Cool, calm and resilient

Our vision is for a greener Sydney that will help improve our health and wellbeing, reduce urban heat impacts, and bring nature into the city.

Our commitment to green living focuses on providing all of the community with equitable access to quality green spaces.

The City of Sydney, like other cities around the world, are embracing tree canopy and urban greening as a solution to address the climate and health challenges that our cities are facing.

In 2012, we released the first Greening Sydney Plan, which set our fundamental groundwork. We began measuring the city's canopy cover and identified important targets to increase our overall canopy cover to 22 per cent by 2030 and to 27 per cent by 2050.

We have made substantial gains in our urban greening and developing policies and programs to meet those commitments. These include:

- developing an urban forest strategy, an urban ecology strategic action plan, a green roof and walls policy, a streetscape gardening policy, and a landscape code
- increasing canopy cover from the 2008 baseline of 15.5 per cent to 18.1 per cent in 2019.

- increasing our parks and open space network managed by the City from 190ha in 2012 to 211.9 ha in 2020.
- creating the Sydney City Farm and supporting the establishment of over 20 community gardens
- restoring and expanding native bushland areas from a baseline of 4.6 hectares in 2012 to 12.9 hectares in 2020.
- planting thousands of lower level gardens and shrubs within our parks and streets.

While we have achieved the goals above, providing healthy green infrastructure in urban environments is challenging. Streets are highly used and contested spaces. Parks and open spaces need to fulfil many roles, such as providing for active and passive recreation. Similarly, urban development patterns, characterised by increasing density and infill developments, reduce the space available for trees and other greening on private land.

However, there is growing research and community recognition that trees and greening is essential infrastructure.

**Sydney is always changing.
We must look forward to
determine and actively plan the
type of city we need.**

There are many opportunities to harness future changes to provide these benefits. A decrease in vehicle ownership and use is one major area that supports redistribution of space to create more inclusive, active and healthy spaces.

Our focus for action

To achieve our vision, for a cool, calm and resilient city, this strategy outlines six directions, and 20 supporting actions.

1. Direction 1 – Turn grey to green
2. Direction 2 – Greening for all
3. Direction 3 – Cool and calm spaces
4. Direction 4 – Greener buildings
5. Direction 5 – Nature in the city
6. Direction 6 - Greening together

The City of Sydney will prioritise greening initiatives to address any inequities, to provide the greatest benefit, and to assist our most vulnerable communities. An implementation program is outlined in Attachment 1.

This strategy outlines the benefits, opportunities and obstacles to greening in our city and how we plan to implement and provide a cool, calm, beautiful and resilient place to live, work and visit.



Redfern Park, Redfern June 2014

Direction 1 – Turn grey to green

To meet all the future challenges we face, we need to set and achieve ambitious greening and canopy cover targets across the city, for our street, park and property portfolios.

The research indicates we ideally need to provide 30-40 per cent canopy cover for heat, and 30 per cent canopy cover for community health.

Our target is to increase overall green cover to 40 per cent across the local area, including a minimum of 27 per cent tree canopy by 2050.

Action 1 – Achieve the targets

We will develop policies, programs and projects to help each portfolio to achieve the targets. It is vital that everyone works together to meet these targets.

Green cover is all of the trees, plants, ground covers and turf throughout the city. Canopy cover relates solely to trees over three metres tall.

Action 2 – Green our laneways

Space in the city is highly contested. It is no longer considered appropriate that laneways, as underused public spaces, are not better designed to become a valued green network for the entire community.

We will transform laneways into greener shared spaces as we transition to a more sustainable city, with fewer private cars. This will include the development of new design solutions for laneways, that challenges the requirement for private vehicle use of laneways.

Action 3 – Harness innovation, technology and inspiration

The increasing momentum in the green infrastructure market continues to encourage cities to implement green policies. We will use, encourage and support the latest research, technology and innovation opportunities to transition our greening.

Direction 2 – Greening for all

In a just and fair city, it is vital that we distribute quality greening fairly across the city so that everyone shares the benefits provided by greening.

Action 4 – Distribute greening equitably

Research outlines 30 per cent canopy cover, within an area of around 1.6 kilometres, provides key heat and health benefits. To ensure greening is shared, we will make informed and data driven decisions about greening in our future projects and developments, making this information accessible where possible.

Action 5 – Provide fair access to quality green space

We need to ensure our green spaces accommodate a wide range of uses to meet our diverse community's needs. We will develop a parks design code and provide standardised maintenance services for robust and sustainable designs, and consistently well maintained open spaces across the city.

Action 6 – Adapt for climate

It is important that we provide mature, thriving and healthy landscapes for future generations. We will review the latest climate science, and available research to assist us to design green spaces and plant new species that will thrive under the changed climate conditions.

Action 7 – Grow food locally

Access to fruit and vegetables is a critical ingredient for our mental and physical health. We will continue to support the community to grow more food locally through our Sydney City Farm programs and community garden network, and increasingly look at opportunities for increased food production on private land.

Direction 3 – Cool and calm spaces

Two key issues facing most of the city's residents relate to high urban heat and impacts on physical and mental health.

Action 8 – Cool the hot spots

Cool streets improve the walkability and liveability of our city. To cool Sydney through greening we will provide programs that support tree planting, shading and using water in the landscape. We will prioritise programs areas and community groups that are particularly exposed to urban heat and other health related issues.

Action 9 – Calm green spaces

Substantial and meaningful greening provides refuge in a busy city, creating calm and healthy spaces that improve our mental health and wellbeing. We will identify and map the calm spaces, share information to assist with usage and wayfinding, consider calm spaces in future design and prioritise programs that provide the greening health benefits to those who most need it.

Action 10 – Celebrate water

Water sustains life and all living things depend on it. Sydney has a special connection with water. The harbour has shaped Sydney and its people for many thousands of years, from the First Nations through to new immigrants today. There are many water bodies across the city that provide us with a place that helps to restore and invigorate us in equal measure.

We will care for and celebrate water by recognising and communicating the importance of water in our lives. We will help ensure water is used efficiently as a natural resource and its role as a habitat for wildlife is understood and protected.

Direction 4 – Greener buildings

Property represents the largest proportion of land use at 61 per cent of the local government area.

To achieve the 40 per cent green cover target, including the 27 per cent canopy cover target, properties have to provide at least 28 per cent greening, including at least 20 per cent of that as tree canopy cover.

The community has also expressed their need for greener buildings. In the Sustainable Sydney 2050 community survey, 85 per cent of respondents want buildings covered with plants and that incorporate nature into their design.

Action 11 – Develop a green factor score

A green factor score is a tool that evaluates and quantifies the amount and quality of urban greening that a project provides.

We will develop a score, or equivalent planning controls, that will assist us to meet the green and canopy cover targets. We will embed the score into updated planning controls, including development control plans, to ensure greening is planned for and provided on private land.

Action 12 – Increase green roofs and walls

To increase the quantity and quality of green roofs and walls, we will review and update our green roofs and walls policy and landscape code. We will also gradually amend the planning controls to increase green roofs in new developments, and allow for retrofitting of existing buildings, where appropriate to do so.

Action 13 – Planning ahead

Greening is essential infrastructure and we need to give it sufficient space to thrive. Space in our city is contested and every square metre is valuable. We need to make informed decisions about how each square metre is used, understanding that we can't have it all and there will be trade-offs.

To plan for a greener future, we will develop minimum requirements within the planning controls to achieve the new greening property targets. We will also consider future land use and trends, such as studios and car ownership, that impact on the retention of or ability to increase greening.

Compliance will also be a focus to ensure long-term greening outcomes.



Central Park, Sydney 2020. Robert Smart

Direction 5 – Nature in the city

When designing and implementing our greening strategies we will be looking for ways to maximise habitat potential and nature in the city.

Action 14 – Recognise and support Indigenous ecological knowledge

The Gadigal of the Eora Nation managed their land resiliently for thousands of years. There is much we can learn to better care for this Country.

To achieve this, we wish to work with the local Aboriginal community to explore and identify opportunities to celebrate, promote and educate about Aboriginal ecological knowledge and principles.

Action 15 – Strengthen urban nature protection measures

As Sydney continues to grow, it is essential we have the necessary mechanisms in place to protect, and increase, nature in the city. To achieve this, we will identify and implement strong urban nature protection measures and include these into our planning controls. We will also develop targets to increase biodiversity, habitats, and ecosystem health, and implement best practice ecological connectivity approaches to allow for the safe movement of priority native fauna.

Action 16 – Perform an urban ecology health check

We will collect information about our existing urban biodiversity status to determine our progress, and to consolidate existing data to determine potential habitat measures, reassess priority works and to define performance targets.

Action 17 – Reconnect with nature

It is important for the community to reconnect with nature and seek to enhance the nature in the city. To achieve this, we will support more citizen science programs and participatory events, and develop a coordinated communication program on urban nature focused programs and achievements.

Direction 6 – Greening together

The community is one of the greatest resources for greening Sydney. Our communities continue to show a strong interest and are passionate about participating in greening the urban landscape.

Action 18 – Support community participation

We encourage the community to have a sense of ownership and acceptance of the community greening initiatives. We will continue to provide, and increase, opportunities for active participation in greening activities, including ongoing education and awareness of the importance of greening the urban environment, and hands-on activities and volunteering.

Action 19 – Develop a greening Sydney fund

The City uses extensive resources to plant and maintain public trees. When a tree is removed, the benefits from the tree are lost for many years until any replacement tree matures. In some instances, the benefits are permanently lost when a tree cannot be replaced. We will continue to place tree removal as a last resort. However, when removal of a public tree is required to facilitate a development / project, we will investigate ways to ensure the City is appropriately compensated for the loss and identify how any compensation received can be used to create the greening Sydney fund.

The City would manage any fund to provide a grants program aimed at improving greening outcomes on private land in line with this strategy. This may include programs such as matching grants programs for residents and landowners to undertake new tree planting, nature plantings or install green roofs.

Action 20 – Increase our community engagement

We will review our community engagement approaches, including our online presence, to maximise engagement with a wider audience. We will also develop a green volunteer network to allow for community knowledge sharing, networking and learning across the city at both an online and face-to-face levels.



Pirrama Park, Pyrmont 2014. Adam Hollingworth

Why we need to green our city

Benefits of greening

Green infrastructure is a city's natural life support system, essential for all functions. It provides multiple social, environmental and economic benefits. Our society relies on these benefits every day; making green infrastructure essential infrastructure.

We have identified community health, climate change and urban heat, and biodiversity and nature as the key risks to our city. Green infrastructure plays a vital role in mitigating these risks.

Whether it is for managing heat or mental health issues, happiness, physical activity or reduced incidences of disease and illness, an increase in our canopy cover, green space, and nature provides multiple benefits to the community.

For millennia humans have had a relationship with forests. The sounds of the forest, the scent of the trees, the sunlight playing through the leaves, the fresh clean air. These things give us a sense of comfort, ease stress and worry, help us relax and think more clearly. Being in contact with nature can restore our mood, give us back our energy and vitality, refresh and rejuvenate us.

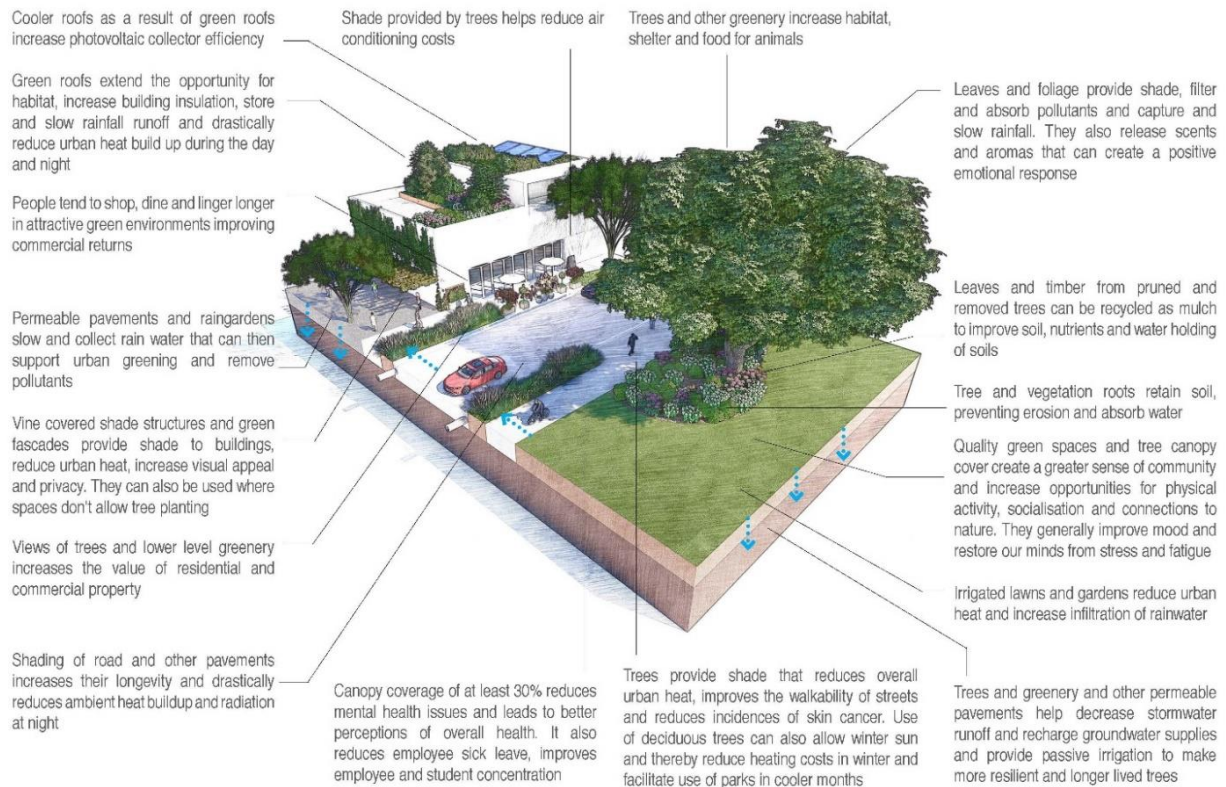
The concept that humans have a biological need to connect to nature is called biophilia. American biologist E O Wilson summarised in 1984 that we are 'hardwired' to affiliate with the natural world and just as our health improves when we are in it, so our health suffers when we are divorced from it.



Bourke Street Surry Hills, 2020. City of Sydney

Greening Sydney Strategy (Draft)

THE BENEFITS OF URBAN GREENING



Note: Graphic will be updated to a larger double page spread at final external typesetting. Example on following pages.

THE BENEFITS

Cooler roofs as a result of green roofs increase photovoltaic collector efficiency

Shade provided by trees helps reduce air conditioning costs

Green roofs extend the opportunity for habitat, increase building insulation, store and slow rainfall runoff and drastically reduce urban heat build up during the day and night

People tend to shop, dine and linger longer in attractive green environments improving commercial returns

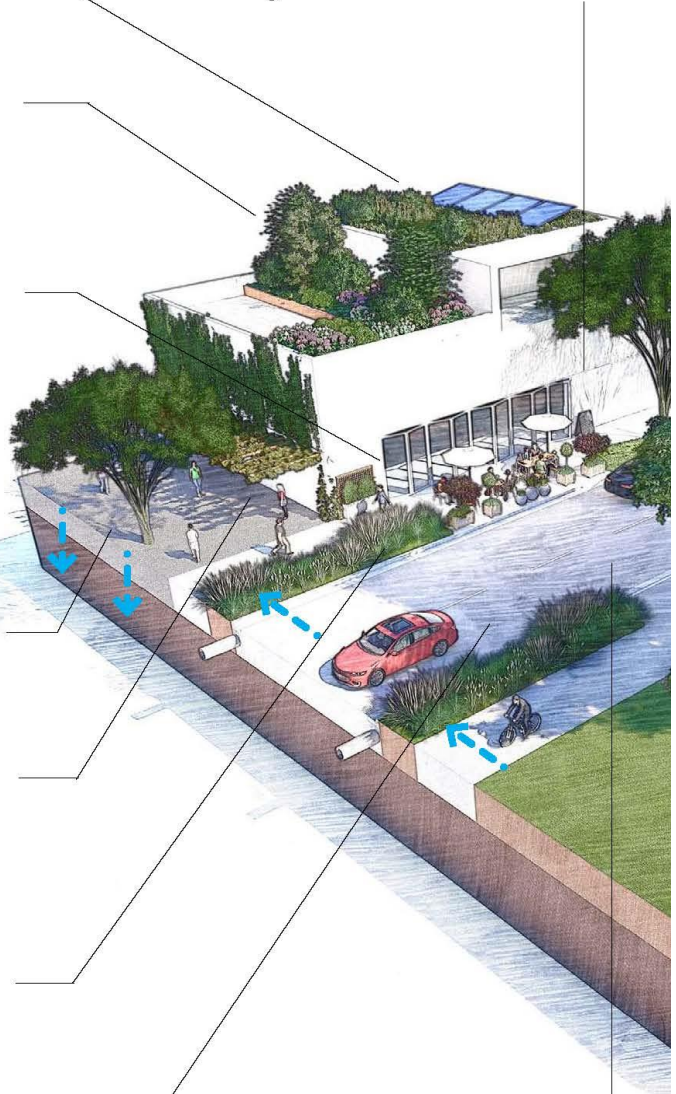
Permeable pavements and raingardens slow and collect rain water that can then support urban greening and remove pollutants

Vine covered shade structures and green fascades provide shade to buildings, reduce urban heat, increase visual appeal and privacy. They can also be used where spaces don't allow tree planting

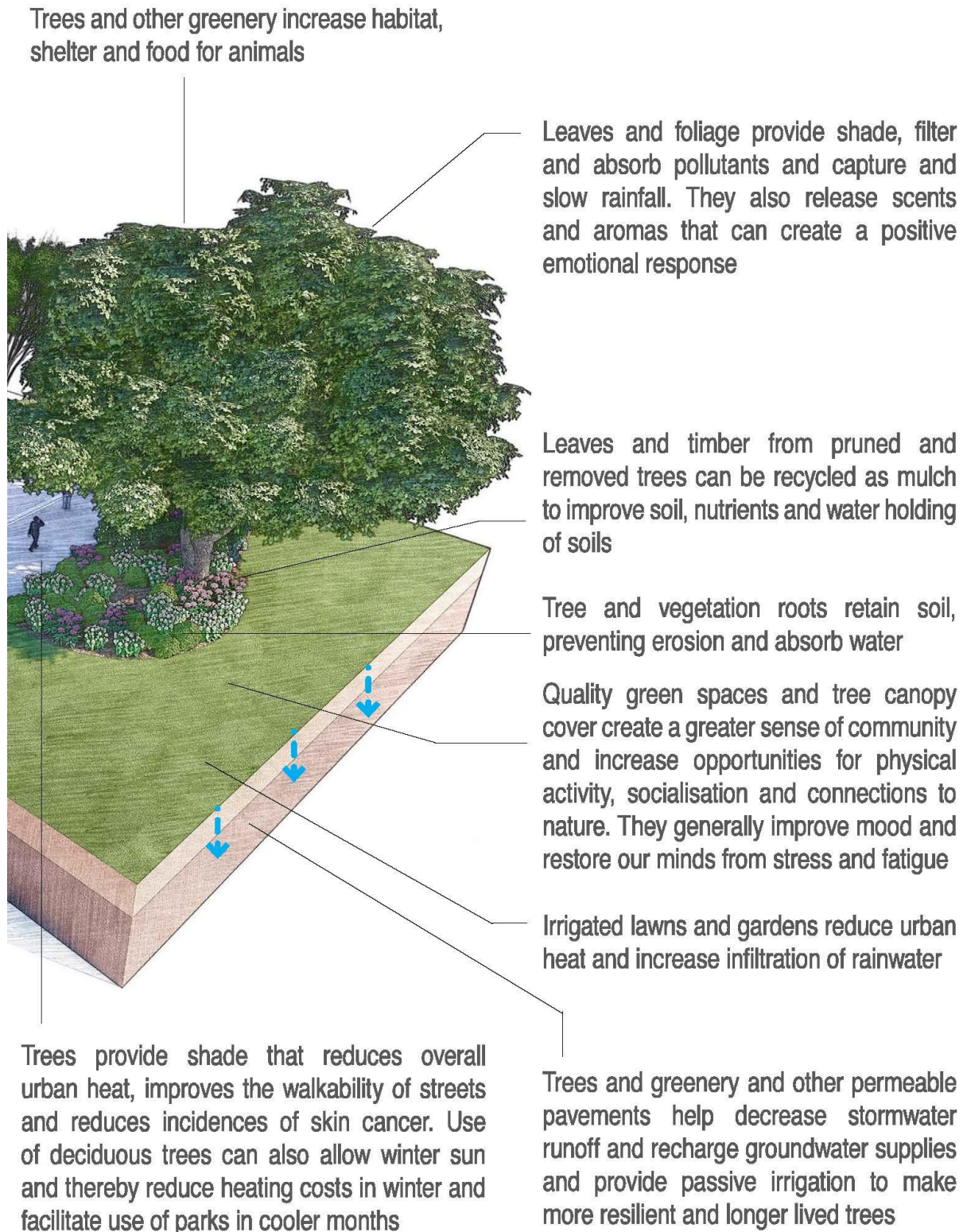
Views of trees and lower level greenery increases the value of residential and commercial property

Shading of road and other pavements increases their longevity and drastically reduces ambient heat buildup and radiation at night

Canopy coverage of at least 30% reduces mental health issues and leads to better perceptions of overall health. It also reduces employee sick leave, improves employee and student concentration



OF URBAN GREENING



Climate emergency

The United Nations describes climate change as the defining issue of our time. In June 2019, the City of Sydney declared that climate change poses a serious risk to the people of Sydney and should be treated as a national emergency.

The City's Climate Emergency Response is very clear on the impacts to the city and its community, and how the City will respond to this emergency.

Average global temperatures are approaching a 1.2°C increase above pre-industrial levels, with significant consequences and impacts.

Any rise above 2°C would have devastating impacts on Australia, including:

- more extreme weather events
- reduced rainfall
- longer, hotter and more frequent heatwaves
- water scarcity
- more extreme bushfires
- increased risks to food production
- reduced biodiversity
- inundation of coastal areas.

We are already seeing the effects of global heating.

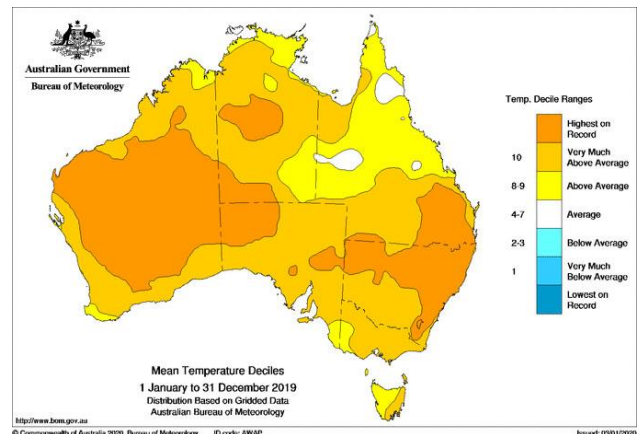
Australia's climate has warmed on average by 1.44 ± 0.24 °C since national records began in 1910. In 2019, Australia experienced its warmest year on record. It was also our driest year on record (1), and one of the worst bushfire seasons experienced.

We are experiencing the impacts of climate change in our urban areas.

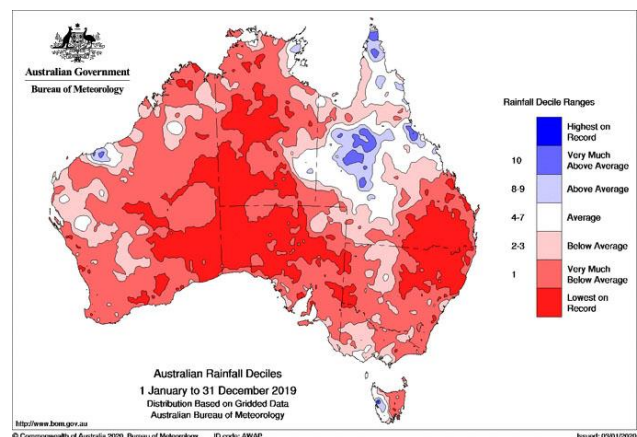
Heat records have continued to be broken, with Sydney reaching its highest ever recorded temperature, and Penrith reaching a staggering 48.9°C during the heatwave of 4 January 2020.

Sydney had many months with below-average rainfall, but also some wet months but still its annual total rainfall was in the driest 15 per cent of years.

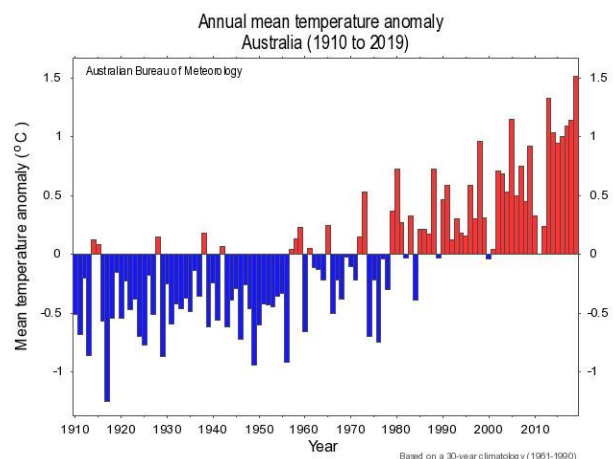
In NSW the Air Quality Index (AQI) reached the hazardous category (with an AQI greater than 200) on a total of 115 days (2).



Australian Mean Temperature Decile Map – 2019 [Source : Australian Bureau of Meteorology - 30/1/2020]



Australian Rainfall Decile Map – 2019 [Source : Australian Bureau of Meteorology - 30/1/2020]



Australian Mean Temperature Anomaly – 1910-2019 [Source: Australian Bureau of Meteorology - 30/1/2020]

1 Bureau of Meteorology: Annual climate statement 2019. bom.gov.au/climate/current/annual/aus/

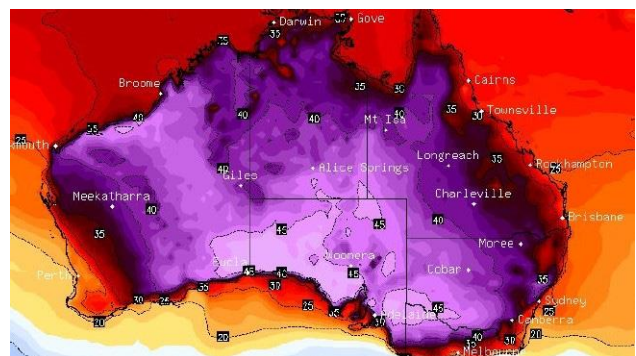
2 NSW Planning, Industry and Environment. environment.nsw.gov.au/topics/air/air-quality-statementp

In coming decades our city will see further:

- increases in sea and air temperatures, with many more hot days and marine heatwaves, and fewer cool extremes.
- sea level rises and ocean acidification.
- decreases in rainfall across southern Australia with more time in drought, but an increase in intense and heavy rainfall events throughout Australia.
- rainfall extremes that are becoming more intense. These short-duration rain extremes are often associated with flash flooding.
- temperature increases with the number of days over 35°C each year expected to rise from 4 days in 2015 to over 15 days by 2070.

Every year that passes without action will increase the scale and severity of the response Australia will need to undertake to mitigate the impacts of global heating.

Our city must adapt to the changing climate and increase its resilience to the likely impacts. There are opportunities to accelerate our action in the areas of canopy cover, greening and biodiversity, as these actions help us mitigate, and adapt, to the impacts of climate change.



Images from top: Sydney storm front, ABC,2018. Sydney smoky with poor air quality, BBC 2019, Centennial Park ponds dry, Cole Bennetts. Australian temperature map, 2019, news.com.

Urban heat mitigation

Heatwaves are Australia's deadliest natural hazard. They now arrive earlier, are hotter, and last longer. Urban temperature extremes can present us with life-or-death situations.

In Sydney, the heatwave of February 2011 resulted in 595 people needing treatment in hospital emergency departments, and it killed 96 people.

In 2009, the Black Saturday bushfires killed 173 people, but the heatwave at his time killed 374 people in Melbourne alone.

Urban areas create 'heat islands', as the built materials, such as buildings, roads, and footpaths, absorb heat during the day, and release it at night.

Urban heat mitigation through greening can significantly reduce human heat related morbidity and mortality.

Canopy trees facilitates the cooling of our homes and streets and parklands via evapotranspiration, shading and providing cooler surfaces to reduce mean radiant temperature. It can result in substantially decreased demand for energy due to reduced air conditioning use as well as lower water consumption. (Low Carbon Living, 2017)

Reducing paved surfaces also helps to reduce heat that is absorbed and radiated into the air. Extreme heat is moderated most effectively where there is more canopy cover and less hard paved surfaces.

Numerous research studies outline the benefits that trees and canopy cover provide, measured at the individual tree, street level and on a precinct scale.

Individual trees can make a valuable difference to air temperatures, by as much as 10°C.

Groups of trees that combine to provide greater than 40 per cent canopy cover at the scale of a city block have been found to reduce local ambient air temperature by more than 1.3°C (Ziter, C. et al 2019).

At the local scale, recent research from Western Sydney University found that temperatures at ground level could vary significantly. In some areas the difference was more than 10°C. The research compared two

streets located 1km apart that had the same microclimate and other site factors.

The key difference was the extent of canopy cover; one street had 30 per cent cover and the other 10 per cent. The street with the higher canopy cover was 10°C cooler.

At the precinct scale, 2017 Australian research found that "a lack of tree canopy correlates to higher intensity of the urban heat island effect in temperate climates. Urban trees provide local shade and evaporative cooling. Increased urban greenery reaching the ideal ratio of 30 per cent combined with water sensitive urban design can provide up to 2°C cooler urban climates compared to business as usual scenario and assist achieving cooler and healthier urban environments in the context of climate change."

When addressing the impacts of urban heat, research confirms we need canopy at both the local and precinct scale – ideally with a **minimum of 30 per cent canopy cover.**

Why is heat an issue for me?

Heat creates physical stressors on humans. You start by getting overly hot, sweaty and uncomfortable. As the temperature rises it starts to affect your concentration and decision-making. You might do things that are more dangerous.

At the threshold of 41 degrees Celsius, critical internal organs – the heart, liver, kidneys and so on – start to function more poorly. Once past that critical threshold, they can actually start to fail and death is more likely to occur.

Going about your daily activities, both at home and work, would become increasingly difficult and this would have a ripple effect across the economy. In addition, hospital admission rates already rise dramatically during heatwave events because heat exacerbates underlying health condition. Sick, young and older patients are particularly vulnerable. But as we move forward, that demographic could expand to include groups currently otherwise considered healthy – individuals from 15 to 55. So, heat and heatwaves increase the burden on the health system.

Prof Dominey-Howes, University of Sydney



Images from top, Aerial view and street views of St Johns Road Glebe, followed by Westmoreland Street Glebe, 25 January 2019 showing the temperature difference as a result of tree canopy.

Community health and wellbeing

There is growing realisation, backed by a rapidly increasing body of research, that green infrastructure also sustains and enhances our health and wellbeing. Compelling data proves connecting with nature for as little as a couple of hours provides a multitude of benefits.

There is no greater good that can be done for health promotion than the protection of greenery on which all humans depend. (Coutts, C. and Hahn M. 2015)

During the Covid-19 pandemic people flocked to nature to help them stay strong – physically and mentally. Access to quality green space is vital, and not just in times of emergencies.

Mental health and wellbeing

The World Health Organisation has called stress a health epidemic of the twenty first century. One in four people worldwide will suffer a significant mental health episode in their lives. Mental ill health and suicide are costing Australia up to \$180 billion a year (the Productivity Commission found in October 2019). Anxiety and depression are estimated to cost the European Union €170 billion a year and in the USA over \$210 billion.

Finding a way to manage this is critical to our health and wellbeing. Trees, nature and other greenery can help immensely.

Simply being in, nearby, or with a view of green spaces may help build mental health capacity, contribute to our ability to restore depleted cognitive capacities, enhance recovery from stress and increase our optimism. Exposure to nature, including sensory elements such as bird song, also has beneficial outcomes for our mental health.

A 2019 Australian study 'Association of Urban Green Space with Mental Health and General Health Among Adults in Australia' by Prof Astell-Burt and Dr Feng found that urban communities with a healthy amount of tree cover – not just grass and green space – were psychologically healthier than those that didn't.

In neighbourhoods with a tree canopy of 30 per cent or more, adults had lower odds of developing;

- psychological distress by 31 per cent
- diabetes by 31 per cent
- cardiovascular disease by 21 per cent
- cardio hypertension by 21 per cent
- rating their general health as fair or poor over six years by 33 per cent.

Urban green spaces with open grass rather than a tree canopy did not provide the same benefits.

This research, which focused on Sydney, Newcastle and Wollongong, helps provide a solid target to work towards to provide the community with tangible health outcomes.

Physical health

Greening also helps to address urban air quality. In most cities, the most damaging air pollutant is particulate matter. Fine particulate matter (less than 2.5 micrograms in diameter) can be deeply inhaled into the lungs and is estimated to cause 3.2 million deaths per year primarily from strokes and heart disease. It also contributes to chronic and acute respiratory diseases, including asthma. One study forecast that by 2050, fine particulate matter could kill 6.2 million people per year world-wide. (The Nature Conservancy, 2016).

It is estimated that air pollution from vehicle emissions causes 60 per cent more than the number of deaths from motor vehicle crashes in NSW (The Electric Vehicle Council and Asthma Australia report 2019). In addition to cars, cities are increasingly exposed to air pollution from distant bushfires as experienced by most Australian cities in the 2019/20 bushfire season.

Local trees will therefore play an important role in making our local air healthier, too. Dozens of studies now show that the tree leaves filter out particulate matter from the atmosphere, along with absorbing many other air pollutants.

Quality shade provision can also reduce exposure to damaging UV by up to 75 per cent. This can be provided by built structures or trees, but trees also produce numerous other benefits.

Greening also has massive benefits for our city's connectivity and walkability. Walking and cycling are important benchmarks for a liveable city. High levels of walking mean a city is safe, vibrant and easily accessible by everyone.

GREENING SYDNEY

Health Benefits

Compelling data now proves that connecting with nature for as little as a couple of hours can:

boost immune systems by increasing the count of the body's natural killer cells

increase anti cancer protein production

reduce blood pressure

improve cardiovascular and metabolic health

lower stress

improve concentration, memory and attentiveness

lift feelings of depression

improve pain thresholds

improve feelings of energy

lower blood sugar levels

help people lose weight

Biodiversity and habitat

Sydney's natural landscape has changed dramatically and is nearly unrecognisable from its state before colonisation more than two centuries ago.

Ecosystem health and biodiversity is important for a sustainable world. Protecting and improving urban biodiversity, while also reclaiming and managing functional ecosystem health and function in the city, can play a role in improving the health of its residents and the liveability of the city.

Biodiversity and habitat can be enhanced by providing environmental conditions and supporting functional ecosystems that will support a diversity of plant species and then in turn these plant communities may provide habitat for wildlife. (Rowe, B., 2019).

Australia's urban areas contain disproportionately more threatened species than non-urban areas. Recent research shows that 30 per cent of Australia's threatened species (370 species) come from within our cities and towns. This reinforces the significance of planning and managing our landscapes to conserve and enhance biodiversity.

We can learn from indigenous culture and "ways of viewing, interacting with and respecting nature". (Martin, C. 2019)

There is an opportunity to reimagine spaces to create steppingstones and biodiversity corridors for our urban wildlife. Even small patches of biodiverse nature can re-invite and support an incredibly diverse population of plant and animal species. From pocket parks, to backyards, to balcony gardens and to formal partnerships with larger landowners.

Creating and fostering a healthy and diverse nature is fundamental for our environment but also our own health and wellbeing. Creating this nature, an effort to rewild across public and private property will not only increase greenery in these spaces but will help boost efforts to reclaim ecosystem function and health, increase canopy cover and wildlife habitat.

The City understands and acknowledges how interrelated all the components of our natural and urban environment can be.

By increasing the greening in our city, implementing water sensitive designs and naturalising our storm water collection and storage we are also creating numerous opportunities for worthwhile and co-dependant habitat creation.

Ecological systems do not discern between public and private and no one government agency, private corporation or professional discipline can deal with this complexity. (Martin, C. 2019)

There are numerous threats to our biodiversity and our efforts in restoring nature in the city that is common to most urban areas, particularly inner-city locations, including

- limited habitat availability
- lack of habitat connectivity
- destruction and fragmentation of remaining habitat
- low genetic diversity
- weed invasion
- use of chemical herbicides and pesticides
- soil degradation
- introduced fauna, diseases and pathogens
- poor water quality and inappropriate hydrological regimes
- light, noise, traffic, and other disturbance, and
- climate change.



Bioblitz Sydney Park 2018

A zero carbon city

The NSW Government and the Greater Sydney Commission both aspire NSW and metropolitan Sydney to achieving net-zero emissions by 2050 and to help NSW become more resilient to a changing climate.

The City of Sydney target is for net zero emissions across the local government area by 2040.

Achieving a carbon neutral city largely relies on our government and community's adoption of renewable energy sources, changes in building design and construction, changes to transport infrastructure and fossil fuel use.

While it is essential we reduce emissions and build better buildings and deal with waste, it is also advantageous to capture and sequester the carbon already in the atmosphere. Studies have shown urban trees contribute to this process, and young and rapidly growing trees can capture carbon at higher rates than more mature and slower-growing counterparts. (Coutts, C. and Hahn M. 2015)

Greening initiatives, therefore, have a large role to play to helping our city achieve this aspirational outcome.

- Reduce energy consumption by shading buildings and streets.
- Reduce car and transport reliance by establishing and making active transport more desirable through 'Cool' and desirable streets and expanding our Liveable Green Networks.
- Green roofs can insulate buildings and lower ambient temperatures.
- Green roofs and other greening can drastically increase rooftop solar panel efficiency by lowering ambient temperatures.
- Plants take up and use carbon dioxide and trees can sequester carbon within their timber and roots.



Cool city streets, Arterra 2020.

Our city

THE CITY TODAY



Workers (2019)

637,651



Residential population

259,273



Dwellings (2019)

131,293

Densest local government
area in NSW

9212 persons/km²

6th largest

LGA in Sydney
Metropolitan area



Economic activity

\$130 billion



18.1%

Canopy cover (2019)

WE'VE CHANGED A LOT



30,000

homes built over
last 10 years

One of the fastest
growing LGAs in
Australia



67,000

more people over
last 10 year

Cost of new Green Square community facilities

\$450 million



30%

jobs growth over
last 10 years



2.6% increase

Canopy cover (2006-2019)

Office space down

20%

per worker (2007-2017)

MORE CHANGE TO COME



115,000

additional people
by 2036



New dwelling by 2036

56,000

1.7 million

people in the LGA each day

Most housing will be in high density apartments

80% by 2036

5+ new

Metro stations

200,000

more jobs
by 2036



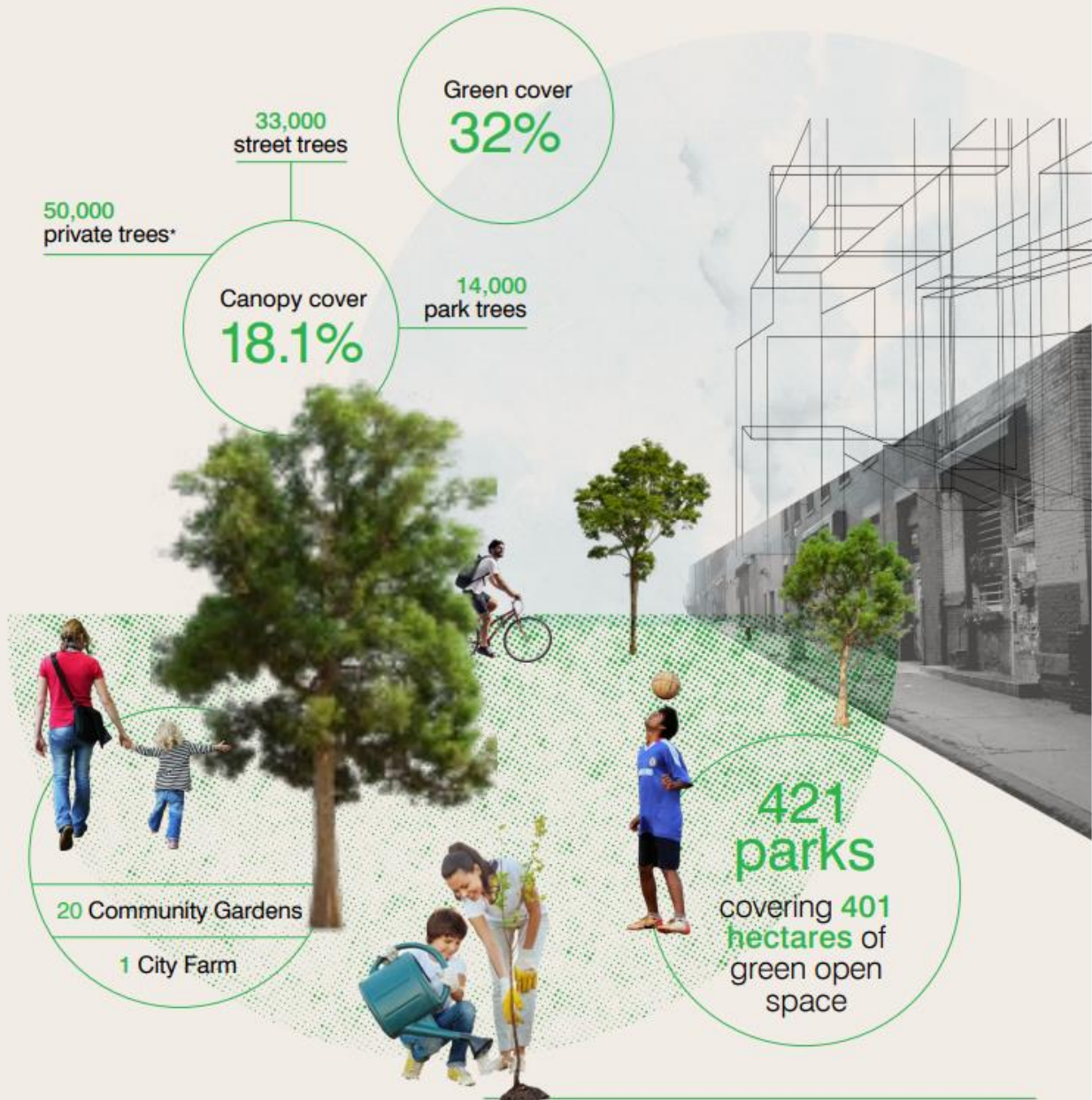
**Net zero
emissions**

City target by 2050

Greening in the city

GREENING SYDNEY

Greening in the City



There are also 2114 traffic bed gardens and 2853 streetscape gardens.

*(estimated)

Sustainable Sydney 2050

The City is reviewing Sustainable Sydney 2030, a set of goals we set our city to help make it as green, global and connected as possible by 2030.

We are creating a plan for our local area to 2050, with everyone who has an interest in our city.

You spoke and we listened. For Sustainable Sydney 2050, you want:

- A city for **people**
- A city that **moves**
- A city that is **environmentally responsive**
- A **lively, cultural and creative** city
- A city with a **future focussed economy**

From the community engagement undertaken for our Sydney 2050 plans we heard:

- People need a city that is **green with trees, plants, gardens and urban farming** has quality public spaces and different types of housing that is affordable.
- People need to be using public transport, **walking and bikes** to move around. They want a reduction of cars. They want streets and public spaces that are easily accessible to people.
- People overwhelmingly want a **response to climate change**. They want a city with sustainable use of resources. People want to see a reduction in emissions and changes to how we use our city to reduce our impact on the environment.

People surveyed for the City's community recovery plan have also identified lack of parks, trees, green and recreation spaces within their top ten concerns for the future.

"Sydney is a big city and so it needs to compensate for reduced air quality with more trees and parks, which are necessary for living a healthier and better life."

Spanish community session

77% of respondents want a green city with parks, trees and nature.

85% of respondents want buildings covered with plants and that incorporate nature into their design.

Our community have also acknowledged that the most vulnerable in our community can often bear an unequal share of the consequences of climate risks or the effects of our changed climate.

We are developing Sydney 2050 to meet these needs. 2050 sounds a long way off, and in many respects, it is. But when it comes to the work of transforming cities to perform in the face of mounting local and global challenges, the next 30 years will be critical.

Sydney 2050 will outline the need for a green and cool city. We will

- increase our **overall vegetation cover**, including all trees, shrubs and groundcovers
- increase our **tree canopy cover**
- put **blue and green infrastructure** at the heart of our city-making
- **connect** our green and blue infrastructure into a wider and valuable city-wide network
- live with and adapt to our **changing climate**
- provide greenery at **every doorstep**
- provide greenery in a **fair and equitable** way and prioritise the way we implement and expand our greening to assist those that are most vulnerable

"I want underground cars and green up top."

Primary school students survey

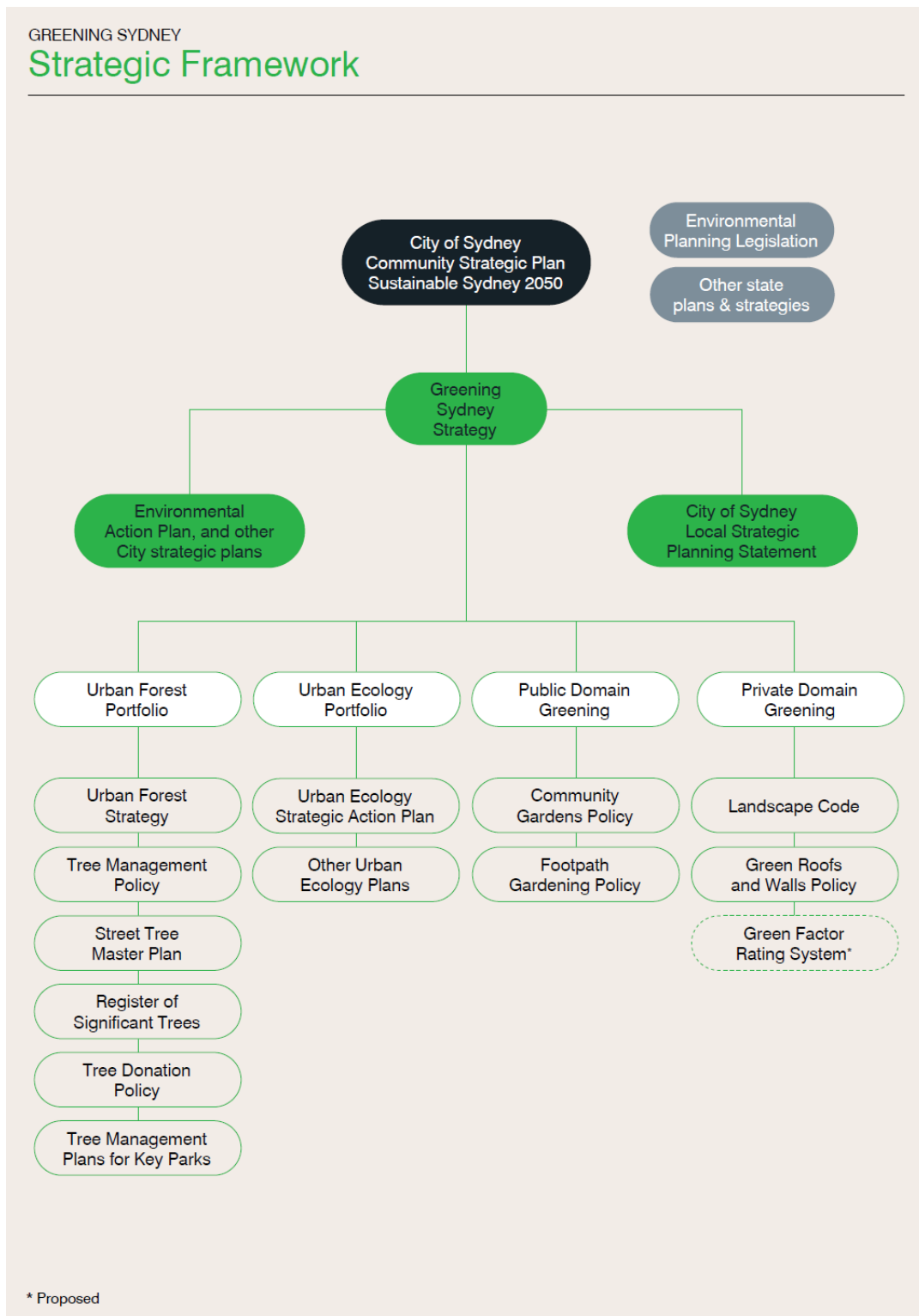
Policy context

We have a comprehensive suite of greening strategies, policies and plans across various portfolios to meet our greening aims and objectives.

This Greening Sydney Strategy will be a key document outlining Sydney's commitment to

becoming a green, cool and resilient city by 2050.

The commitment to green living must be implemented at both the city-wide scale and the micro scale of individual businesses and homes. It must involve the public domain, parks, streets and the privately managed domains of buildings, open spaces and gardens.



Our green achievements

The City has long valued the important environmental, social and economic benefits that greening and canopy cover provide our community.

We have been actively adapting to climate change. We have ensured our streets, parks and private open spaces have more greening, which is critical as our city's density increases.

In 2012, we developed our first Greening Sydney Plan, and we have many programs and measures to increase canopy cover, biodiversity and nature in our city, and to expand and improve our open spaces and streetscapes. Our key achievements since 2012 are the;

Development and implementation of our:

- urban forest strategy
- urban ecology strategic action plan
- green roof and walls policy
- landscape code
- streetscape gardening policy

Development and support of these programs:

- community gardens – established 20 gardens, two community footpath gardens and one community composting group.
- Sydney City Farm – established in Sydney Park. Volunteer sessions and education programs.
- bushcare groups – established five groups who play a vital role in restoring bushland areas.
- biodiversity engagement programs – participation in numerous programs such as BioBlitz, Birdlife Australia programs, Wildlife Watch etc.

And the following outcomes:

- increased canopy cover across the entire city, from the 2008 baseline of 15.5%, to 18.1% in 2019.
- planted 14,692 new street trees since 2005.
- increased our parks and open space network, with 17 new parks contributing an additional 21.9 hectares

- upgraded 52 parks.
- increased bush restoration sites by 300% from the baseline of 4.3ha, and planted thousands of native plants and increased habitat across the city.
- installed 78,219 square metres of landscaping throughout the city's streets
- installed 574,133 new shrubs and grasses installed in City parks and streets.
- continued the popular annual floral displays and hanging baskets in areas with limitations for permanent landscaping.
- installed 249 raingardens.
- facilitated volunteer and educational sessions at the City Farm with seasonal produce harvested donated to local charities.
- installed provision for future collection and distribution of recycled water within the George Street upgrade.
- installed green roof projects at Surry Hills Library, Prince Alfred Park Pool, and Beare Park amenities block. Currently the city has at least 155,319 square metres of green roofs and walls. 2019 saw an additional 4212 square metres provided on eight new properties.

We are one of only a handful of councils across all of Australia that has managed to increase its canopy over recent years. Most have a decline in measured canopy due to increased development pressure and tree removals.

The easiest opportunities for greening and tree planting have now largely been exhausted. To increase greening from now on needs a more focused, multi-disciplinary and entire council approach.

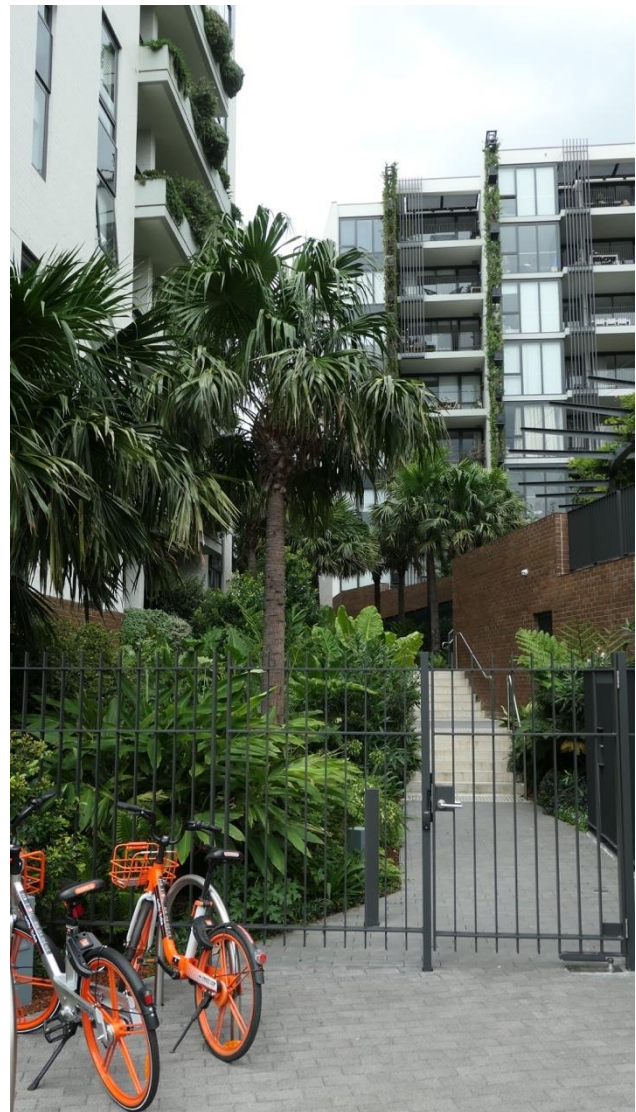
Challenges and opportunities

We must understand and address the key risks, challenges and opportunities to green infrastructure to provide this strategy and make our greening resilient.

The challenges and opportunities for our greening include:

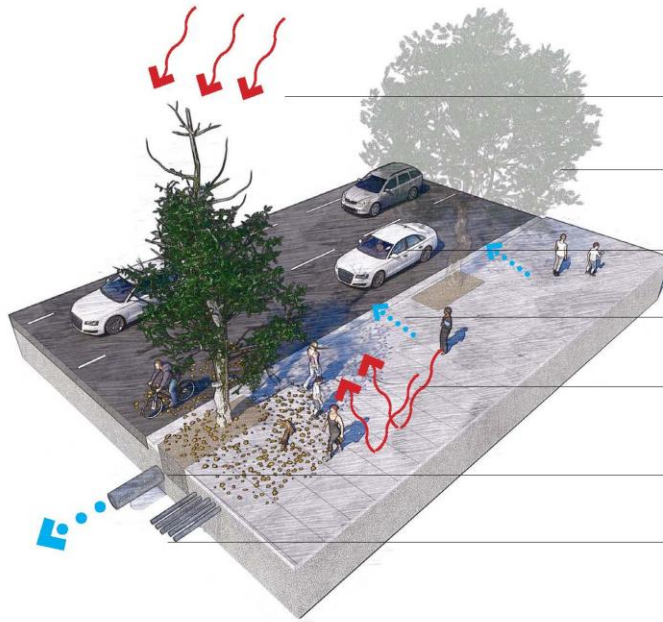
- water and the green-blue connection
- competition with other infrastructure and services and resulting lack of space for greening
- climate change and its impact on existing and proposed plant species
- pest and diseases
- maintenance and funding
- removing inter-governmental and other authority roadblocks and impediments to greening

Our plan to address these threats, to build a resilient and sustainable city, and meet our targets, is highlighted in the diagrams below.



Greener buildings, Harold Park 2020. Robert Smart.

KEY THREATS TO GREENING OUR CITY



Insufficient resources to maintain and increase urban green

Loss of habitat and connectivity

Impacts from climate change

Trees and vegetation subject to excessive and extreme heat leading to death or poor health

Loss of existing trees and vegetation due to infill and other development

Continued reliance on cars as it is too hot to walk or cycle

Water not collected for the benefit of greening and leading to flooding and erosion and downstream problems

Heat absorbed and radiated from exposed and dark pavements and buildings affecting vegetation and human health

Insufficient space and soil quantity and quality to sustain resilient trees and other vegetation

Competition for space where services, power lines and other elements are given priority over trees and other greening

IMPROVING OUR CITY'S RESILIENCE



Ensure community engagement and education

Undertake continuous monitoring, perform trials and consider new and worthy innovations

Strong habitat protection, with improved connectivity for a diverse range of wildlife

Strong tree management controls and enforcement. Largest trees possible used in all planting situations

Diversity of species, ages and sizes throughout the City with dependable, proven and hardy species capable of dealing with changing climate

More greenery at ground level and reductions in hard paved surfaces

Cool and shaded streets to improve human health and liveability, less reliance on cars

Increased use of light coloured pavement to reduce heat absorption

Greater use of permeable pavements to allow water infiltration

Soil volumes and conditions are well designed to sustain trees and vegetation for the long term

Water is recycled and used well for greening

Water – The blue green connection

Water and plants are natural partners. Many natural systems rely on the connection between plants and water. Plants require water for photosynthesis and growth, and without adequate water plants will die. Plants also contribute to the natural cycle of water through the landscape, as their roots absorb moisture from the soil and transpire it into the atmosphere. In doing so, they effect local humidity and temperature.

Challenges

City landscapes often disrupt the natural connections between water and plants. Conventional roads, roofs and other hard surfaces prevent rainwater soaking into the soil, and typical storm water pipes drain rainwater directly into the harbour before any plants can use it. However, it does not need to be this way. More sustainable designs and approaches are available to mimic and reconnect these natural systems in urban landscapes.

Water is a valuable resource in cities. Changes to our climate are likely to cause increasingly variable and unpredictable supplies of water as we experience droughts and floods. Securing a reliable supply of adequate water for parks and other greening is a challenge we must overcome.

The alignment of both our greening and water strategies and initiatives will be key in addressing this challenge and realising the benefits of a reconnected blue-green urban landscape.

Opportunities

Mutual benefits are gained from a more sustainable and integrated approach to water management. Recent stormwater studies conducted in Melbourne reveal that the integration of trees within rain gardens has the potential to markedly increase the evapotranspiration of water from the rain gardens and therefore further reduce the volume of stormwater runoff (Thom, Jasmine K. 2020).

Potential opportunities to enhance and reconnect our blue and green infrastructure exist at all scales, from large public

infrastructure projects to small private developments, and include:

- Diverting storm water from engineered piped solutions to deep soil, landscaped green areas and trees whenever possible;
- The use of permeable pavements and timber decks (where hard surfaces are necessary) to allow water to recharge ground water storage;
- The local collection and storage of storm water for reuse in efficient landscape irrigation;
- The local treatment of waste / grey water and distribution for use in private and public greening;
- Promoting the greening of previously hard surfaces, including available space within roadways and rooftops;
- The selection of plant species that suit the available water whilst maximising the benefits they provide.



Images from top: Green Square Water Treatment Plant 2018, Sydney Park water reuse wetlands 2015.

Competition for space

A significant impediment to urban greening is the lack of space and the conflict with services.

Cities are congested and contested places. They are always under pressure with competition for space above and below ground and subject to constant change and development.

By 2051, over 2 million people are expected within the city.

This Greening Sydney Strategy considers many competing functions and interests. Our buildings, houses, roads, services and open spaces need to co-exist and function together. We are also a very diverse community with many different views and aspirations as to how green Sydney should be.

Challenges

Our challenge is to give greening the priority it deserves while still accommodating all the other necessary city functions and services.

The key greening challenges are the;

- **Increasing population** placing additional pressure on the provision of transport infrastructure, parks and recreation facilities and providing enough space on our footpaths for a steadily increasing pedestrian load.
- **Reliance on vehicles** as the major means of accessing and servicing the city, dominating street use, and increasing backyards for off street parking. This limits greening and other use options.
- Desire to **maximise private land use** for financial or recreation pursuits, such as extensions, rear studios, off street parking, plunge pools, and ‘low maintenance’ lifestyles.
- **Overhead and underground services and other infrastructure** continue to affect existing vegetation, and limit options for future greening increases.
- Managing the **increased usage of parks** whilst balancing the wide range of park user

needs (from organised sport, passive play and contemplative spaces).

- Ensuring **safety, visibility and accessibility across the city** through sensitive and sympathetic green infrastructure design.
- Increasing **connectivity** is important for a healthy and resilient urban landscape, yet a continuous vegetated corridor requires numerous landowner’s commitment and investment.
- Increasing **nature in the city** and protecting wildlife with minimal human impact.

Opportunities

- Increase the priority that we give to our green infrastructure and particularly to tree planting.
- Encourage and demand that development provides appropriate and efficient ways to include greening and water sensitive urban design solutions into all developments while still providing the other functional needs.
- Investigate all available opportunities to achieve multiple and space efficient uses within our streets and other public areas, while facilitating greening through innovative design solutions.
- Consider and promote a future where there may be fewer cars, particularly within the city centre, and thereby accommodate additional spaces for tree planting and lower level greening.
- Integrate green infrastructure into all pedestrian, cycling and public transport solutions.
- Increase our collaboration with service authorities to minimise, relocate or remove impediments to effective and longer term greening.

Changing climate, and pests and disease

As Australia's climate changes over the next 50 to 100 years, the species of trees and plants used in our city today may not be suited to the range of conditions presented by the new climate.

Research has found that Sydney's climate would be more like Grafton by 2050.

Climate shift by 2050



Sydney currently has an average annual temperature of 22.7C, average summer of 26.7C, average winter of 18.1C.

Grafton's average annual temperature of 25.5C, average summer of 29.4C, average winter of 20.9C

Our average number of days above 35C goes from 4.9 currently to 10.9 days.

CSIRO Climate Analogue Explorer.
<https://www.climatechangeinaustralia.gov.au/en/climate-projections/climate-analogues/analogues-explorer/>

Some species are more vulnerable than others. It will also depend greatly on microclimatic influences and the amount of soil and water that is available to the plants.

For example, in Canberra, experts believe that around 27 per cent of tree species are becoming unsuitable for Canberra's new summer normal.

A nationwide study that examined 2.5 million Australian herbaria specimens found that 47 per cent of the country's native vegetation is

potentially at risk from rising temperatures by 2070. Gallagher et al. 2019.

As we implement our greening strategies we will continually monitor and update our underlying policies and plans to cater for updated information on different species. When we review our urban forestry policy, street tree master plan and urban ecology strategic action plan we will consider species selections that can survive potential heat waves and prolonged dry spells in the coming decades. Particular relevance will be placed on species with:

- proven heat resilience
- tolerance to droughts and prolonged dry periods
- contribution to urban cooling via its transpiration and shade provision
- tolerance to pollution
- the ability to trap air pollutants and minimised contribution to photochemical smog via its own emissions of volatile organic compounds.

As the species change, so too will the look, and in some cases feel, of our cultural landscapes. We will increase our stakeholder engagement relating to this change, as we transition from the landscapes we know and love, to new landscapes that will grow on us over time.

Which Plant Where

The City will use the latest research when selecting the species that will cope, and thrive, under the emerging conditions.

Which Plant Where is a five-year industry collaborate research project that will provide information on how species respond, adapt and survive heatwaves and drought events. Additionally, the project will provide information in regard to how different cooling benefits provided by the plant species influence insect biodiversity.

Some plants can cope with adverse weather conditions better than others. It is important to understand just how much heat and drought stress each of our existing and proposed species can tolerate.

This will be critical for a sustainable, robust and thriving green Sydney for future generations.

Land tenure and change

We have a wide and varied population of residents - living in apartments, terrace houses, small and large lot suburban housing. Each resident will have a different perspective and interaction with public and private trees and the wider urban forest. The community also includes business owners and employees who may visit and engage with the area and its vegetation every day. As such, our city encompasses many people with an extremely diverse range of interests and attitudes towards trees and vegetation.

2016 Australian Bureau Statistics census data found that 72% of all households within the City of Sydney moved from their previous location to another location within only 5 years (between 2011 and 2016).

Further extrapolating this information, nearly all residents will only occupy their houses for a maximum of 10-15 years before moving on.

In contrast the trees selected for our streets, parks and even private properties may occupy their sites for between 50 to 150 years, or even longer.

This illustrates that our trees must be increasingly viewed as longer term assets that will outlive numerous owners of the same property. We should merely consider ourselves as temporary custodians of the landscapes that we occupy.

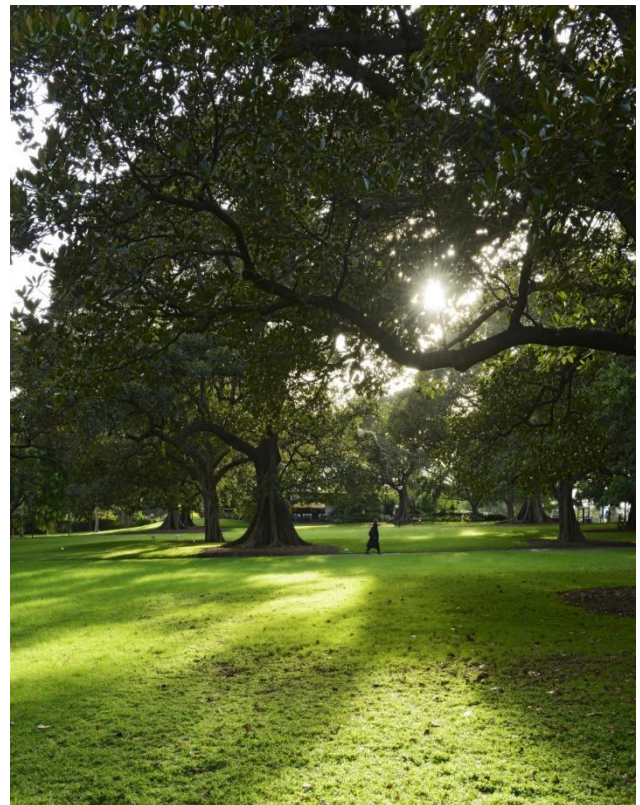
Likewise, landscapes and tree planting are often a product of short term 'fashion' and current societal objectives that can easily change over time. What we do now may not reflect what we did in the past, and likewise in the future we may do things differently.

Consider, for instance, 20 years ago solar panels on private dwellings were a rarity. Today it's common place and even expected that most new houses will include solar panels. Likewise, in another 20-30 years, green roofs and private yards dominated by large trees may be the norm rather than a rarity.

Therefore, if we currently have a large tree, let us consider its overall life span and its contribution to the wider urban forest and community, ahead of shorter term or personal outcomes.

Trees can last for well over 100 years, yet most people occupy their houses for less than 10 years. We must consider ourselves as custodians rather than masters, and nurture and improve our greenery for the benefit of following generations.

We need to consider ourselves merely as custodians of the surroundings under our control. Rather than looking for reasons to remove trees and other nature from within our city, we should instead try to maintain it past our own short tenure and secure a better future for our children and their children beyond them.



The Domain, 2013, Adam Hollingworth

Management and funding

Green infrastructure can provide incredible returns on investment as well as many other far less tangible benefits. We need to commit to the ongoing management and funding of our greening, just as we do with any other asset.

We recognise that there will be different levels of investment required. Numerous small-scale initiatives and simple changes can be just as important as larger capital projects. Greening Sydney needs to be multi-faceted, both micro and macro scales and both public and private.

Challenges

Maintaining and increasing greening requires expenditure by Council and the private sector to provide the greening targets that are both essential for, and desired by, the community.

Perceptions and attitudes may also need adjustment. Greening is an essential service and can no longer be viewed as a 'nice to have' or solely as an amenity product.

The funding and maintenance of greening can be susceptible to various external shocks and crisis. These can be natural factors, such as extreme weather events, or unexpected global incidents resulting in financial market volatility, affecting the efforts to fund greening initiatives.

This Greening Sydney Strategy is an important component of responding to such shocks. A resilient and healthy society is better placed to deal with such stresses. A resilient, green and healthy city is at the core of our greening policies.

Opportunities

The opportunities available include to;

- Strengthen our acknowledgment that greening is an essential asset that supplies numerous public benefits.
- Communicate to stakeholders how they benefit from the City's initiatives and that it is equitable that in some instances they share the costs.
- Where reasonable and effective to do so, partner with and assist property owners where it can have a demonstrated benefit to the City's greening and community outcomes.

- Work proactively with other stakeholders to find opportunities and streamlined ways to provide greening initiatives, and to access funding from other private and public sources to support the City's greening outcomes.

Investments made in trees has a definite return on investment, with one study finding that every dollar invested in planting, cities can see an average US\$2.25 return on that investment each and every year. (Dr David Nowak)

Collaboration with government and other agency stakeholders

There is a ground-swell of support for urban greening and we aim to be at the forefront of this movement. Substantial opportunities now exist with this growing recognition and we must capitalise and act.

Importantly, we cannot green Sydney alone.

There are many stakeholders who benefit from our greening. There are also many stakeholders that have an impact on our current green assets, and our ability to increase greening across the city.

We are actively listening to and engaging with our community and higher level agencies, governments and other key stakeholders such as the NSW Government, Greater Sydney Commission, NSW Government Architect, adjoining local government authorities and Resilient Sydney.

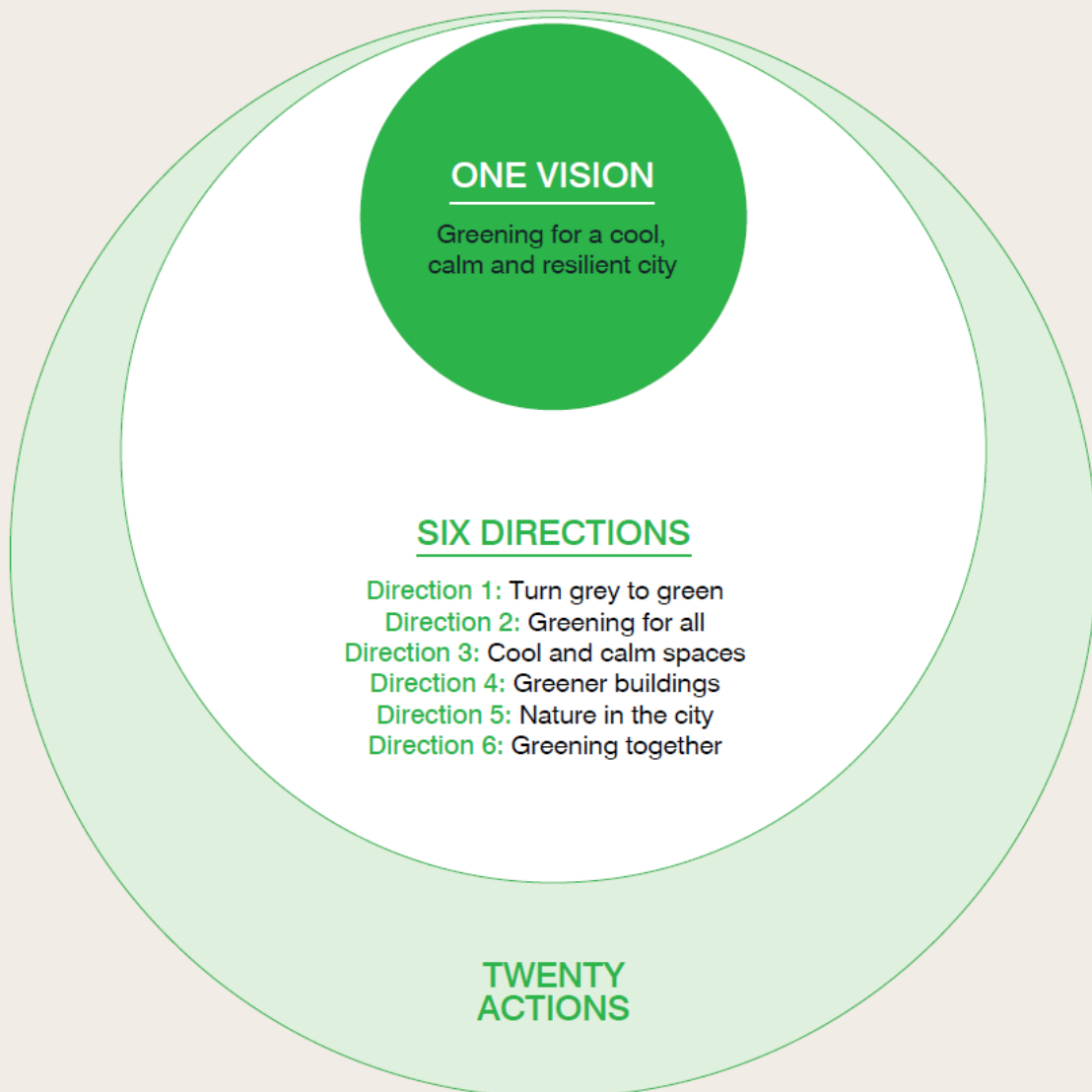
We will work with all stakeholders to ensure they are aware of the greening benefits they receive, and to also ensure they are aware of their impact to greening.

It is vital that every stakeholder understands their impact so that they can make informed decisions and be accountable for their policies and action impact on a greener Sydney.

Our greening strategy

GREENING SYDNEY

Strategy Structure



Direction 1 – Turn grey to green

Our green targets

To meet all the future challenges we face, we need to set and achieve ambitious greening and canopy cover targets.

The research indicates we ideally need to provide 30-40 percent canopy cover for heat, and 30 per cent canopy cover for community health.

We also need to consider the city's context and capacity to meet these research guides.

To develop our targets, significant detailed analysis was undertaken of the extent of existing greening and the capacity to provide increased greening across the city. This included all of our streets, parks and our largest land use – property.

Our target is to increase our overall green cover to 40 per cent across the local area, including a minimum of 27 per cent tree canopy by 2050.

Two targets – green and canopy cover

The two principal and inter-related targets have been developed to ensure that all our greening efforts are measured, valued, protected and enhanced. The first being the overall greening cover and the second being the canopy over. Both are equally important.

Green cover target – based on all trees, plants, ground covers and turf located throughout the local government area.

Canopy cover target – based solely on trees over 3 metres in height. As trees provide exponentially more benefit than other plants, we need to ensure they are prioritised ahead of other greenery.

How we developed the targets

Detailed analysis and careful consideration have been given to the various types of streets, parks and property. The attributes of each area were measured and assessed, using precise data from the City's corporate systems. Attachment 2 has a more detail on the methodology.

We have undertaken extensive analysis and modelling to:

- determine the current extent of greening and canopy across streets, parks and property
- determine the current and future capacity available for further greening and canopy (based on public and private space configurations)
- confirm and commit to our greening targets for 2050.

Action 1 – Achieve the green and canopy cover targets

The green and canopy cover targets recognise the important benefits the physical greenery in our streets, parks and property provides.

As trees provide exponentially more benefits than other types of greening, the City has a specific target for canopy cover.

The community's need for an increase in greening, especially on buildings and as part of development, is measured through this target.

The minimum overall green target for the city is 40 per cent, including an overall canopy target of 27 per cent.

This is based on the provision of greening and canopy cover being shared between all our streets, our parks and all property.

To achieve the target, we will ensure that across their portfolio:

- streets provide 39 per cent green cover with a minimum 34 per cent canopy cover
- parks provide 86 per cent green cover with a minimum of 46 per cent canopy cover
- property areas provide 28 per cent green cover with a minimum of 20 per cent canopy cover.

Importantly, each portfolio needs to provide their share, as there is limited capacity for others to make up any difference. It is vital that all everyone works together to provide the targets.

The City will develop policies, programs and projects to help all parties to achieve the targets in each portfolio, including in;

- **Streets** by increasing the number and type of street gardens and inroad plantings, and planting more street trees, including a comprehensive review to ensure the largest tree species appropriate for the space is planted.
- **Parks** by planting more trees in parks, to meet the individual parks capacity for canopy trees, and through minimising hard surfaces in the parks, where appropriate to do so.

- **Property** through developing planning tools and programs like the green space factor and greening Sydney fund. This will assist the increasing of canopy, greening, trees in deep soil and the number of green roofs, walls and façades, and ensuring every development application provides its minimal greening target.

We will also work with other authorities and agencies, such as Ausgrid and Transport for NSW, to ensure they understand their impact, make informed decisions and are accountable for their actions on greening Sydney.

The City will review the targets as new research becomes available, technology (especially for the aerial canopy / greening measurement) improves and as the city develops and changes over time.

Figure 1. Green cover targets

Property Type	Existing Green Cover 2019	Proposed Green Cover 2050
Streets	33%	39%
Parks	80%	86%
Property	20%	28%
TOTAL	32%	40%

Figure 2. Canopy cover targets

Property Type	Existing Canopy Cover 2019	Proposed Canopy Cover 2050
Streets	25%	34%
Parks	31%	46%
Property	12%	20%
TOTAL	18%	27%

WHERE WE
ARE NOW
2020



Greening and canopy is measured by looking down from above. Shrubs and lawns under canopy is not counted only the canopy above is measured



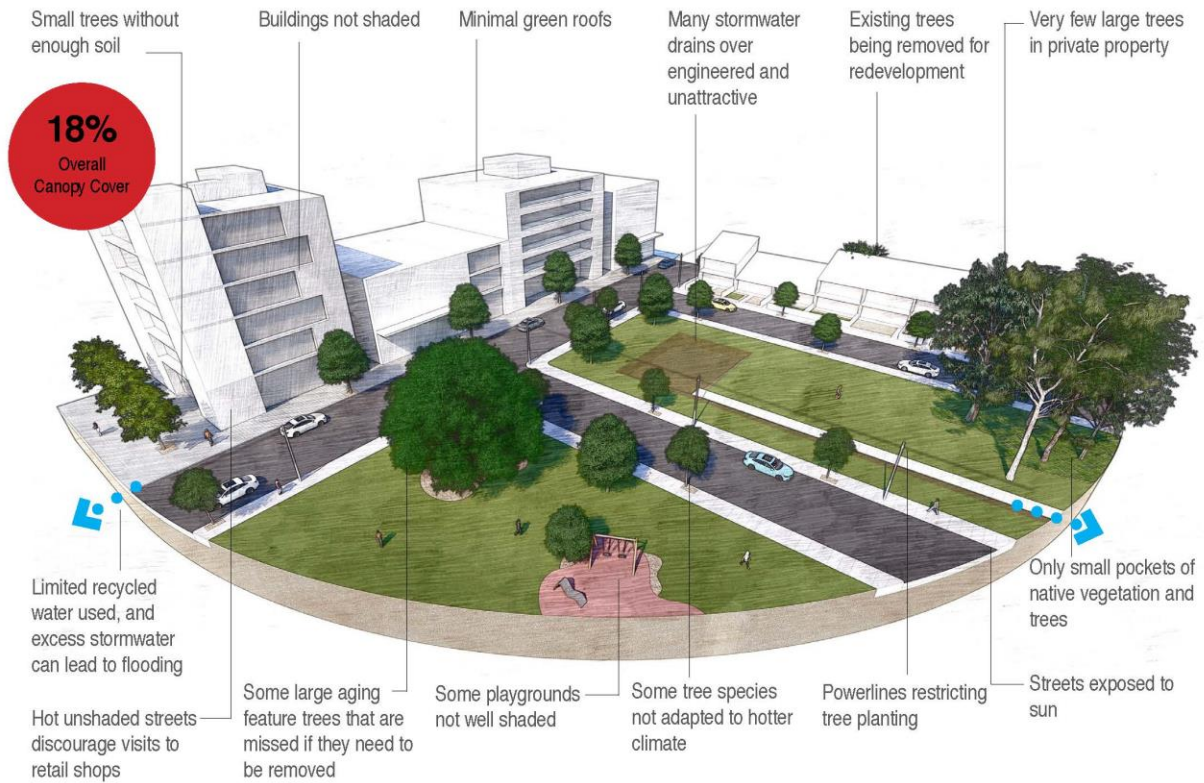
WHERE WE
NEED TO BE
2050



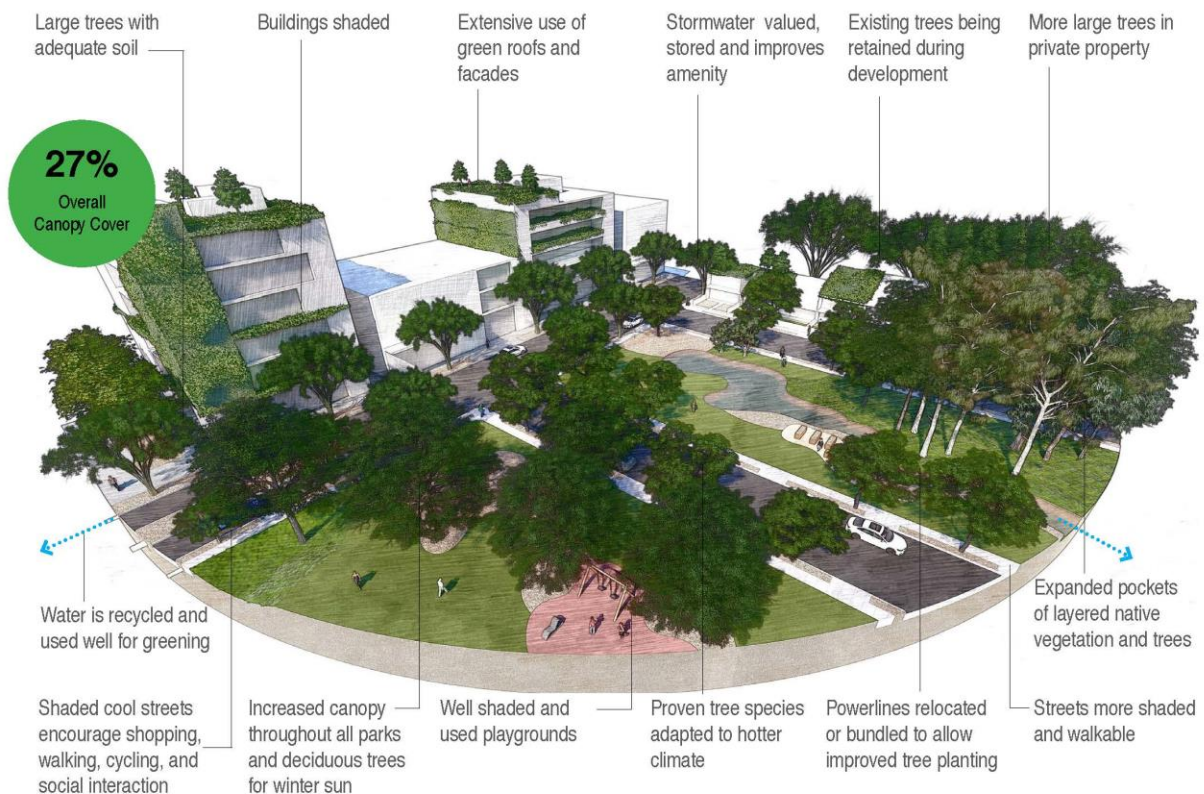
Green roof and additional shrub and ground covers, when not under tree canopy will expand our overall greening

Greening and canopy is measured by looking down from above. Shrubs and lawns under canopy is not counted only the canopy above is measured

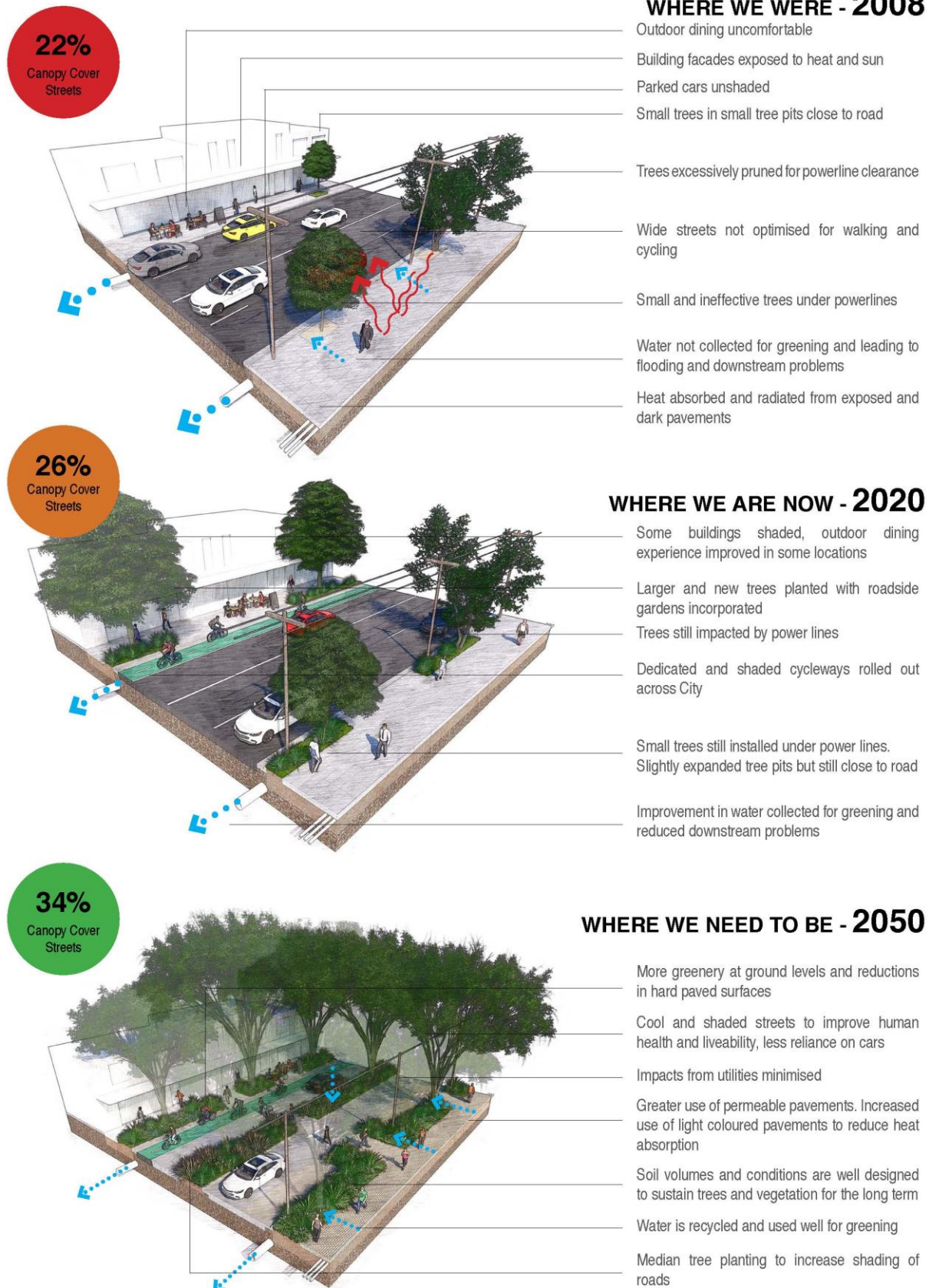
WHERE ARE WE NOW - 2020



WHERE WE NEED TO BE - 2050



PUBLIC DOMAIN - STREETS



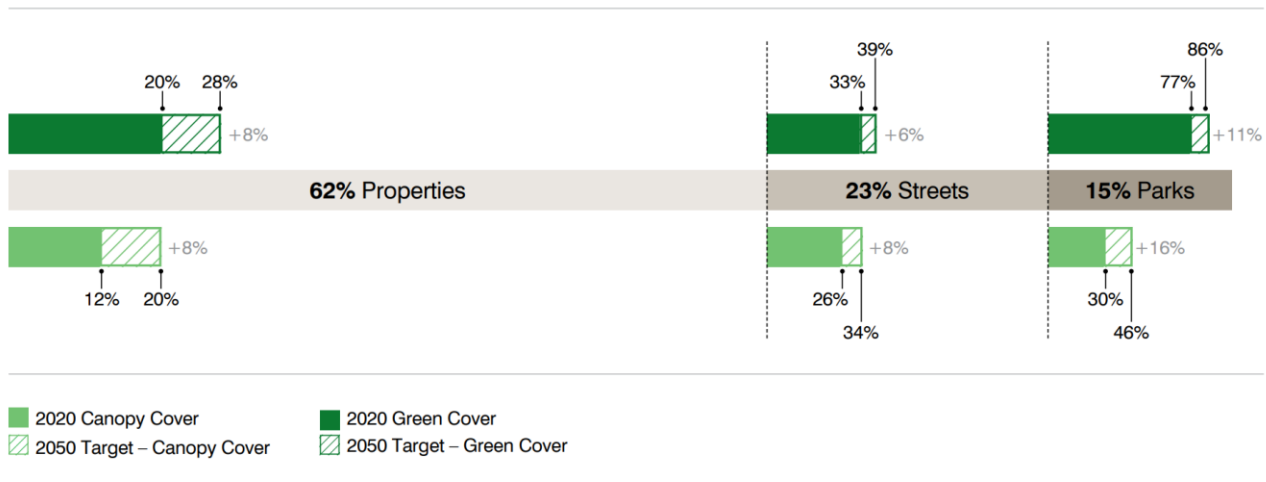


Figure 3 - Land use relative to existing cover and future targets for greening and canopy cover.

Action 2 – Green our laneways

Across the city, there is 383,000m² (38.3 hectares) of narrow streets classified as laneways. That is a considerable amount of space, and community owned land, that could be harnessed for greening.

Laneways are often under used and unappreciated. Often they are only infrequently used by very local traffic to access off-street parking, or by waste management teams for waste collection.

Where other space is so contested, it is considered appropriate that these underused spaces are looked at in more detail and better designed to become a valued green network, for the entire community.

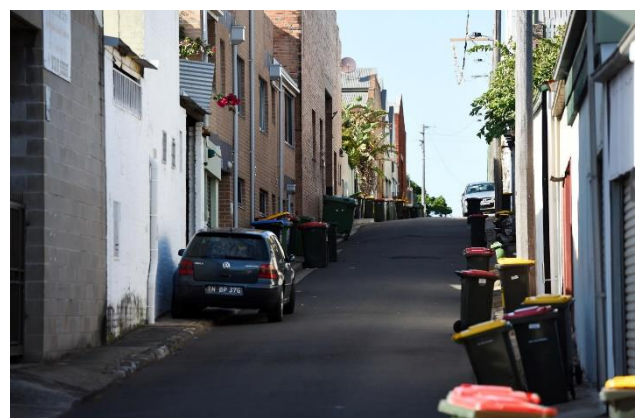
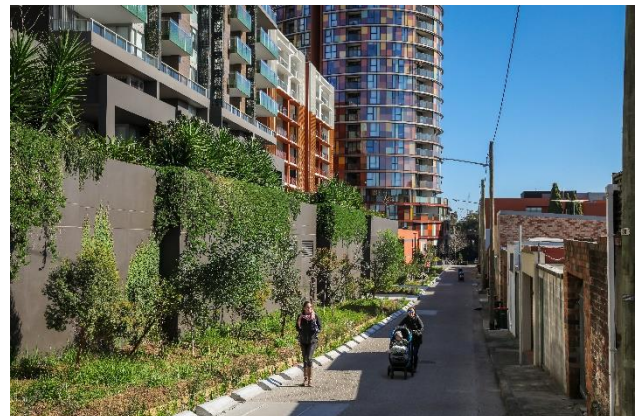
Opportunities to increase laneway greening, however, is limited by their size, which is generally only sufficient widths for passenger and service vehicles.

Transforming laneways into greener shared spaces can be achieved as we transition to a more sustainable city, with fewer private cars and more innovative design solutions for other constraints such as waste collection.

Laneways in Green Square and Alexandria, 2020 City of Sydney.

To realise this vision, we will:

- review the various design and usage issues to identify laneway greening projects or programs that are most easily provided.
- review the impacts and the need for new development and site usage that requires private vehicle use of laneways.
- collaborate with waste management experts to identify opportunities for innovative waste storage and collection systems, to reduce service vehicle usage of laneways.



Action 3 – Harness innovation, technology and inspiration

The increasing momentum in the green infrastructure market continues to drive cities to implement green policies, which in turn help stimulate innovation and job growth in the green building sectors.

Research on the benefits of greening has exponentially increased. This research guides improved policy development, which helps drive innovation, and innovation can drive economic development and environmental outcomes.

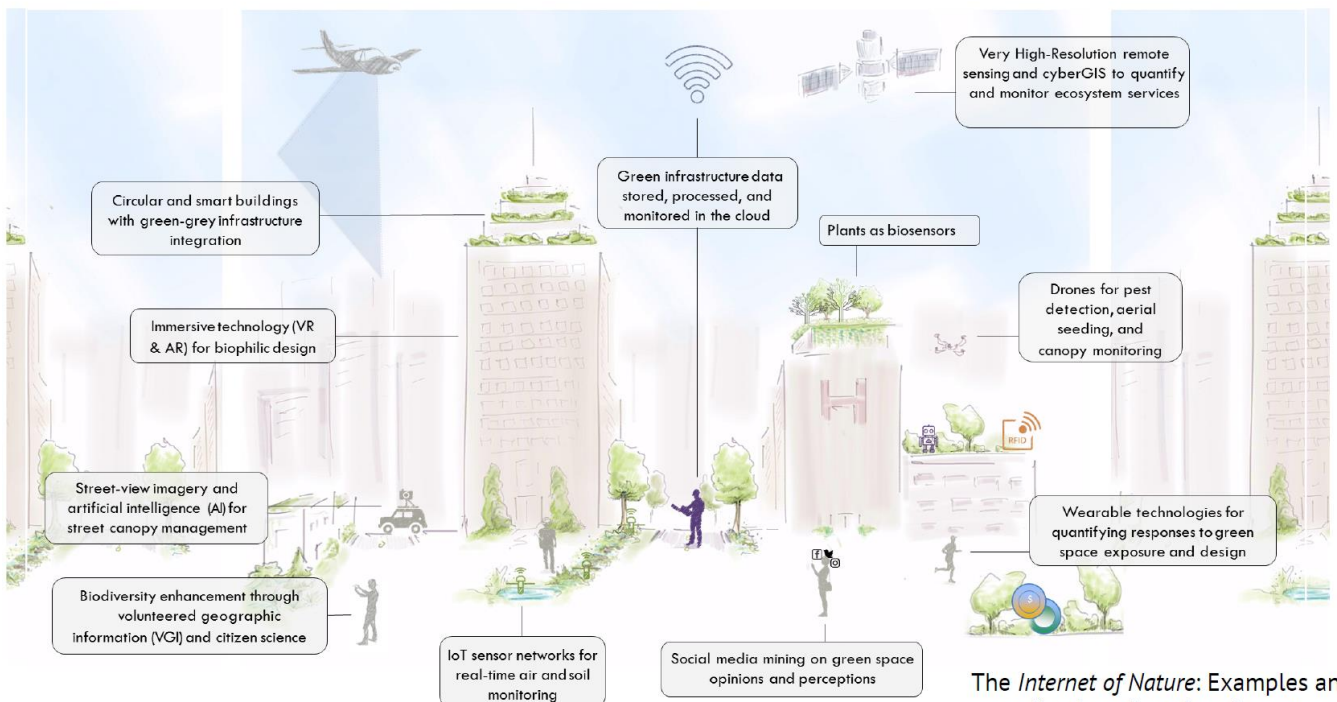
The City understands the various roles it plays within this process. We use the latest research to inform the policy and strategic levers for city governance. Further, we encourage and support continuous improvement and innovation, including through leading by example for our own projects, operations and services.

One of the City's key advantages is our extensive asset and operational data. We are also planning for digital transformation, as 5G

and new technology becomes available. This will be a key focus area over the next decade.

To transition our greening, we will

- share insights from our data analysis and visualisations with relevant stakeholders.
- encourage, and where appropriate support, new business models and products that will assist us achieve a greener Sydney.
- investigate innovative solutions for addressing key challenges, such as
 - Reducing heat through movable planters, misters and vines where canopy trees cannot be installed.
 - Increasing green moments through pop-up parks and green spaces where permanent greening is not achievable.
- continue to review the opportunities for improved management of our green and blue assets through technology improvements.



The *Internet of Nature*: Examples and applications for urban forestry and green infrastructure management.
From [The Internet of Nature](#).

Direction 2 – Greening for all

A just and fair city

The City needs to provide sufficient and quality greening across our streets, park and other council land under our control.

It is also imperative that the community has equitable access to the greening benefits.

Trees and plants help cool the city, create more liveable places, support our well-being and support urban biodiversity. Improved mechanisms to equitably green the city will be needed.

In a just and fair city, we need to ensure

- All of the community contributes and has access to the benefits of trees, canopy cover, greenery and open spaces.
- All land use types (streets, parks and properties) to contribute to achieve the precinct and city wide cover.

Greening must not be concentrated in specific areas. We must remember that residents in Rosebery will require as much canopy cover as residents in Potts Point.

With the expected increase in the number of hot days, one group of residents should not experience temperatures 10°C hotter than other groups due to tree and green cover not being prioritised for our most vulnerable and impacted areas.

It is not all just about quantity of greening. Access to quality green space is also important. Well designed and maintained green spaces and assets provide our community a tool for maintaining their health and wellbeing. Quality green spaces enhance our sense of place and belonging, and demonstrates our recognition and care for the natural world.

Action 4 – Distribute greening equitably

It is vital that we distribute greening fairly across the local government area so that everyone shares the benefits provided by greening.

Research outlines 30 per cent canopy cover, within an area of around 1.6 kilometres, provides key heat and health benefits.

Analysis of each individual site (street, park and property) has been undertaken to confirm the extent of greening and canopy cover distribution across the city.

As shown on both images below, an increase is required across most of the city, especially in the southern suburbs of Alexandria, St Peters, and Rosebery, and the northern suburb of Pyrmont.

To ensure greening is shared and each community member has access, we will;

- Make informed and data driven decisions regarding greening in our future projects and developments, including through the comparison of the individual site extent of greening provided against its greening / canopy cover capacity.
- Regularly review and update the data to ensure we respond to the latest site conditions or research available.
- Make the information accessible, where appropriate, to assist stakeholders to engage and provide equitable greening.

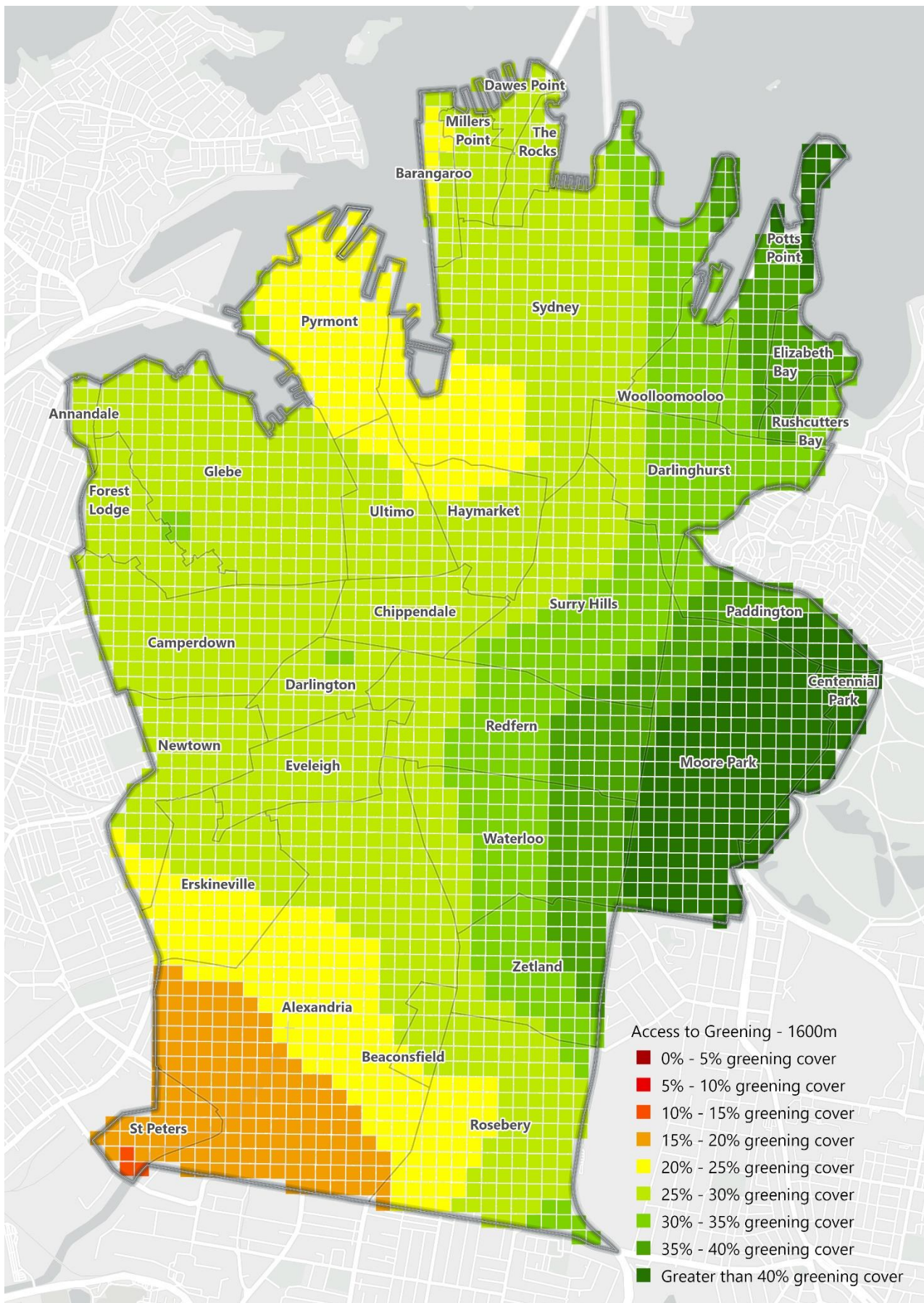


Figure 4 – The community's current access to **greening** across the local government area. Each coloured point measures the amount of greening, in streets, parks and private land, within a 1.6 kilometre radius of that point (including surrounding council areas).

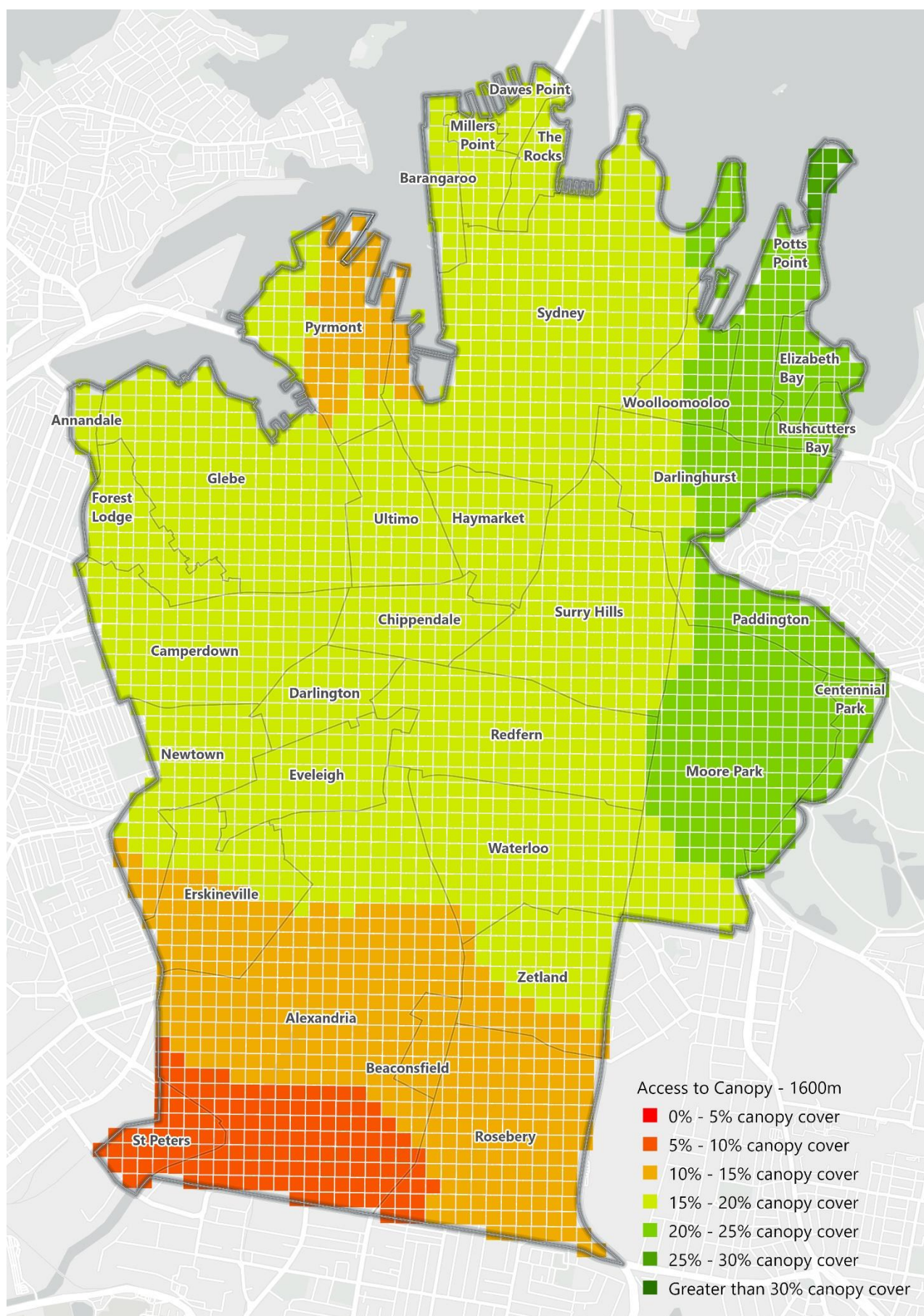
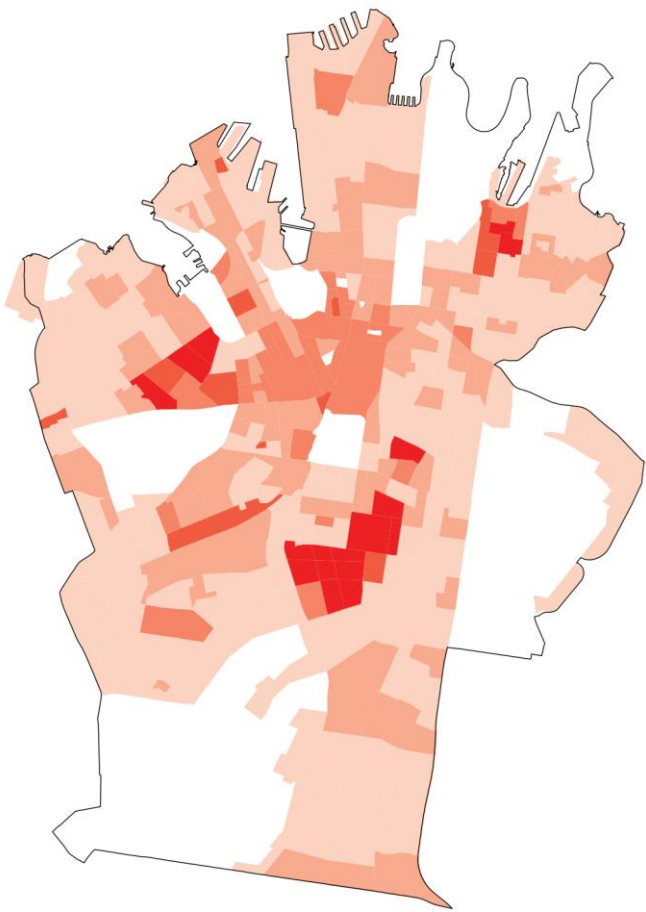


Figure 5 – The community's current access to **canopy cover** across the local government area. Each coloured point measures the amount of canopy, in streets, parks and private land, within a 1.6 kilometre radius of that point (including surrounding council areas).



Vulnerability to heatwaves at 2016

Least vulnerable
↓
Most vulnerable

Source: Australian Bureau of Statistics (ABS)

Figure 6 – The community’s vulnerability to heatwaves.

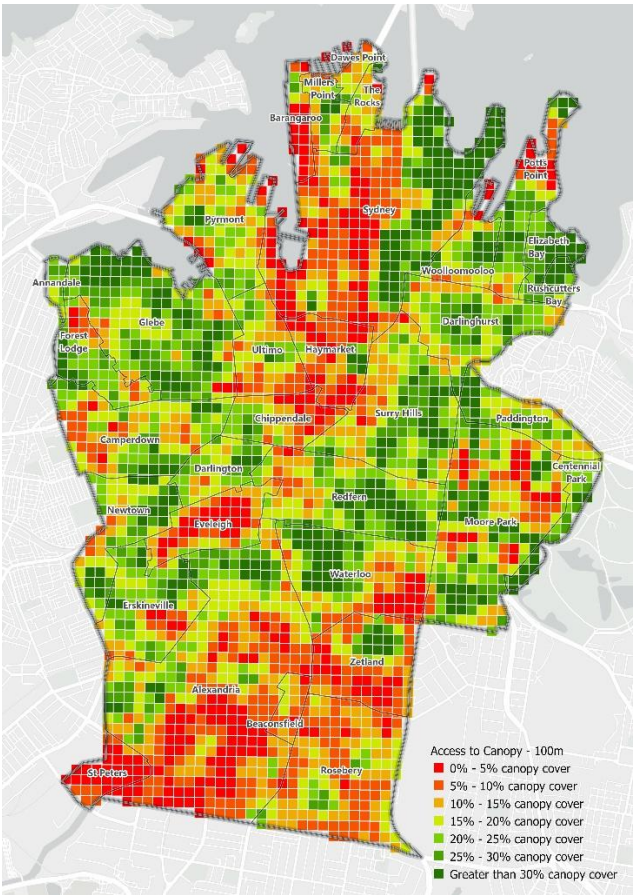


Figure 7 – the community’s current access to **canopy cover** across the local government area. Each coloured point measures the amount of canopy, in streets, parks and private land, within 100 metre radius of that point (including surrounding council areas).

Action 5 – Provide fair access to quality green spaces

The City's green spaces need to accommodate for a wide range of uses to meet our diverse community's needs.

Our green space network, consisting of over 420 parks, caters for active sports, passive play and contemplative places, for people and their companion animals, and for wildlife.

With competition for space so high, and our population increasing, the City needs to balance the competing uses and desires.

In some instances, this will require a considerable change in materials. For example, to meet the demand for sport fields, synthetic sportsfield will be used in some parks to provide equitable access for the number of people, the various sporting groups, and the different sport types (e.g. AFL, Hockey, soccer etc.).

To achieve equitable access to greening, we will;

- Develop a Parks Design Code to ensure consistent robust designs and application of materials are used across the parks network.
- Continue to look for opportunities to adapt the green space network, where appropriate, to cater for community needs.
- Continue to implement the standardised maintenance service levels throughout the city – to ensure park types are maintained to the same levels across the entire local government area.
- Make informed and data driven decisions regarding our parks and open spaces, and make the information accessible, where appropriate, to communicate issues to stakeholders.

Action 6 – Adapt for climate

Greening for all includes providing for future generations. We have been fortunate. We inherited many beautifully established parks, with significant trees that are more than a hundred and fifty years old.

It is important that we provide such mature, thriving and healthy landscapes to future generations.

To do so requires us to understand the impacts of climate change on our existing plant species and green spaces. We now have to design green spaces and plant new species that will thrive under the changed climate conditions.

Importantly, we will need to communicate these changes well, as we prepare for our much loved landscapes to change overtime.

To provide greening for future generations and climate adaptation, we will:

- Review the existing tree and plant species used across our public spaces, and plant appropriate species to suit changing environmental conditions.
- Keep up to date with the latest climate science, and available research on species adaptability / tolerance for Sydney's future climate conditions.
- Continually monitor and update our underlying policies and plans to cater for updated information on different species.
- Ensure new landscapes are designed to be adaptable, resilient spaces that accommodate people and environmental requirements.
- Manage the change in our cultural landscapes over time, with comprehensive community engagement, ensuring future generations inherit healthy, mature parks and trees.

Action 7 – Grow food locally

Access to fruit and vegetables is a critical ingredient for our mental and physical health. Food insecurity is also increasing. There are many reasons to increase the food we grow locally.

For many people, growing food restores a connection to nature, and the ability to nurture themselves, their friends and family through food. There is much joy in watching fruit and vegetables grow, the anticipation and patience waiting for the right time to harvest a crop, and then sharing recipes and produce with friends, family and even the wider community.

Unfortunately, an increasing number of people struggle to afford fresh food. Access to locally grown food from friends, neighbours or through community gardens, increases the opportunities for those who need it most.

We will continue to support the community to grow more food locally through;

- Our Sydney City Farm programs and community garden network.
- Encouraging proposals that support increased food production on private land. This includes the potential for dedicated large green roofs for food production.
- Encouraging innovative solutions for urban food production, including integrated community, food and gardening spaces.



Images above: Yerrabingin Rooftop Farm, A world-first Indigenous rooftop farm in the heart of Sydney. The farm grows over 2,000 edible, medicinal or cultural plants, using the principles of Indigenous knowledge and permaculture. Credit Destination NSW and Mirvac

Direction 3 – Cool and calm spaces

Two key issues facing most of the city's residents relate to high urban heat and impacts to physical and mental health.

Heatwaves are Australia's deadliest natural hazard. They now arrive earlier, are hotter, and last longer.

As outlined earlier, research indicates that we ideally need a minimum of 30 per cent canopy cover. This canopy cover can reduce temperatures at ground level by more than 10°C.

During the COVID 19 pandemic, people flocked to nature to help them stay strong – physically and mentally. Access to quality green space is vital, and not just in times of emergencies. We all need to make sure green space is not taken for granted.

“In times of crisis, the natural world is a source of both joy and solace. The natural world produces comfort that can come from nothing else”.

David Attenborough

Trees and plants are nature's air conditioners.

The natural process of photosynthesis requires that trees and plants use energy and transpire. This transpiration is what cools the air around the green spaces and reduces ambient temperatures.

Greening also facilitates the cooling of our homes, streets and parklands by shading and providing cooler surfaces to reduce mean radiant temperature.

Trees improve our health

Professor Astell-Burt and Professor Feng found that the residents of neighbourhoods with a higher amount of tree canopy had better mental and general health, but didn't find the same correlation when the type of green space was open, grassed areas.

They advise the shapes, colours, smells and sounds of rustling leaves also provide a natural distraction from our thoughts (particularly stressful ones) and attractive spaces for social and physical recreation.

Does sleep grow on trees?

Professor Astell-Burt and Professor Feng also investigated whether people with more green space had lower odds of developing insufficient sleep over about six years.

They found 13% lower odds of developing insufficient sleep among people in areas where 30% or more of land cover within 1.6km had tree canopy, compared to people in areas with less than 10%. These results were consistent after taking into account factors that can influence both our sleep and access to neighbourhoods with more tree cover. These factors included age, sex, education, work status, marital status and household income.

Action 8 – Cool the hot spots

Cool streets improve the walkability and liveability of our city. To cool Sydney through greening we will:

- Increase the shade provided by trees, and select species to help channel cooling breezes to where they are most needed.
- Reduce absorbed and radiated heat from buildings, roads and paving, including reducing the amount of paving.
- Celebrate water in our landscape, by providing a range of opportunities for people and our vegetation to access water. This includes increasing passive irrigation, the storage and re-use of water to support vegetation and facilitate the cooling effects of evapotranspiration.
- Increase the provision of shaded and appropriately spaced seating and rest stops
- Include other suitable vine covered or artificial shade structures and misters where trees are not possible.

The City's priorities will be based on vulnerability analysis. We will analyse and map socio economic indicators to identify vulnerable groups, and combine that with our greening data to establish areas that are particularly exposed to urban heat and other health related issues. These areas will benefit most from our greening efforts.

What is a cool street or park?

Cool streets and parks have these elements in common:

- Greater than 30 per cent canopy cover
- Provides sun protection
- Contain the largest trees possible (ideally large to medium trees)
- Reduced amounts of paving, particularly dark paving
- Provide comfortable, shady and safe rest stops
- Lower level greening is combined with trees
- Good access to water and passive irrigation to support vegetation health and growth

Action 9 – Calm green spaces

Provision of substantial and meaningful greening can provide refuge from a busy city, creating calm and healthy spaces that improve our mental health and wellbeing. To calm Sydney through greening we will:

- Identify the calm spaces located throughout the city.
- Map these spaces and identify any areas that require intervention to provide a calm space network. Further, we will share this mapping with the community to assist in calm space usage and wayfinding.
- Identify the community most in need of greening, and prioritise our programs to provide the greening health benefits.
- Consider how future green space design can further accommodate calm spaces, whilst managing the range of other open space use requirements.
- Investigate opportunities to use temporary and 'pop-up' parks and green spaces that provide new calming or respite in areas where permanent greening is not available.

What is a calm space?

Calm spaces have these elements;

- Well maintained and balanced mix of tree canopy, biodiverse gardens and open turf areas.
- Access to water bodies, including the harbour, lakes or water features.
- Low traffic noise and visual screening from busy streets.
- Seating and rest stops as opportunities for tranquil 'time-outs'.

Action 10 – Celebrate water

The City is fortunate that our northern boundary

adjoins Sydney harbour. The harbour has shaped Sydney and its people for many thousands of years, from the first nations through to new immigrants today. It's a place that helps to restore and invigorate us in equal measure. Importantly, it is also precious habitat for wildlife.

There are also many natural and created wetlands, lakes, canals and other water features across the city that provide us with the opportunity to enjoy and connect with water.

We understand that water has particular importance for our Indigenous community. The depth and strength of this connection is vast, and vital.

We also acknowledge that water plays both special and everyday parts in all of our lives.

Water sustains life and all living things depend on it. Therefore, we must care for and celebrate water.

To do this, we will;

- Identify opportunities to celebrate water in our landscapes.
- Recognise and communicate the importance of water in our lives, particularly for keeping us cool.
- Ensure the efficient and effective use of water as a natural resource.
- Ensure that water as a habitat for wildlife is understood and protected.
- Look for alternative water sources to assist us to adapt to changing climate and sustainably keep our green spaces green.



Images from top: Archibald Fountain Hyde Park, Sydney Park wetlands, Pirrama Park, Pyrmont

Direction 4 – Greener buildings

Greener buildings are designed to promote, encourage and foster significant greening as part of all new developments.

Our appreciation of having access to and outlook or views to greening has recently been heightened as the community stayed at home and spatially isolated during the COVID19 pandemic response. We recognised during that time that the research was right, people need greening for physical and mental health and wellbeing. Further, we need to plan that everyone can see and have access to greenery from their property.

Property represents the largest proportion of land use, at 61 per cent of the local government area.

To achieve the 40 per cent green cover target, including 27 per cent canopy cover target, property has to provide at least 28 per cent greening including at least 20 per cent of that as tree canopy cover.

To meet these targets, in addition to trees, other forms of greening is going to be an important and integral design consideration for all new buildings. As will considering ways to enable nature to be integrated into the design. Most of these new buildings will occur on property.

Policy changes will be required, and these policies will build on the earlier Directions, by providing quality greening equitably across the city.

85 per cent of respondents want buildings covered with plants and that incorporate nature into their design.

Sustainable Sydney 2050 community survey.

Action 11 – Develop a green factor score

A Green Factor Score is a planning tool that evaluates and quantifies the **amount** and **quality** of **urban greening** a project provides.

It is designed to promote, encourage and foster significant greening as part of all new developments. Its focus is to assist all parties to green property and achieve wider community outcomes.

A Green Factor Score is embedded into the relevant planning controls to help designers, developers and homeowners to informed decisions about good design to achieve appropriate levels of greening in any new development.

Most importantly, a green factor score takes into account that not all greening is equal.

Medium to large canopy trees provide the largest benefit to the city and lawn grass providing the least. For example, a green factor tool applied in Seattle equates one large tree to 39 shrubs, or 6 smaller trees, or 3 medium trees or a roof top garden 33 square metres in size.

The tool therefore allows architects, planners and other experts to determine how they plan to green their property and meet the City's requirements and planning controls.

Equivalent green factor tools have been in place in many international cities for years, including Berlin, London, Seattle and Helsinki. There is also Columbia's 'Flexible Green Area Ratio Policy', 'Portland Eco-roof Requirement' and the 'Denver's Green Roof Initiative'. The City of Melbourne is also developing a web-based tool.

To develop a new green tool, City will;

- Review the various green factor scores currently being implemented.
- Develop an appropriate Green Factor Score, or equivalent planning controls that facilitates the assessment of greening features (quantity and quality), for the City

that will assist us to meet the green and canopy cover targets.

- Embed the Green Factor Score into updated planning controls, including the Development Control Plan to ensure greening is planned for and provided on private land.

How does it work?

The Green Factor Score assigns an overall greening score, based on the extent of greening on the site, compared to the overall property area.

The required score can be based on the development type (e.g. commercial or residential), its geographic location (e.g. CBD, suburban) or other site considerations (e.g. heritage, storm water management).

A bias has been placed on the ability to retain and protect existing trees on private land in deep soil. The score favours the re-establishment of medium and larger trees. Where retention and tree planting cannot be achieved, only then are other greening options considered in the scoring. As a guide to designers, hierarchy of greening alternatives and benefits is provided on a sliding scale. These include installing green roofs, walls and permeable pavements amongst many other types of greening. The ranking is commensurate with the greening benefits provide, and the relative ongoing maintenance costs, together with its effective lifespan.

For example, trees in natural ground have significantly greater benefits than shrubs. Shrubs have greater greening and habitat benefits over turf and grasses. Green roofs are also valuable, but due to their shorter lifespans and higher maintenance costs they score less than trees. Typically, green walls or facades have far fewer benefits than these other forms of greening and are ranked accordingly.

Like the BASIX tool, the Green Factor Score is a minimum score-based system to assist developers and Council to determine the appropriate type of greening (trees, ground covers, turf etc.) and the required quantity to ensure green infrastructure benefits are provided.

Action 12 – Increase green roofs and walls

Imagine a building designed and constructed to function elegantly and efficiently. Imagine a building that responds to the climatic region and native plants in which it belongs. Imagine a building that generates its own renewable energy, captures and treats its own water and the building is beautiful. All of this is possible now, and green roofs, green walls and green facades are an essential part of that puzzle.

Green roofs and walls are becoming increasingly common in new developments, as developers seek to make the most of rooftop spaces and provide attractive offerings for residents and workers.

Rooftop, communal open spaces and podium gardens have great potential to improve our urban environments and can be incorporated into higher density residential, mixed use and commercial buildings. They can be retrofitted to some existing buildings. They can also be achieved without taking up additional space because they are part of the building footprint.

We understand that not all our buildings can incorporate green roofs or walls. However, we increasingly expect, and in time will insist, that all new buildings contribute to urban greening and biodiversity. Further, we will look for opportunities and innovations for retrofitting urban greening on existing buildings.

To increase the quantity and quality of green roofs and walls, we will;

- **Review and update our Green Roofs and Walls Policy, Sydney Landscape Code** and technical details to demonstrate how such greening can be done in a sustainable way with suitable consideration to energy, maintenance inputs, water use and life span.
- Gradually amend the City's planning controls to increase the adoption and use of green roofs **in new developments**, particularly where green cover is currently limited, such as in the CBD, commercial and industrial areas.
- Gradually amend the planning controls for the **retrofitting of existing buildings**, where possible and appropriate, with suitable low-weight extensive green roofs

when applications for alterations or additions are received.

- Assess any **potential or perceived barriers** for installation or ongoing maintenance. Adapt our policy, controls and conditions to address such issues, in an effort to ensure the benefits of green roofs are realised and their longevity ensured.
- Continue to **provide knowledge and skills** to the community about creating domestic scale green walls and roofs through Sydney City Farm education programs.

Benefits of green roofs

Green roofs can:

- Store and treat rainwater, slow water discharge and use captured stormwater for irrigated reuse. In similar cities, green roofs can retain between 86–92% of annual stormwater runoff, depending on rainfall patterns and intensity. Rainfall retention is enhanced by deeper substrates with greater water-holding capacity.
- Use captured and stored greywater from the building for irrigation.
- Provide cooling and improved insulation to reduce energy costs.
- Greatly reduce urban heat island effects by removing surfaces that absorb and then radiate heat at night.
- Improve efficiency of solar panels by reducing the ambient temperatures around the panels when they are installed with surrounding greenery.
- Provide significant gains in aesthetics and recreation, even if only for the neighbours who overlook them.
- Provide valuable locations for social and business activities.
- Facilitate installation of community gardens, orchards, bee hives and urban food production.
- Improve biodiversity and habitat for wildlife, and contribute to connectivity across the urban landscape.
- Improve financial returns and increases in property values.

Action 13 – Planning ahead

Sydney is always changing. We must look forward to determine and actively plan the type of city we need.

With greening recognised as essential infrastructure for addressing urban heat and improving our health and wellbeing, we need to ensure we give greening sufficient space to grow and thrive.

Space is contested. Every square metre above and below ground is valuable. In developing our plans for the future, we need to make informed decisions about how every square metre should be used. Unfortunately, we can't have it all, there are trade-offs.

For example, if we prioritise standalone studios over backyards, we may increase small housing and short term visitor accommodation, but our suburbs will be hotter and our health and wellbeing will diminish.

For off-street above ground parking, do we start planning now for the expected extensive reduction in car ownership, so that we maintain that space for greening?

How do we increase our population and density, whilst maintaining the greening and overall character of the area?

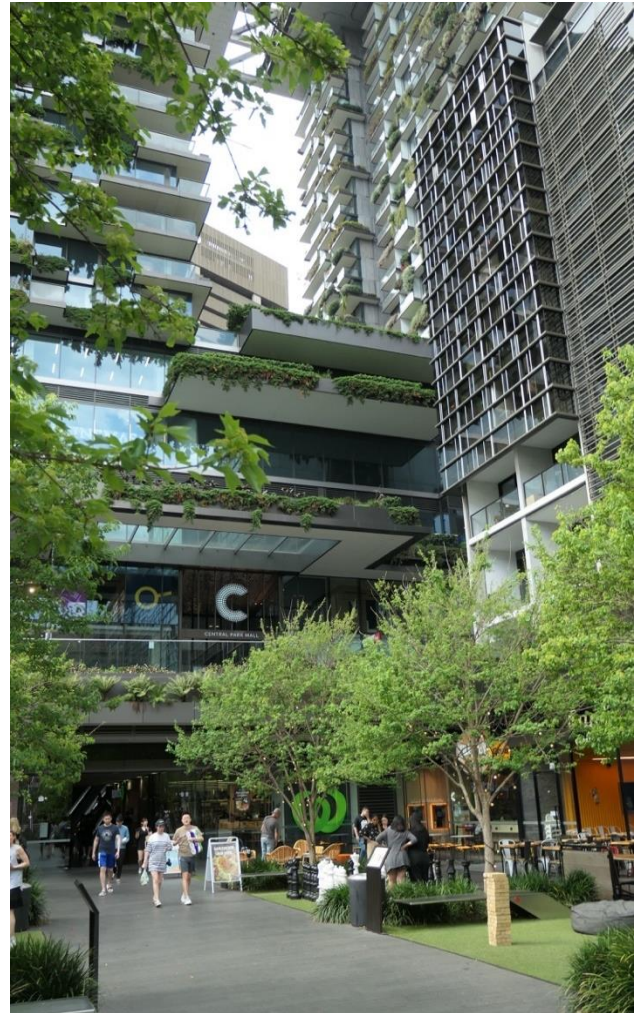
The City has an important role to play, through our planning controls and processes, in ensuring we make these informed decisions, and ensure the community contributes to the greening on their land.

To plan for a greener future, we will

- Amend the planning controls to include the key initiatives developed from this Strategy.
- Develop minimum requirements within the planning controls to achieve the new greening and canopy cover targets on property.
- Consider future land use and trends, such as building studios, basements and car ownership, that impact on the retention or ability to increase greening. Adopt a position that ensures greening and the environment is a key priority through the informed decision making.
- Consider the use of incentives, where appropriate, to provide sustainable greening

outcomes where they would otherwise be considered unachievable.

- Ensure compliance of greening outcomes is achieved, including the retention and protection of greening throughout the development process and long term greening maintenance outcomes.



Central Park, R. Smart 2020 and Bosco Verticale, Italy
https://commons.wikimedia.org/wiki/File:Bosco_verticale.jpg

Direction 5 – Nature in the city

Urban ecology has a wide scope of applications from the building scale to the whole city including streetscapes, private space and public open space.

When designing and implementing our greening strategies we will be looking for ways to maximise habitat potential and nature in the city. The key elements that we will focus on include:

- providing a wide diversity of plants, with preference for species, particularly locally native where appropriate, that will contribute to habitat and food sources for native wildlife
- considering all sizes and types of native wildlife, small mammals, bats, reptiles and even insects. Ecosystems require a complex 'food web' and without smaller animals such as insects, other animals can't survive and prosper either
- continuing the restoration of urban bushland and seek opportunities to rewild where nature and ecosystems have the opportunity to recover from degradation
- strengthen biodiversity corridors to facilitate the safe movement of species between places of refuge and food sources
- support healthy natural aquatic systems such as creeks and wetlands
- seeking opportunities to translate research into relevant on ground actions to improve how we manage and restore urban nature and healthy ecosystems
- developing opportunities for the community to reconnect with nature and seek to enhance the natural values of the city
- continuing to improve knowledge, skills and resources to enhance urban nature in the city.

Action 14 – Recognise and support Aboriginal ecological knowledge

The Gadigal of the Eora Nation managed their land resiliently for thousands of years. Aboriginal people know that if we care for Country, it will care for us. There is much we can learn to better care for this Country.

To achieve this, we wish to work with the local Aboriginal community to explore and identify opportunities to celebrate, promote and educate about Aboriginal ecological knowledge and principles.

The City will engage with the local Aboriginal community to identify the cultural and practical principles that should be considered when designing new spaces or that may contribute to help integrate people with nature.

Working together, we will listen first and explore opportunities to expand greening within the Eora Journey, and emerging approaches such as the Government Architect of NSW 'Designing with Country'.

The City of Sydney expresses deep respect for the traditional custodians and seeks to draw on the sophisticated, resilient and continuous culture of this place. The City acknowledges we all stand on sacred land.

City of Sydney Reconciliation Action Plan 2015

Action 15 – Strengthen urban nature protection measures

As Sydney continues to grow, it is essential we have the necessary protection mechanisms in place to protect, and increase, nature in the city. To achieve this, we will;

- Identify and implement strong urban nature protection measures.
- Develop stronger biodiversity planning controls and assessment checklists for planners and proponents.
- Set targets by 2023 to provide net increase in biodiversity, habitats, and ecosystem health and provide by 2033.
- Strengthen urban nature protection through the inclusion of urban habitat targets in the City's planning controls.
- Identify and refine the biodiversity corridors and embed in planning controls.
- Identify and implement best practice ecological connectivity approaches to enhance biodiversity and allow for the safe movement of priority native fauna.
- Increase the contribution of the private realm in supporting biodiversity conservation and ecosystem health.



Images from top: Bio Blitz 2018, Moorhen in Sydney Park wetlands, Seawall pots installation 2016.



Glebe bush care group in Forest Lodge, 2018.

Action 16 – Perform an urban ecology health check

Works will be undertaken to collect information about our existing urban biodiversity status to determine the progress the City has made since the baseline data was collected. This will be combined with other data sources to not only contribute to the surveys but also to consolidate existing data to determine potential habitat measures, reassess priority works and to define performance targets.

Action 17 - Reconnect with nature

It is important for the community to reconnect with nature and seek to enhance the urban natural values of the city. To achieve this, we will;

- Support more citizen science programs and participatory events. These events play a major role for the success of urban nature focused programs
- Increase community engagement through urban nature volunteering and grant opportunities.
- Develop a coordinated communication program on urban nature focused programs and achievements.

Direction 6 - greening together

The community is one of the greatest resources for greening Sydney. Our community continue to show a strong interest and are passionate to participate in greening the urban landscape.

One of the most important things the community can do is to green their own property.

They can also assist greening efforts on City land, and ideally assist others in the community with gardening on their property.

There are social capital benefits to this work. For example, the Sydney City Farm involves the community in meaningful volunteer opportunities while learning about urban agriculture and sustainable food production.

The ongoing participation in nature focused programs, such as National Tree Day, show

community desire to not only green the city but to work together to achieve this goal.

Communications that raise awareness about the importance of greening and nature is essential in developing a cue to care.

Further, communication and support with volunteer groups, which work independently from the City, are important to nurture to provide community empowerment. They provide people with the responsibility and autonomy to undertake greening projects in partnership with the City without directing resources away from the core City business.

The City will also look at opportunities to assist the community to green their property. The establishment of a fund and grants program is being considered to assist the community to provide resilient greening initiatives on property.

National Tree Day 2014, Sydney Park



Action 18 – Support community participation

We encourage the community to have a sense of ownership and acceptance of the community greening initiatives.

Further, we understand it is crucial to provide opportunities for active participation in greening activities throughout the city, including ongoing education and awareness of the importance of greening the urban environment, citizen science programs and participatory events, and hands-on activities and volunteering.

To achieve this, we will continue to support:

- our community gardens and their members. We will also assist new groups to develop gardens.
- Sydney City Farm volunteering and the provision of high quality educational programs for the farm members and wider community.
- bushcare and landcare groups in restoring bushland areas in line with the Bushland Restoration Management Plan.
- footpath gardening projects undertaken by community members in line with the City's Footpath Gardening Policy.
- donation of trees, to commemorate a special event or loved one, as outlined in the Tree Donation Policy.
- wide-ranging annual greening events, such as Free Tree Giveaway, National Tree Day, community planting days, Bioblitz, fauna counts and many other events that support the aims of this strategy.

We will also undertake a comprehensive review of our current policies and programs, including the Community Gardens Policy, Urban Ecology Strategic Action Plan, and Sydney City Farm.

Opportunities for programs that assist the community to help others green and garden their property will also be investigated.

The reviews will help us explore innovative potential models and frameworks that will assist us to meet the increase community involvement.



Images from top: Sydney City Farm 2017, Beaconsfield Community Garden Group 2017, Reconciliation Park Community Garden 2018, City Farm Indigenous talk 2015.

Action 19 – Develop a greening Sydney fund

Cities are congested and contested places, above and below ground. They are always under pressure and subject to constant change and development. There are many competing social, and economic demands to be considered. This places our urban trees at risk.

The City uses extensive resources to plant and maintain public trees. Tree removal is always considered as a last resort. When a tree is removed, the environmental, social and economic benefits are lost for many years until any replacement tree matures. In some instances, those benefits are permanently lost when a tree cannot be replaced.

With appreciation that trees are essential urban assets, and the community correctly places a high value on their retention and management, it is considered appropriate that the City seeks appropriate compensation for their removal.

The City will continue to place tree removal as a last resort. However, when removal of a Council-owned tree is required to facilitate a development / project the City will investigate ways to ensure it is appropriately compensated for the loss and identify how any compensation received can be used to create the greening Sydney fund.

Any fund would be managed by the City to provide a grants program aimed at improving greening outcomes on private land in line with this strategy. This may include programs such as matching grants programs for residents and landowners to undertake new tree planting, new habitat / nature plantings, or install green roofs, green walls and façades.

In investigating options for the fund, we will:

- review how the program can be developed within the existing statutory framework and develop any necessary policies to support the program
- have a balanced approach in establishing the tree removal compensation values – a value will be based on various tree attributes, but not of too high a value that is a major financial hardship
- ensure any grants program developed achieves the key greening objectives of this strategy

Action 20 – Increase our community engagement

Community engagement is key to developing green initiatives that the community wish to see and want to participate in.

Better solutions often appear when a diverse set of people participate and embrace the problems and potential solutions. Collecting diverse opinions, knowledge and perspectives from within the community will help to provide a more balanced, and inclusive solution.

To achieve this, we will:

- review our community engagement approaches to maximise engagement with a wider audience.
- increase our online presence, including providing more resources, data and information on our greening initiatives, programs and assets.
- develop Green Volunteer Network to allow for community knowledge sharing, networking and learning across the city at both an online and face-to-face levels.



Images from top: James Street community Garden, 2011, Sydney City Farm Workshop 2017.

Our green future

We have developed this strategy to re-ignite and affirm our commitment to provide a greener, cooler, calmer and resilient Sydney to all of our community.

Trees and other urban greenery are a vital and integral part of our urban lives. It is as important as roads and broadband internet, and significantly more beautiful than either. More and more studies are revealing that there can be no greater good for human health than to protect and enhance the green infrastructure within and around our cities.

Trees remove thousands of tonnes of pollution from our air, store carbon and help mitigate extreme weather. Their roots and leaves absorb water and help slow down and deal with excess rainfall. They provide respite and relief from noise and dirt, boost our immune systems and relieve stress, depression and anxiety.

As trees are lost to development, buildings and roads, to disease and storms there is an ever-pressing need for us to value everything that the broader urban forest and greenery can do for us.

In 2015 the World Economic Forum made increasing green cover one of its top 10 urban initiatives. Across the entire world there are movements to encourage cities to plant more trees and increase their green spaces. Analysis reveals that much of our green cover is located in private land, on golf course and on railway and other utility corridors. This shows that individual contributions and intergovernmental approaches to urban greening is vital. Every tree counts, even it is only a small tree in your back garden.

Singapore, already the greenest city in the world, is aiming to make itself even greener. Its goal is to have 85 per cent of all its residents to live within only 400 metres of a green space. Sydney must strive for such outcomes as well.

As cities become more crowded, they also have to become more innovative about how to create more green space. Inspiring projects such as New York's High Line railway and the Promenade Plantee in Paris, illustrate how cities across the world are turning disused railways and motorways into parks and green space. The Skygarden in Seoul has been built on an abandoned motorway flyover. The former concrete overpass has been planted with 24,000 shrubs and trees and is open 24 hours a day.

It is vital that we share knowledge on lessons learned. We must regularly review and update policies, plans and planning controls, using data to make informed decisions, in order to continue producing innovative technologies to meet the climate change challenge and support green building initiatives.

The City has developed this strategy to drive everything we do. We need to encompass both small and large actions. We need to address our streets, our parks and buildings and new development on both public and private lands.

We need to look after our future. We are the only ones that can. The time for action is now. Please help and support us in our efforts to green our city.

Attachment 1 – Review, implementation and action plan







































We will implement this Greening Sydney Strategy over the next ten years.

As greening is located across streets, parks and property, several departments will be involved in leading the specific actions, as outlined below.

A review of this strategy will be done by 2031. The review will include an assessment of the new research, technology and how the city has developed and changed during that time. This will include a comprehensive review of the greening and canopy targets, and all other actions required to provide a cool, calm and resilient city.



Images from the top: 100 Joynton Ave, Zetland, 2015 credit Adam Hollingworth, Turruwul Park, Sydney Park 2015.

Strategic Direction	Action	Lead Responsibility	Implementation (years)			
			1-2	3-5	5 +	Ongoing
Direction 1 - Turn grey to green	Action 1 – Achieve the targets	City Services				
	Action 2 - Greener laneways	City Planning, Development and Transport				
	Action 3 – Harness innovation, technology and inspiration	All departments				
Direction 2 – Greening for all	Action 4 – Equitable greening distribution	City Services				
	Action 5 – Fair access to quality green spaces					
	Action 6 – Adapting for climate					
	Action 7 – Growing food locally					
Direction 3 - Cool and calm spaces	Action 8 – Cool the hot spots	City Services				
	Action 9 – Calm green spaces	City Services				
	Action 10 – Celebrate water	All departments				
Direction 4 - Greener buildings	Action 11 – Green Factor Score	City Planning, Development and Transport				
	Action 12 – Increase green roofs & walls					
	Action 13 - Planning ahead					
Direction 5 – Nature in the City	Action 14 – Recognise and support Indigenous ecological knowledge	City Services				
	Action 15 – Strengthen urban nature protection measures					
	Action 16 - Urban ecology health check					
	Action 17 - Reconnecting with nature					
Direction 6 - Greening Together	Action 18 – Support community participation	City Services				
	Action 19 – Greening Sydney Fund					
	Action 20 - Increase our community engagement					

Attachment 2 – Target methods

Introduction

Urban local government areas differ in their capacity to accommodate tree canopy and greening. The relative proportions of streets, parks, and other built or open spaces is a major influence on this capacity. The City of Sydney has endeavoured to develop targets for greening and canopy that are ambitious, yet also achievable and relative to the current and future opportunities provided by the specific composition of land uses within our local government area. Consideration was also given to research that suggests minimum amounts of canopy or green cover is required for community health or cooling outcomes.

In the process of setting targets for greening and canopy, all land within the City of Sydney local government boundary (the city) was considered and assessed, including all public and private land regardless of ownership or accessibility.

The capacity and opportunity for greening and canopy was quantified and assessed at the scale of individual land parcels using techniques specific to their land use type.

Analysis at such a fine scale allows for the data to be aggregated in many different ways, but for the purpose of setting greening and canopy targets it was summarised under three broad land-use themes; being Streets, Parks, and Properties. Overall targets for greening and canopy for the entire city were produced as a sum of these parts.

Our stratified approach to the development of targets provides a rich dataset that may be used to guide site-specific actions towards their achievement. This approach also promotes accountability within each of the three land-use themes, encouraging land managers to strive to meet the targets specific to the land or site that are managing.

To allow the targets to be directly compared and assessed against current or future aerial measurement of vegetation areas, the analysis of land parcels included only those that are visible from the air. Road tunnels and street segments beneath bridges or viaducts were not assessed. Similarly, parcels of property that exist above or below the surface (e.g. private basements beneath roads etc.) were also excluded from the analysis.

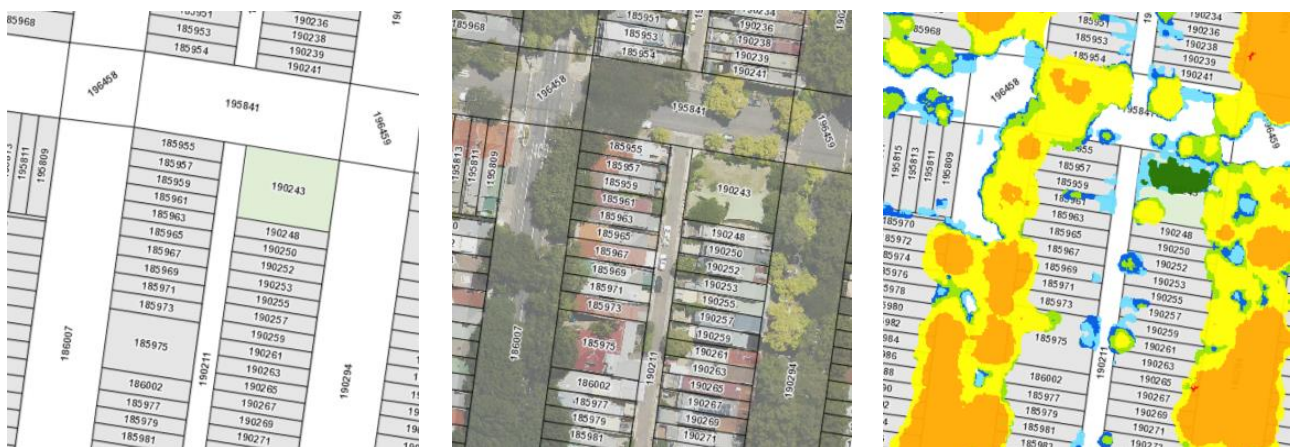


Figure 1: Example of street, park, and property land parcels, each with a unique site code identifier, overlaid on aerial image and aerial acquisition of vegetation height strata.

Street method

The city's road network is a sum of 4915 individual road segments, covering a total of 608.8 hectares (or 23%) of the city's land area.

Most street segments follow a conventional layout, with road pavement areas allowing movement of heavy traffic and roadside verge or nature strip areas between the road pavement and other land parcels being the space for typical street tree planting.

Attributes and measurements of these street segments were used as inputs to formulas to calculate the capacity of each street segment to host tree canopy.

The aim was to quantify the potential canopy area that may be achieved within the boundary of each street segment under real world conditions, and model the potential for additional canopy based on specific scenarios.

Data used

The following road segment attributes and measurements were compiled or calculated from existing City datasets:

- Segment code, name, location, suburb
- Street Segment Type (Street Section or Street Intersection)
- Street Classification (State, Regional, Local, Laneway, Motorway)
- Street segment area (m²)
- Street segment length (m)
- Street segment width (m, derived from area and length)
- Road pavement width (m)
- Street verge width (m, derived from road segment width and road pavement width)
- Percentage of existing trees impacted by overhead power lines

The optimal mature size of tree suitable for planting in each street segment was determined based on the available street verge width in accordance with the City's Street Tree Master Plan guidelines.

Street Verge Width	Mature Tree Size	Mature Tree Canopy Diameter
Less than 1.3m	Unable to Plant	-
1.3m - 1.8m	Small	5m
1.8m – 3m	Medium	8m
Greater than 3m	Large	12m

The number of trees able to be planted within each street segment was calculated using the following formula:

$$Tree\ Quantity = 2(P - V) \left[\left(\frac{L - 10}{S} \right) + 1 \right]$$

Where:

P = Planting Optimisation Rate (expressed as a decimal)

V = Planting Site Vacancy Rate (expressed as a decimal)

L = Street Segment Length (m)

S = Tree Spacing (m)

The formula assumes typical street segments have two single rows of trees and a 10m tree setback on approach to intersections. Tree spacing is proportional to the size of tree suitable for the street segment, and was equal to mature tree canopy diameter.

The planting optimisation rate is an indication of the reduced proportion of trees able to exist due to conflicts within the streetscape (e.g. driveways, poles, shop awnings etc.). The general rate applied in the city was 0.8 (or 80%), however a lower rate (0.7) was applied in the central business district due to a greater prevalence of awnings and below ground utility conflicts.

The vacancy rate is the proportion of planting sites that may be expected to be vacant at any point in time. The rate used by the City, based on historical data, is 0.015 (or 1.5%).

Street intersection segments were treated in a similar way but assumed one row of trees only and a reduced optimisation rate of 0.5. All street segments defined as motorways were assigned a tree quantity of zero to reflect the inability to plant trees within roads of this type in the city.

Age diversity in trees

Not all trees in the City's streets are mature. Therefore, a diversity of tree ages was factored into the analysis before the quantity of trees was used to calculate the canopy area.

A percentage age class distribution was used to represent the expected distribution of age classes for the entire population of street trees. For the city this was determined to be 60% mature (including over-mature), 30% semi-mature, and 10% juvenile, based on the current age distribution of the City's tree assets and expected future removal and planting rates. The canopy diameter for semi-mature and juvenile trees were defined as 75% and 25% of the mature canopy diameter respectively.

These relative proportions and size parameters were applied to the quantity of trees in each street segment to calculate a realistic and sustainable total canopy area produced by trees located within each street segment.

Infrastructure impacts

Data on the proportion of existing street trees within each street segment impacted by overhead power lines was used as a factor in the analysis to reflect the reduced potential of trees beneath such infrastructure.

Within relevant street segments, the proportion of impacted large, medium, and small sized trees were assumed to achieve 60%, 50%, and 80% of their respective potential canopy area. This analysis enabled the modelling of reduced impact scenarios, such as exposed low voltage power lines being converted to insulated bundled cables or the complete removal of overhead wires.

Canopy calculations

The total canopy capacity for each street segment was calculated as the sum of each tree canopy area, factoring in the above considerations, using simple formula for the area of a circle. Since canopy cover is measured and aggregated according to boundaries between land use types it was necessary to calculate the areas of canopy overhanging other land parcels adjacent to the road segment and subtracted these from the total canopy capacity area. This was done by applying a trigonometric formula for the area of a circle segment, where the known parameters are the circle segment height and circle radius.

The circle segment height was derived from the width of the road verge and the typical tree setback from the road kerb for each tree size.

In-road planting scenarios

The planting of trees within the road pavement area is an opportunity to increase tree canopy within the street network above that provided by typical planting within the verge. Three different in-road tree planting scenarios were modelled and added to the base canopy capacity calculation for relevant sites, as listed below.

1. Tree planting within parking lanes. Within local road segments wider than 12m, every third tree located within the verge is replaced with a large sized tree planted within the parking lane.
2. Tree planting within laneways. Within local road segments or laneways wider than 6m, having narrow verges unable to accommodate conventional tree planting, a single row of trees is planted within the parking lane at the side of the road. If the road pavement width was wider than 10m the tree size was large. If less than 10m it was medium.
3. Tree planting within medians. In local roads wider than 15m, an additional row of large sized trees is planted in a median island.

If more than one modelled scenario applied to any single street segment, the scenario that produced the highest canopy amount was used.

Overall street targets

The canopy capacity areas overhanging each street segment were summed to provide an overall capacity for the entire street network. This total canopy area was divided by the total area of the street network to give a percentage canopy target for the city's streets. Since the overall target is an aggregate of individual site analyses, the overall target is a summary and cannot be applied to any specific site. Each individual street segment has a site-specific canopy target equal to its calculated capacity.

Targets for green cover were recommended for each street type classification and aggregated to an overall target for the street network. They were based on the existing green cover and a consideration of the potential increase in green cover realistically able to be achieved within each street type in addition to the increase in tree canopy cover.

Park method

Parks are parcels of land dedicated for public open space and recreation.

A total of 421 parks covering a total of 401.7 hectares were assessed in this analysis, representing 15% of the city land area. They are owned and managed by a number of government agencies, including the City, the Royal Botanic Gardens and Domain Trust, Centennial Parklands, and Property NSW.

Parks must provide for a range of competing uses and may serve a variety of functions, including active and passive recreation, heritage conservation, wildlife habitat, and other environmental services. The expected uses and functions of a park influence the amount of greening or tree canopy cover that is appropriate for the space, and therefore parks with similar uses and functions are assumed to have similar potential for canopy and green cover.

An analysis of the parks was undertaken, with the aim being to determine the most appropriate amount of tree canopy and green cover for each park type.

Park classifications

All parks were grouped into one of the following park types; iconic, neighbourhood, pocket, civic, sports field, or golf course. These park types were existing functional categories used by the City for park asset management.

Within each category, parks were ranked by their existing canopy cover percentages (2019 aerial canopy measurement). The median and per centiles above and below the median (15%, 25%, 75%, and 85%) were plotted over the ranked distribution of parks.

This analysis was then used to identify and select five examples within each of the park types, each having different levels of canopy cover. Consideration was given to the age of the parks and maturity of trees when selecting each of the examples.

Qualitative survey

A survey was developed asking respondents to score each of the examples on a scale on 1 (least appropriate) to 5 (most appropriate) in terms of the amount of canopy cover being appropriate for the type of park. Aerial images

were used to present the examples within the survey.

Professional staff of the City familiar with park management issues were invited to participate, including professionals in park and tree management, landscape architecture and city design. Staff less involved with parks management also participated, including strategic planning and engineering. 46 responses to the survey were received.

The survey results were used to consider and identify the most appropriate target for canopy cover for each park type.

Overall park targets

Target percentages were also identified for green cover for each park type based on the function and design expectations for their spaces. The relevant target percentages were applied to each park, with target canopy and greening areas calculated and summed to determine an overall target amount of canopy and greening area and percentage canopy and greening cover for the entire park land-use area of the city

Property method

For the purposes of this analysis, property was considered to be any land parcel not classified as a street or a park. It included 26,527 individual parcels of land covering 1,651 hectares (or 62%) of the city land area.

A wide variety of uses, ownership arrangements, and controls apply to this large group of land parcels. They range from small single lot private residences through to large commercial CBD properties and large tracts of government owned land used for transport infrastructure or education.

Estimating private open space

Analysis was undertaken to estimate the amount of open space potentially available for tree planting within these land parcels. Data gathered from the City's floor space and employment survey was used to calculate an approximate building footprint area per land parcel, with the remaining unbuilt portion of each land parcel then used to assess the potential for tree canopy.

The area of private open space required to accommodate trees was determined to be 20-25m² for a small sized tree, 25-60m² for a medium sized tree, and >60m² for a large sized tree. Areas of private open space less than 20m² were considered as inadequate spaces for any tree. If a land parcel had greater than 200m² of open space, multiple large trees were assigned to the parcel with each requiring at least 200m² of space.

A consideration of age diversity was factored into the analysis (using the same method as for the street tree analysis) to estimate the potential canopy area for each private land parcel.

The potential canopy areas for each land parcel, along with the measured amount of existing tree canopy and greening per parcel, were aggregated by the City of Sydney Local Environment Plan land zonings to assess and consider potential targets for tree canopy cover and green cover for each zoning and the private land use overall.

Assumptions and limitations

The above analysis for private land is based on a number of assumptions that make it less reliable than the capacity analysis used for the street land area. The analysis inaccurately assumes that any open space not occupied by a building is available for tree planting, and that tree canopy is unable to overhand buildings. It is also based on existing land development only, with no consideration for how properties may change or be developed in future.

Overall property targets

For the reasons outlined above, the analysis was used as a guide to indicate existing potential only, and to compare and contrast the existing potential between different zonings and specific areas such as heritage conservation areas, urban renewal areas, and the city centre.

The future development and potential for canopy and greening, along with the City's ambition for greener development of private open spaces were important considerations when setting overall targets for properties.

Achieving these targets

Analysis at the scale of individual land parcels has resulted in a detailed comparison of existing and targets for greening and canopy cover.

The analysis highlights sites that are over or under achieving, and provides insight to drive site-specific projects and programs aimed towards the achievement of targets. It will also help to highlight specific land where the removal of greening or canopy will compromise the ability to achieve targets.

Combining the site-specific analysis with the City's asset management data will provide further opportunity to better manage the City's park and tree assets within roads and parks.

Future analysis will be undertaken to determine the best method to express the target for property, and the controls required to promote its future achievement.

Within a ten year period, a comprehensive review of these greening and canopy targets will be undertaken as new research, technology and other tools become available. This will include improved technology for the acquisition of aerial greening and canopy cover data.

Further, as the city develops and changes over time, we will closely review any land use changes over time – such as new park, streets and changes to planning controls for properties.

These targets are based on current land use. As these change over time, so too will the potential extent of greening and canopy cover. We will need to ensure that greening and canopy is a key consideration in those changes, to provide a cool, calm and resilient Sydney.

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Item 3.

Project Scope - Bike Network Connections in Erskineville, Alexandria and Waterloo

File No: X026143.001

Summary

This report describes the proposed bike network connections in Erskineville, Alexandria and Waterloo, which will form part of the Regional and Local Bike Network identified in the City's Cycling Strategy and Action Plan 2018-2030.

Following community consultation in November and December 2020, this report seeks Council approval of the proposals for new separated cycleways and sections of shared paths as well as pedestrian improvements in the form of raised pedestrian crossings, footpath continuations and widening.

Recommendation

It is resolved that Council:

- (A) approve the concept design for the Gadigal Avenue, Potter and Crystal Streets Cycleway as shown in Attachment B to the subject report for detailed documentation and construction tender;
- (B) approve the concept design for the Mitchell Road and Huntley Street Cycleway as shown in Attachment C to the subject report for detailed documentation and construction tender;
- (C) approve the concept design for the Alexandria Shared Path connections as shown in Attachment D to the subject report for detailed documentation and construction tender;
- (D) approve the concept design for the Ashmore and Harley Streets Cycleway as shown in Attachment E to the subject report for detailed documentation and construction tender;
- (E) approve the concept design for the Bridge Street, Railway Parade and Henderson Road Cycleway as shown in Attachment F to the subject report for detailed documentation and construction tender;
- (F) approve the one-way road closure of Railway Parade to northbound traffic between Swanson Street and Sydney Road;
- (G) approve the closure of Alexander Street at Henderson Road to through traffic, allowing left-in and left-out traffic movements only;

- (H) approve the concept design for traffic calming in Park Street as shown in Attachment I to the subject report; and
- (I) note the estimated project costs as detailed in confidential Attachment J to the subject report.

Attachments

Attachment A.	Bike Network Connections Map
Attachment B.	Community Consultation Drawings - Concept Design for Gadigal Avenue, Potter Street and Crystal Street Cycleway
Attachment C.	Community Consultation Drawings - Concept Design for Mitchell Road and Huntley Street Cycleway
Attachment D.	Community Consultation Drawings - Concept Design for Alexandria Shared Paths
Attachment E.	Community Consultation Drawings - Concept Design for Ashmore Street and Harley Street Cycleway
Attachment F.	Community Consultation Drawings - Concept Design for Bridge Street, Railway Parade and Henderson Road Cycleway
Attachment G.	Engagement Report - Gadigal Avenue, Potter Street and Crystal Street Cycleway
Attachment H.	Engagement Report - Combined Erskineville and Alexandria Cycleways
Attachment I.	Park Street - Refined Traffic Calming Concept Design
Attachment J.	Financial Implications (Confidential)

Background

1. In November 2018, Council endorsed the Cycling Strategy and Action Plan 2018-2030, for incorporation into the City's community strategic plan Sustainable Sydney 2030.
2. The Cycling Strategy and Action Plan includes an overall proposed Bike Network which is being implemented in sections over time. Concept designs for several routes in Erskineville, Alexandria and Waterloo (as shown in Attachment A to the subject report) have been developed and consultation was undertaken at the end of 2020.
3. The proposals for each section are described below.

Gadigal Avenue, Potter and Crystal Streets cycleway

4. The proposal is a separated bi-directional cycleway on the eastern side of Crystal Street between Danks and Potter Streets, the northern side of Potter Street between Crystal Street connecting to the eastern side of Gadigal Avenue between Potter and Lachlan Streets. The design has minor impact to existing kerb locations.
5. The proposed work is comprised of:
 - (a) a separated bi-directional cycleway on the eastern side of Crystal Street between Danks and Potter Streets between existing kerbs;
 - (b) modification to the existing shared pedestrian and bicycle crossing at the intersection of Danks and Crystal Streets;
 - (c) eight new street trees and garden beds on Crystal Street;
 - (d) separated bi-directional cycleway on northern side of Potter Street between Crystal Street and Gadigal Avenue;
 - (e) new raised pedestrian crossing across Potter Street east of Crystal Street; and
 - (f) separated bi-directional cycleway on eastern side of Gadigal Avenue in place of existing shared path between the intersection of Potter and Lachlan Streets.
6. A total of 12 parking spaces will be removed on both Crystal and Potter Streets including:
 - (a) ten parking spaces on Crystal Street to accommodate the cycleway; and
 - (b) two parking spaces on Potter Street to accommodate the new pedestrian crossing.
7. The proposal was endorsed by the Local Pedestrian, Cycling and Traffic Calming Committee on 18 February 2021.

Mitchell Road and Huntley Street Cycleway

8. The proposal is a separated bi-directional cycleway at road level on the western side of Mitchell Road between Sydney Park Road and Coulson Street, and the northern side of Huntley Street between Mitchell Road and Belmont Street. The design minimises changes to existing kerbs, streetscape elements and other infrastructure to reduce impacts to the community during construction.
9. As a condition of the WestConnex New M5, B51 – Pedestrian and Cycle Implementation Strategy, Transport for NSW is required to provide improved pedestrian and bicycle facilities within a one-kilometre area of the St Peters interchange. This project falls within this zone and will directly connect to the cycleway on Sydney Park Road to the south.
10. Proposed work is comprised of:
 - (a) separated bi-directional cycleway on the western side of Mitchell Road between Coulson Street and Sydney Park Road;
 - (b) separated bi-directional cycleway on the northern side of Huntley Street between Mitchell Road and Belmont Street;
 - (c) continuous footpath treatment at Belmont Lane and Huntley Street;
 - (d) continuous footpath treatment at Mitchell Road and the driveway to Sydney Park Village; and
 - (e) shared path at the four corners of the signalised intersection at Mitchell Road and Huntley Street.
11. A total of five parking spaces will be removed, including:
 - (a) Three spaces on the western side of Mitchell Road between Coulson Street and Sydney Park Road.
 - (b) Two spaces on the northern side of Huntley Street between Mitchell Road and Belmont Street.
12. Transport for NSW will make changes to Sydney Park Road and the intersection with Mitchell Road as part of the King Street Gateway project to fulfil the consent conditions of the WestConnex. These changes will include:
 - (a) relocating the existing bus stop (routes 370 to Coogee, 308 to Surry Hills) on the Western Side of Mitchell Road to Sydney Park Road on approach to the Mitchell Road intersection;
 - (b) right turn from Mitchell Road into Sydney Park Road for buses only; and
 - (c) a permanent cycleway on Sydney Park Road, replacing the existing pop-up cycleway
13. The proposal will be reported to a future meeting of the Local Pedestrian, Cycling and Traffic Calming Committee for endorsement.

Alexandria Shared Path connections

14. The proposal for the Alexandria Shared Path Connections includes a suite of shared path and bicycle crossing improvements to create a safe connection for children riding to school. It will connect schools in Alexandria and Erskineville from Buckland Street to Elliott Avenue by creating new shared paths and using low traffic streets.
15. Proposed work is comprised of:
 - (a) a shared path on the southern side of Swanson Street between Fox and Elliott Avenues;
 - (b) a shared path on the northern side of Swanson Street between Park and Newton Streets;
 - (c) a raised pedestrian and cycle crossing across Park Street at Swanson Street. In addition to improving connectivity and safety for pedestrians and bike riders, it will also reduce the speed of vehicles as they enter Park Street. It is expected it will discourage non-local traffic from turning into Park Street;
 - (d) a widened footpath at the corner of Swanson Street and Elliott Avenue to allow space for the shared path around the bus shelter;
 - (e) extension of the existing shared path in Buckland Street to Mitchell Road; and
 - (f) bicycle contraflow provisions in Brown Street and Elliott Avenue.
16. The project does not require changes to parking or loading.
17. The proposal was endorsed by the Local Pedestrian, Cycling and Traffic Calming Committee on 18 February 2021.
18. Note that Council resolved on 22 February 2021 to install temporary barriers to affect a narrowing of Park Street at the Swanson Street intersection, to deter and slow vehicular traffic. These temporary works were also endorsed by the Local Pedestrian, Cycling and Traffic Calming Committee on 18 February 2021 and are currently under way.

Ashmore and Harley Streets cycleway

19. The proposal completes a large portion of the route between McEvoy Street (Alexandria) and Erskineville station, and beyond to the now complete Wilson and Burren Streets Cycleway. It includes a bi-directional cycleway along Ashmore Street and one-way separated cycleways on Harley Street between Mitchell Road and McEvoy Street.
20. Proposed work is comprised of:
 - (a) a continuous footpath treatment across Fox Avenue at the intersection with Ashmore Street, a raised pedestrian crossing across Ashmore Street and widened footpaths in Ashmore Street at the intersection with Fox Avenue;
 - (b) a bi-directional separated cycleway on the northern side of Ashmore Street between Fox Avenue and Mitchell Road;

- (c) upgrading the existing pedestrian crossing across Mitchell Road between Ashmore and Harley Streets to a raised bicycle and pedestrian crossing;
 - (d) one-way cycleways along Harley Street between Mitchell Road and McEvoy Street with separated cycle lanes on each side of the road (in the direction of vehicle travel) between the footpath and parking lane; and
 - (e) footpath widening and short sections of shared path to provide a connection at intersections where the separated on-road cycleway cannot be continued.
21. Parking changes
- (a) On Ashmore Street parking will be kept along the new cycleway. Seven parking spaces will be removed to provide space for widened footpaths and transition to a shared path near the intersections with Fox Avenue and Mitchell Road.
 - (b) On Harley Street parking will be kept along the cycleway on both sides of the road. Seven parking spaces will be removed to provide space for the cycleway transition near Mitchell Road, clearance around mature trees on Harley Street and a wider footpath near McEvoy Street to create short sections of shared path.
22. The proposal was endorsed by the Local Pedestrian, Cycling and Traffic Calming Committee on 18 February 2021.

Bridge Street, Railway Parade and Henderson Road cycleway

23. The Bridge Street, Railway Parade and Henderson Road cycleway forms part of the priority Bike Network and will service the large number of current and future residents in the Ashmore Precinct to the Australian Technology Park, Redfern and on towards other existing bicycle connections to the CBD.
24. This project, in connection with the Ashmore Street and Harley Street Cycleway connects two major trip attractors; University of Sydney to the west and University of New South Wales to the east. The route serves the growing populations of Green Square and the Ashmore Precinct.
25. In May 2020, Transport for NSW approached the City with the proposal to deliver pop-up cycleways in response to the pandemic, to allow people to travel more safely and maintain physical distancing. Henderson Road was identified as a suitable route for a pop-up because the City had already commenced developing a concept design for a permanent cycleway along this route. The City subsequently constructed a pop-up cycleway along Bridge Street, Railway Parade and Henderson Road.
26. Bike counters are in place on Henderson Road. Since the construction of the pop-up cycleway the number of bike trips has increased by 46 per cent (as of the week starting 8 February 2021).
27. The proposal for the permanent cycleway is shown in Attachment F to the subject report. It provides a bi-directional separated cycleway along the western side of Bridge Street north of Ashmore Street, the western side of Railway Parade and the northern side of Henderson Road from Railway Parade to Davy Street.

28. To accommodate the bi-directional separated cycleway and provide safe connections into the wider network, the proposal includes the same functional arrangements and reallocation of road space that have been implemented for the pop-up cycleway, including the following:
- (a) the cycleway replaces 32 parking spaces on the western side of Bridge Street;
 - (b) a one-way southbound restriction for vehicles on Railway Parade, Eveleigh between Sydney and Swanson Streets. Vehicles can no longer turn into Railway Parade from Swanson Street which has allowed the left turn lane on the railway bridge to be re-allocated as a bike lane for eastbound riders;
 - (c) narrower general traffic lanes on Henderson Road in conjunction with speed humps are providing effective traffic calming as previously requested by Henderson Road residents;
 - (d) restricting through traffic along Alexander Street at Henderson Road, making Alexander Street left-in and left-out only; and
 - (e) an overall reduction of on street parking in Henderson Road of one space as a result of the new road geometry.
29. The proposal was endorsed by the Local Pedestrian, Cycling and Traffic Calming Committee on 18 February 2021.
30. Railway Parade has been closed to northbound vehicles at Swanson Street since the pop-up cycleway was installed. This has led to increased traffic volumes and speeds in Park Street. A range of traffic calming measures are proposed to mitigate this impact:
- (a) The narrowing of Park Street at Swanson Street as shown at Attachment D. This narrowing will be installed as a temporary measure ahead of the permanent works as resolved by Council on 22 February 2021.
 - (b) To further calm traffic in Park Street the proposed angled parking and chicanes as shown at Attachment I will be installed as a temporary measure ahead of the permanent works as resolved by Council on 22 February 2021.
31. Note that City staff are also progressing the process for a turn ban or road closure on Park Street at Henderson Road which will be subject to Section 116 (Roads Act 1993) consultation, Local Pedestrian, Cycling and Traffic Calming Committee endorsement and Council approval.

Key Implications

Strategic Alignment - Sustainable Sydney 2030

32. Sustainable Sydney 2030 is a vision for the sustainable development of the City to 2030 and beyond. It includes 10 strategic directions to guide the future of the City, as well as 10 targets against which to measure progress. This report is aligned with the following strategic directions and objectives:
- (a) Direction 3 - Integrated Transport for a Connected City - The projects include traffic calming initiatives that support behaviour change in the city and its villages and encourage a shift to sustainable travel modes.

- (b) Direction 4 - A City for Walking and Cycling - The proposals will meet the objective of implementing priority projects to improve safety, accessibility, connectivity and amenity across the local government area for people cycling.

Organisational Impact

- 33. The projects will create additional assets, such as new civil infrastructure and pavement markings, which will require ongoing maintenance.

Risks

- 34. Risks associated with the proposals have been considered through the concept design and consultation phases. These include safety (in particular road safety for pedestrians, cyclists and motorists), environmental impacts and economic impacts, as well as community concerns.
- 35. Road Safety Audits will be carried out on the developed designs to further identify any risks associated with the proposals and develop mitigation measures.

Social / Cultural / Community

- 36. People will have improved access to safe cycling infrastructure. The proposed bike network connections will contribute to better connected neighbourhoods, increased transport choice and a more active and healthier community.
- 37. These cycleways can supplement public transport in key corridors. They create a safe option for travelling between workplaces, schools, health care and the city centre. The cycleways will free up space on public transport, roads and parking and allow people to travel while maintaining physical distance. They will play an important role in allowing people to safely return to work and local businesses, helping support economic recovery.
- 38. The City is committed to making bicycle transport easier and safer, so it is an attractive and feasible option for more people.

Environmental

- 39. The projects align with the City's Sustainable Sydney 2030 goals which aim to provide a better environment for people walking and riding bikes, resulting in lower emissions.
- 40. Cycling and walking are integral to our transport future because they are the most accessible, equitable, sustainable and reliable forms of transport.

Financial Implications

- 41. The Mitchell Road and Huntley Street cycleway is funded by Transport for NSW via the WestConnex New M5, B51 – Pedestrian and Cycle Implementation Strategy.
- 42. The total forecast project construction costs are based on the concept plans and have been verified by independent quantity surveyors. A summary of the financial implications is included in confidential Attachment J.
- 43. The projects include the upgrade of assets owned by third parties, such as traffic signals owned by Transport for NSW. These works will need to be recognised as expenditure within the City's operating budget for the relevant financial year in which they occur.

44. There are sufficient funds in the 2020/21 Capital Works budget and future year forward estimates to deliver these projects.

Relevant Legislation

45. Local Government Act 1993 - Section 10A provides that a council may close to the public so much of its meeting as comprises the discussion of information that would, if disclosed, confer a commercial advantage on a person with whom the council is conducting (or proposes to conduct) business.
46. Attachment J contains confidential information which, if disclosed, would confer a commercial advantage on a person with whom Council is conducting (or proposes to conduct) business.
47. Discussion of the matter in an open meeting would, on balance, be contrary to the public interest because it would compromise Council's ability to negotiate fairly and commercially to achieve the best outcome for its ratepayers.
48. Roads Act 1993 for road related approvals.
49. Local Government Act 1993 for construction procurement.
50. A Review of Environmental Factors (REF) will be prepared to assess the impacts of the proposal and seek consent under the Environmental Planning and Assessment Act 1979 (Part 5) for the project.

Critical Dates / Time Frames

51. Key dates for Gadigal Avenue, Potter and Crystal Street are:

Milestone	Target Dates
Local Pedestrian, Cycling and Traffic Calming Committee Approval	February 2021
Contractor engagement	April 2021
Construction Commence	October 2021

52. Key dates for Mitchell Road and Huntley Street are as follows:

Milestone	Target Dates
RMS Traffic Signal Plan Approval	March 2021
Local Pedestrian, Cycling and Traffic Calming Committee Approval	April 2021
Tender Period and Approval to appoint contractor	July-October 2021
Construction Period	January-July 2022

53. Key dates for Alexandria Shared Path Connections are as follows:

Milestone	Target Dates
Local Pedestrian, Cycling and Traffic Calming Committee Approval	February 2021
RMS Traffic Signal Plan Approval	March 2021
Construction Period (narrowing and new crossing on Park Street at Swanson Street)	May - June 2021
Tender Period and Approval to appoint contractor	April - July 2021
Construction Period (other intersections)	October 2021 - December 2022

54. Key dates for Ashmore and Harley Streets are as follows:

Milestone	Target Dates
Local Pedestrian, Cycling and Traffic Calming Committee Approval	February 2021
Tender Period and Approval to appoint contractor	April - July 2021
Construction Period	October 2021 - December 2022

55. Key dates for Bridge Street, Railway Parade and Henderson Road are as follows:

Milestone	Target Dates
Local Pedestrian, Cycling and Traffic Calming Committee Approval	February 2021
Temporary traffic calming works in Park Street	March 2021
RMS Traffic Signal Plan Approval	March 2021
Permanent traffic calming works in Park Street	mid 2021
Tender Period and Approval to appoint contractor	April - July 2021
Construction Period	October 2021 - December 2022

Public Consultation

Gadigal Avenue, Potter and Crystal Streets

56. The City consulted residents and businesses in the area between 12 November to 10 December 2020. There were 2,435 letters sent out and advertisements on the Sydney Your Say website and in the Sydney Cycleways newsletter.
57. The City received a total of 55 responses with 51 responses in support of the proposal, two mixed responses and two responses against the proposal.
58. Submissions in support of the proposal believed the project improved safety and connectivity throughout Waterloo. Submissions objecting to the proposal believed the project was unnecessary.
59. A detailed Engagement Report is included at Attachment G.

Erskineville and Alexandria Cycleway Links

60. Public exhibition of the concept designs for Mitchell Road and Huntley Street, Alexandria Shared Path Connections, Ashmore and Harley Streets and Bridge Street, Railway Parade and Henderson Road was undertaken between 20 November and 18 December 2020 and included the following activities:
 - (a) mailing consultation letters to 9,750 residents and businesses in the area requesting feedback on the proposal;
 - (b) a page on the Sydney Your Say website where the design plans could be viewed, and feedback provided via a survey;
 - (c) promotion on the SydneyCycleways and City of Sydney social media channels including two Facebook posts and two tweets; and

- (d) community information session on 9 December 2020 on Zoom.
- 61. Notification, as required under Section 116 of the Roads Act, was also carried out from 20 November to 18 December 2020 for the proposed turn bans at Swanson Street and Railway Parade as well as Alexander Street and Henderson Road.
- 62. Overall 599 submissions were received. Details of these can be found in the Engagement Report at Attachment H.

Key findings for Mitchell Road and Huntley Street

- 63. The design has been developed in consultation with Transport for NSW, and the State Transit Authority.
- 64. A total of 78 submissions were received during the consultation period with 33 responses supporting the proposal, 29 opposing and 17 with mixed responses.
- 65. Key points raised during community consultation include:
 - (a) general support for more safe riding and the connection this project will provide;
 - (b) support for spaces for riding over parking spaces is supported by some respondents; and
 - (c) more people will ride knowing that these connections are there.
- 66. Concerns people raised about the project include:
 - (a) the cycleway on Mitchell Road will cause congestion; and
 - (b) the right-hand turn ban on to Mitchell Road will impact access for people driving.
- 67. The above concerns are related to the King Street Gateway project, managed by Transport for NSW and feedback will be shared with them.

Key findings for Alexandria Shared Path Connections

- 68. Of the submissions received, 77 comments were in relation to the proposals for Alexandria Shared Path Connections. Twenty-nine submissions provided mixed or qualified support, 26 were in support of the project and 22 submissions were opposed to the proposal.
- 69. Submissions in support of the proposal believed the changes would promote walking and cycling and creating safer paths to and from the school. Submissions opposed to the proposal raised concerns about conflicts between cyclists and pedestrians on the footpath.

Key findings for Ashmore and Harley Streets

- 70. Of the submissions received, 51 comments were in relation to the proposal on Ashmore and Harley Street. Thirty-four submissions received were in support of the project, nine submissions provided mixed or qualified support and eight opposed the proposal.
- 71. Submissions in support of the proposal identified that the proposal would improve accessibility for bicycle riders and improve safety. Submissions opposed to the

proposal raised concerns about private vehicles ability to park and increased congestion resulting from narrowed streets.

Key findings for Bridge Street, Railway Parade and Henderson Road

72. There were 453 submissions in response to the Henderson Road, Railway Parade and Bridge Street proposal with 347 objecting to the proposal, 65 comments with mixed support and design suggestions, and 41 supporting the proposal.
73. Submissions supporting the proposal believed the changes would improve safety and cycle access through the area and reduce vehicle speeds. Some of the concerns raised related to the narrowing of the adjacent traffic lanes and loss of parking.
74. A large number of submissions opposed the Railway Parade one-way closure as it has resulted in increased traffic in Park Street. In response, the City has developed a proposal for traffic calming measures in Park Street, with input from Park Street residents, and sought community feedback on this proposal from 24 February 2021 to 3 March 2021. Engagement activities have included letterbox drops, drop in sessions at Solander Park and email correspondence. The design will be further refined following review of the feedback from the community.

Future Consultation

75. In response to a request from Park Street residents, Council on 22 February 2021 approved the immediate preparation of a Traffic Impact Assessment Report and Traffic Management Plan for the precinct, for the following two options,

- (a) Option One: No Right Turn from Park Street into Henderson Road; or
- (b) Option Two: Full closure of Park Street at Henderson Road;

This proposal will be subject to future consultation with stakeholders from the broader surrounding area.

76. Community members and organisations that have made submissions were notified when the projects were reported to the Local Pedestrian, Cycling and Traffic Calming Committee.
77. Notification letters will be sent to property owners and businesses prior to construction.
78. During construction, there will be close liaison between property owners, businesses, City staff and the contractors to minimise disruption to residences and trade in the area.

AMIT CHANAN

Director City Projects and Planning

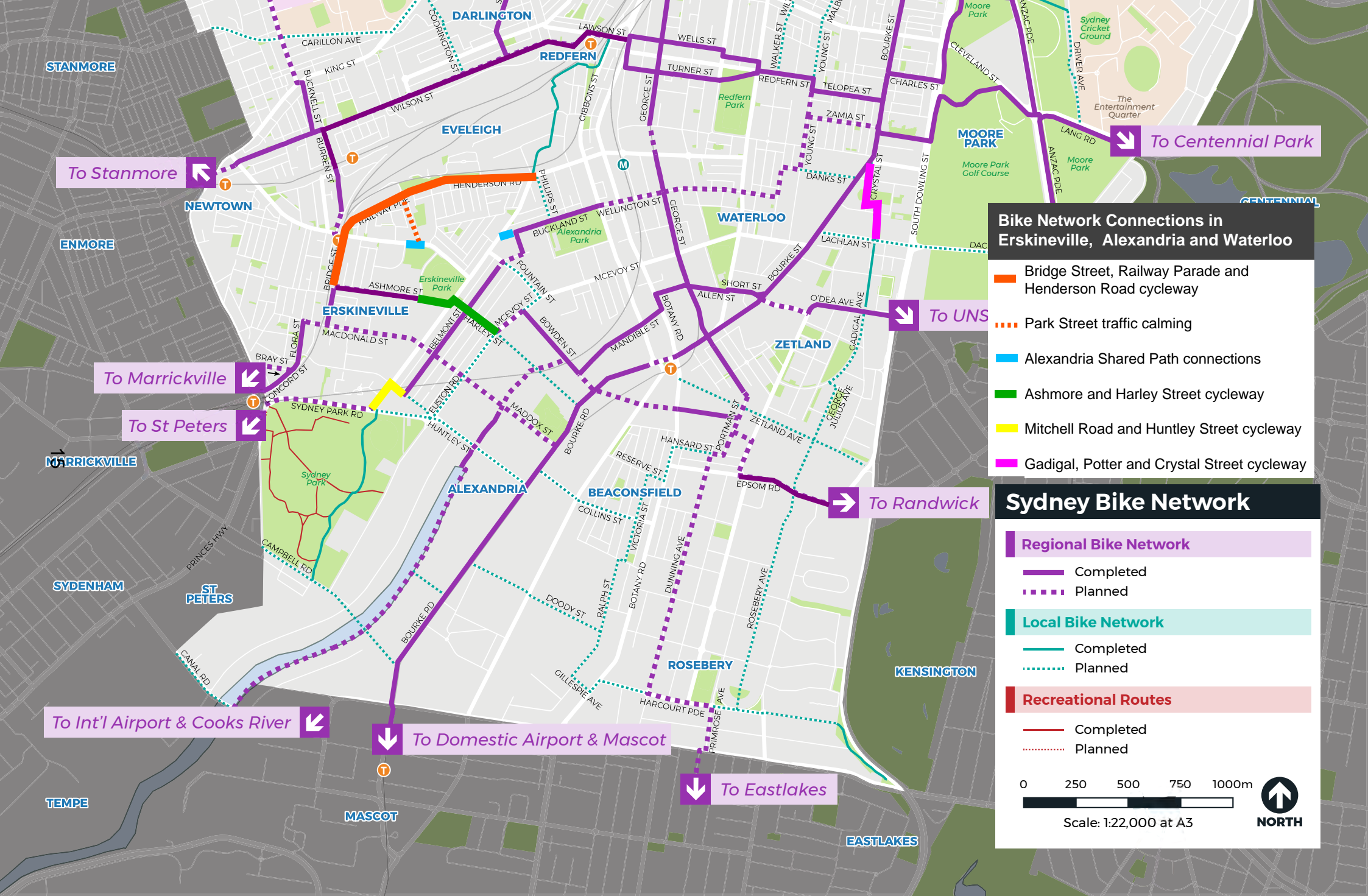
Maren Parry, Development Manager

Sam Wheatley, Delivery Manager

James Kidd, Design Manager

Attachment A

Bike Network Connections Map



Bike Network Connections in Erskineville, Alexandria and Waterloo

- Bridge Street, Railway Parade and Henderson Road cycleway
- Park Street traffic calming
- Alexandria Shared Path connections
- Ashmore and Harley Street cycleway
- Mitchell Road and Huntley Street cycleway
- Gadigal, Potter and Crystal Street cycleway

Sydney Bike Network

Regional Bike Network

- Completed
- Planned

Local Bike Network

- Completed
- Planned

Recreational Routes

- Completed
- Planned

0 250 500 750 1000m

Scale: 1:22,000 at A3

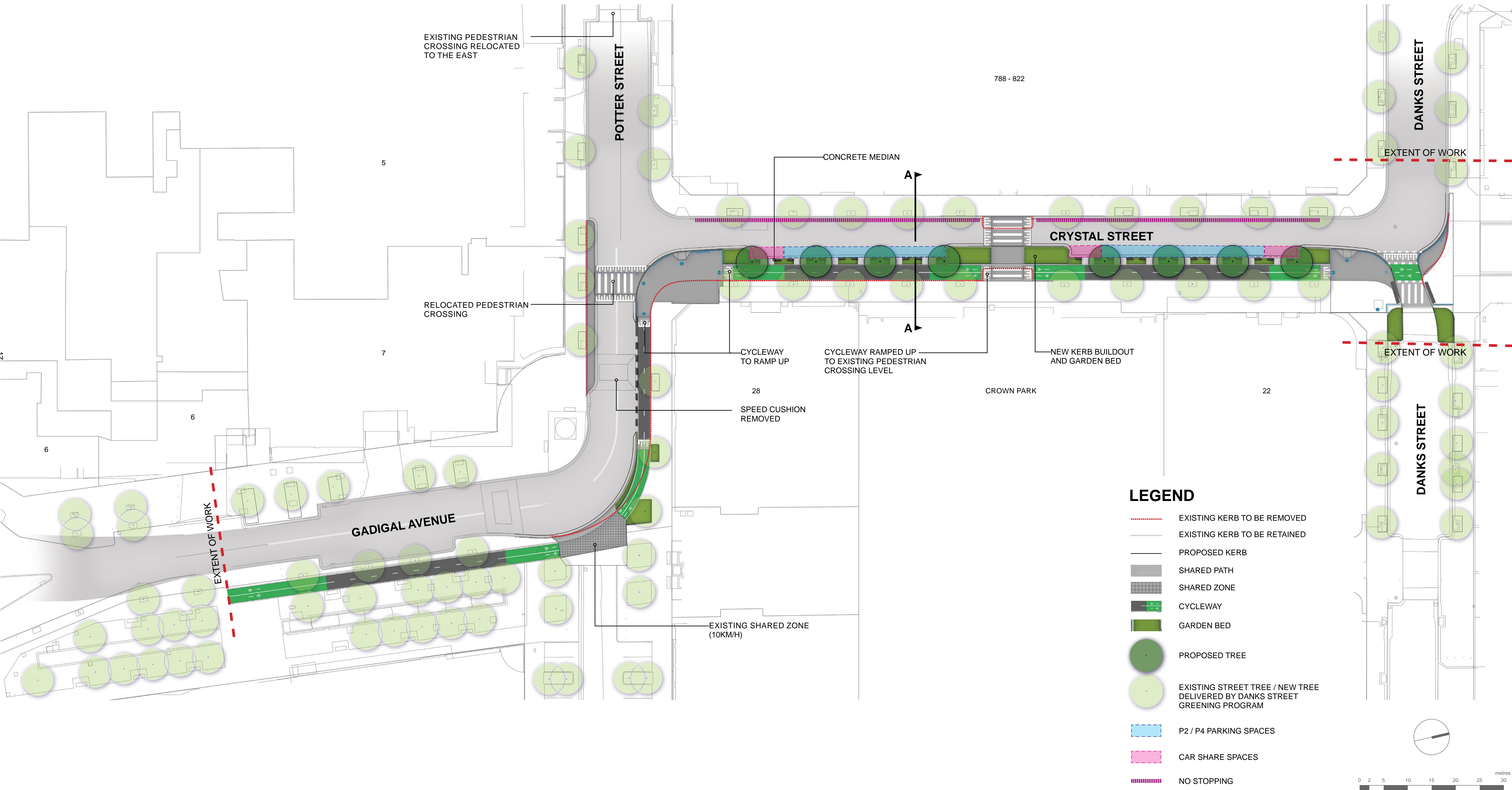
NORTH

Attachment B

**Community Consultation Drawings –
Concept Design for Gadigal Avenue, Potter
Street and Crystal Street Cycleway**

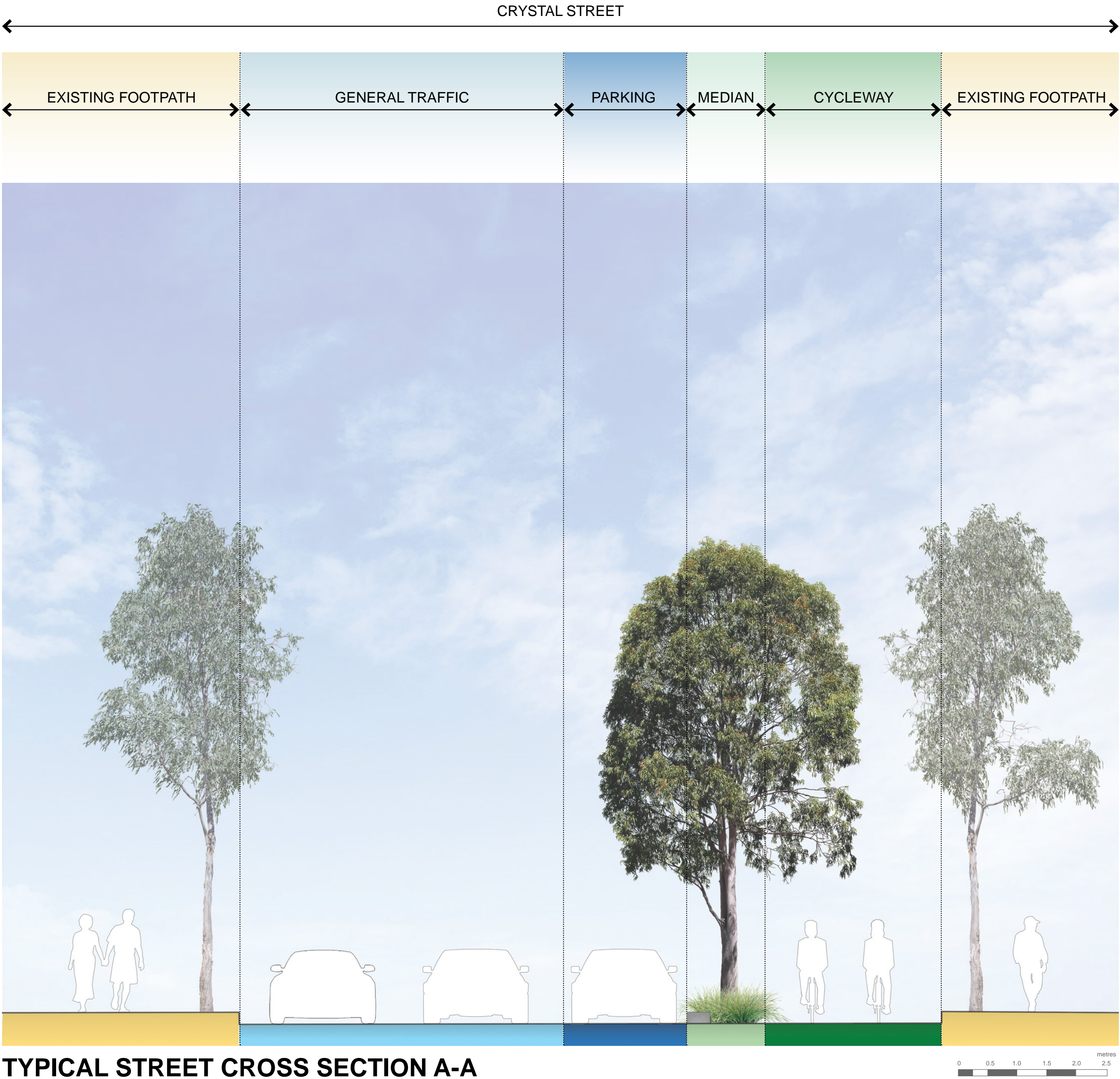
Improving Gadigal Avenue, Potter Street and Crystal Street

Gadigal Avenue to Crystal Street



Improving Gadigal Avenue, Potter Street and Crystal Street

Typical Street Cross Section



Improving Gadigal Avenue, Potter Street and Crystal Street
Existing View - Crystal Street



EXISTING VIEW OF CRYSTAL STREET NEAR THE POTTER STREET INTERSECTION LOOKING NORTH

Improving Gadigal Avenue, Potter Street and Crystal Street
Artist's Impression - Crystal Street



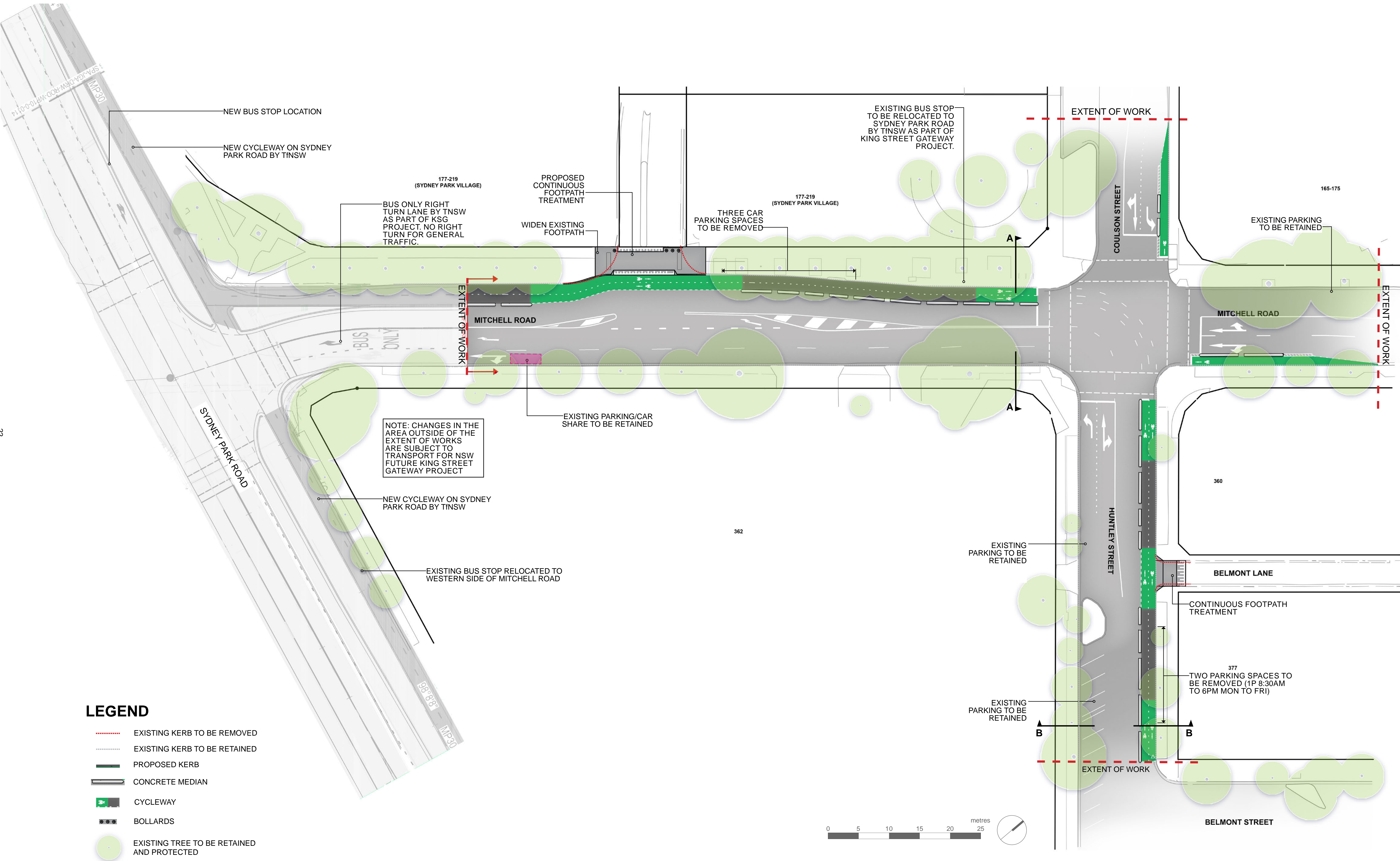
ARTIST'S IMPRESSION 1: PROPOSED VIEW OF CRYSTAL STREET NEAR THE POTTER STREET INTERSECTION LOOKING NORTH

Attachment C

**Community Consultation Drawings –
Concept Design for Mitchell Road and
Huntley Street Cycleway**

Improving Mitchell Road and Huntley Street

Mitchell Road and Huntley Street



Improving Mitchell Road and Huntley Street

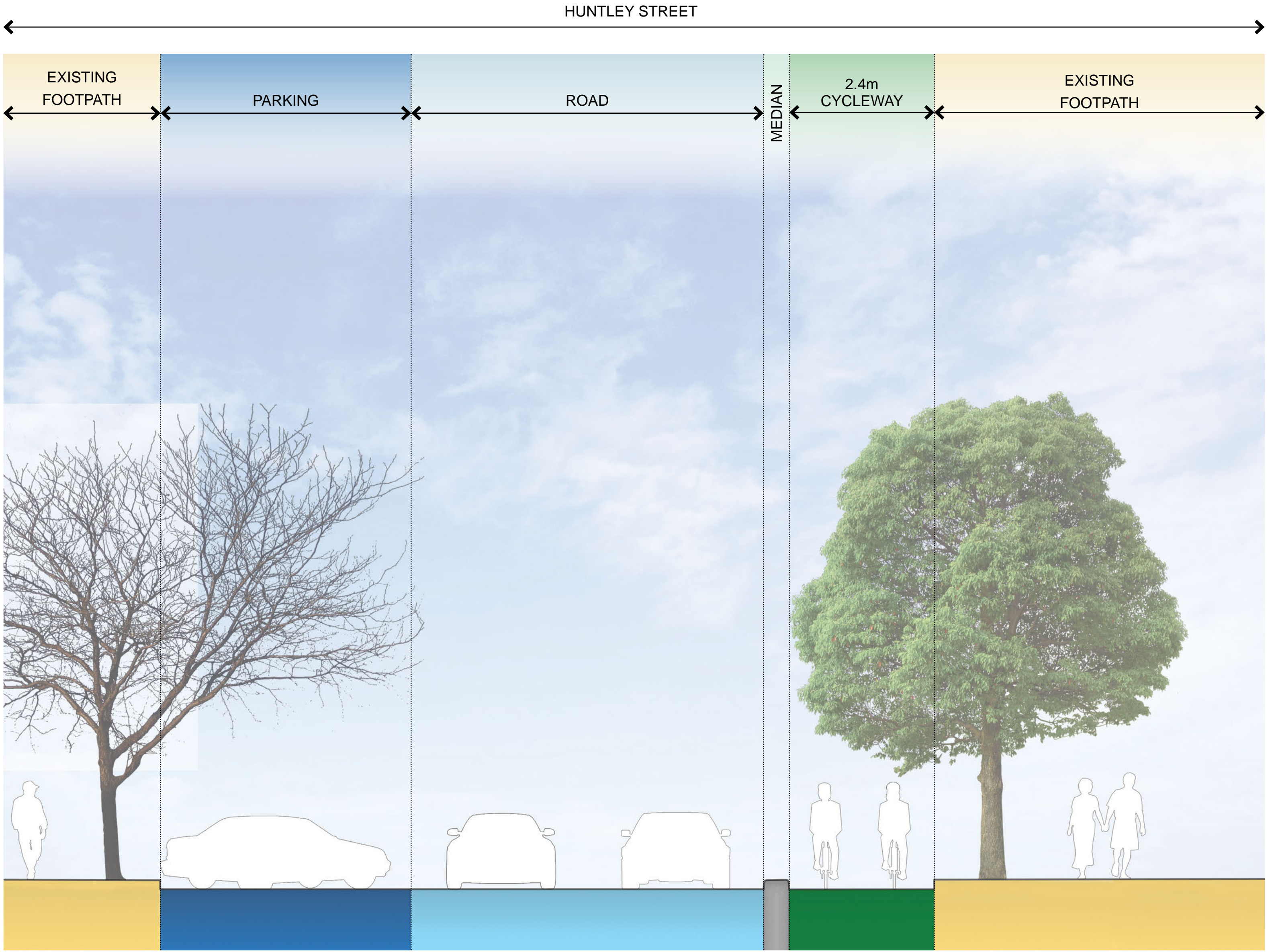
Typical Street Cross Section - Mitchell Road



**TYPICAL STREET CROSS SECTION A-A
MITCHELL ROAD**

Improving Mitchell Road and Huntley Street

Typical Street Cross Section - Huntley Street



**TYPICAL STREET CROSS SECTION B-B
HUNTLEY STREET**

Improving Mitchell Road and Huntley Street

Existing View - Mitchell Road



EXISTING VIEW OF MITCHELL ROAD LOOKING SOUTH-WEST

Improving Mitchell Road and Huntley Street
Artist's Impression - Mitchell Road



ARTIST'S IMPRESSION 1: PROPOSED VIEW OF MITCHELL ROAD LOOKING SOUTH-WEST

Improving Mitchell Road and Huntley Street
Existing View - Huntley Street



EXISTING VIEW NORTH-WEST ALONG HUNTLEY STREET NEAR BELMONT STREET INTERSECTION

Improving Mitchell Road and Huntley Street
Artist's Impression - Huntley Street

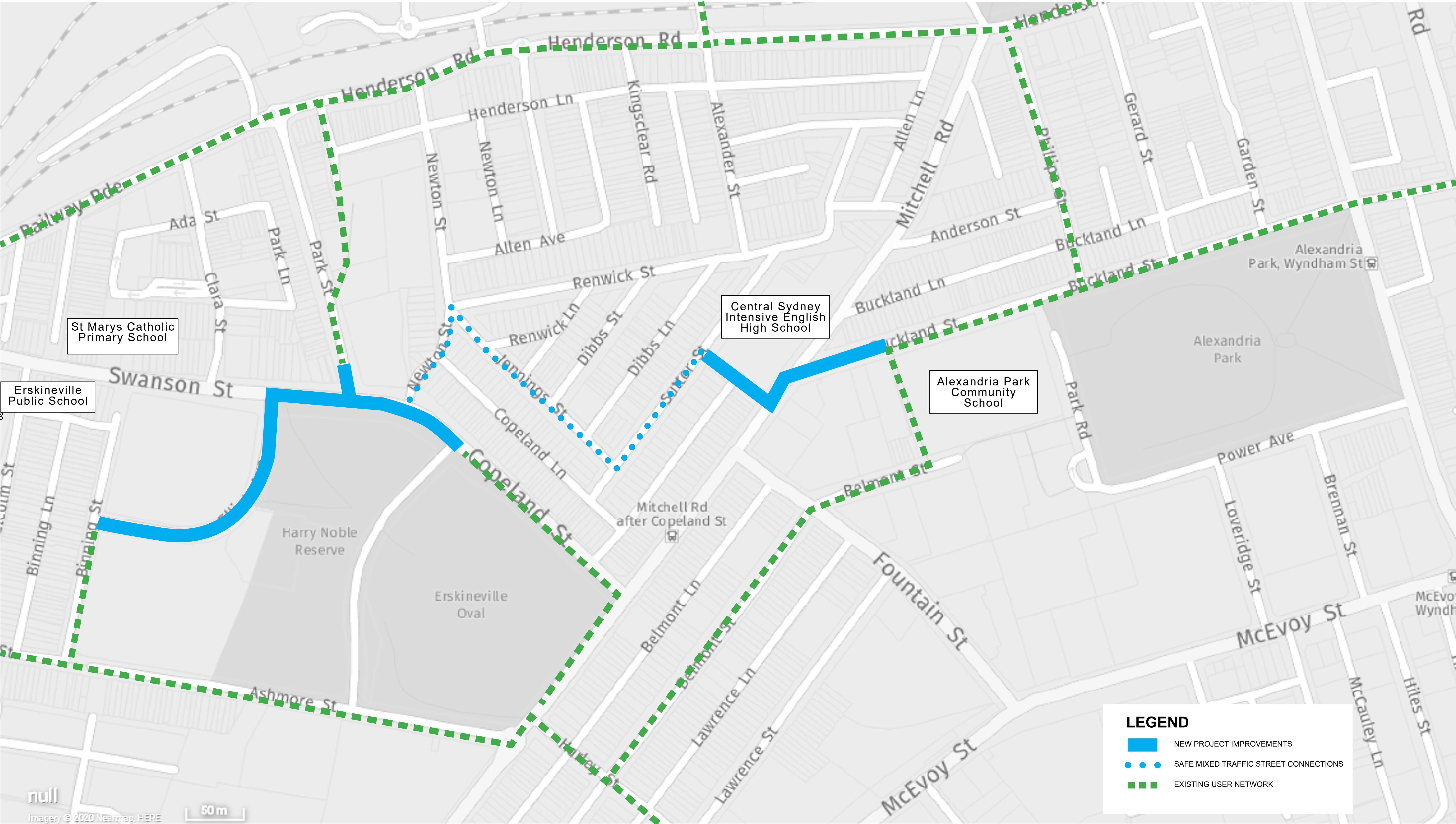


ARTIST'S IMPRESSION 2: PROPOSED VIEW NORTH-WEST ALONG HUNTLEY STREET NEAR BELMONT STREET INTERSECTION

Attachment D

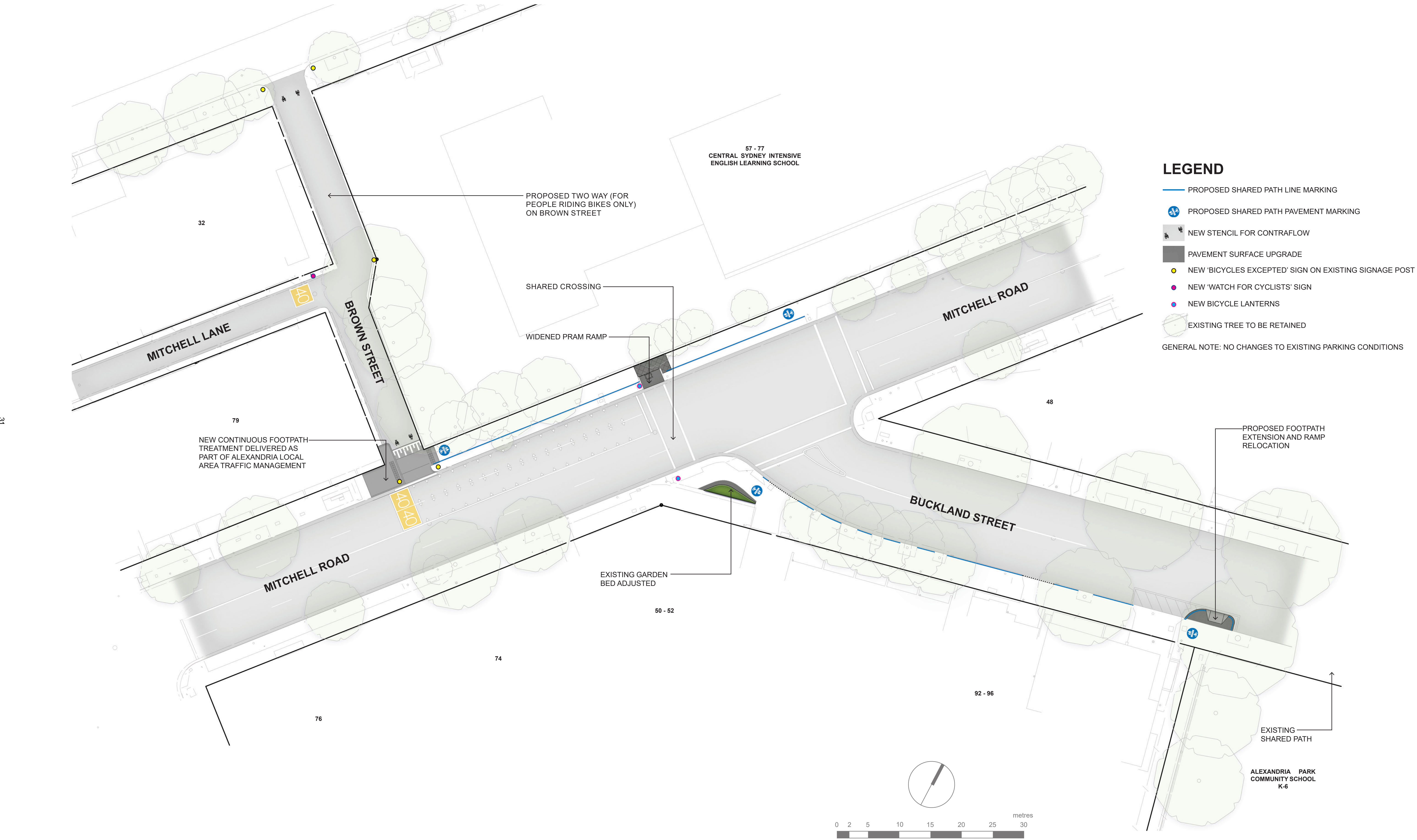
<p>Community Consultation Drawings – Concept Design for Alexandria Shared Paths</p>
--

Safe Routes to School - Context Map



Safe Routes to School

Cycling and walking improvements to Brown Street, Mitchell Road and Buckland Street



Safe Routes to School

Cycling and walking improvements to Swanson Street

32

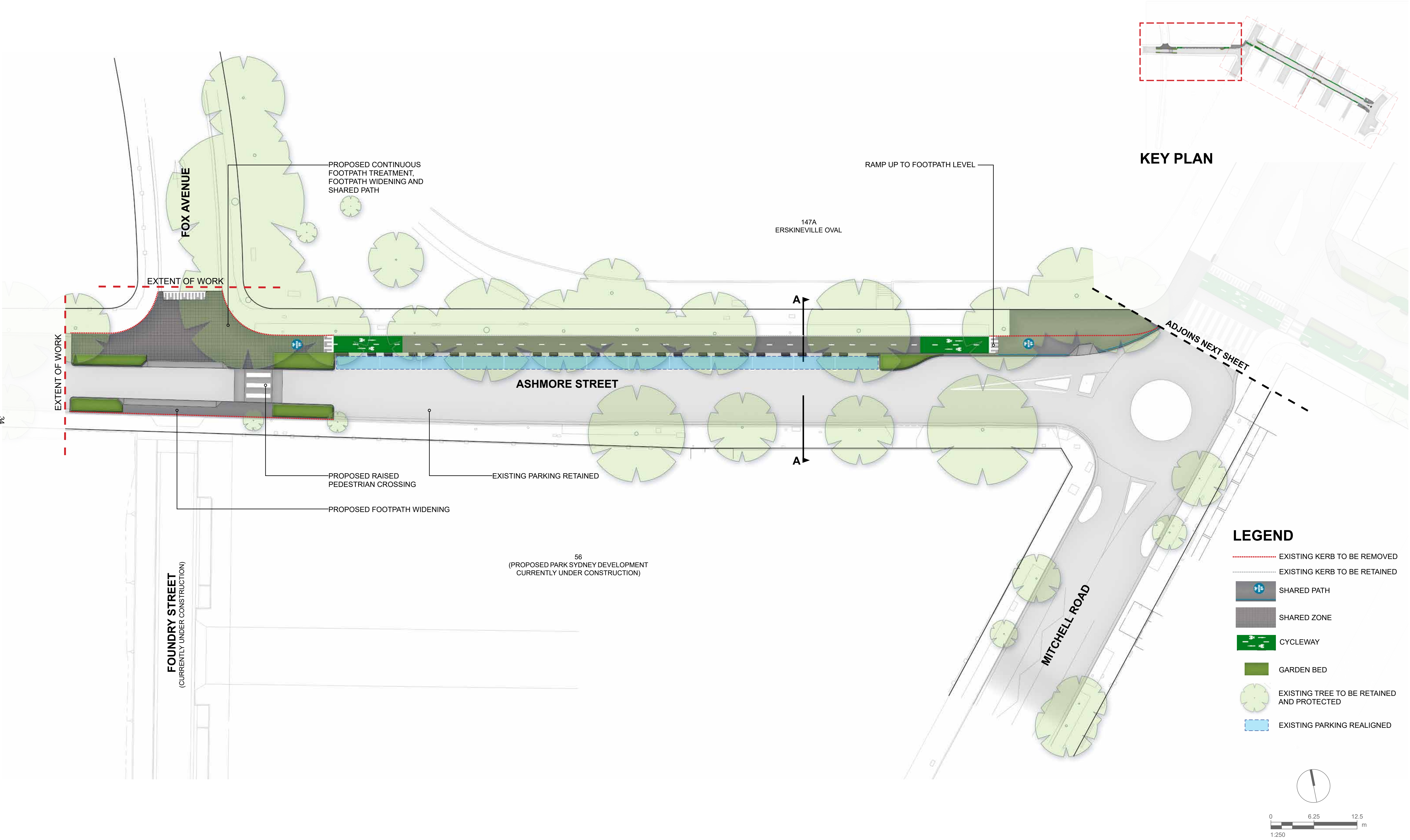


Attachment E

**Community Consultation Drawings –
Concept Design for Ashmore Street and
Harley Street Cycleway**

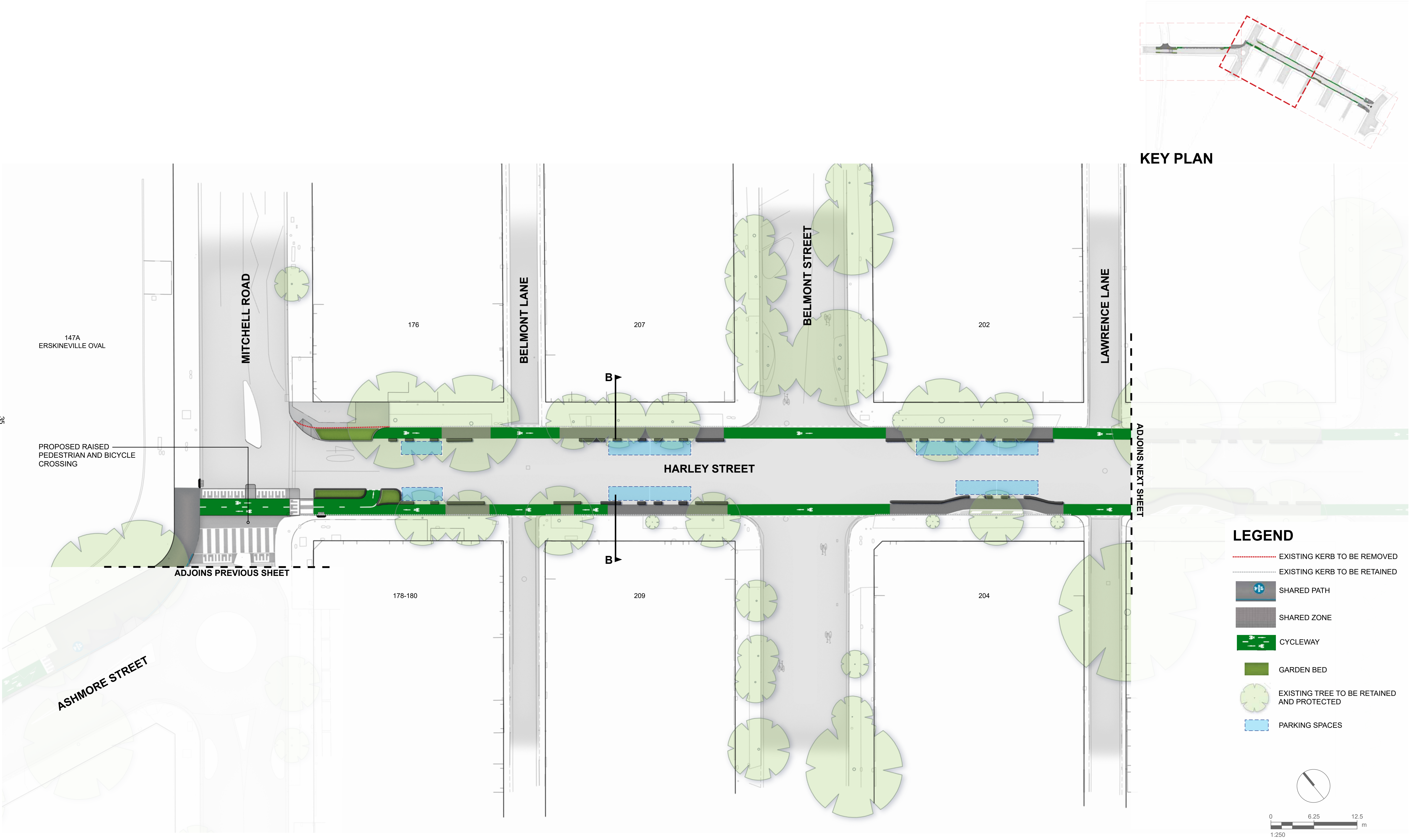
Improving Ashmore Street and Harley Street

Ashmore Street



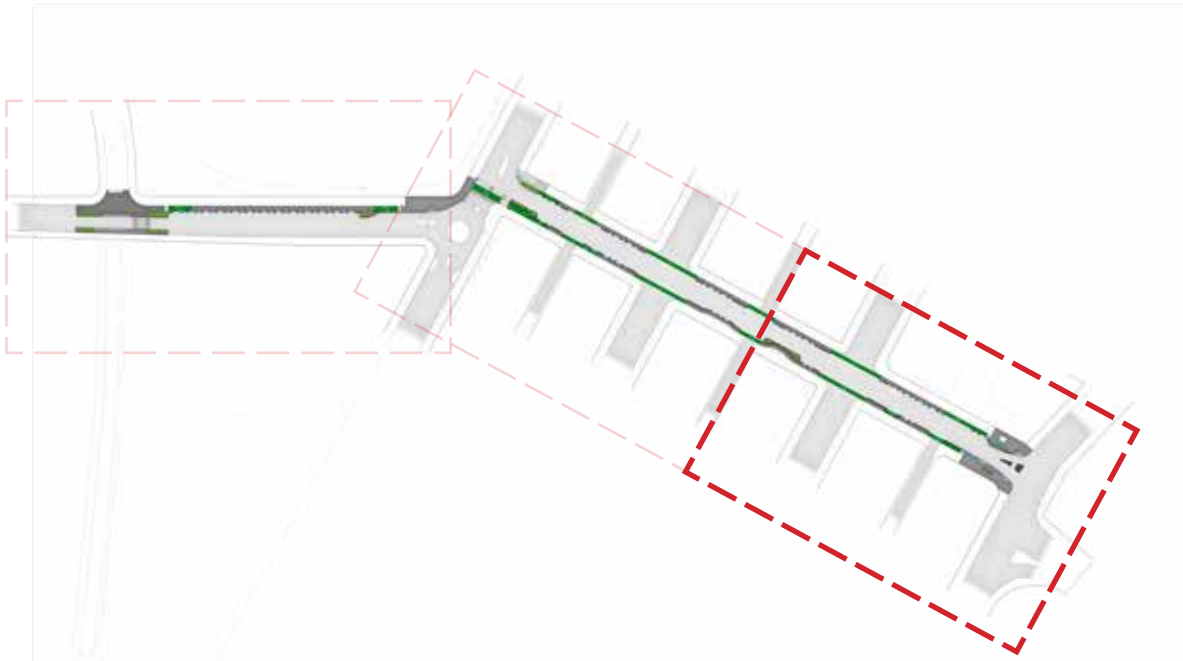
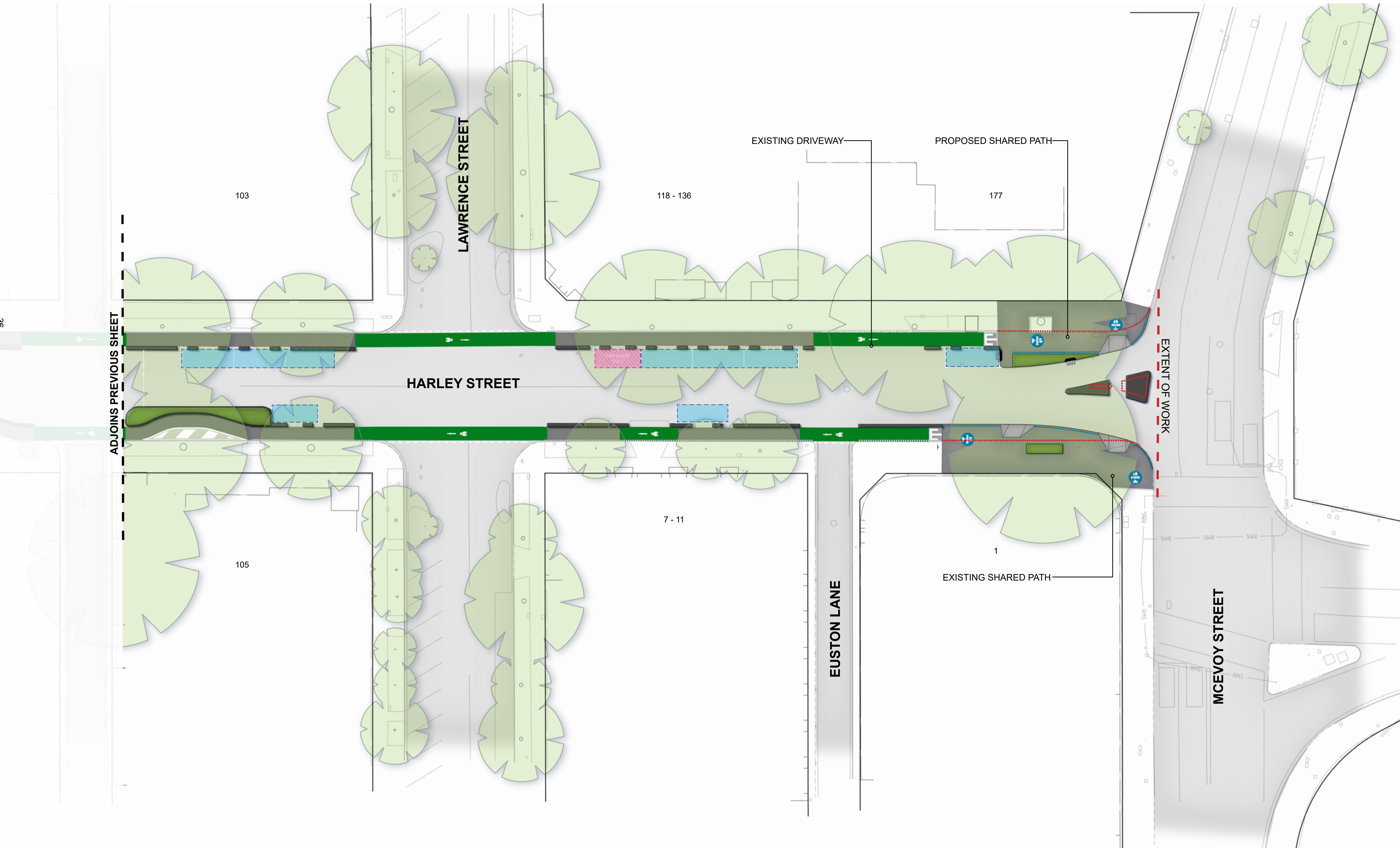
Improving Ashmore Street and Harley Street

Harley Street



Improving Ashmore Street and Harley Street

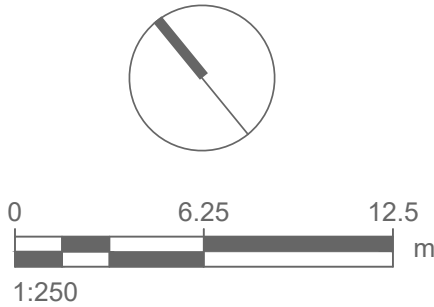
Harley Street



KEY PLAN

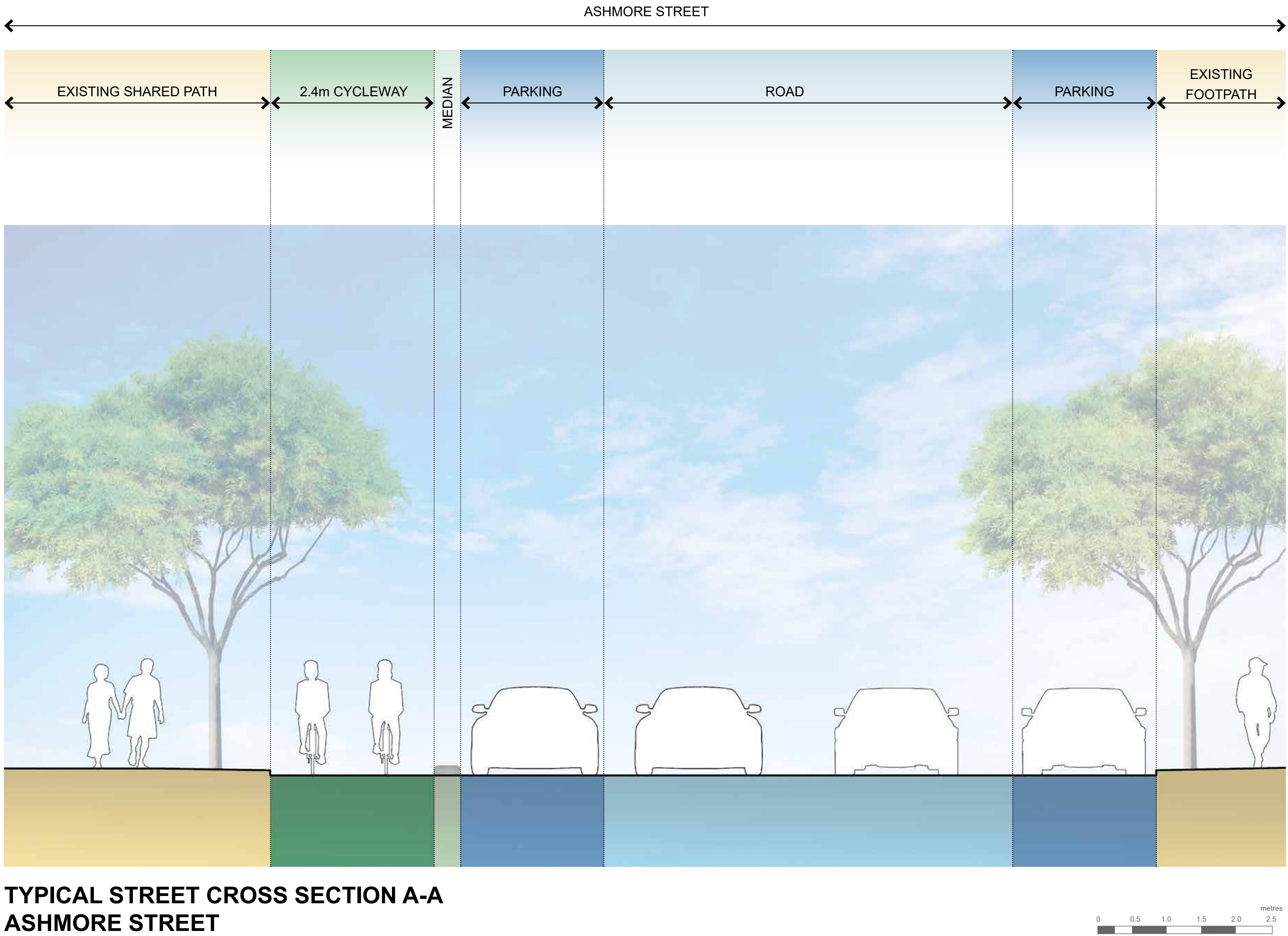
LEGEND

- EXISTING KERB TO BE REMOVED
- EXISTING KERB TO BE RETAINED
- SHARED PATH
- SHARED ZONE
- CYCLEWAY
- GARDEN BED
- EXISTING TREE TO BE RETAINED AND PROTECTED
- PARKING SPACES
- CAR SHARE SPACES



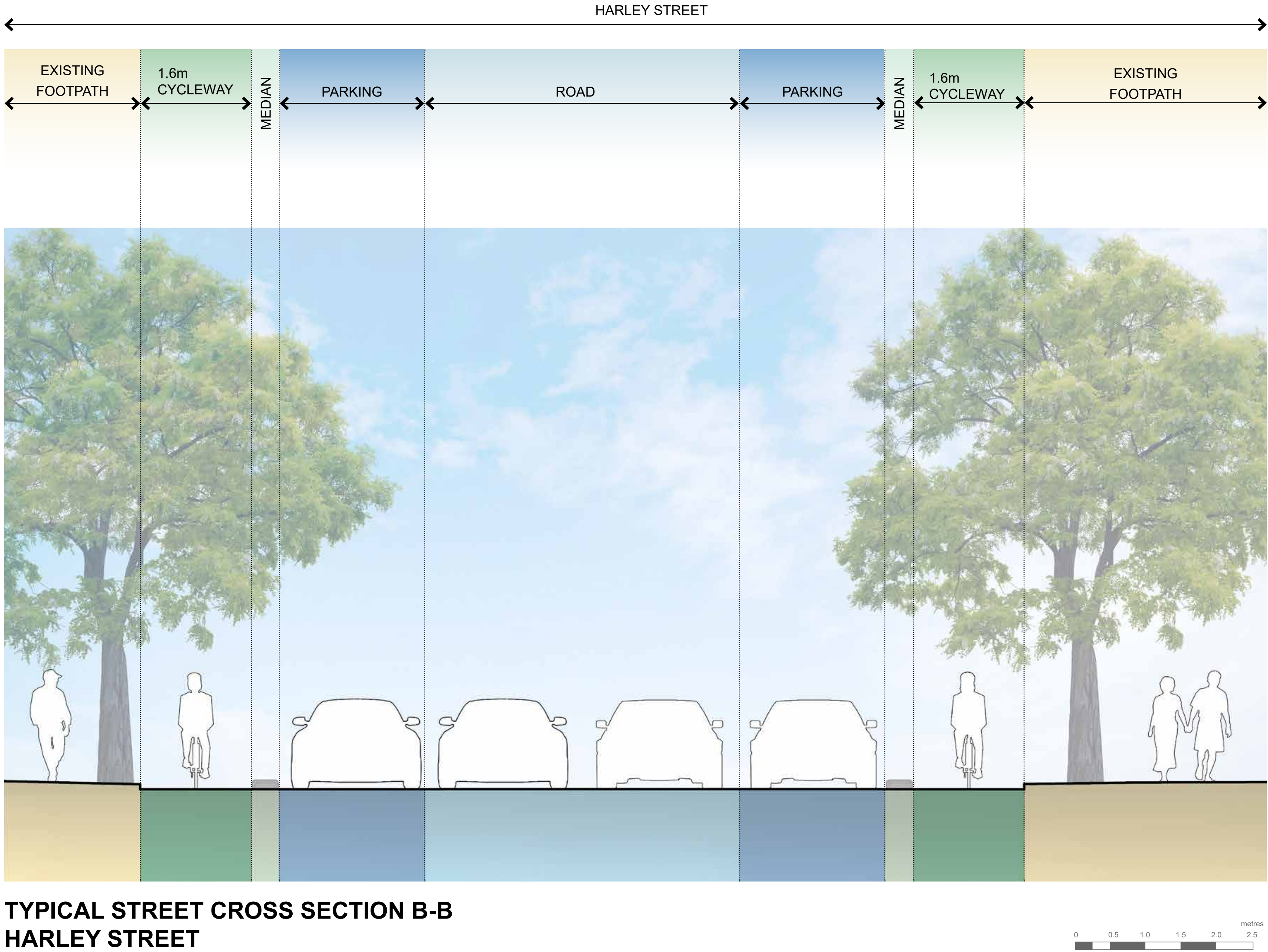
Improving Ashmore Street and Harley Street

Typical Street Cross Section - Ashmore Street



Improving Ashmore Street and Harley Street

Typical Street Cross Section - Harley Street



Improving Ashmore Street and Harley Street
Existing View - Ashmore Street



EXISTING VIEW OF ASHMORE STREET NEAR MITCHELL ROAD LOOKING WEST

Improving Ashmore Street and Harley Street
Artist's Impression - Ashmore Street



ARTIST'S IMPRESSION 1: PROPOSED VIEW OF ASHMORE STREET NEAR MITCHELL ROAD LOOKING WEST

Improving Ashmore Street and Harley Street
Existing View - Harley Street



EXISTING VIEW OF HARLEY STREET NEAR LAWRENCE STREET INTERSECTION LOOKING WEST

Improving Ashmore Street and Harley Street
Artist's Impression - Harley Street



ARTIST'S IMPRESSION 2: PROPOSED VIEW OF HARLEY STREET NEAR LAWRENCE STREET INTERSECTION LOOKING WEST

Attachment F

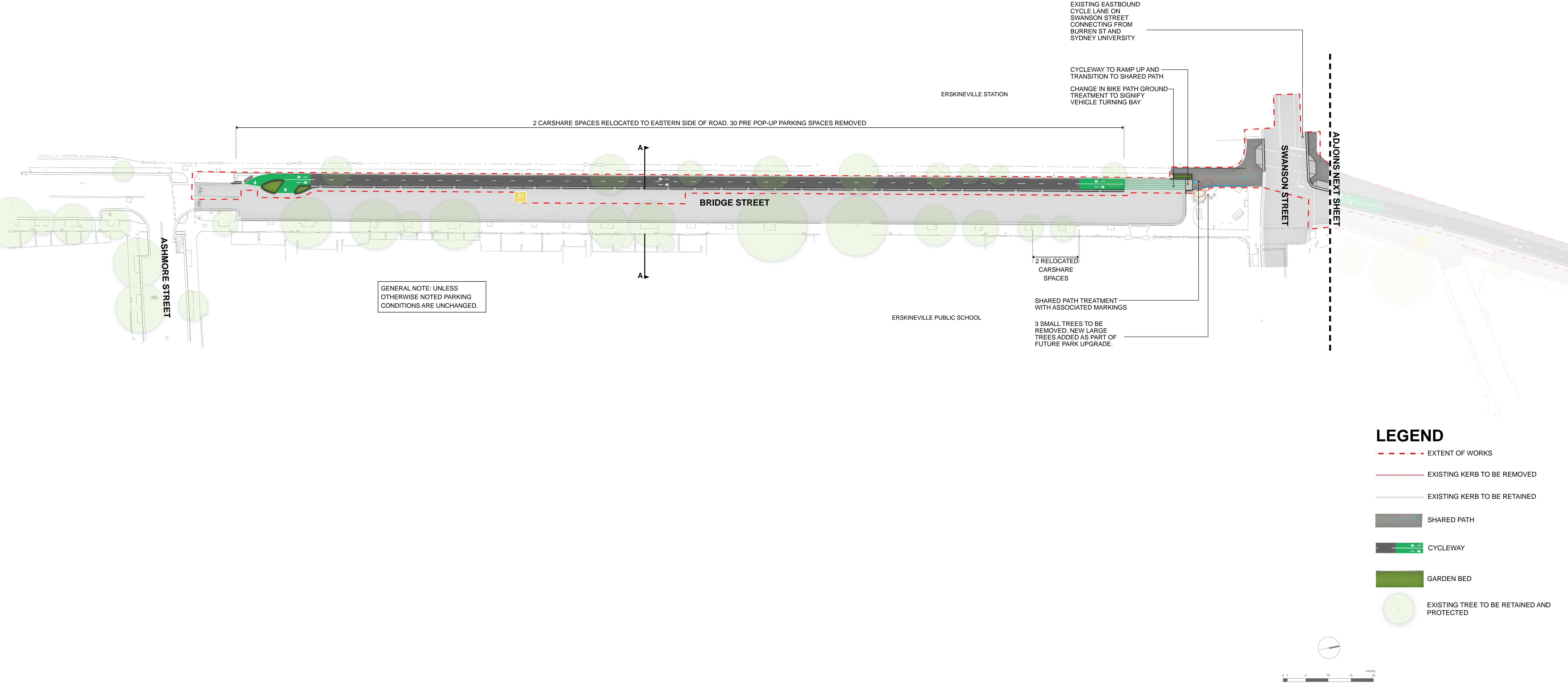
**Community Consultation Drawings –
Concept Design for Bridge Street, Railway
Parade and Henderson Road Cycleway**

Improving Bridge Street, Railway Parade and Henderson Road

Bridge Street

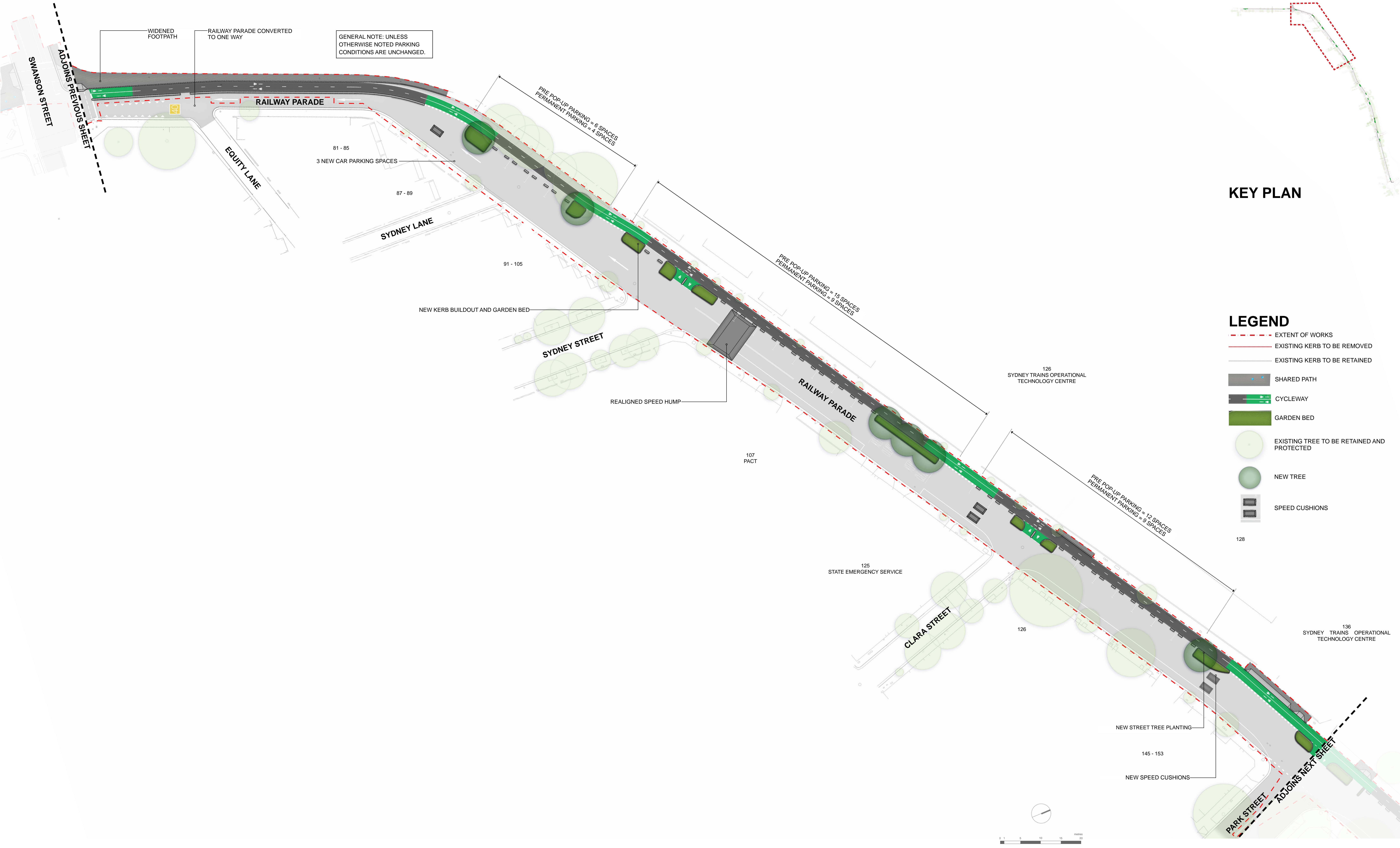


KEY PLAN



Improving Bridge Street, Railway Parade and Henderson Road

Railway Parade



Improving Bridge Street, Railway Parade and Henderson Road

Henderson Road



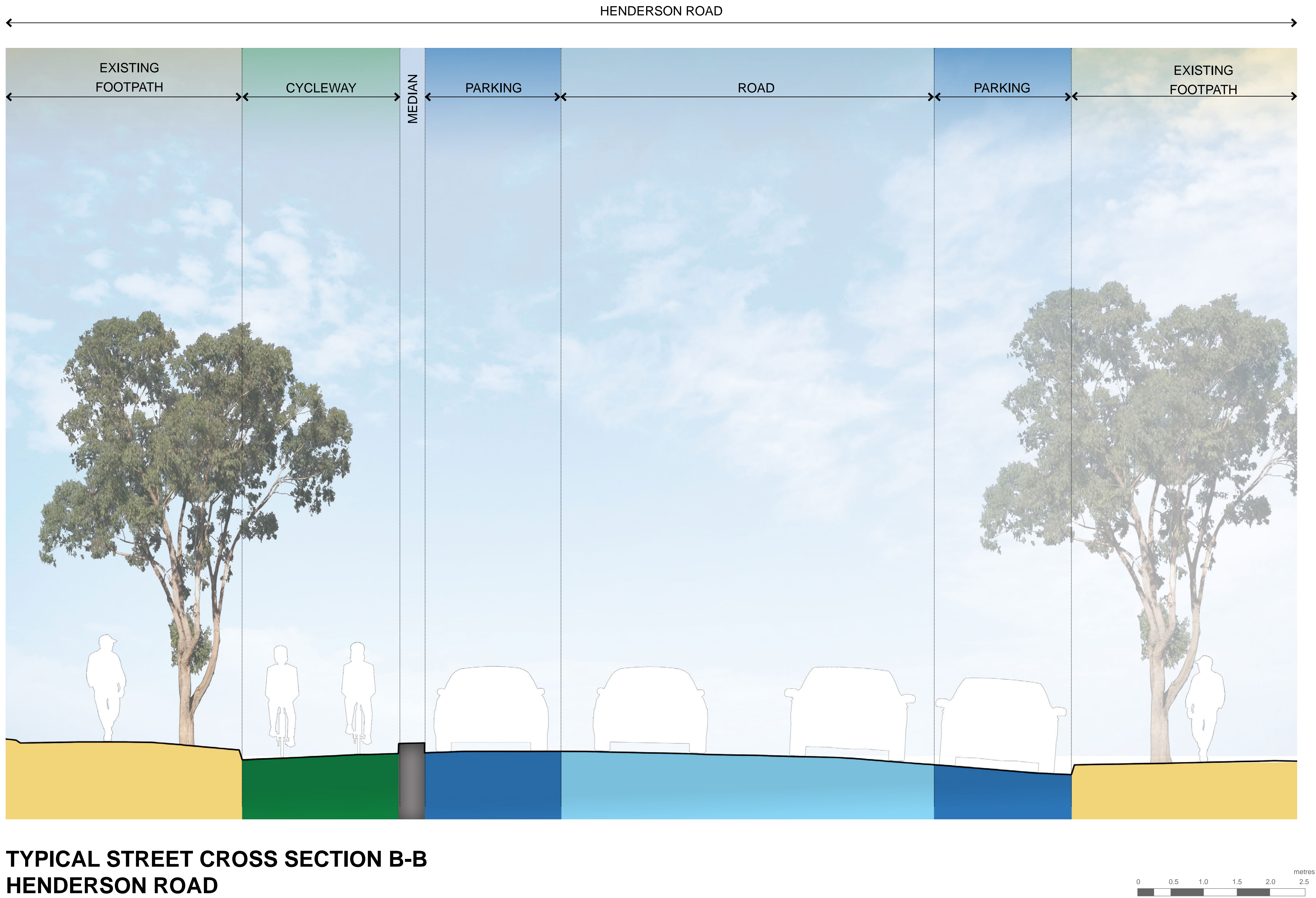
Improving Bridge Street, Railway Parade and Henderson Road

Typical Street Cross Section - Bridge Street



Improving Bridge Street, Railway Parade and Henderson Road

Typical Street Cross Section - Henderson Road



Improving Bridge Street, Railway Parade and Henderson Road
Existing View - Bridge Street



EXISTING VIEW OF BRIDGE STREET LOOKING NORTH

Improving Bridge Street, Railway Parade and Henderson Road
Artist's Impression - Bridge Street



ARTIST'S IMPRESSION 1: PROPOSED VIEW OF BRIDGE STREET LOOKING NORTH

Improving Bridge Street, Railway Parade and Henderson Road
Existing View - Railway Parade



EXISTING VIEW OF RAILWAY PARADE LOOKING NORTH-EAST

Improving Bridge Street, Railway Parade and Henderson Road
Artist's Impression - Railway Parade



ARTIST'S IMPRESSION 2: PROPOSED VIEW OF RAILWAY PARADE LOOKING NORTH-EAST

Attachment G

**Engagement Report – Gadigal Avenue,
Crystal Street and Potter Street Cycleway**

Engagement report



Contents

Background	3
Engagement summary and activities	3
Survey findings	3
Appendices	7

Background

The project will create a safe connection for people walking and riding, between Green Square and south eastern suburbs and the Bourke Street cycleway, Redfern and Surry Hills. It connects with the existing cycleway on Gadigal Avenue between O'Dea Avenue and Lachlan Streets, utilising a new signalised crossing of Lachlan Street.

Improvements include:

- A bidirectional cycleway on the eastern side of Crystal Street
- New garden bed plantings in medians
- Safer crossings for people walking
- Planting of eight new trees (Corymbia Maculata or spotted gum which match the existing trees on the verge).

So that we can provide these improvements, it is proposed to remove 10 parking spaces on Crystal Street. There are no proposed changes to parking on Potter Street.

Engagement summary and activities

From 12 November to 10 December 2020, we asked the community for feedback on improvements on Gadigal Avenue, Crystal and Potter streets.

The purpose of the engagement was to make concept plans available for comments that will inform a detailed design on the improvements that will benefit community including people walking and riding.

The Sydney Your Say page was created and visited 396 times during the consultation period. The plan was downloaded 181 times.

We received a total of 55 submissions (via Survey Monkey) during the public exhibition period.

A notification letter was sent to 2435 properties and the project featured in the Sydney Your Say and Sydney Cycleways e-newsletter.

Snapshot of people who answered the survey



55 people surveyed

98% completed the survey as individuals (not as an organisation or business)



24% live in Waterloo and Zetland

36% live in the City of Sydney Local Government Area

29% live in other Local Government Areas

11% didn't indicate where they live



94% of submissions support the project

3% of submissions were neutral

3% of submissions do not support the project

Idea or issue raised	City of Sydney response
Interested in seeing this project connect to the work currently happening at Lachlan Street.	The works are underway to install traffic signals at the intersection of Gadigal Avenue and Lachlan Street this will connect the existing cycleway on Gadigal Avenue to the proposed new cycleway north of Lachlan Street.
Suggests that the cycleway is at least 3 meters wide.	On Crystal Street and Gadigal Avenue the cycleway is 3m wide. On Potter Street the cycleway is 2.4m wide to accommodate the turning circle of larger vehicles.
Make sure that the crossings are safe, accessible and free from debris.	All crossings are designed to meet relevant standards and technical guidelines. Roads and cycleways are cleaned on a regular basis.
What information is there that supports the need for more cycleways.	<p>Cycleways are important to provide a safe transport option for people wanting to ride. Customer research by Transport for NSW found that 70% of Sydneysiders would ride, or ride more often if it were safe and convenient.</p> <p>A survey of over 1,000 people living within 10kms of city centre in June 2018 found:</p> <ul style="list-style-type: none"> • 72 percent support separated cycleways • 62 percent agree bikes help to cut congestion on roads and public transport • Most want bike network built faster • Two thirds support bike network even if it means longer car journeys
Where can people riding electric assisted bikes ride?	Electric assisted bikes are treated the same as bicycles in the road rules. They may ride on roads, cycleways and shared paths. If the rider is under 16, or riding with a child, or is a postal worker, or has a medical certificate, they may ride on the footpath.

Idea or issue raised	City of Sydney response
The cycleway doesn't connect anywhere.	The works are underway to install traffic signals at the intersection of Gadigal Avenue and Lachlan Street this will connect the existing cycleway on Gadigal Avenue to the proposed new cycleway north of Lachlan Street. At the northern end of Crystal Street, cyclists can use the through site link to connect to the Bourke Street Cycleway.
The separated cycleway should continue all the way to Dyurulya Square instead of pushing people riding on to shared paths.	The works are underway to install traffic signals at the intersection of Gadigal Avenue and Lachlan Street this will connect the existing cycleway on Gadigal Avenue to the proposed new cycleway north of Lachlan Street without the need for Shared Paths at this intersection
Provide adequate wayfinding signage to show the connection from Danks Street to East Village.	This is a good suggestion, thank you. We will do so.
Experienced riders feel that this isn't needed and existing crossing and speed hump make the space comfortable to ride.	We build cycleways for the many people (ie 70% of Sydneysiders) who would ride if there was safe infrastructure, separated from traffic.
Can the speed limit be reduced to 30km/h?	Speed limits are controlled by NSW State Government and the City of Sydney has no jurisdiction over speed limits.
The crossing should also include a green cycle strip as well as the existing one in the middle of Crystal Street near the fountain.	At the mid-block crossing in Crystal Street pedestrians will have right of way over bike riders. Green paint would suggest a bicycle priority.
The existing crossing should be retained.	The crossing across Potter Street will be relocated to the existing pedestrian desire line near Crystal Street.
The area is already oversubscribed with on-street parking, so the removal of the spaces is supported.	Noted

Appendices

Appendix A: Sydney Your Say webpage (including online survey)

Proposed works & maintenance

Proposed improvements on Gadigal Avenue, Crystal and Potter streets, Waterloo

Our proposal will create a safe connection for people walking and riding on Crystal and Potter streets in Waterloo.

Waterloo

Under review

Contributions to this consultation are closed for evaluation and review. The project team will report back on key outcomes.

PUBLIC CONSULTATION PERIOD
12 November 2020 to 10 December 2020

What we're doing

We invite your feedback on improvements to Crystal and Potter streets, between Gadigal Avenue and Danks Street in Waterloo, including a new bike connection.

Improvements include:

- a bidirectional cycleway on the eastern side of Crystal Street
- new garden beds and plants in medians
- safer crossings for people walking
- 8 new trees.

To make these improvements, we'll remove 10 parking spaces on Crystal Street. There are no proposed changes to parking on Potter Street or Gadigal Avenue.

Haidi Egan
PROJECT OFFICER
[Show details](#)

Craig Ryan
SENIOR COMMUNITY ENGAGEMENT COORDINATOR
[Show details](#)

Speak up. Sign up.
Get our regular newsletter to have your say.

[Subscribe](#)

Why we're doing this

The project will create a safe connection for people walking and riding. It will connect to Green Square and the south eastern suburbs and link into the Bourke Street cycleway and Redfern.

Improving Crystal, Potter streets and Gadigal Avenue designs [Download](#)

PDF - 9.48 MB - Last modified 9 November 2020

How you can give feedback

Comment on the proposal by completing an online form.

[Online form](#)

Appendix B: Digital marketing

Sydney Your Say e-News



Proposed improvements on Gadigal Avenue, Crystal and Potter streets, Waterloo

We're improving these streets and creating safer spaces for people walking and riding. This is the last chance to have your say.

[Read more](#)

Sydney Cycleways e-News



An artist's impression of the new cycleway on Crystal Street.

New bike links between the city centre and Waterloo

We want your feedback on [plans for new cycleways](#) in Waterloo. We're proposing riding and walking improvements on Crystal and Potter streets and Gadigal Avenue.

The new cycleways will link the existing bike lanes in city's south-east to the Bourke Street cycleway. These improvements will make it a safer journey for people riding between the city centre and the Green Square precinct.

As part of the improvements we'll also plant new trees, and add pedestrian crossings, making the street a nicer place people walking.

We'd love to [hear your thoughts](#). Submissions close 10 December.



Attachment H

<p>Engagement Report – Combined Erskineville and Alexandria Cycleways</p>
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Global Research
Turning **Information** Into **Insight**

City of Sydney – New cycling connections for Alexandria and Erskineville – **Mitchell Road and Huntley Street**

Henderson Road, Railway Parade and Bridge Road; Ashmore and Harley Streets; Mitchell Road and Huntley Street; and shared path improvements

ENGAGEMENT: summary and analysis

15 January 2020

Prepared by Global Research Ltd
For

CITY OF SYDNEY 

Contents

Executive summary	3
Key findings.....	4
Project overview	5
Introduction.....	5
What is proposed	5
Engagement objectives.....	5
Written comments analysis and reporting overview	7
Engagement results	9
Who responded	9
Proposal for Mitchell Road and Huntley Street.....	10
Feedback on all the connections	15
Short term solutions to impacts on Park Street	24
Appendix 1.....	26

Executive summary

Respondents were asked to comment on each of the four proposed sites where cycleway improvements are proposed, and/or to provide additional feedback or feedback on *all* the connections.

- Findings show that the largest number of responses on ‘all connections’ were supportive of the proposed cycleway improvements.
- Site by site, there was more support than opposition to:
 - Ashmore and Harley Streets
 - Mitchell Road and Huntley Street
 - Shared path improvements in Alexandria and Erskineville and changes to parking and traffic on Park Street.
- There was more opposition than support for:
 - Henderson Road, Railway Parade and Bridge Street. However, it is noteworthy that within opposition to the proposed changes at this site, there was a strong thread of support for cycleways in general, just not in the way that this proposal suggests.

Support for and opposition to the changes to cycling connections were frequently consistent regardless of which site was under discussion.

- Support was frequently on the basis that the proposed changes were perceived to:
 - Improve cyclist safety
 - Encourage cycling and, to a lesser degree, active transport
 - Inspire younger and older cyclists to increase use of this form of transport
 - Encourage mode shift from personal carbonised forms to active forms of transport.
- Opposition arguments also took similar forms across all sites, these were:
 - That cycleways either take up valuable road-space or reconfigure road-space in ways that are detrimental to vehicle users; increases in traffic congestion and journey times are a frustration for drivers
 - That use of cycleways is either sporadic, or not of sufficient volume to justify reconfiguration of road-space (and the associated cost)
 - That certain demographic segments are not able to cycle and so must continue to be provided with road-space for personal vehicle use.

A significant level of support was contingent on modifications to the proposed plans that were perceived to create either a better connected network, or a safer cycleway/pedestrian experience.

Key findings

Below are the key findings from written feedback on the cycleway proposals.

Mitchell Road and Huntley Street

- There were slightly more comments in support of the Mitchell Road and Huntley Street improvements than there were objections, and, when qualified support is included, clear support for the proposals at these sites was evident.
- Support was on the basis of improved safety, and ease of use for residents.
- The Sydney Park Road/Mitchell Road intersection was identified as problematic for both cyclists and vehicle traffic; the ‘no right turn’ onto Sydney Park Road was viewed as an impediment to traffic flow, and as potentially difficult to navigate for cyclists.
- Traffic congestion and loss of parking were the main objections to the proposed changes in this area.

Feedback on ‘all connections’

- Supportive comments were double the objections to *all connections*.
- Support was offered either generally, or for a connected, safe and useable cycle network, the benefits of which were many (and included health, environmental and a reduction in the number of vehicles on roads).
- Objections comprised around a third of all comments received on ‘all connections’ and were typically made on behalf of vehicle users who feared increased road congestion (e.g., due to road narrowing), and who had animosity towards cyclists whose numbers were not believed to warrant reconfiguration of roadways and whose intent to use cycleways was deemed questionable.
- Qualified support was offered by a large number of respondents, who, although generally supportive of the proposed connections, these respondents had reservations about the negative impacts on vehicle users.

Project overview

Introduction

The City of Sydney is working on changes to cycling connections in Alexandria and Erskineville to improve safety and access for cyclists, pedestrians, and local residents, in alignment with the New South Wales Government's bike network plans for Inner Sydney. The new links are located on well-used bike routes and will connect Alexandria and Erskineville to the broader bike network.

In response to the COVID-19 pandemic, several pop-up cycleways were installed across the city to allow people to travel more safely and maintain physical distancing. A pop-up cycleway was established on Henderson Road, Railway Parade and Bridge Street. The City proposes to make this cycleway permanent, as well as creating new cycleways on Ashmore and Harley Street, Mitchell Road and Huntley Street, and four new shared paths between Elliott Avenue and Buckland Street to create connections to schools.

Feedback was sought on four proposed connections that were available on the Sydney Your Say webpage, all of which were accompanied by consultation drawings.

This report contains a summary of the engagement activities undertaken during the consultation, and an analysis of the responses received from the community.

What is proposed

The proposals for Mitchell Road and Huntley Street are:

- A bi-directional cycleway on Mitchell Road between Sydney Park Road and Huntley Street
- A bi-directional cycleway on Huntley Street between Mitchell Road and Belmont Road

Engagement objectives

The objective of this engagement was to provide information including concept design to the community and allow them to have their say. The feedback informs the next steps of the project and suggestions will be incorporated into the detailed wherever practical.

The City sought community feedback on four proposals that were available on the Sydney Your Say webpage, all of which included consultation drawings. The consultation period ran from 20 November – 18 December 2020.

The Sydney Your Say web page received 1461 page views.

Overall, 599 submitters provided feedback to the City of Sydney on the proposal:

- 589 online surveys were completed
- 10 submissions in respondents' own formats:

In the online survey, respondents were asked to provide open-ended feedback on the connections all together, or by separate area. Respondents were able to give feedback on the proposals for:

- Henderson Road, Railway Parade and Bridge Street

- Ashmore and Harley Streets
- Mitchell Road and Huntley Street
- Shared paths in Alexandria and Erskineville and changes to parking and traffic on Park Street
- Feedback on all the connections or add to your feedback

The discussion section of this report has been structured based on respondents' answers to the above questions. Responses have also been filtered based on sentiment. Further explanation of how written comments have been analysed can be found on the following page.

Note that the results for each project will be reported to Council separately.

Written comments analysis and reporting overview

Analysis approach

The following discussion presents results from qualitative analysis of written feedback provided by respondents who completed the online survey or submitted written feedback in their own formats.

In the online survey, respondents were able to give open-ended comment on the proposed changes different cycleway sections separately, or all together. Respondents were asked to give feedback on:

- Henderson Road, Railway Parade and Bridge Street
- Ashmore and Harley Streets
- **Mitchell Road and Huntley Street**
- Shared paths in Alexandria and Erskineville and changes to parking and traffic on Park Street
- **Feedback on all the connections or additions to previously given feedback.**

The discussion section of this report has been structured based on respondents' answers to the above questions. Responses have also been filtered based on sentiment. Comments are discussed below in order of most to least frequently mentioned.

The submissions received in respondents' own formats were combined with the survey comments, with similar points grouped together under particular topics.

How analysis was completed

To complete the analysis, Global Research analysts read each comment received from individuals and organisations during the consultation period and organised (coded) them into themes and topics based on the points made. Some comments contained multiple points, relevant to multiple topics, resulting in comments being coded to multiple topics. The analysis was assisted by NVivo qualitative analysis software.

Analysts then synthesised the coded comments and used the results to inform this report. The discussion below was written in the order of most-to-least commonly mentioned topics under each of the five different sections: Henderson Road, Railway Parade and Bridge Street; Ashmore and Harley Streets; Mitchell Road and Huntley Street; Shared path improvements and changes to parking and traffic on Park Street; and Feedback on all the connections or add to your feedback already given.

Throughout the discussion of written comments, the number of points made on particular topics have been consistently represented by the amounts described below:

- A sizeable number: 75 – 99 comments
- A substantial number: 50 – 74 comments
- A considerable number: 25 – 49 comments
- A moderate number: 15 – 24 comments
- Several comments: 8 – 14 comments
- A small number: 4 – 7 comments
- A few: 3 comments

- A couple: 2 comments

Adjacent to headings, bracketed numbers represent the number of points made on particular topics. The aggregate of all points made on particular topics is included in the heading.

To illustrate the content and flavour of the feedback, quotes from respondents have been included throughout the report. Note that grammar and spelling mistakes have been corrected, especially in cases where the meaning was impacted. However, these were minimal.

Report structure

As respondents were able to select whether to comment on specific connections individually or comment on the proposal overall, this report has been separated into five different sections. These sections are as follows:

- Feedback on the proposed Mitchell Road and Huntley Street cycleway
- Feedback on all the connections (overall)

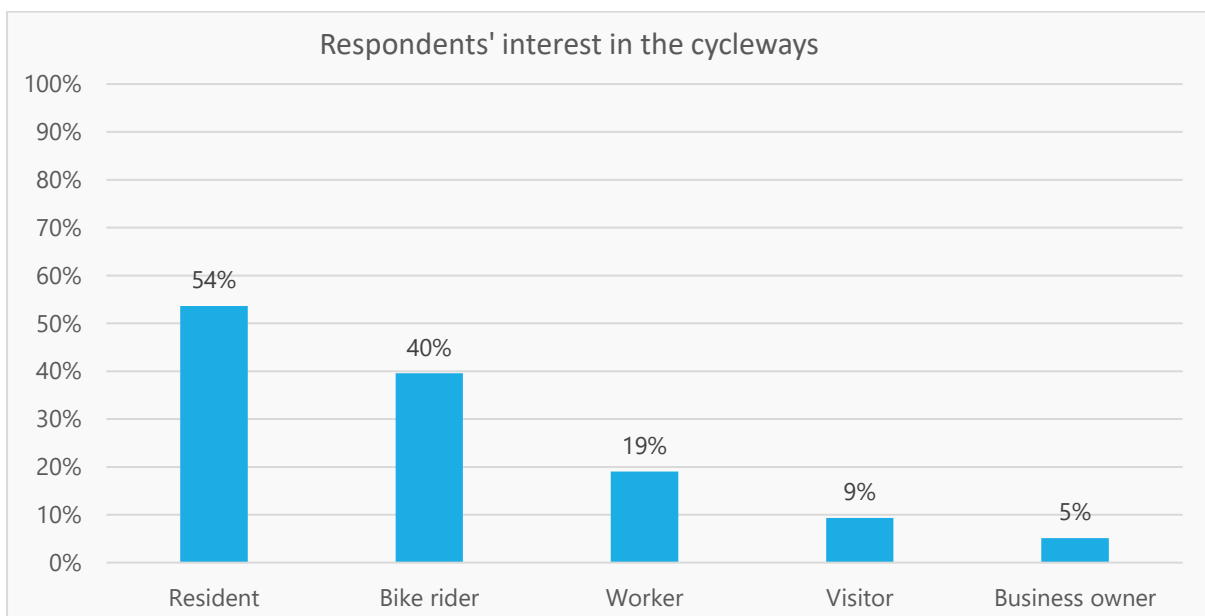
Engagement results

Who responded

Respondents were asked: *What is your interest in the cycleways?*

They were given the following response options to select from – Resident within the City of Sydney local government area; Bike rider; Worker in the City of Sydney local government area; Visitor to the City of Sydney local government area or Business owner. Respondents could select more than one option.

The chart below presents the percentage of respondents who selected each option. Note that the percentages added to greater than 100% because respondents could select more than one option.



Key findings:

- > The most commonly represented group amongst respondents was residents, with over half of respondents selecting this option (54%).
- > Just under half of respondents were bike riders (40%).
Those who work within the City of Sydney local government area made up 19% of respondents.
Visitors to the city were 9% of respondents and business owners 5%.



Proposal for Mitchell Road and Huntley Street

Proposal for Mitchell Road and Huntley Street

Respondents were asked: *Please provide your feedback on the proposed Mitchell Road and Huntley Street cycleway*

This section contains comments received in response to this question, relating specifically to the proposal for Mitchell Road and Huntley Street. Overall comments that cover all four connections can be found on page 12.

OVERALL

78 COMMENTS

Below is a summary of points made by respondents about the proposed cycleways on Mitchell Road and Huntley Street, based on their overall sentiment towards the proposal.

Opinions on proposed changes in this area were mixed but, overall, were more supportive than unsupportive.

Supportive comments

- Almost half of the comments on the proposed changes in this area were supportive of the plans.
- Most support was general in nature, with safety, convenience and utility for cyclists and pedestrians the most frequently given responses.

Unsupportive comments

- Around a third of comments about Mitchell Road and Huntley Street opposed the changes.
- Comments against the proposal for Mitchell Road and Huntley Street were mostly around the loss of road space deemed necessary for the movement of and parking for vehicles.

Mixed or qualified support

- Mixed comments, or those offering qualified support, made up around one fifth of all comments about this area.
- Comments were comprised of either weak support for proposed changes (and corresponding notification of small issues with its implementation), or of suggestions for additional changes that were perceived to improve the plans.

SUPPORTIVE COMMENTS

33 COMMENTS

General Support

23 comments

Support for the proposed changes to Mitchell Road and Huntley Street was either general, or, based on safety for cyclists. Respondents agreed that the proposal was a “great idea”, “great news”, or stated that they “fully support this”. Examples of such comments follow.

Great news. My partner and I will ride this route for sure.

This is a win for both pedestrians and cyclists trying to get to Sydney Park. The current shared path is too thin for people and bikes. Given the number of families that visit the park daily both on foot and by bike, this is a very needed change.

General comments also included those in which respondents conveyed admiration for the proposed changes, stating that they would use the new cycleways, or that their implementation would improve cycling, walking, or the general area or city in some way.

Several respondents were in favour of the proposed changes due to the perception that they would result in improved safety, and, sometimes implied, that this would encourage more use.

I haven't cycled on either of these to date because they look too risky. Making them safe to cycle on would be great.

We love it! thank you for expanding safe cycling!

Sydney park Mitchell Road connection is a long time coming. It enables longer distance safer riding.

Other topics

10 comments

A small number of respondents made comments regarding how the continuous cycle path through this area will make cycling easier. A few respondents made the point that cycling access should be prioritised over parking spaces. Lastly, a couple of comments were specific about routes or cycleway design.

UNSUPPORTIVE COMMENTS

29 COMMENTS

Congestion

15 comments

The proposed changes were anticipated to result in increased congestion or impeded traffic flow by a moderate number of respondents; this was not welcomed. Several respondents raised concerns that already congested roads would face pressure if the proposed narrowing goes ahead.

You have narrowed yet another arterial road from 2 lanes to one with a corresponding build up in congestion.

Mitchell Road is now one of the most congested roads in Erskineville, particularly following Westconnex. This will not assist traffic flow in our area. Not everyone can ride a bicycle

Additionally, a small number of respondents noted that the 'no right turn' from Mitchell Road into Sydney Park Road would increase congestion and impede traffic flow. This is shown in the comment below:

By removing the right hand turn land on Mitchell Road, this will only further funnel traffic onto nearby residential streets as drivers look for alternative routes.

Parking

5 comments

A small number of comments expressed opposition to the proposal for Mitchell Road and Huntley Street on the basis that the reduced parking would negatively impact on local residents. Although only five parking spaces are designated for removal, this was a sore point for respondents, who projected further, ongoing loss of car parking space as indicated by the following comment:

Parking in this suburb is hard enough as it is, with more and more parking taken off the main roads it's only going to funnel cars into Belmont & Lawrence Streets to park making it tougher for residents.

Other

9 comments

Remaining objections were either general in nature (e.g., “I don’t support it”), or were based on little perceived use of the cycleways currently, and the negative impact that cycleways are perceived to have on car owners or residents. The following comments are representative:

These cycle paths are destroying the usability for residents that live in these suburbs and need a car for their lives...they create visual pollution & destroy the ambience of the villages.

Absolutely stupid and dangerous and exactly how many cyclists have used the Sydney Park Road pop-up cycleways??

I understand cycle ways are a priority for the council but the current cycle ways are not being used and realistically cars are dominate on the road and enough space needs to be provided for them!

MIXED OR QUALIFIED SUPPORT

17 COMMENTS

While almost of these comments supported cycleways generally, there was the sentiment that the proposed changes could and should be improved in a variety of specific ways.

Several respondents noted the difficulties involved for cyclists in navigating the Sydney Park Road/Mitchell Road intersection. A few comments suggested that the cycleway would be more suitable on the “other side of Mitchell Road”, and that this would solve the issue for cyclists travelling east from Sydney Park Road onto Mitchell. One person noted that:

in the current design, cyclists would have to cross over Mitchell Road before being able to cross to Sydney Park.

Others reiterated this, as evident in the following comments:

Proposal looks great. When I use this connection, I’m generally coming from Sydney Park. The connection currently is on the other side of the road, and the proposal would introduce additional road crossings and time to my journey.

Many cyclists exit Sydney park and cross Sydney Park Road onto the existing shared path on Mitchell Rd. straight to Huntley Street. The proposed cycle way will be on the opposite side of Mitchell Road.

I like the continuous cycleway from Sydney Park Road onto Mitchell Road. However, it is unclear how cyclists are meant to cross between the cycleways at Mitchell Road and Coulson / Huntley Street, as there is no continuity between any of the lanes, except to turn left from Mitchell Road onto Huntley Street.

Amongst praise for cycleways generally, a small number of comments expressed frustration that the ‘no right turn’ would be implemented onto Sydney Park Road from Mitchell Road, and wanted the

plans amended to reinstate this option for motorists. The following comment is indicative of many, in which the idea of the plan in general was applauded, but its application questioned:

Love the idea. But if they are going to turn Mitchell Road into a replica of Henderson Road then forget it!

One respondent who submitted an annotated version of the proposed plans, noted that that “public domain improvements [are] required to better integrate the proposal into the streetscape”.

The final mixed comment was from a respondent who questioned the need for a cycleway on Huntley Street (due to it already being “such a quiet street”) but who supported the Mitchell Road proposal.

Feedback on all the connections



Feedback on all the connections

Respondents were asked: *Please provide your feedback on all the connections or add to your feedback already given.* This question was the final open-ended question asked in the survey, however as it received the largest response, it has been discussed before sections about the individual connections.

This section contains a synthesis of the comments received in response to this question, about the proposal overall.

OVERALL

549 COMMENTS

Below is a summary of points made by respondents about all of the connections, grouped by their overall sentiment towards the proposal.

Supportive comments

- There were almost 300 comments made in support of the cycleways, which was the largest group of respondents.
- The largest group of supportive comments were general in nature, expressing enthusiastic support for the initiative(s).
- Cycleways were praised for improving safety and for enabling health and sustainability benefits for people and the environment and increased cycle use.
- Some respondents who supported the cycleways made specific suggestions for further improvements, particularly regarding routes and connectivity.

Unsupportive comments

- Just over 150 comments were made which were critical of, or which did not support the initiative(s).
- The impacts on vehicle traffic was the biggest focus of these comments, in particular, criticism of predicted increased congestion.
- Some made critical points that existing cycleways are not currently used, while others were critical of the visual appearance of the presence of cycleways.
- Other criticisms included: cyclists don't follow road rules and commonly ride on roads rather than in cycleways that have been provided, on-street parking will be negatively impacted, road space narrowed causing safety risks and inconvenience, a variety of safety aspects that can be improved, cycleways are unnecessary and there is a need to consider pedestrian safety.

Mixed or qualified support

- Just over 100 respondents had qualified support for the cycleways, commonly making specific suggestions for how they could be improved.
- The most commonly made point was criticism over the narrowing of roads which was viewed as contributing to increased congestion.
- Route and design suggestions were also made which were commonly specific in nature and focused on a particular location or aspect. Other specific suggestions were regarding how particular streets are controlled in terms of closures or openings. The visual appearance of cycleways was also important to some respondents.

- Other specific improvement suggestions related to parking, cycleway and footpath widths, and improvements for pedestrians.

SUPPORTIVE COMMENTS

291 COMMENTS

General Support

118 comments

A large number of respondents conveyed support for all the connections in general ways, often making very positive statements such as “Fantastic to see this”, “Great initiative!”, “These are great and improve Sydney significantly” and “Love this!”.

The language used often expressed a high level of excitement or support, with respondents describing themselves as “thrilled” and “so looking forward to these new connections.”

Examples include:

I fully endorse this plan. I love it.

Great changes! Looking forward to further improvements and the development of more inner-city cycle ways.

I support the plans for more cycling paths in the whole city of Sydney.

Overall, I think all of these changes are very positive and look forward to them getting implemented.

General support was also offered for the proposals on the basis that a functional cycleway network contributes to the city’s liveability.

Safety

89 comments

Respondents most frequently explained their support for the proposals in the context of safety. A substantial number of comments were received which praised the enhanced safety for cyclists and described increased confidence and increased usage, and that families and children are now able to use the cycleways to travel safely and conveniently. Comments praising the increased safety of the cycleways included:

They are essential to provide a safe route for cycling.

I wholeheartedly support these measures to make pop-up cycleways permanent...This will make it easier and safer for me to use existing cycleway routes.

Better connections will make a huge difference to me and my family feeling safer when riding these areas.

Connectivity, network and route design

48 comments

A considerable number of respondents offered support for the proposals while adding that improvements to connections and design of the cycleways would enhance the projects.

The majority of these noted the importance of having a “well-connected,” “integrated” cycle network that works “safely and practically”, noting that it was vital for cycleways to be connected “for commuters to use them properly”, and that the previous approach had been somewhat “piecemeal”. As one respondent pointed out:

You would not build a bridge, railway or highway with gaps in it. A bicycle route with gaps in it is useful only to the small minority of people who are comfortable bridging those gaps by riding in traffic.

One respondent suggested the proposals would “close missing connections in the network”, while several comments expressed enthusiasm for further extending the network, for example:

Those cycling lanes are great addition to the patchwork of Sydney City cycle lanes and there is so much more to add to complete that patchwork.

Thanks for this excellent project to make pop-up lanes permanent and to close missing connections in the network. Hoping for many more of these to come in the future.

Careful design that involves cyclists was deemed important with one respondent suggesting that “using more temporary routes would help to build out a cycle grid that people find useful, rather than planning things on paper and building something inadequate.” Another respondent stated:

I support all measures to provide more space for cyclists to ride safely. The more the better. Sometimes dedicated cycle paths or shared paths have gaps or end in ways that suggest no cyclist was involved in the design - or that the cyclist(s) were over-ruled by petrol heads!

Other specific suggestions about connections and design included:

- Ensuring cycle lanes were protected effectively from cars.
- A better/marked route from Eve and MacDonald Street to Bridge Street.
- Not forcing cyclists onto the footpath when cycle lanes end.
- A more obvious connection to Buckland from Henderson Road.
- Research should be carried out to find out common routes for schoolchildren and include these in the plan.
- Improve links between Alexandria and the CBD.
- Dedicated cycleways on Regent/Lee Street.
- A connection between Harley Street and the Bowden Street cycleway to link Green Square with the proposed cycleways.
- A link along Huntley Street between Sydney Park and the Grounds of Alexandria, and the shared paths along the canal.
- Links between Bridge Street (between Victoria Street and Ashmore Street), Mitchell Road (between Coulson Street and Ashmore Street), Codrington Street (between University of Sydney and Wilson Street), Buckland Street - Bourke Street, Australia Technology Park - Turner Street.
- Make the existing pop-up cycle way right on the Erskineville railway bridge two way.
- Consider removing the pedestrian pedestal at the dual walkway cycle way into Burren Street from Erskineville Road as it is too narrow for a bike on one side because of the telegraph pole.
- Ashmore Road roundabout and Mitchell/Harley junctions need to be made safer for cyclists to navigate.

Mode shift

16 comments

The opportunity provided by the cycleways to transition away from cars was lauded by respondents, many of which described their enthusiasm for more active forms of transport, more space for

cyclists and pedestrians, and for reducing cars and non-essential traffic. Many respondents noted that both people and the environment benefited from more cycleways and fewer cars. Comments illustrating these opinions included:

Cars in cities should be discouraged and cycling and PT prioritised.

Change, as we all know is hard. Bold changes will lead to less pollution getting cars off the road. Love City of Sydney council's progressive plans. Bring it on.

Too much of Sydney is given over to cars and drivers so it's great to see some space re-allocated for more people and climate friendly forms of transport. More more more!!

Sustainability

11 comments

Several respondents praised cycling as a more environmentally friendly mode of transportation, noting that this was crucial to reduce pollution and carbon emissions, with comments such as:

The cycle lanes make the city safer and lessen pollution.

Cycling infrastructure plays a big role in reducing our impact on climate change.

Health

9 comments

Respondents praised the significant health benefits of cycling, noting that not only was the physical activity important but that cycleways enabled “more socialising on streets” and “people interacting.” One respondent pointed out:

Cycleways mean more cyclists and that is a good thing for the city and health. A large evidence base shows the health benefit and reduced mortality for cycling and active transport, with the opposite for private motor cars. IF any drug showed a similar efficacy to reduce mortality in clinical trials as active transport does Big Business would be monetising. Cycle commuting is of significant benefit to health and a huge contributor to reduced mortality in contrast to private motor transport.

UNSUPPORTIVE COMMENTS

154 COMMENTS

Impacts on vehicle traffic

36 comments

The most common criticism of the installation of cycleways as the negative impacts that will result for vehicle traffic.

Increases in congestion as a result of reducing space for vehicles was the most common criticism expressed by a moderate number of respondents. Associated increases in journey times was also considered a considerable problem perceived to arise from cycleways. The following is a typical comment:

Sydney roads generally are heavily congested, providing bike lanes are not the solution as the roads were never intended to have cycleways down them. Other solutions need to be found to allow safe cycling without further slowing down traffic.

A variety of other points were made regarding impacts on vehicle traffic, including: large noisy vehicles using quiet streets at night that didn't occur prior to cycleway installation; safety issues for schools that now experience more traffic; impediments for emergency vehicles using narrower or blocked off streets; reduced visibility on streets; the slowing of traffic; that cars should be prioritised over cycles because they are the most common traffic mode; that traffic seems faster on Henderson Street with roundabout removed; that it is difficult for pedestrians to cross a road and a cycleway; and, that rerouting makes some vehicle journeys longer.

Existing cycleways not used

23 comments

A moderate number of respondents were consistent in expressing statements to the effect that they have seen no or few people using particular cycleways. A small number of these questioned the counts of cycleway users. The following was a typical comment.

The bike lanes are very infrequently used. I see about one or two cyclists using them on Henderson.

Parking negatively affected

16 comments

A moderate number of respondents were critical of the impacts on parking. The most common point made, which was made by a majority of respondents, was that the reduction of vehicle parking was an inconvenience. Many of these comments took the following form:

The current bike path is taken up valuable parking spaces on Bridge Street.

Other parking related comments were that it has become more difficult to park, with the following point made.

Parking along the street has become a dangerous exercise - reverse parking blocks both lanes of traffic causing chaos and distress for motorists. Exiting a parked car requires traffic behind you to come to a complete halt, causing road rage. Someone is inevitably going to get clipped by a car.

Cyclists not following rules

15 comments

A moderate number of respondents were critical of cyclists who do not follow road rules. In particular, the point was made that some riders often do not use the cycleways provided and that they weave from the road to the footpath. The following comments are indicative:

The one concern I have is that some cyclist persist in using the road when there is a cycle path which adds to the risks for motorist on the narrower street and the opening parked car doors. Use of the bike paths should be mandatory for cyclists and education is required.

I actually see more cyclists using the road where the cars are trying to drive.

Other points made include: cyclists are not mindful of residents; cycleways merging with footpaths which endangers pedestrians; and, cyclists take up road-space where car-drivers wish to be the sole occupants.

Additional safety aspects

15 comments

Additional to the safety concerns raised above, around half of the those under this heading stated that the cycleway was "dangerous" providing little supporting information. In addition, the Henderson Road connection was said not to comply with "nominal safety standards"; the Elliott

Street connection was said to not consider the traffic attributable to day care operations; on respondent noted that there is need for clearer safety signage; and, lastly, one person stated that the roundabout removal has resulted in faster vehicle speeds.

Visual amenity and liveability negatively affected

13 comments

Several respondents were critical of the impacts on street amenity on streets that had experienced changes from cycleways. Over half of the comments discussed under this heading criticised the look of the cycleway infrastructure, as well as the changes to street design and appeal. The following comment expresses a common sentiment:

The visual amenity of the area has been ruined - once wide open streets are now dangerously narrow. It's given rise to a very claustrophobic feeling that would be alien to any resident.

Other points made included: increased noise from vehicles, in particular negotiating their way through obstacles placed in streets to reduce traffic speeds; and, that angled parking will send fumes and bright lights from headlights into houses close to streets.

Road-space narrowed by cycleways

13 comments

Several respondents were critical of the impacts of reducing road widths caused by adding cycleways to the road architecture. Increased danger was the most common point made, with others describing the inconvenience of having to pull over to allow other vehicles to pass. The following point was made:

The bike lanes on Henderson take up too much space. Henderson has become congested and too tight to safely manoeuvre your car at times, especially when there are trucks coming in the opposite direction.

Cycleways not necessary

8 comments

Several respondents made the point that cycleways are not necessary. Most of these were general comments, but some identified specific sections that are not needed: Bridge Street cycle path in Erskineville because it is already a slow road; and, Henderson Road because it is unnecessary.

General criticism

7 comments

A small number of respondents made general comments that opposed the continued development of cycleways.

Not happy about the pop[-up] cycle on Bridge Street.

Overall I object to the temporary cycleways becoming permanent as well as the installation of new cycleways in the Erskineville and Alexandria areas.

Pedestrian safety

6 comments

A small number of respondents stated that more needs to be done to increase safety for pedestrians as a result of changes caused by cycleways. This was one of the comments.

Near ERSKINEVILLE public school and train station, so many people walk on the road because the lack of walking path. The cycle way just made it worse,

pedestrians cars and cyclist all use the narrow road. We need better walking path not the cycle way.

Need for vehicles

2 comments

A couple of comments identified the need for the ability for vehicles to be used by those who need them such as families, people with a disability and businesses.

MIXED OR QUALIFIED SUPPORT

104 COMMENTS

Increased congestion from narrower roads

21 comments

A moderate number of respondents were generally favourable towards cycleway development but were opposed to the narrowing of roads that has already led to increased congestion and subsequent impacts, or would like this to be avoided. The specific issues identified were: generally reduction of space caused by adding cycleways for all traffic and pedestrians; fears of crossing roads because of the high levels of traffic, particularly with children; speeding vehicles even with speed bumps in place; cars being side-swiped; volumes of traffic being redirected into previously quieter streets; blasting of horns by frustrated drivers; car doors opening are dangerous; and, longer periods of peak traffic volumes.

Specific roads and places mentioned included: Park Street Erskineville; Erskineville connection; Henderson Road; Fox Street; Ashmore/Harley Street; Bridge Street Erskineville.

The following was a typical comment.

It's a great idea to look for way to make our city more green and provide local resident options. However, consideration must be given to the impact on local residents due to increase congestion and reduced parking spaces. The benefit of usage of the cycleway must outweigh the costs to local residents.

Route and design suggestions

19 comments

These comments were generally supportive of cycleway development but made suggestions of routes that should be added to or removed from the existing network plan. Of these, a small number of comments made overall route suggestions with the consistent point made in these comments that the overall network needs to be holistically planned.

The remaining comments made specific route amendment suggestions. This is typical of how these suggestions were made:

Whilst I support this the cycle links seem rather haphazard and a bit illogical if you're riding through the area. I think a cycle path should be built along Mitchell Road all the way from Sydney Park Road to Copeland Street. It could be on the western side adjacent to the new Park Sydney development and then beside Erko Oval. This would create a direct path connecting many of these links together, and most of the infrastructure is there just needs line painting.

A summary of route and design suggestions comments can be seen in Appendix 1.

Specific traffic control suggestions

13 comments

Several respondents made suggestions to either close particular streets to traffic to reduce the level of traffic or to open up streets to enable more traffic flow. Most of these comments were specific and pertained to particular intersections or streets.

Examples of suggestions were:

- reducing traffic in Park Street to protect local residents
- remove the Left In- Left out restrictions at Henderson Road and Alexander Street, as well as the unnecessary pedestrian and bicycle turning median
- make right turns legal out of Newton on to Henderson
- two way traffic on Railway Street towards Henderson Road
- maintain right turn from Mitchell Road onto Sydney Park Road
- the Railway Pde closure pushes traffic onto the once quite Park Street
- Reopen the bridge and Railway Parade
- make the one way from Sydney Lane not Sydney Street.

Amenity and specific suggestions

12 comments

A variety of other topics were commented on by a small number of respondents.

A few comments criticised the visual appearance of cycleways, and a similar number made the point that cycleways could be narrower than what they are.

One respondent suggested that there is a need for campaigns to encourage more cyclists and another suggested spending more money on public education programmes that encourage more to use the road and cyclists and vehicle drivers to be more accommodating of each other. A couple of respondents emphasised the need for more separated cycle paths; and two respondents suggested the need for more cycle parking.

Signage, markings and navigation

12 comments

The underlying sentiment of these comments was the need to increase safety by improving signage, road markings or layout. Again, the comments were predominantly specific often focusing on particular streets or intersections. The underlying point made was that there needs to be care taken in the design of roads and the inclusion of elements that orient users and direct and guide them to take safe routes and be protected by physical barriers when necessary. These comments are typical examples of the types of points made.

Victoria Street is one-way for cars but supposedly two way for bikes, however car drivers mostly don't realise this and don't keep left to let oncoming bikes safely pass. Currently on Victoria Street there are white bicycle outlines painted on the road to indicate two-way bike traffic, but these are inconspicuous and in the wrong places, so mostly car drivers don't realise they are there and then tend to be aggressive with bike riders coming toward them. A dedicated cycleway would be much safer and could also be routed around the existing traffic calming garden beds, to provide additional separation from car traffic.

Care needs to be taken, however, over the entrance roads on the north side, because bicycles may not give way, and cars may turn out of Henderson road without looking for bicycles (this happened to me!) Clear signage would be needed.

Parking

11 comments

These comments predominantly focussed on the need to retain parking. The general sentiment was parking is already difficult and so should not be reduced further. This was a typical comment.

Considerations need to be given to balancing local residents needs for car parking, access to footpaths etc with the needs of cyclists and safety.

One comment suggested that The Mitchell Road to Huntley stretch should be cleared of parking and made a clear way to allow for better traffic flow.

Cycleway and footpath widths

9 comments

Several comments made a variety of comments regarding cycleway or footpath widths. These included: more need for continuous footpaths for pedestrian safety; widen the Erskineville Road Rail Bridge northern footpath; footpath, especially for school children on Can Brown Street; bicycle paths should be added by expanding footpaths, which are in many cases already very wide; the area around Erskineville station is in need of an upgrade as the footpath is dangerously narrow; and shared pedestrian/bicycle crossings should be wider.

Improvements for pedestrians

7 comments

A small number of respondents made specific comments which focused on the needs of pedestrians, including: safety islands so that visibility of pedestrians is increased in narrower streets with cars travelling quickly; a couple of respondents suggested a raised pedestrian crossing on Fox Street to reduce risks for pedestrians crossing the road; put in pedestrian crossings across Henderson Street when separate bike lanes are installed to increase safety; Zebra Crossing on Park Street from the Kurrajong Hotel to Naked Brew Café to assist hundreds of children crossing; and, a final comments suggesting that cycleways have reduced vehicle speed and enhance the pedestrian environment in some places.

ABOUT THE PROCESS

32 COMMENTS

A considerable number of respondents recommended more consultation on the development of cycleways. The benefits of greater consultation were that this would assist in delivering what the majority of people want, and that it can tap into the ideas of locals and refine the design to improve the outcomes.

Some were appreciative of being able to have their say in this process, while a greater number of respondents were in favour of more consultation. There was a call by some for the 'general community' to be listened to over a vocal minority. The majority of these respondents made general points, such as.

I plead with the Council to provide consultation and discussion with the most viable options and solutions to be presented to Residents. Then an agreed action plan adhered to after community consultation, input and feedback with Council.

One respondent asked if observation studies had been completed. And another would have liked more information regarding assessment of the pop-up cycleways. Another suggestion was to work with the state government to find "real solutions" that work for everybody.

Short term solutions to impacts on Park Street

Some of the submissions above make reference to impacts on Park Street that are out of the scope of these projects, but are being addressed currently.

The closure of Railway Parade has caused increased traffic on Park Street, Erskineville. The *Shared Path Improvements project* will address some impacts by creating a pedestrian crossing and narrowing the south end intersection of Park Street. CoS are also working on other solutions to be implemented in the short term. Three- tonne limit signs and speed cushions have been installed and changes to the north intersection are being investigated.

Appendix 1

This appendix contains verbatim comments from respondents who were unsupportive of the proposed changes to cycling connections in Alexandria and Erskineville, and offered suggestions about the design of the proposal. The comments below have been included in this appendix due to their specific and detailed nature which makes them more useful for CoS use as whole statements. Note that the key points made in each of these comments have also been synthesised into the body of the report, above.

UNSUPPORTIVE FEEDBACK ON ALL THE CONNECTIONS - ROUTE AND DESIGN SUGGESTIONS

- *Still missing critical cycle ways that go west-east. For example, Swanson street from Erskineville station and Copeland street down to Michell road (the suggested shared paths along Swanson seems like useless patch work). Then along Michell road to from Copeland to Harley street and create safe passage to Bowden and Mandible street cycle paths.*
- *Other one I use is Sydney Park going to Belmont Street via Mitchell and Huntley. I disagree with the plan. I would recommend having the cycle path on the east side of Mitchell Road if you were going to have it, not the west side.*
- *... we really need a connection from the North side to the South side of King Street at Erskineville Road. Easy to use the roads to cross from South to North, but impossible to get across King Street from North to South to Erskineville as left turns on King are not permitted at Erskineville Road or Wilson Street.*
- *I think a cycle path should be built along Mitchell Road all the way from Sydney Park Road to Copeland Street. It could be on the western side adjacent to the new Park Sydney development and then beside Erko Oval. This would create a direct path connecting many of these links together, and most of the infrastructure is there just needs line painting.*
- *... Botany Road and the provision of cycle ways there. I am tired of taking my life into my hands when walking along the footpath between Green Square station and McEvoy Street.*
- *... other places in the city that would benefit from safer and more convenient cycleways. Throughout the CBD, Oxford Street, City Road, McEvoy Street, the rest of Henderson Road, Gibbons Street/Regent Street are a few examples.*
- *This cycleway is a direct duplication of services on the other side of the train tracks on Wilson Street. If you can justify a duplication of services, build a cycleway along Rowley Lane, where it can connect directly with South Eveleigh precinct - giving riders a direct, gentle slope to Redfern Station and not going up the steep Gibbons Street - join into the new Explorer Street housing development, and lastly - find a way to get it either over or under the tracks to Wilson street.*

- *A new cycleway is needed on Victoria Street Erskineville (extending also to Munni Street, then Harold Street). This would connect the existing Bridge Street cycleway and proposed Ashmore Street cycleway to the popular Angel Street cycle route.*
- *Rather than two single direction cycleways on Harley Street I would suggest one bi-directional cycleways on the southern side of Harley Street.*
- *I support all cycleways except for the Henderson and Railway Parade cycleway.*
- *The path on Bridge Street Erskineville is unnecessary and is often used as a pedestrian pathway. That road has a low level of traffic and was fine as it was to cycle on.*
- *The Bridge Street bike lane doesn't really add any real value to the area. It is already a dead end street it is very quiet anyway so I don't really see the need for the cycle lane maybe just a smoother transition entering the Road via the Henderson Street end.*
- *The Mitchell Road to Huntley stretch should be cleared of parking and made a clear way to allow for better traffic flow. Mitchell Road is always heavily congested in that zone making it very difficult for Sydney Park Village residents to access Sydney Park Road and the complex. The cycle way could be relocated to the Euston Road end of Sydney Park Road with easier access to Belmont Street.*
- *aware to watch for this, I would hate to put children in harms way, without council addressing this issue first.*
- *The crossing at park is a good initiative. However should not result in the loss of large London plane trees on Swanson between Newton and Park. Removal of these mature trees wouldn't be accepted for any other public works undertaken in a development. Why should council remove them instead of working around them like every other private infrastructure upgrade has to. Parking changes to Park street would also ruin the street character and are a poor outcome for residents here*
- *Regarding Park Street. It needs 2 chicanes along it rather than those speed bumps.*
- *All the continuous footpath treatments make perfect sense, especially at the extra wide crossing across Park Street on Swanson Street. I also strongly support traffic calming and angle parking on Park St in principle, as there is currently greatly increased volumes of traffic due to the pop-up cycleway, and parking is often completely full at night. However, I definitely want to see more details of how precisely this will be implemented before any work is approved. I do not think the footpaths on Park St and the north side of Swanson St should become shared paths, as they are already quite narrow.*
- *I am concerned about the impact these routes will have on existing amenities in the area. In particular, by funneling cyclists into the footpaths where there is currently outdoor dining venues, such as 'Kurrajong Hotel', 'Naked Brew' and 'Parkview Hotel'. The addition of cyclists on the footpath would be dangerous for what is a very populated footpath with residents, diners and pub-goers. A better option*

would be to direct cyclists to the foot path on the opposite side of the road where there are no businesses or residential premises.

- *There is not enough room on these narrow paths for fast bike riders as you also have a highly popular with local cafe (Naked Brew) that utilise this space for their dining. So bikes could hurt these diners. PLEASE DO NOT REMOVE the outside dining option of this cafe as it gives the area a lovely community feel!*
- *If Park Street remains the only option for local traffic, there ABSOLUTELY needs to be a pedestrian crossing placed at the intersection of Park and Copeland.*
- *I don't think these changes are necessary as the flow of traffic down Park Street is not excessive in my opinion. I would be more in favour of amending the current cycleway on Henderson road and reopening railway terrace to bidirectional traffic which would in turn reduce the traffic burden on park street.*
- *Place the traffic calming measure at both ends of Park Street making it inaccessible to heavy vehicles.*
- *I think bike lanes are a great idea but the ones I am commenting on are not well placed and have a detrimental effect on people who rely on a car for transport*
- *Along this section of Swanson Street there is a lot of extra space from the road width. Could some of this be converted to a dedicated cycle path?*
- *I have not seen detailed plans on Councils plans for Park Street. Park Street is shown on the safe routes to school map only briefly and refers to calming measures and angled parking, but I haven't seen what this will actually look like. Council needs to urgently put out a more detailed look at what the plans for Park Street are. It probably needs to be closed off altogether or at a minimum, closed to traffic turning right from Park onto Henderson.*
- *I don't know these roads well but Swanson Street should have a cycleway down each side and perhaps shared path helps get us there. What changes do you have for Park Street? Temporary cycle lanes like in Dalmeny Avenue would seem very suitable.*
- *The changes to traffic on Park Street is not clear. Will traffic be able to travel from Swanson Street to Henderson Street via Park Street?*
- *Shared paths are a reasonable use of space so long as they don't reduce road way. Where are the plans for this proposal?*
- *The installation of a pedestrian crossing on Park Street is absolutely crucial. It should have been installed at the same time as the "pop-up" cycle lanes, given the predictable impact on traffic flows down Park Street, which has been horrible for a once quiet and safe street.*
- *Residents require access to Railway St from Swanson road via Park street due to the need to avoid further congestion on Mitchell Rd, which has gotten / will get much worse since Park Sydney complex opened.*

- *The ability to access Railway pd from Park Street is essential. The constant limiting of residents' access to houses in the Erskineville triangle from Swanson St ruining amenity in the area.*
- *Cycle ways are great and I am supportive BUT unfortunately the consequences have been significant for Park Street. Cars and trucks are racing down it constantly all times of day and night. I am so terrible worried that someone is going to be hit as the cross at the Swanson street end. I recommend that an island be put between the Kurrajong and Naked Brew Cafe. It would force cars to completely slow down as they enter the street. It is such a concern, it is such a heavily pedestrian focused end of the street with so many kids every day walking home from the two schools only a hundred metres away. A change needs to happen to our street to stop all the rat runners. It cannot stay as it is.*
- *Safe routes to school/shared path improvements (Buckland Street, Mitchell Road, Swanson Street)*

Parts of the "existing user network" shown on the context map are not safe for children walking/riding to school. In particular, children going to/from Alexandria Park along Belmont Street must cross Fountain Street, which has high-speed/volume traffic. Measures are required to reduce crash risk here, e.g., Pedestrian/bicycle crossing; kerb extensions to reduce crossing distance; and narrow traffic lanes to reduce traffic speed.

A continuous footpath treatment is needed at Swanson St/Elliot Ave.

The existing Swanson St pedestrian crossing should also have a bicycle crossing.

To reduce traffic speeds and crash risk, Brown Street laneway should be 10 a km/h shared zone.

This report has been prepared by:

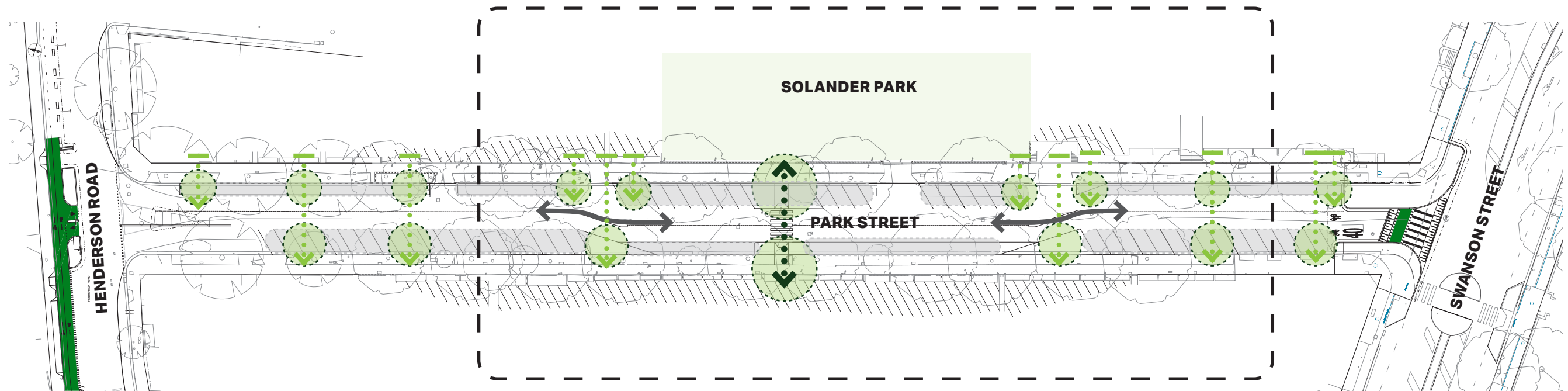
Global Research
150 Office Rd
Merivale
Christchurch 8014
New Zealand
+64 3 355 4562
www.globalresearch.nz







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Attachment I

Park Street – Refined Traffic Calming Concept Design



KEY MOVES

-  NARROWING THE STREET AND CREATING CHICANES THROUGH STAGGERED ANGLED PARKING
-  OPPORTUNITY FOR NEW PEDESTRIAN CROSSING OR CONTINUOUS FOOTPATH TREATMENT
-  EXTENDING THE PARK INTO THE STREET
-  NEW PLANTED GARDEN BEDS AND MEDIANS TO REPLACE PARKING AND MATCH PLANTING PALETTE IN SOLANDER PARK.

PROPOSED STREET TREE TO MATCH EXISTING
(*Lophostemon confertus*)

ANGLED PARKING (REAR TO KERB)

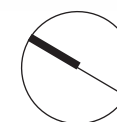
SOLANDER PARK

EXISTING PARALLEL PARKING

PARK STREET

PLANTED MEDIAN TO REDUCE THE CARRIAGEWAY
WIDTH, TO REDUCE VEHICLE SPEEDS AND IMPROVE
PEDESTRIAN AMENITY

PROPOSED GARDEN BED TO MATCH EXISTING PLANTING
PALETTE WITHIN SOLANDER PARK
PROPOSED KERB BUILDOUT AND PEDESTRIAN CROSSING.



1:400
0 2 4 8 12 16 20 24 metres

PROPOSED PLANTING



Liriope muscari



Philodendron 'Xanadu'



Trachelospermum jasminoides



BUCKLAND STREET CHICANE WITH PLANTED MEDIANS

Client: City of Sydney

Project Name: Park Street

Date: 02.02.2021

Landscape Concept Sketch - Park Street

CONFIDENTIAL

By virtue of the Local Government Act 1993 Section 10A Paragraph 2

Document is Restricted

Item 4.**Ad Hoc Grant - 2021 Australasian Emissions Reduction Summit Sponsorship**

File No: X009205.001

Summary

The Carbon Market Institute Limited has approached the City of Sydney to support the 8th Annual Australasian Emissions Reduction Summit to be held in Sydney (within the local government area) on 24 and 25 June 2021.

The Carbon Market Institute is a peak not-for-profit organisation assisting businesses to understand climate risks and opportunities in a decarbonised economy.

The Australasian Emissions Reduction Summit is the largest business and climate industry event in Australasia. It attracts over 600 business leaders and professionals, sub-national and national government leaders, and those from finance, technology, research and development and professional/legal services operating in the climate change space.

This is the first year that the Summit will be held in Sydney. It is anticipated that many city businesses will benefit by attending this event.

This report recommends a \$25,000 (excluding GST) cash grant to support this important event being held at the International Convention Centre (ICC) in Sydney which also includes a one-year Associate Membership of the Carbon Market Institute.

Recommendation

It is resolved that:

- (A) Council approve a cash grant of \$25,000 (excluding GST) to the Carbon Market Institute Limited for the 2021 Australasian Emissions Reduction Summit and one-year Associate Membership; and
- (B) authority be delegated to the Chief Executive Officer to negotiate, execute and administer a sponsorship agreement with the Carbon Market Institute Limited in relationship to the sponsorship described in (A) above.

Attachments

Nil.

Background

1. The Carbon Market Institute (CMI) is a leader in facilitating Australia's transition to a net zero emissions economy through information, policy, carbon markets, research, capacity building and expertise. Its mission is to help business manage risks and capitalise on opportunities.
2. The Carbon Market Institute Australasian Emissions Reduction Summit is one of Australia's most important annual climate change events. This is the 8th annual Summit and the first to be held in Sydney.
3. The theme of this year's Summit is "Destination Zero and Beyond" which refers to the myriad of transition issues and planning for net zero emissions and the following decades of drawdown to repair our climate.
4. In December 2020 the Hon Matt Kean MP, Minister for Energy and Environment wrote to the Lord Mayor advising that the NSW Government will be the primary sponsor of the 2021 Summit to showcase both NSW and Sydney as leading carbon markets.
5. As a hub for banking, finance and insurance, there are many businesses which will benefit directly by the event being held locally, especially in the context of a green-led recovery and in the lead up to COP26 in Glasgow.
6. Benefits of sponsorship to the City would be agreed with the Carbon Market Institute via a sponsorship agreement and include program involvement (including keynote speaker), theme input, complimentary registrations, promotional material and Carbon Market Institute Associate Membership.

Key Implications

Strategic Alignment - Sustainable Sydney 2030

7. Sustainable Sydney 2030 is a vision for the sustainable development of the City to 2030 and beyond. It includes 10 strategic directions to guide the future of the City, as well as 10 targets against which to measure progress. This sponsorship is aligned with the following strategic directions and objectives:
 - (a) Direction 1 - A Globally Competitive and Innovative City - this event will help local businesses to understand the risks and opportunities of a decarbonised economy.
 - (b) Direction 2 provides a road map for the City to become A Leading Environmental Performer - sponsorship benefits will showcase City leadership and learn from other leading organisations.
 - (c) Direction 9 - Sustainable Development, Renewal and Design - the Summit relates to economy wide opportunities for reducing emissions including sustainable development.
 - (d) Direction 10 - Implementation through Effective Governance and Partnerships - the Summit is attended by government, business and community organisations working to a common goal.

Environmental

8. This event will provide insights into climate science impacts and opportunities to reduce and sequester carbon emissions via programs, policy and good governance.

Economic

9. This event will provide insights into climate risks and opportunities for businesses operating in the local government area.

Financial Implications

10. Funding for the grant amount of \$25,000 (excluding GST) will be drawn from savings in the 2020/21 Grants and Sponsorship budget.

Relevant Legislation

11. Section 356 of the Local Government Act 1993 provides that a council may, in accordance with a resolution of the council, contribute money or otherwise grant financial assistance to persons for the purpose of exercising its functions.

Critical Dates / Time Frames

12. The 8th Annual Australasian Emissions Reduction Summit is due to be held on 24 and 25 June 2021.

KIM WOODBURY

Chief Operating Officer

Nik Midlam, Manager Carbon Strategy