Ku-ring-gai
Green Grid Strategy
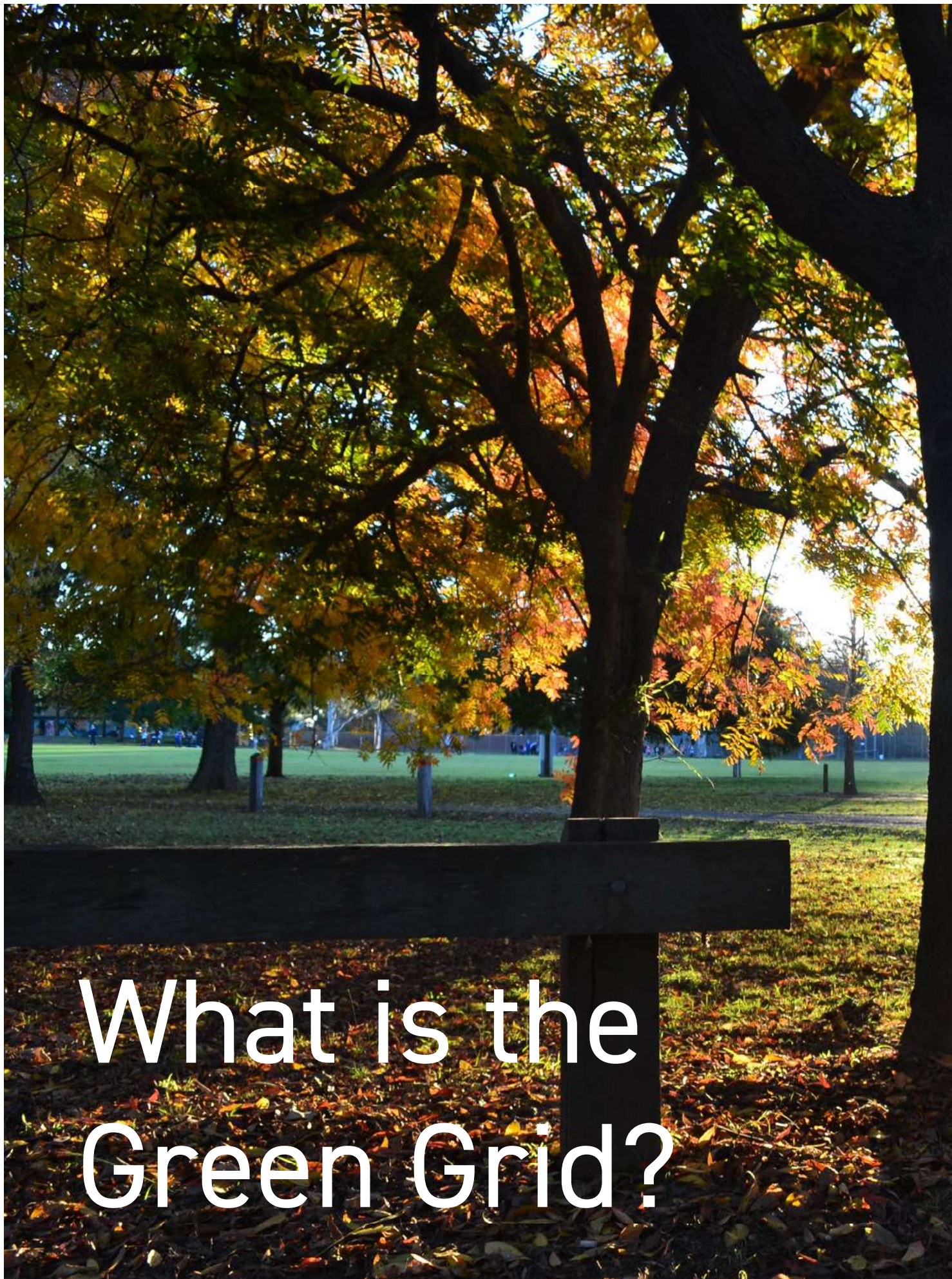
Draft Strategy

Ku·ring·gai
Council

Acknowledgment of Country

Council acknowledges the Durramurragal people as the Traditional Owners of the land of which the Ku-ring-gai local government area is a part, and pays its respects to their Elders, past and present.

Contents

What is the Green Grid?

- **bushland**
- **parks**
- **recreation areas**
- **paths**
- **bike lanes**
- **trails**
- **vegetation**

A network of corridors to connect green spaces and centres

The Sydney Green Grid project is a metropolitan wide strategy with projects to be delivered by local authorities to connect Sydney's green spaces. In simple terms it can be described as "a network of corridors to connect green spaces and centres". These corridors are made up of paths, bike lanes, trails, and vegetation. This means they serve the dual purpose of allowing people to walk or use active transport to get between open spaces and centres and serve as ecological corridors to promote biodiversity. These green spaces can be public open space such as parks or recreation areas and bushland.

The Ku-ring-gai Green Grid

The Ku-ring-gai Green Grid

The aim of the grid is to facilitate the connection of key areas of public and private open space, national parks and bushland, suburbs, key local and neighbourhood centres and adjacent Local Government Areas (LGA's).

Ku-ring-gai's liveability and sustainability rely on maintaining, managing and planning for green infrastructure. Green infrastructure is the network of green spaces and water systems within both public and private ownership, that deliver multiple environmental, economic and social values and benefits to urban communities. It extends beyond physical vegetative structures (such as the urban forest) and includes natural and semi-natural systems as well as the management and integration of various components of urban environments. Greener Places (the draft green infrastructure policy by GANSW, 2017) and the Greater Sydney Region Plan and North District Plan highlight the importance of planning for, protecting, creating and maintaining green infrastructure within Greater Sydney. This planning framework has sought to protect and improve Sydney's network of water related systems (our Hydrological Grid), biodiversity and urban forest (our Ecological Grid) and passive and active recreation and transport (our Recreational Grid).

The Greater Sydney Region Plan's vision for the Eastern Harbour City (including Ku-ring-gai) is for improved access to foreshores, waterways and the coast for passive and active recreation, tourism, cultural events and water-based transport. This vision is to be achieved through implementation of the Sydney Green Grid, providing a network of water related systems (our Hydrological Grid) and green spaces (our Ecological Grid), that will connect communities (through our Recreational Grid) to green infrastructure.

Improved access and connections from Ku-ring-gai's Local Centres to nature and green infrastructure is increasingly important, as the number of people living in high density dwellings increases. There is significant opportunity for local residents and visitors to walk or cycle via a network of streets and parks to bushland areas given that all centres (with the exception of Wahroonga and Pymble) are within a 1km walk of a natural area.

The Ku-ring-gai LGA provides extensive walking trails traversing bushland reserves and connections with the adjoining national park trails.

While extensive planning has been undertaken to enable recreation in natural areas, there is a gap in the provision of marked recreational trails leading from the Local Centres and rail stations to the bushland reserves via local streets and parks. Currently Council only has one marked track from Lindfield Station to the Two Creeks Track which starts in Seven Little Australians Park.

The aim of the grid is facilitate the connection of key areas of public and private open space, national parks and bushland, suburbs, key local and neighbourhood centres and adjacent Local Government Areas (LGA's).

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The purpose of this strategy is to prepare a Ku-ring-gai specific local Green Grid as outlined in the Local Strategic Planning Statement (LSPS). This includes:

- Reviewing and assessing the practicality and feasibility of the Sydney Green Grid Projects identified for the Ku-ring-gai LGA

- Reviewing and assessing the practicality and feasibility Ku-ring-gai walking trails as identified within the Ku-ring-gai Destination Management Plan 2017 -2020

- Reporting on how the Green Grid may support potential biodiversity connections and corridors Ku-ring-gai Biodiversity and Riparian Lands Study Version 5

- Articulating a vision, goals and actions for the strategy

- Recommending a preferred network for the Green Grid; and

- Defining a staging and implementation plan.

The strategy investigates the assessment, prioritisation and implementation of the Greater Sydney Green Grid and Ku-ring-gai Local Green Grid connections, incorporating four stages;

- Stage One - Background Studies Review

- Stage Two - Mapping Analysis

- Stage Three - Draft Guidelines, Principles and Actions

- Stage Four - Final Report
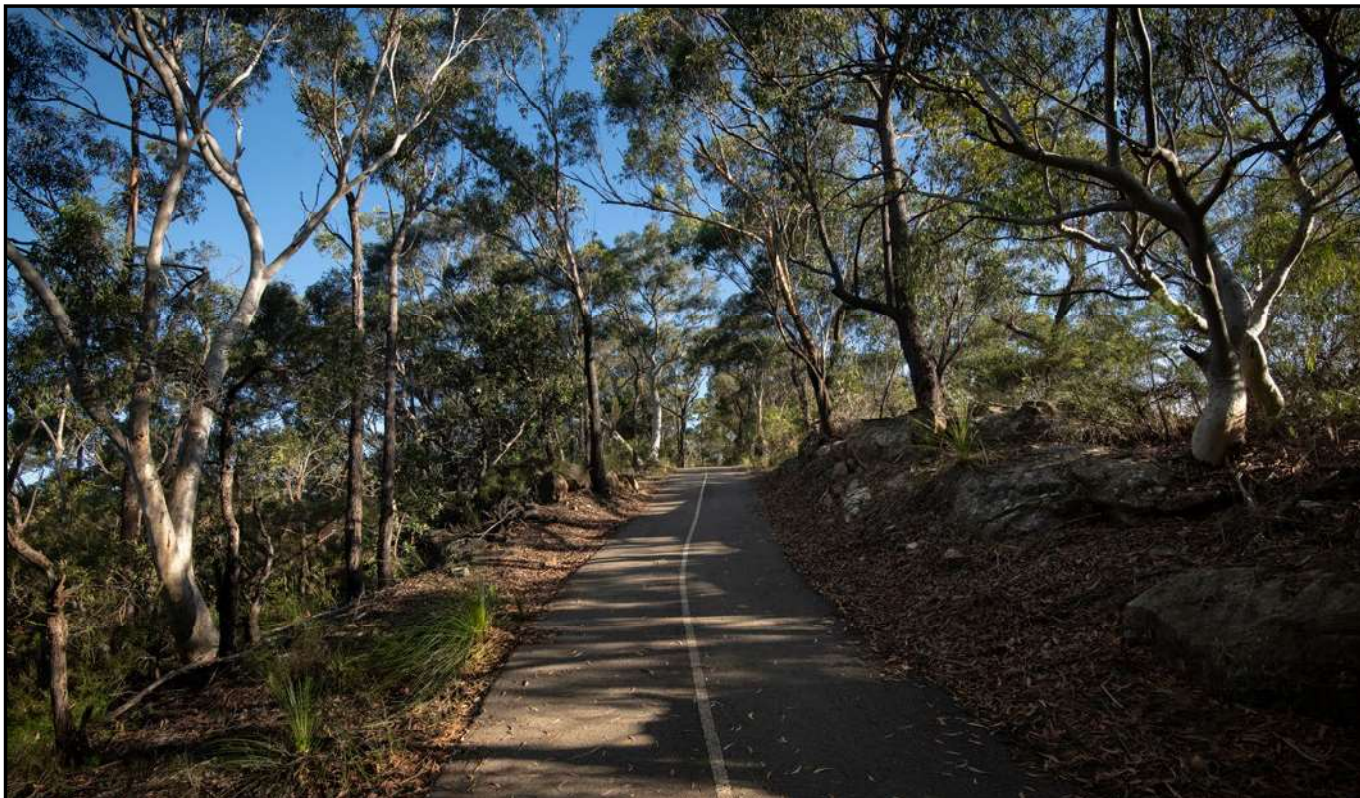
Ku-ring-gai Local Green Grid connections

These Green Grid connections have sought to address connectivity shortcomings, identified within the Ku-ring-gai Biodiversity & Riparian Lands Study 2016; including that:

- There is no continuous, good condition vegetation/ habitat crossing the urban area of Ku-ring-gai in either a north-south or east-west direction.

- Middle Harbour Valley (including Garigal National Park) is considered to be poorly connected to surrounding bushland; including Ku-ring-gai Chase National Park to the north (connectivity is highly compromised by Mona Vale Road).

- The Lane Cove Valley bushland (including Lane Cove National Park) is not connected to adjacent protected areas or reserves, including bushland in the Berowra Valley in the Hornsby and Ryde local government areas.

The Green Grid Strategy considers:

- The need to minimise fragmentation and impact upon bushland areas.

- Walking track connections between Richmond Park and Governor Phillip Reserve. This link is designed to replace the Sydney Green Grid, crossing through the Ku-ring-gai Flying Fox Reserve. This Reserve is subject to a long-term Conservation Agreement and home to an important maternal colony of grey-headed flying-fox. As Council does not support public recreation within this reserve, further development of this Section of the Sydney Green Grid is also not supported.

- The rarity, significance and the special conservation agreements associated with Dalrymple Hay Nature Reserve / Browns Forest and Sheldon Forest, which need to be fully recognised. The nature of these reserves and their protection needs to be promoted. It is envisaged the current ongoing restricted access and usage will continue to ensure their preservation for future generations.

To discourage any unintended future use as general transit ways, Green Grid track linkages will not rely on passage through these reserves, but will employ neighbouring or adjoining routes.

- Walking track links to improve connections between Local Centres and rail stations via a network of streets, private bushland and other agency lands and parks to bushland areas connecting with the Great North Walk and broader trail network along Lane Cove River, Middle Harbour and Cowan Creek.

- Walking track connections from the St Ives Showground Precinct with Brooklyn, Bobbin Head and West Head, linking with existing national park's infrastructure and walking trails as identified within the Ku-ring-gai Destination Management Plan 2017 -2020.

- Opportunities to combine recreation and transport with biodiversity corridors (as identified within Council's DCP Greenweb Map and LEP Terrestrial Biodiversity Map).

- Opportunities to improve biodiversity and recreational disconnect caused by main roads (in particular Ryde Road, The Comenarra Parkway and Mona Vale Road).

- Opportunities and priorities to enhance a variety of open spaces; improve streetscapes; connect with local European heritage and Aboriginal cultural heritage, and undertake street tree planting.

- Access to waterways, water based recreation and creation/inclusion of Water Sensitive City features.

The Green Grid Strategy, planning and implementation will be integrated with other Ecological Grid and Hydrological Grid projects within Ku-ring-gai, and the broader North District, and will inform and be informed by priority actions identified within the LSPS, namely within Urban Forest (Planning Priorities K30 and K31), Bushland and Biodiversity (Planning Priorities K28 and K29), Climate Change Resilience and Adaptation (Planning Priorities K39 and K40) and Water Sensitive City (Planning Priorities K35, K36, and K37).

Layers

The Green Grid is underpinned by layers which serve to meet a range of objectives beyond walkability. In addition to these routes which provide walking or active transport connections, there will be corridors which enhance biodiversity, hydrology, and ecology. These are interconnected and serve to link the network but won't necessarily be 'walkable'.
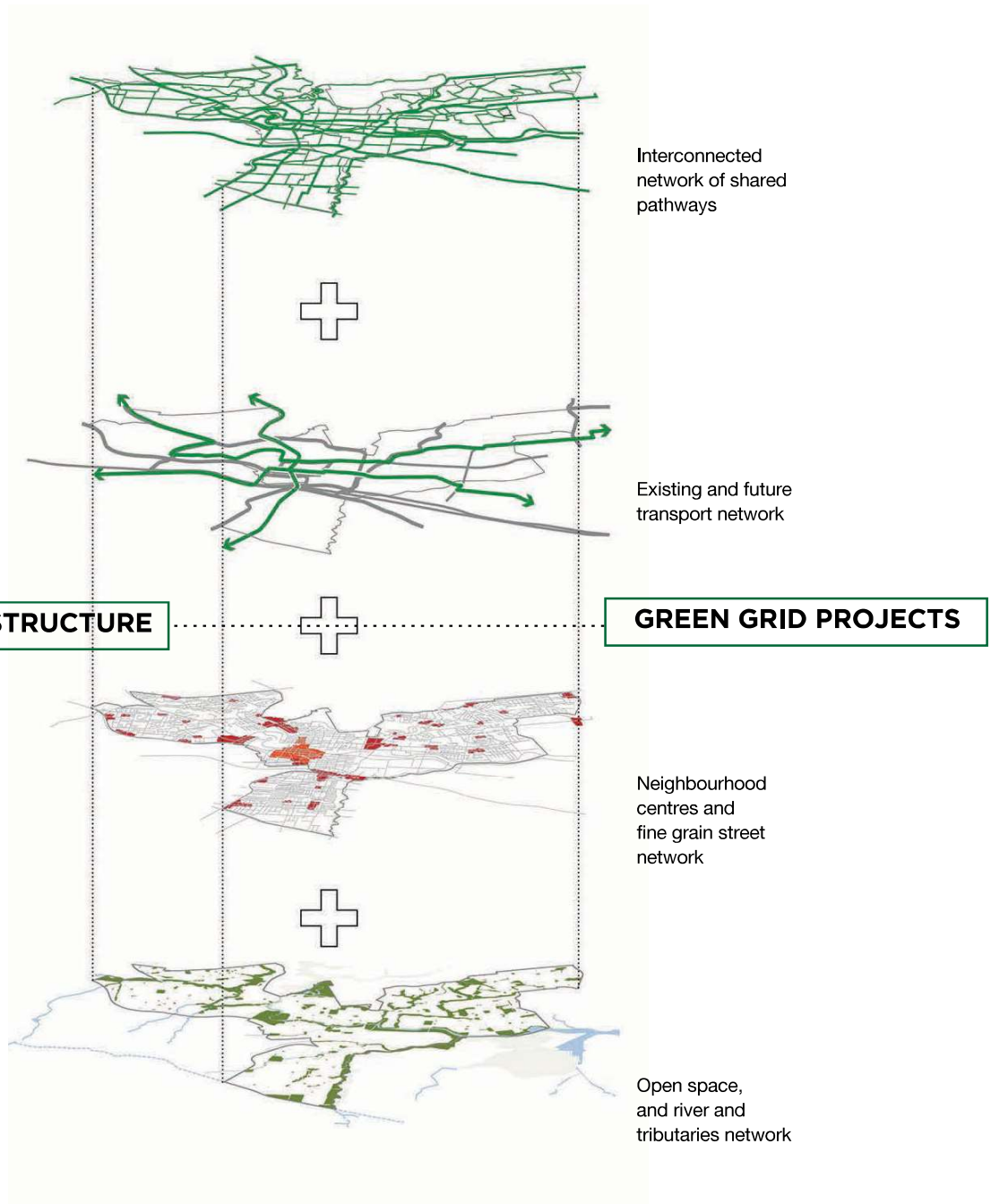

EXISTING SYDNEY LANDSCAPE

AGRICULTURAL GRID

RECREATIONAL GRID

ECOLOGICAL GRID
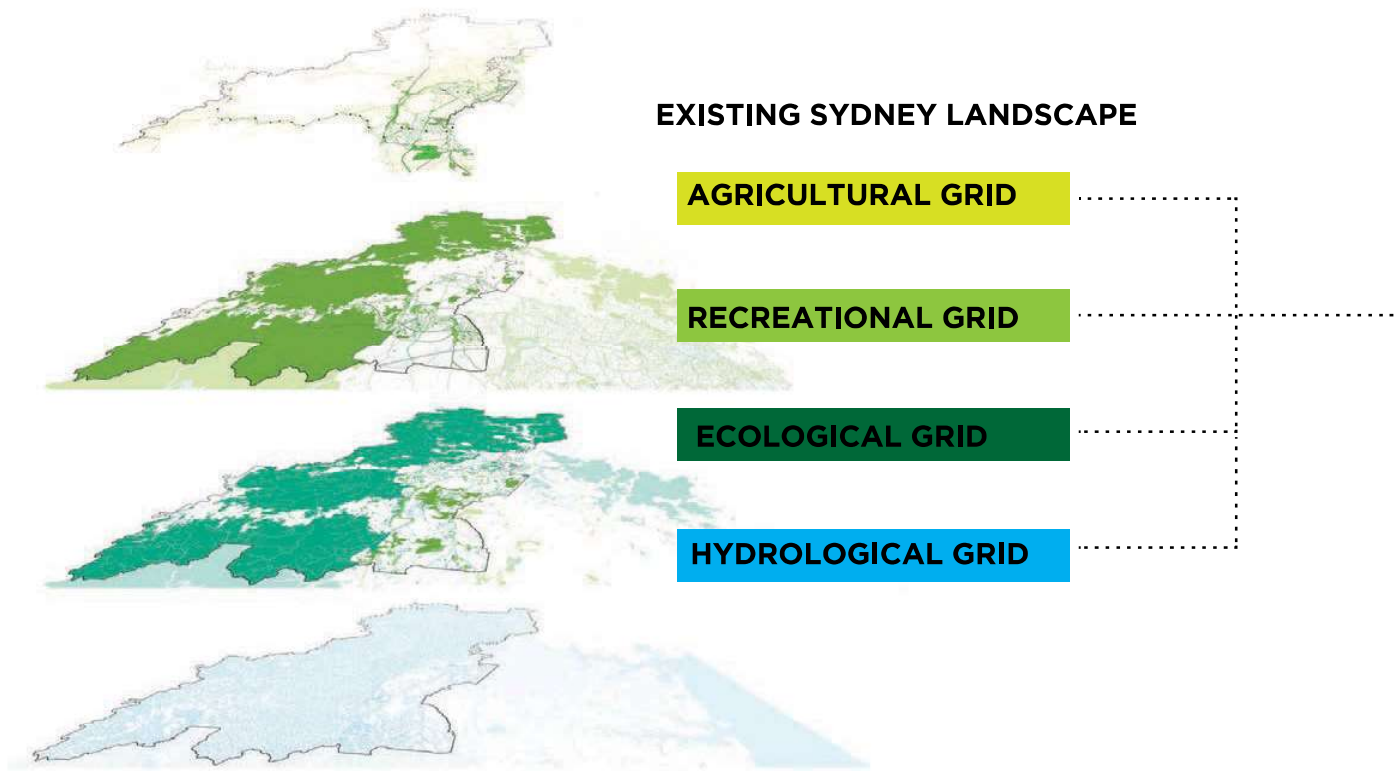
HYDROLOGICAL GRID

RECREATIONAL GRID

Our recreational grid incorporates open space such as parks, sports fields, reserves and play spaces, along with bushland including nature reserves and National Parks.

ECOLOGICAL GRID

The ecological grid captures areas of environmental significance encompassing existing and remnant bushland. It identifies a range of vegetation communities shaped by the local soils and topography including those that have been fragmented by development.

Interconnected network of shared pathways

Existing and future transport network

GREEN INFRASTRUCTURE   **GREEN GRID PROJECTS**

Neighbourhood centres and fine grain street network

Open space, and river and tributaries network

HYDROLOGICAL GRID

Rivers, creek and waterways including those encapsulated in grey infrastructure constitute our hydrological grid.

It is important to note that these layers are interconnected with some elements inherent to all layers, in particular our extensive areas of bushland characteristic of Ku-ring-gai.

Issue no. 03— 2023

Better Placed

CONNECTING WITH COUNTRY

Good practice guidance on how to respond to Country in the planning, design and delivery of built environment projects in NSW

GOVERNMENT
ARCHITECT
NEW SOUTH WALES

NSW GOVERNMENT
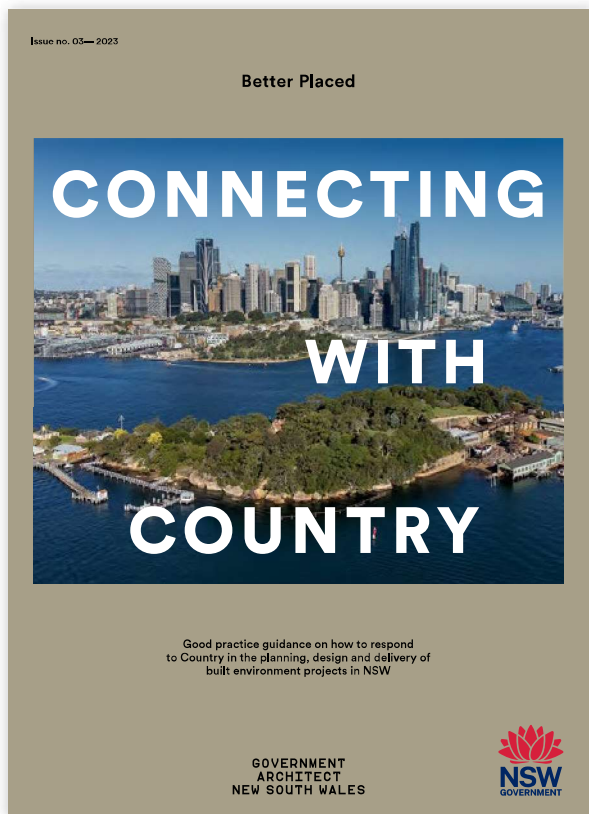
Country

Underpinning the Green Grid is the long history of first nations peoples care and connection to the land. Whilst much of this knowledge has been lost through dispossession, displacement and death, evidence remains of the cultural relationships with the land that can be embraced and acknowledged through the Green Grid.

The Connection to Country Framework document produced by the Government Architect NSW was finalised in 2023. Along with the draft document, this has helped guide the development of the Green Grid Strategy.

The Green Grid explores engagement with the framework through the following methods.

Establish and build relationships that are ongoing

Relationships - Aboriginal Heritage Office (AHO), and exploring further opportunities. Council has a key stake in the AHO, and will continue to foster this relationship. Reaching out to engage and build new relationships with other cultural contacts and community members will be ongoing.

Seek knowledge - co-design and co-manage

Walking Country - walking is fundamental to the Green Grid. Walking on Country during the analysis phase assists in building understanding of the land, and determining appropriate routes. As part of relationship building, opportunities for doing this with first nations people will be investigated throughout the life-cycle of the project.
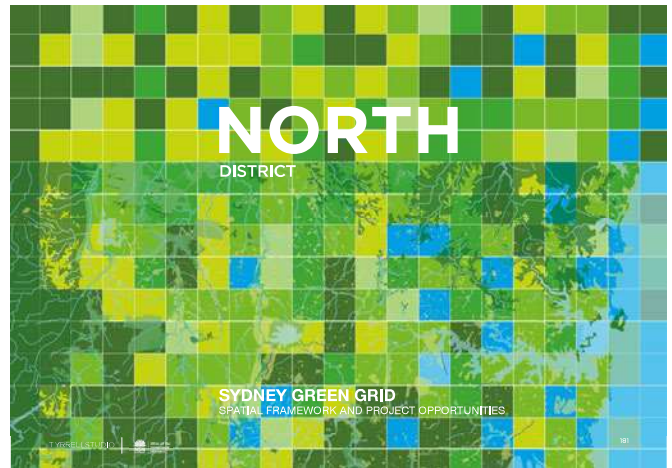
Protect and respect heritage

Working towards maintaining the integrity of significant sites by either providing interpretation opportunities, or discouraging access to them.

The mapping indicatively shows areas of first nations cultural significance. This has been determined through the location of cultural heritage items inlcuding rock art, engravings, grinding grooves, middens, stone tools and other artefacts. Anecdotally, like many of NSW major arterial roads, the Pacific Highway corridor is likely to follow a similar route taken by local people if they had engaged with trade between neighbouring clans. It is evident that these areas align with ridges, gullies and waterways where development is limited allowing for the protection of these remnants, and reflects the nature of resource gathering and movement through country.

Legend:
- Pacific Highway Corridor
- Areas of Cultural Significance

Map labels: TURRAMURRA, ST IVES, PYMBLE, GORDON, LINDFIELD, ROSEVILLE
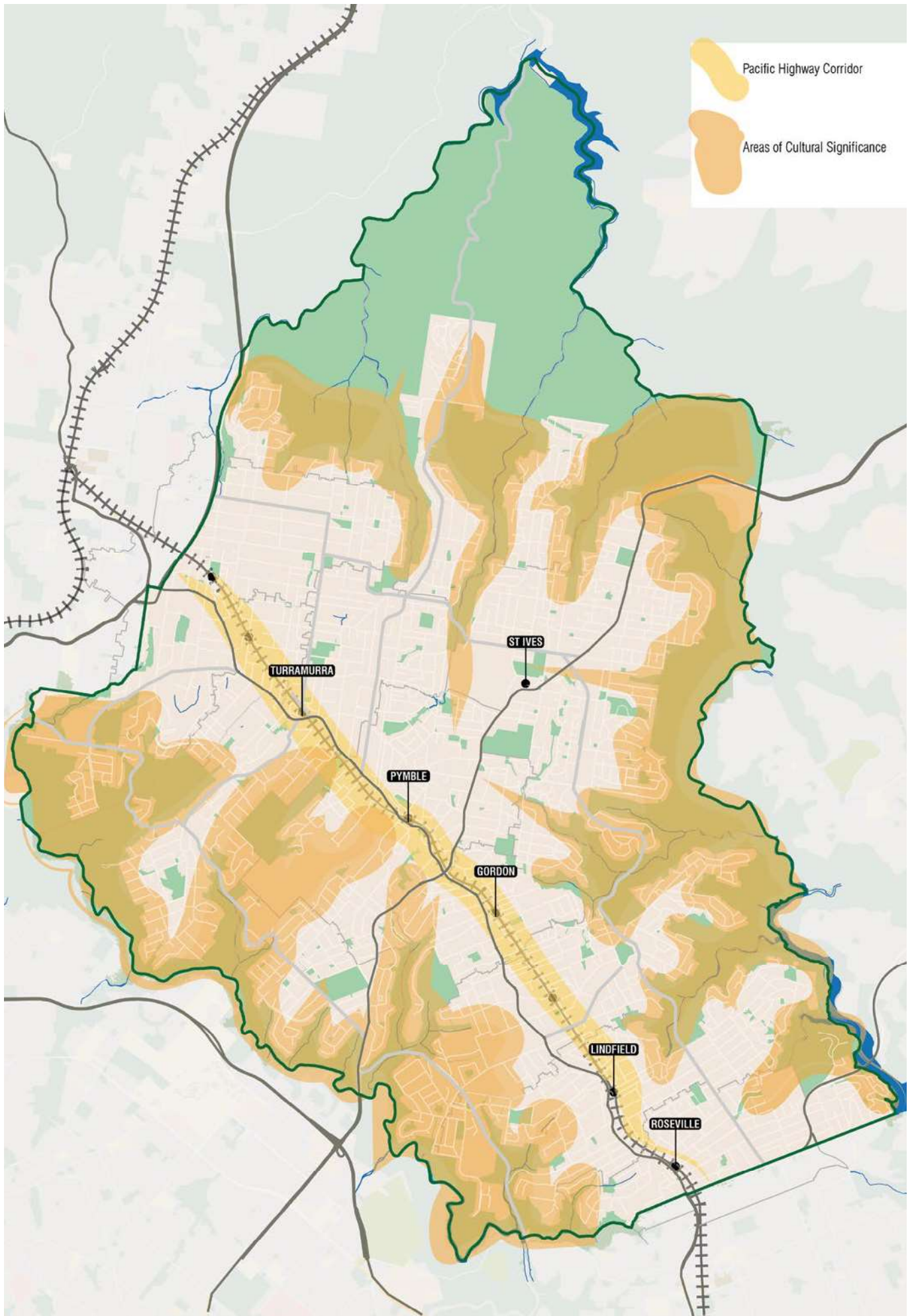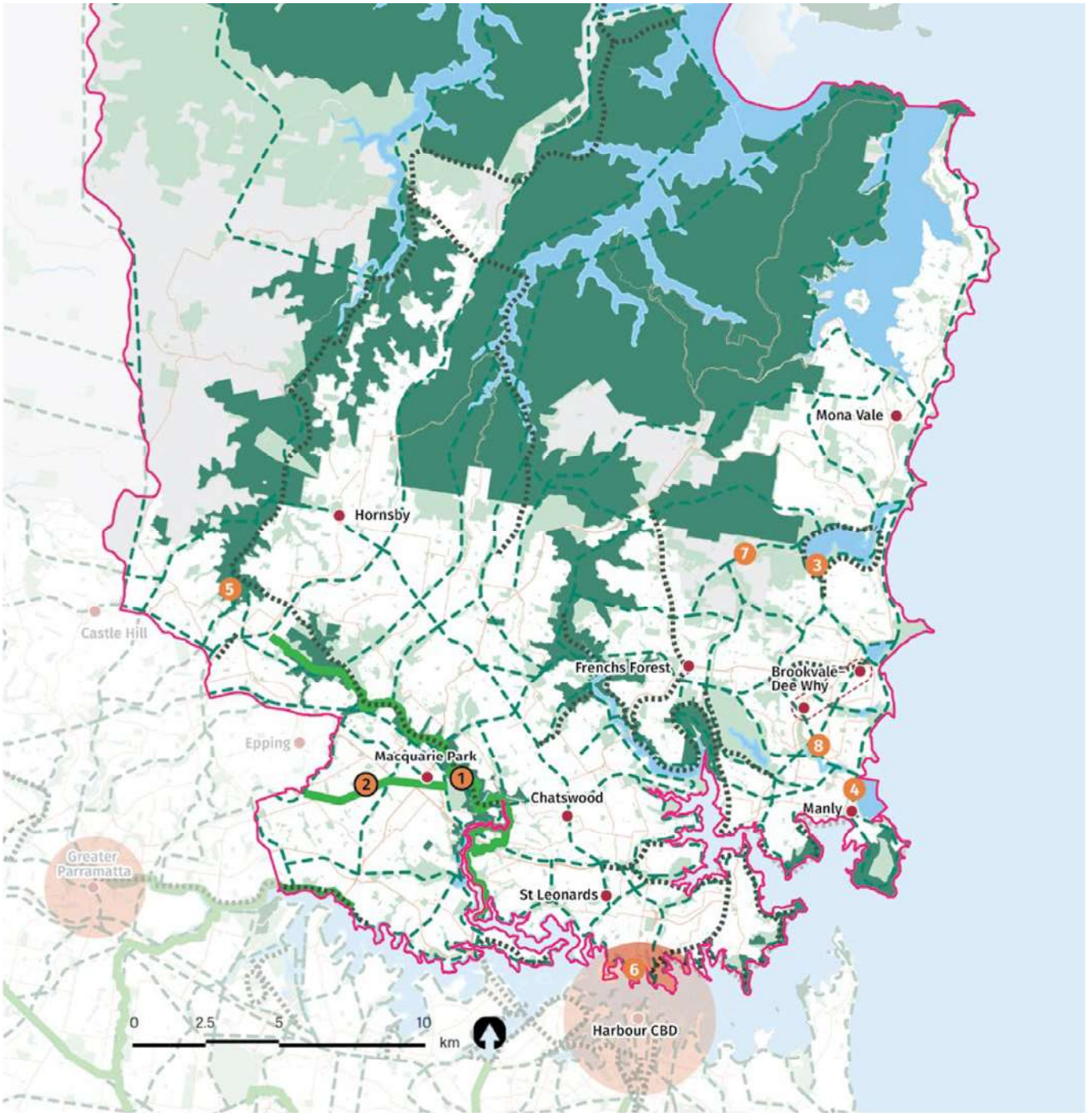
Strategic context

The Greater Sydney Green Grid (2017) is a long-term vision for a network of high quality green spaces that connects communities to the natural landscape across metropolitan Sydney. It links existing tree-lined streets, waterways, bushland corridors, parks and open spaces to town centres, public transport and public spaces. The *Greater Sydney Green Grid* builds on established open spaces, the Regional Tracks and Trails Framework and the Principal Bicycle Network produced by the Government Architect New South Wales (GANSW).

"The Sydney Green Grid is a network that seeks to combine hydrological, ecological and urban resilience through a network of green infrastructure."

Local Authorities across metropolitan Sydney are required to prepare their own Green Grid Strategy, which will implement this overarching vision incrementally over decades, as opportunities arise and detailed plans for connections are refined. The premise of Ku-ring-gai's Green Grid Strategy is to deliver Green Grid infrastructure utilising various mechanisms such as capital works funding, grants, and development contributions.

Legend:

District Boundary	Green Grid Priority Corridor	Road
Metropolitan Centre	Projects important to the District	National Parks and Reserves
Strategic Centre	Other Green Grid Opportunities	Open Space and Reserves
Metropolitan Rural Area	Existing Tracks and Trails	Waterways

Wider context: Interfaces with Ku-ring-gai

Council recognises that the Green Grid network will be a continuous resource independent of ownership boundaries and seeks to collaborate with other agencies and councils to improve open space and bushland management and strengthen partnerships.

Locating corridors

Sydney Green Grid: Spatial framework and project opportunities – North District

Specifically, priority projects are determined for each of the six districts, of which Ku-ring-gai is within the North District. The North District is examined in terms of its landscape character, strategic context, project opportunity clusters, and objectives including:

- Increase access to open space.

- Promote healthy and active living.

- Create new high quality public realm.

The Strategy will include an analysis of opportunities, constraints and required actions, regarding implementation of the Sydney Green Grid, including the following key projects:

- Sydney Green Grid Project 16 Pacific Highway Urban Transformation. This includes Council's projects within the Local Centres along the Pacific Highway:

1. The Lindfield Village Green project which comprises turning an at grade public carpark into a public park, and providing basement car parking beneath.

2. Lindfield Community Hub and Turramurra Community Hub projects which include the provision of new public parks.

3. Tree planting and greening within the Local Centres and other areas along the highway and rail corridor.

- Sydney Green Grid Project 33 – Pacific Highway Centres. Open Spaces and Green Links which seeks to provide a connection through urban areas (including town centres) to open space and bushland on either side of the Pacific Highway.

- Sydney Green Grid Project 4 – Lane Cove River and Lane Cover National Park. Priority Corridor 1 - which includes open spaces along the Lane Cove River foreshores to create unique recreational experiences, linking the Lane Cove National Park to Macquarie Park, Macquarie University, Chatswood and Epping.

NORTH DISTRICT:
THE GREEN GRID PROJECT OPPORTUNITIES

PROJECT OPPORTUNITY	DOMINANT GRID LAYER
1. Sydney's Great Coastal Walk: Barrenjoey Head to Manly	RECREATIONAL
2. NBCL: Curl Curl Lagoon, Open Space and Greendale Ck	HYDROLOGICAL
3. The Great North Walk: Berowra to Brooklyn	RECREATIONAL
4. Lane Cove River and Lane Cove National Park	ECOLOGICAL
5. Manly Dam and Creek Open Space Corridor	HYDROLOGICAL
6. Middle Harbour Beaches and Harbour Foreshore	RECREATIONAL
7. Parramatta River and Sydney Harbour Foreshore	RECREATIONAL
8. Garigal National Park and Coastal Lagoons	ECOLOGICAL
9. Pittwater Road Active Transport Corridor	TRANSPORT
10. Frenchs Forest and Hospital Precinct Green Links	RECREATIONAL
11. Dee Why Town Centre Green Links to Beaches	RECREATIONAL
12. Middle Harbour Village Shops to Bushland Green Links	RECREATIONAL
13. Narrabeen Lagoon and South Creek	HYDROLOGICAL
14. NBCL: Warriewood Wetlands and Narrabeen Creek	HYDROLOGICAL
15. St Leonards and Chatswood to Bushland Green Links	RECREATIONAL
16. Pacific Highway Urban Transformation	DEVELOPMENT
17. M2 Active Transport Corridor	TRANSPORT
18. Pennant Hills Road Green Link	TRANSPORT
19. NBCL: Dee Why Lagoon and South Creek	HYDROLOGICAL
20. Ingleside Green Links	RECREATIONAL
21. Chatswood CBD Green Links	RECREATIONAL
22. Shrimptons Creek Green Link: Eastwood to Macquarie Pk	HYDROLOGICAL
23. Northern Rail Line Linear Open Spaces	RECREATIONAL
24. Berowra Valley Regional Park Open Spaces	ECOLOGICAL
25. Berowra and Hornsby Villages to Bushland Green Links	RECREATIONAL
26. Lovers Jump, Cowan and Ku Ring Gai Creek Corridors	HYDROLOGICAL
27. Hornsby CBD Open Spaces and Green Links	RECREATIONAL
28. St. Leonards Open Space and Green Streets	RECREATIONAL
29. North Sydney CBD Open Spaces and Green Streets	RECREATIONAL
30. Waterloo Road Green Link, Macquarie Park	RECREATIONAL
31. Bantry Bay and Middle Harbour Trails	ECOLOGICAL
32. Terrys Creek Bushland Link	ECOLOGICAL
33. Pacific Highway Centres Open Spaces and Green Links	DEVELOPMENT
34. Warringah Road Active Transport Corridors	RECREATIONAL
35. Upper Middle Harbour Foreshores	ECOLOGICAL
36. Middle Harbour Creeks and Bushland	HYDROLOGICAL
37. Colah Creek and Bushland, Galston	HYDROLOGICAL
38. Bobbin Head and Cowan Creek Foreshores	ECOLOGICAL
39. Ku-ring-gai National Park Trails	ECOLOGICAL
40. Lane Cove and Artarmon Green Street Links	RECREATIONAL
41. Balgowlah to Manly Green Street Link	RECREATIONAL
42. Manly Creek Golf Course Edges	RECREATIONAL
43. Wakehurst Parkway Active Transport Corridor	TRANSPORT
44. Road Reserve Corridor: Macquarie Park to Eastwood	RECREATIONAL
45. Hornsby Quarry	RECREATIONAL
46. Ku-ring-gai and Pittwater Foreshores	RECREATIONAL
47. Murramurra National Park and Muogamurra Trails	ECOLOGICAL
48. Hawkesbury River Foreshore Trails	HYDROLOGICAL
49. Oxford Falls and Middle Creek Trails	HYDROLOGICAL
50. Terrey Hills Perimeter Trail Network	ECOLOGICAL

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Key documents and development

2017

2018

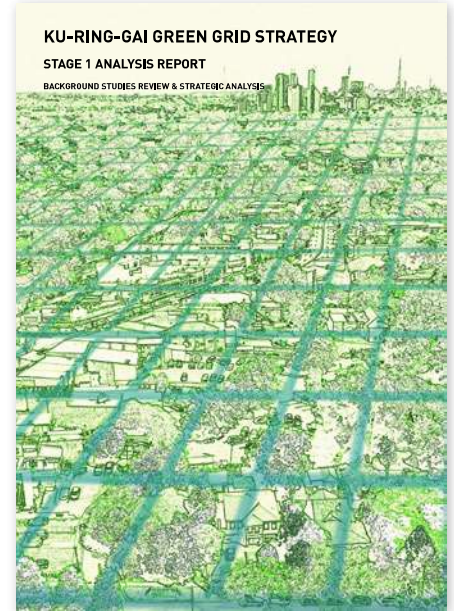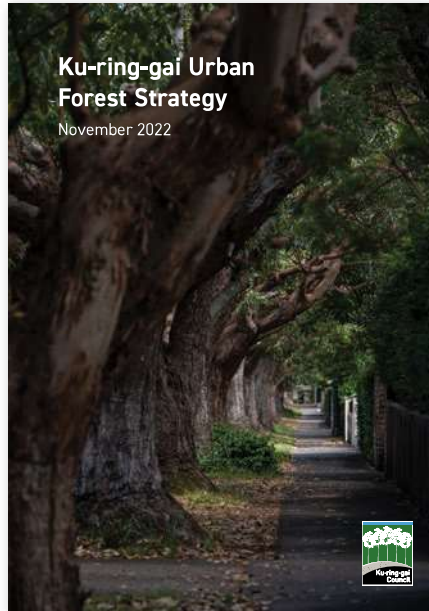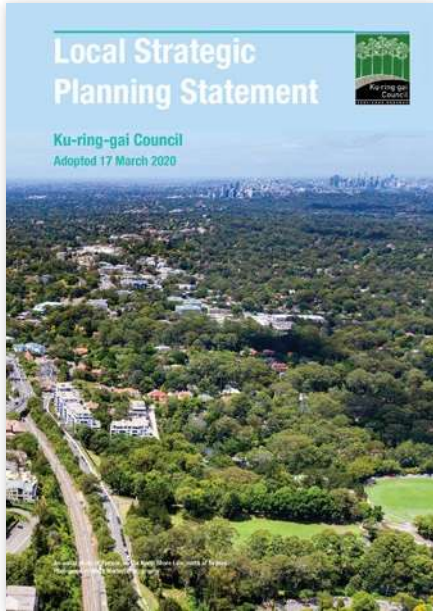Increase access to open space

Promote healthy and active living; and

Create new high quality public realm.

Objective 32
The Green Grid links parks, open spaces, bushland and walking and cycling paths.

Planning Priority N19 Increasing urban tree canopy cover and delivering Green Grid connections.

2020 **2022** **2024**

Planning Priority K32
Protecting and improving
Green Grid connections.

The strategy was identified in the Greater Sydney Commission planning guidelines from 2018 and articulates objectives to be delivered as part of Ku-ring-gai's Local Strategic Planning Statement. The Greater Sydney Green Grid Strategy was developed by the GANSW and Tyrell Studio in 2017 and identifies key corridors and project opportunities within the framework.

Ku-ring-gai falls within the North District and has 4 priority projects and 1 priority corridor which interfaces with the Lane Cove River. Since the adoption of the LSPS we have been developing our Green Grid Strategy in conjunction with the Urban Forest Strategy adopted in 2022.
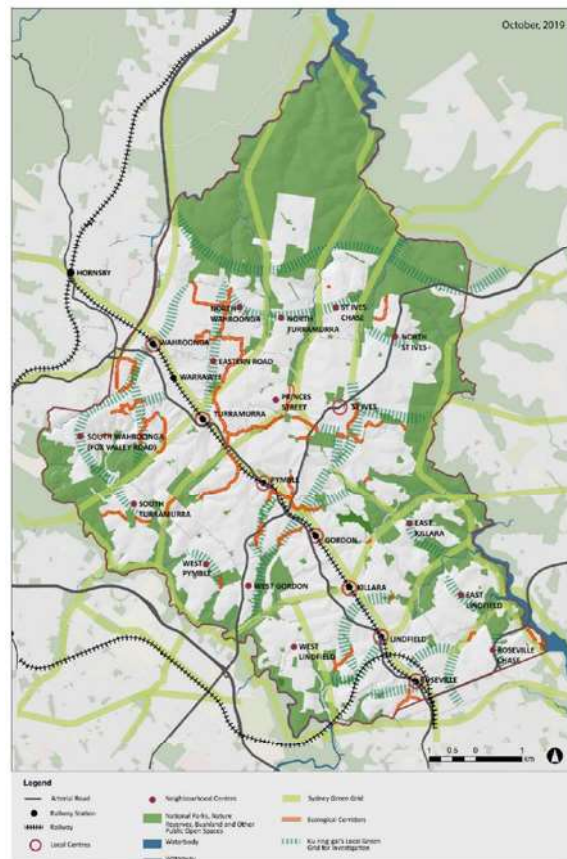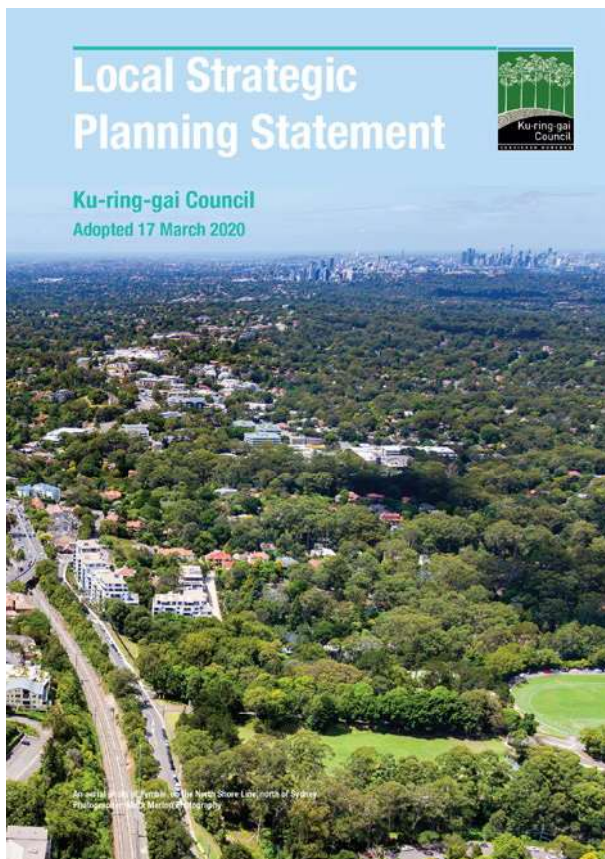
Figure 1 LSPS Green Grid Map

Our LSPS adopted in 2020 gives details of the framework for our Ku-ring-gai green grid which will deliver on both the metropolitan network and our own local grid. This high-level plan gave the overarching locations for potential routes.

The North District component of the Greater Sydney Green Grid outlines clear opportunities for Green Grid connections within the Ku-ring-gai LGA. As part of Ku-ring-gai's Local Strategic Planning Statement (LSPS), Council has further developed these opportunities as shown in Figure 1 – Green Grid, and Figure 2 – Walking Green Grid. Council's mapping of Biodiversity (ecological) Corridors as shown in Figure 3 – Ecological Grid, Figure 4 – Hydrological Grid, and Figure 5 – Active Transport compliment these.

The Local Strategic Planning Statement Priorities that are relevant to the Ku-ring-gai Green Grid Strategy are summarised below:

- K32. Protecting and improving Green Grid connections.

- K33. Providing a network of walking and cycling links for leisure and recreation.
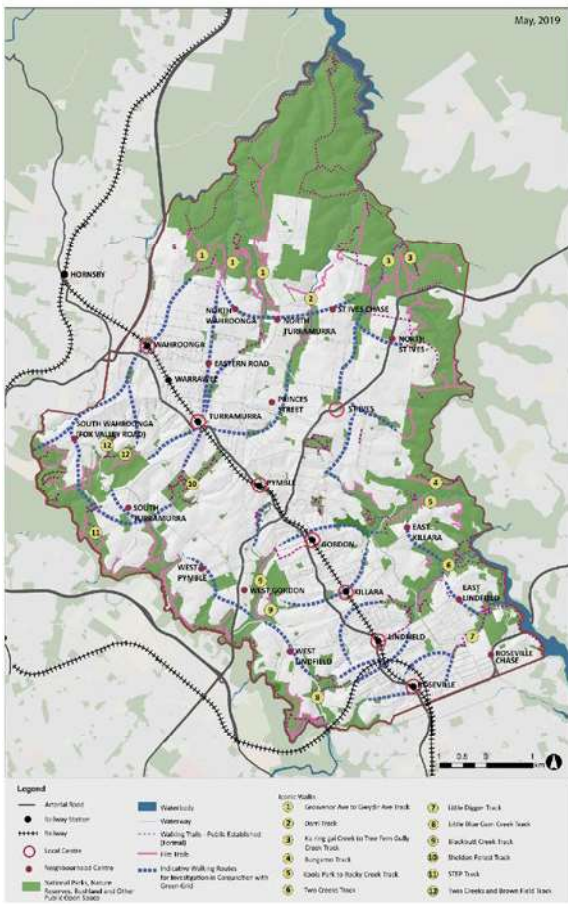
Figure 2 LSPS Walking Green Grid Map
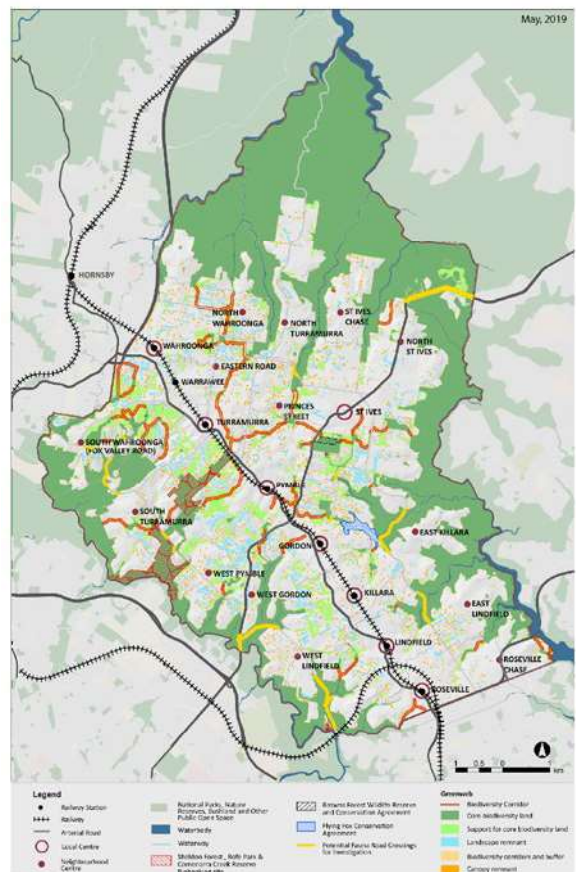
Figure 3 LSPS Ecological Grid Map
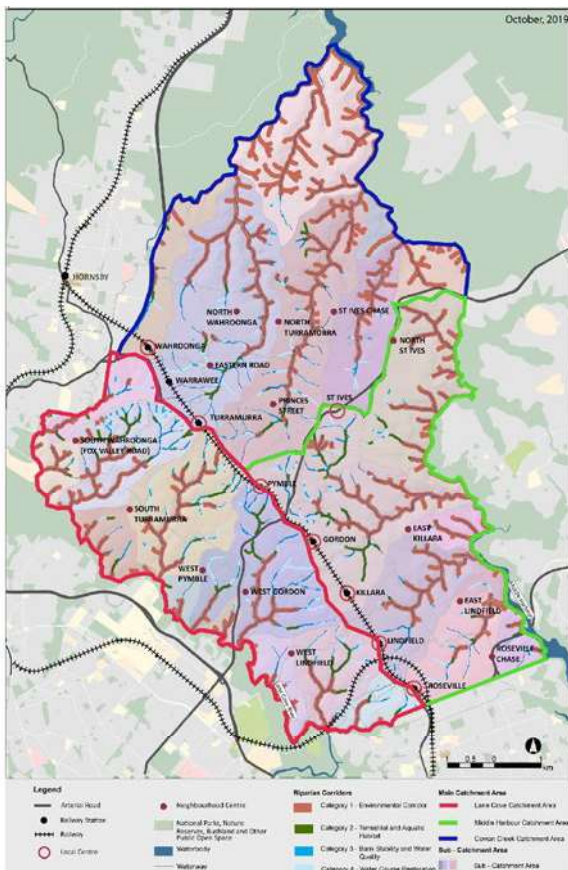
Figure 4 LSPS Hydrological Grid Map

Figure 5 LSPS Active Transport Map

Open Space and Recreation Needs Study & Urban Forest Strategy

The open space network provides the foundation for establishing the Green Grid. Allowing connections for fauna and flora, and humans between these open space resources will reinforce these links. Recreational reserves, bushland, and urban public domain can all be connected via tree-lined active transport routes. Opportunities for connecting biodiversity corridor loops will also be explored. The Green Grid will be a unifying agent to connect our open space resources. Closely linked to the Green Grid Strategy are the Open Space and Recreation Needs Study (OSRN) and the Ku-ring-gai Urban Forest Strategy (UFS). The OSRN study was completed in 2023 by Cred Consulting and focused on examining Ku-ring-gai's current provision of open space and recreation trends particular to our area. It also established five priority needs to improve our open space and recreation management into the future.

- The high provision of natural areas across the LGA provides the opportunity to increase recreational links for walking and cycling along streets and in neighbourhoods to connect up the recreational network.
- In particular, where opportunities for new parks is limited, there is a need to provide recreational loops around local streets with facilities for play and fitness that increase opportunities for walking and activate neighbourhoods.

Need 4 articulates the requirement for improved connections between open space areas, particularly to make streets more walkable. Our Stage 2 Mapping and Analysis identified potential recreation loops throughout the LGA, which will be integrated into the final network.

The Ku-ring-gai Urban Forest Strategy was adopted by Council in December 2022. The critical aspect of the UFS influencing the Green Grid is the identification of planting opportunities, particularly in those areas susceptible to the impacts of the Urban Heat Island Effect. The Green Grid will provide a mechanism for ensuring that the canopy targets identified in the Urban Forest Strategy through tree planting are achieved.

Principle 2 of the UFS is Expand and Integrate. A direct action underlying this principle is increased tree planting. Item 2.1.4 identifies; *Develop a 'Street Tree Master Plan' or similar to guide future tree planting programs. This plan should incorporate a tree planting prioritisation framework that incorporates heat mapping, canopy mapping, green grid, local centres, major cycle and pedestrian routes and social vulnerability mapping.*

Principle 3 of the UFS is Monitor and Maintain. Mapping urban forest landscapes and habitat values will help to identify opportunities for the creation and enhancement of corridors through targeted planting of particular species as informed by the Biodiversity Policy, Green Grid Strategy and Council's LEP and DCP biodiversity controls. Item 3.4.1 identifies; *Audit trees in priority areas on Council-managed land (excluding bushland) and develop a tree inventory database. Utilise existing aerially acquired tree data as a base for this inventory. Collect additional fields such as species, condition, risk profile and Useful Life Expectancy via ground-based assessment. Priority areas for data collection include a number of District Parks throughout the LGA, as well as Green Grid Links.*

Vision & objectives
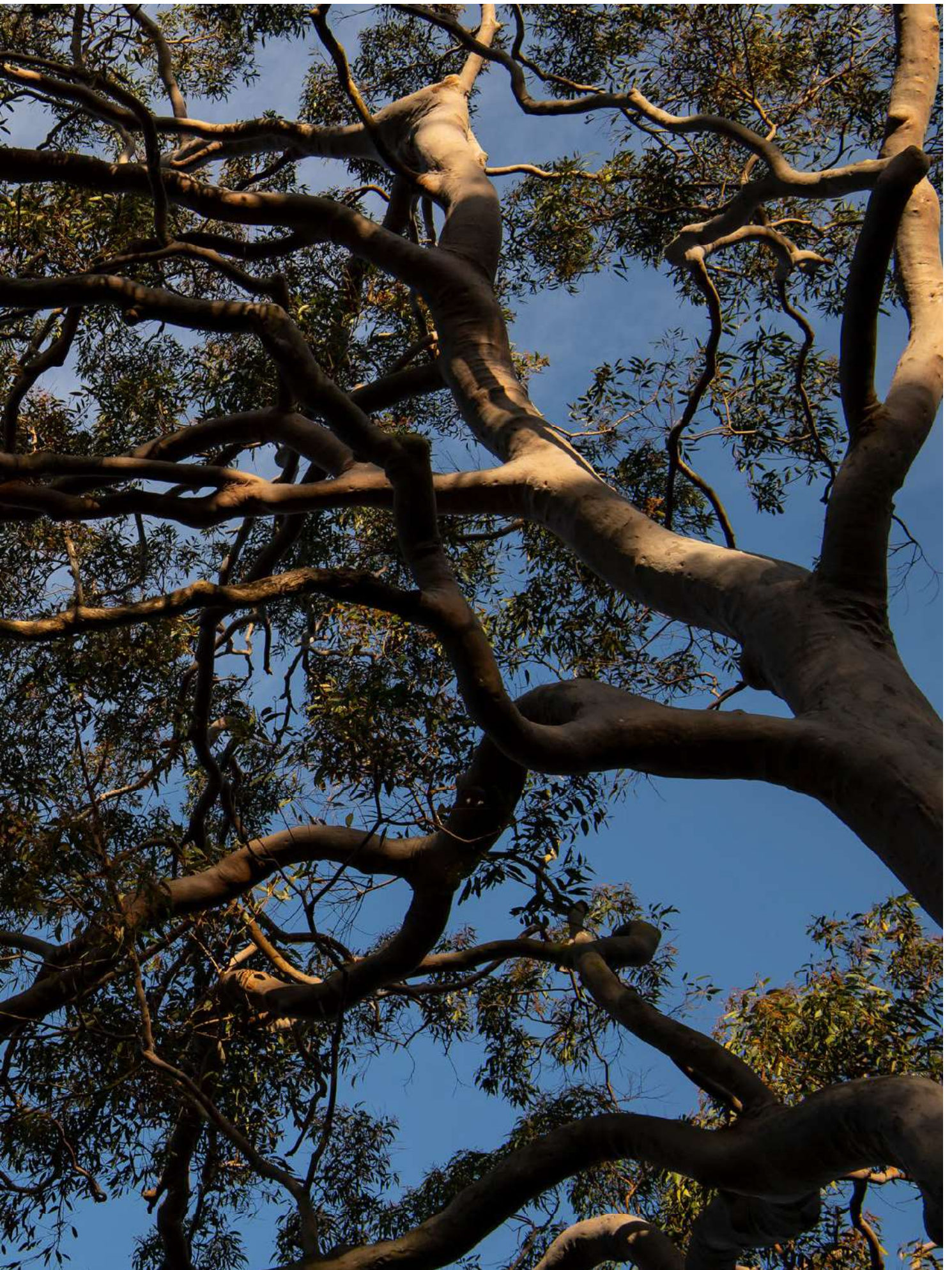
What we have now

Key facts about Ku-ring-gai

Size
land area of
approximately
85km²

Population
2023 = 126,983
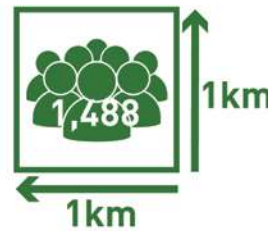
Density
1,488.7 people/km²

**Estimated average
population growth**
1% per year
(past 20 years)

The Ku-ring-gai Local Government Area (LGA) is situated on Sydney's North Shore, approximately 16km from the city, nestled amongst national parks characterising its leafy aesthetic. The three national parks include Garigal National Park, Lane Cove National Park, and Ku-ring-gai Chase National Park. An extensive array of natural areas and bushland reserves supplement these throughout it's suburbs. It's suburbs extend from Wahroonga in the north, Roseville in the south, St Ives in the east and West Pymble in the west.

Natural vegetation, biodiversity, lush landscapes, and unique fauna and flora are all key attractors and assets for those living in and visiting Ku-ring-gai. Highlights include:

- Nationally significant ecological communities including remnant Blue Gum High Forest and Sydney Turpentine Ironbark Forest

- Over 800 recorded native plant species and more than 400 species of native animals; and

- A 99 hectare bio-banking site comprising three reserves at Rofe Park, Sheldon Forest and Comenarra Creek Reserve.

Ku-ring-gai's reputation as belonging to the 'leafy north shore' is underpinned by its proliferation of mature trees. The percentage of canopy cover across the LGA of trees above 3 metres in height is 50% (2022 data).

These images highlight the different scales of roads, paths and trails that exist throughout the LGA offering opportunities for green connections. The current condition and existing features on these routes are variable.

Regional routes such as the Pacific Highway corridor are challenged with infrastructure constraints but have the benefit of established guidelines for their development courtesy of the public domain plans.

Suburban routes like this example at Park Street typically have existing trees and footpaths and possibly passive irrigation around local centres. The streets and verges are wider allowing for more complex interventions.

Local routes are similar, such as St John's Avenue but on a smaller scale hence with less opportunity for larger infrastructure remodelling. They still typically have footpaths and trees.

Trails such as this example at the Blackbutt Creek track vary in condition, however the LGA's key tracks have recently been upgraded in line with NPWS guidelines.

Pacific Highway

Park Street

St John's Avenue

Blackbutt Creek Track

What will the benefits be

The implementation of the green grid projects will achieve several outcomes including,
- Increased urban canopy
- improved biodiversity
- a more resilient urban environment
- improved health outcomes
- an expanded green infrastructure network

The main means of executing this will be through green and blue infrastructure transitioning away from Business-as-usual grey infrastructure and planting.

Green infrastructure is defined as "the network of green spaces, natural systems and semi-natural systems that support sustainable communities. It includes waterways, bushland, tree canopy and green ground cover, parks and open spaces that are strategically planned, designed and managed to support a good quality of life in an urban environment."

Climate change and increases in extreme weather events pose significant threats to our urban environment. By improving infrastructure to incorporate a nature based approach we can begin to soften the impacts of these shocks.

More trees provide multiple benefits;
- More shade creates cooler environments
- Increased resources for fauna - food for pollinators, habitat for birds
- Soil stabilisation
- Reduced stormwater run-off
- Reduction in air pollution

By planting more trees and incorporating layered planting with an emphasis on understorey planting in place of turf biodiversity will be increased along with supporting ecological connections between fragmented vegetation.

As well as providing benefits for our fauna and flora, the community will benefit from the positive physical and mental health advantages provided by urban nature. Alongside the aesthetic benefits of green infrastructure, systems that work with or mimic nature assist in supporting an ageing grey infrastructure system under pressure from increased development. Stormwater systems struggle to cope with severe weather events and by incorporating water sensitive design measures that include planting can help reduce pressure on the network.

Vision

The Green Grid Strategy will consider road corridors, bikeways, pedestrian facilities, walking tracks, fire trails and footpath network improvements having regard for the access, transport, health and recreational needs of the community.

Specifically, it will identify walking and cycling routes, connecting Local Centres and Neighbourhood Centres with nearby parks and natural areas, walking track connections from the St Ives Showground Precinct with existing national park walking trails, and improve biodiversity connections and green infrastructure. Interface and liaison with neighbouring Councils and relevant agencies as applicable to facilitate the development of the Green Grid Strategy will be instigated as part of this process.

Importantly, the Ku-ring-gai Green Grid Strategy is being developed concurrently with the Ku-ring-gai Urban Forest Strategy. The Urban Forest Strategy is examining the opportunities for expansion of Ku-ring-gai's urban canopy cover, and the projects implemented as part of the Green Grid will help to facilitate this.

For the Ku-ring-gai Green Grid the vision is to create a walkable network connecting centres and green spaces.

Key terms when discussing the green grid are;

- The 'GRID' and 'NETWORK' can be used interchangeably. This is the overall 'big picture' and includes all the corridors or routes.

- CORRIDORs are typically those areas which link significant bushland locations and serve as ecological connections. It also includes those major transport infrastructure arteries such as the Pacific Highway and North Shore rail line.

- ROUTEs are larger scale connections that are based around active transport typically interconnecting suburbs.

- LINKs are smaller scale connections at the suburban and local levels.

'A network of corridors to connect green spaces and centres'

Objectives

Increased canopy

Active transport

Walkability / Interest

Biodiversity

What would we like the Green Grid to achieve? These objectives articulate the overarching vision for what Council wants our Green Grid to deliver.

Increased canopy cover across the LGA

Ku-ring-gai benefits from a well-established and extensive urban tree canopy. Pressures from development, climate change and risk mitigation all impact on how this is able to thrive and expand. Clear targets for the delivery of an improved urban forest canopy are essential for ensuring the longevity and success of our urban forest. Green Grid projects are fundamental to achieving this.

A consolidated active transport network providing comfortable walking and cycling routes

Active transport is critical in sustainable progress towards meeting climate change mitigation targets. Council is pursuing opportunities to develop the best possible links that provide the infrastructure to support both walking and cycling transport options. Integral to the comfort of these routes is shade and an aesthetically pleasing environment, which co-ordinated street tree planting as part of the Green Grid can deliver.

Walkable connections between points of interest in the LGA

Local Centres, historic sites, parks and recreation facilities all provide points of interest within the LGA which residents want to access. The Ku-ring-gai Green Grid will endeavour to make walking the preferred way to get to, from and between these points by improving green infrastructure interventions along these routes, ensuring they are shaded, pleasant and accessible.

Enhanced biodiversity and riparian corridors

Fundamental to the Green Grid is the enhancement and protection of our existing natural systems. These need to be supported and expanded wherever possible. The balance needs to be struck between creating new connections to re-link patches of bushland, and allowing the appropriate level of access to sensitive areas.
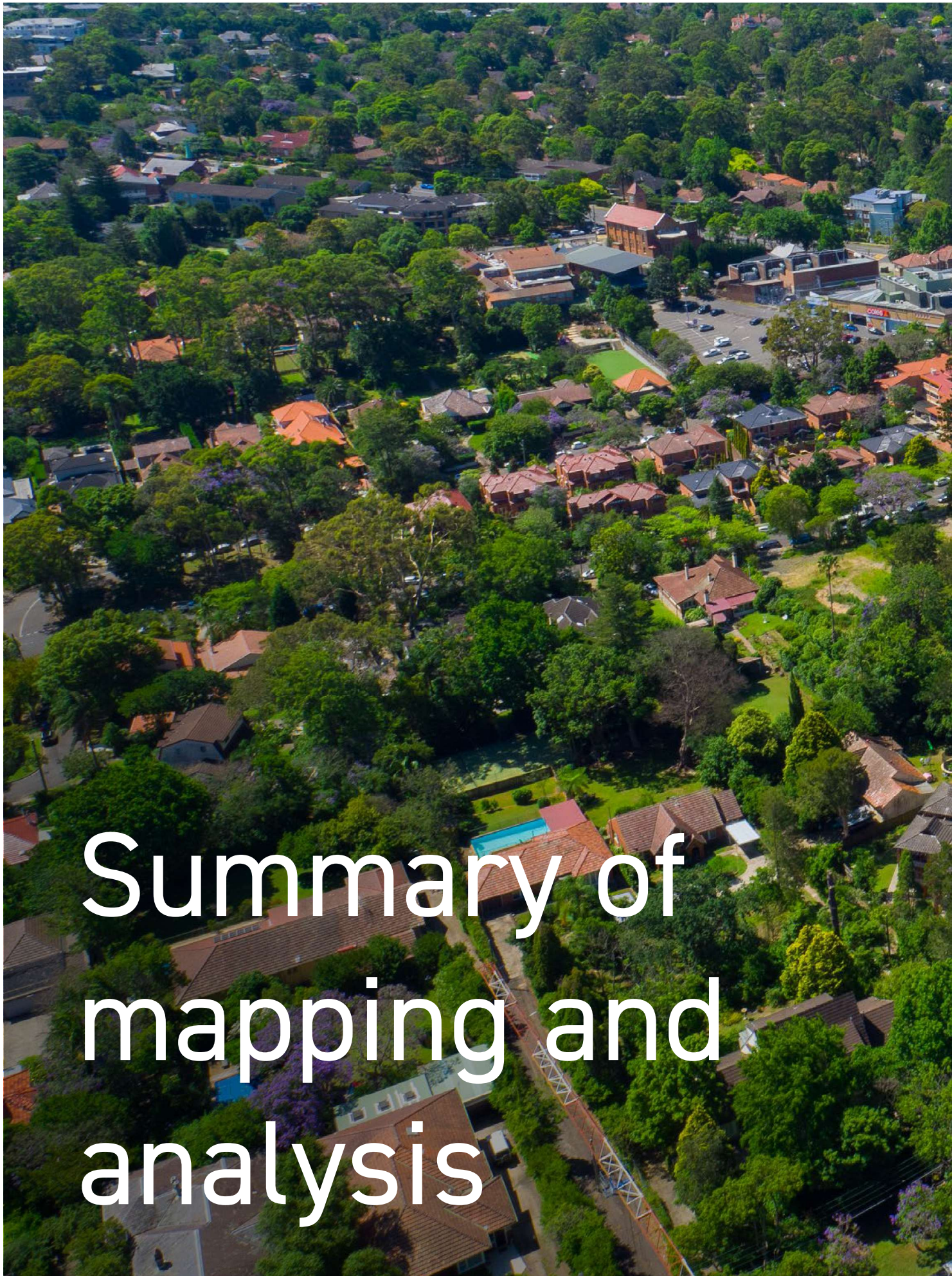
Summary of mapping and analysis

Stage 1: Background studies report

KU-RING-GAI GREEN GRID STRATEGY

STAGE 1 ANALYSIS REPORT
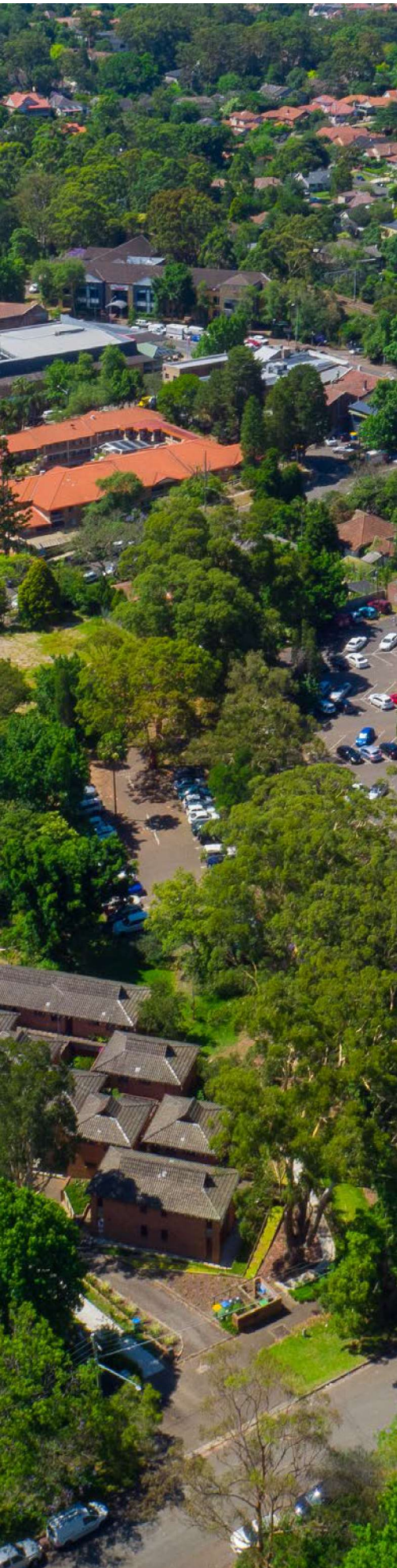
BACKGROUND STUDIES REVIEW & STRATEGIC ANALYSIS

Contents

Introduction

Analysis of current Green Grid status within Ku-ring-gai

Strategic Policy Objectives

Connecting with country

Background Studies

Open Space Provision

Development

Council Policies and Strategies

Neighbouring councils - Ryde, Hornsby, Willoughby, Northern Beaches

Case Studies

Objectives and guidelines

To initiate the strategy, we have developed a Stage 1 background studies report. This has provided the foundation for our exploration of the network, allowing us to examine precedents and our own opportunities and constraints.

Stage 2: Mapping & analysis

Stage 2 has included our in-depth mapping and analysis. We have examined the range of data that will influence the network, including physical, climatic, cultural, governance and movement considerations.

Mapping and Analysis: LGA Wide
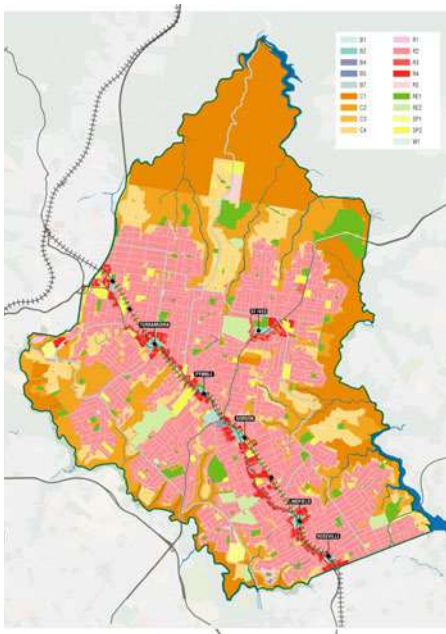
1. Zoning
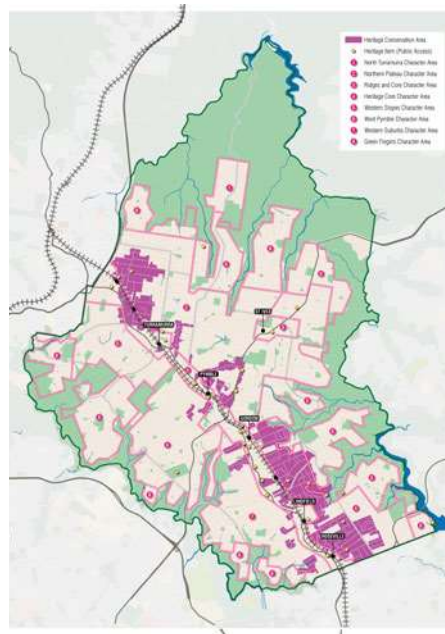
2. Character & heritage
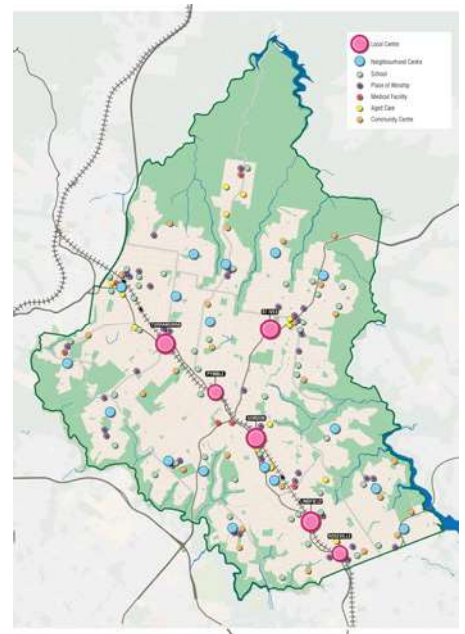
3. Places of interest
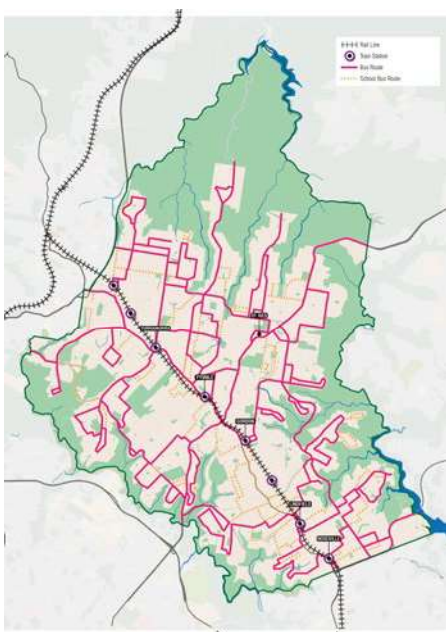
4. Public transport

5. Active transport
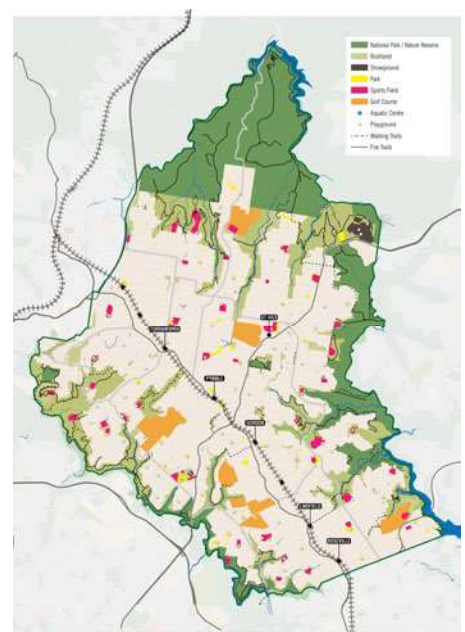
6. Open space & recreation
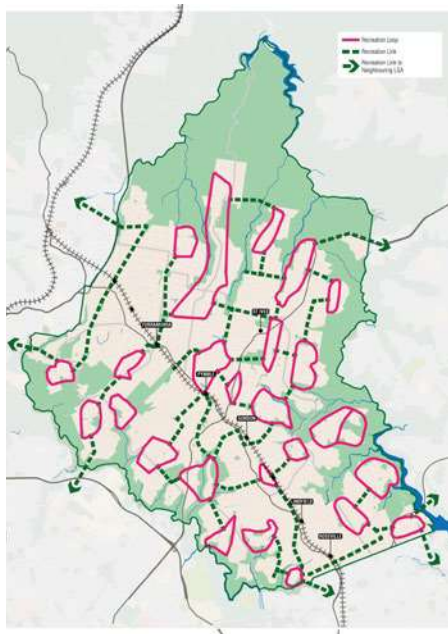
7. Recreation loops
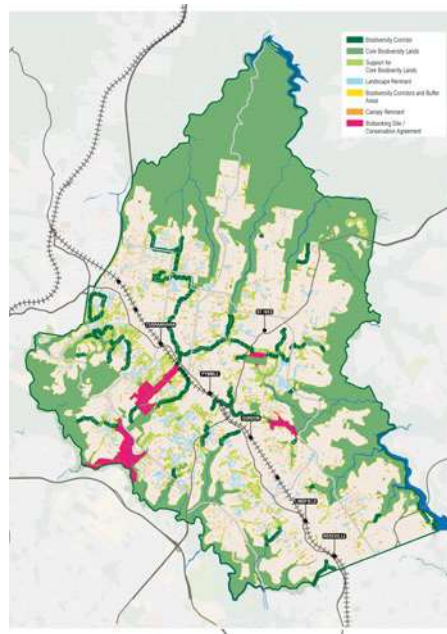
8. Biodiversity
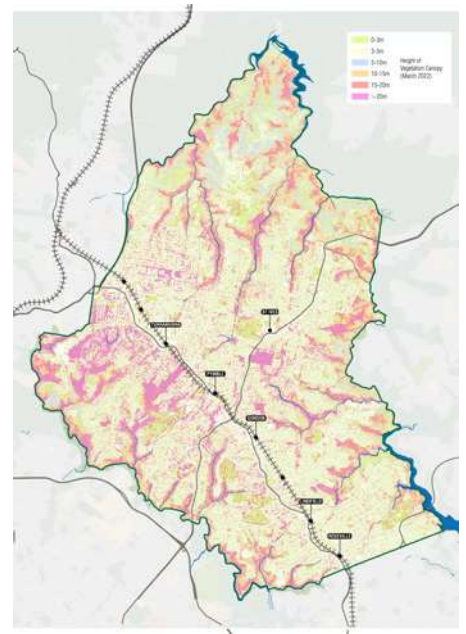
9. Vegetation
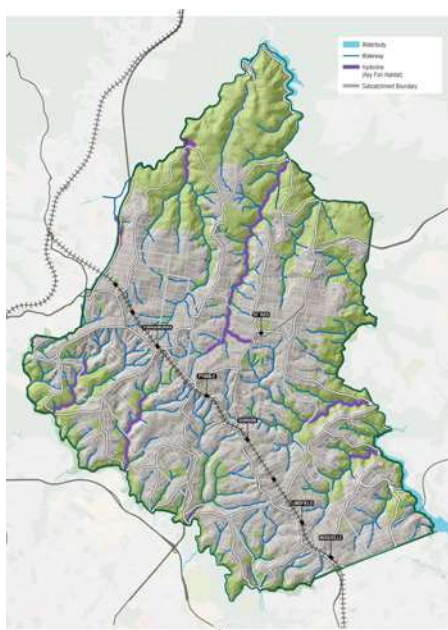
10. Topography & hydrology
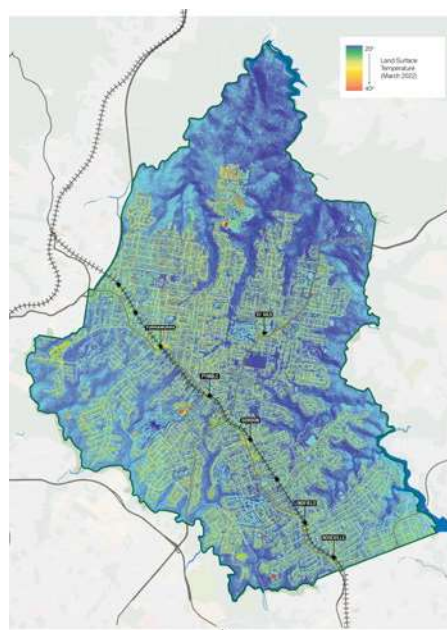
11. Heat mapping

Baseline Data

This baseline data for the LGA provides an overview of each of the selected focus areas. The detail at this LGA wide range gives a snapshot of how things look and can give a broad overview of the key corridors for opportunities and constraints. This wide range view will then be overlaid at a suburban level to help determine street level routes.

The Green
Grid Network

Ku-ring-gai Green Grid

Approach – how we have developed the network

Methodology

The high level proposed routes identified in the LSPS as;

- Ku-ring-gai Green Grid
- Walking Grid
- Ecological Grid
- Hydrological Grid

The analysis of these overarching routes has led us to develop and refine the network that was established as part of the greater Sydney green grid and the Ku-ring-gai green grid. The network is now defined down to street level based on compilation of the data. The selection of all the routes regardless of scale have been guided by an accumulation of features, existing infrastructure, and accessibility.

Opportunities and constraints were analysed at an LGA wide level for the following focus areas;

- Density and Zoning
- Local Character
- Heritage
- Key Destinations and Attractions
- Transport
- Open Space
- Heat Mapping
- Canopy
- Biodiversity
- Hydrology
- Topography

The base data has been overlaid to identify cumulative features that provide the most opportunities and least constraints. This broad brush approach aimed to produce corridors of activation for further analysis.

Opportunities

The key opportunities relate to ease of access relating to topography and existing infrastructure, and those routes that incorporate the most significant points of interest and destinations.

Constraints

Constraints on the network include steep topography, narrow infrastructure corridors, and desirability of walking environment. Busy roads with little vegetative buffer present a more challenging environment to retrofit, and alternatives to these routes were explored.

The network hierarchy of routes from large to small scale is as follows.

Regional connections - these are the predominant North-South corridors following the Pacific Highway and North Shore rail line and east-west links encompassing Ryde Rd and Mona Vale Rd.

Suburban connections intersect suburban boundaries and interface with neighbouring councils.

Local link connections are the more small-scale interventions that highlight local points of interest and fill the gaps in suburban connections.

Trail connections are the more ecologically focused routes directly connecting existing trails through bushland.

Trail

Local Link

Suburban

Regional
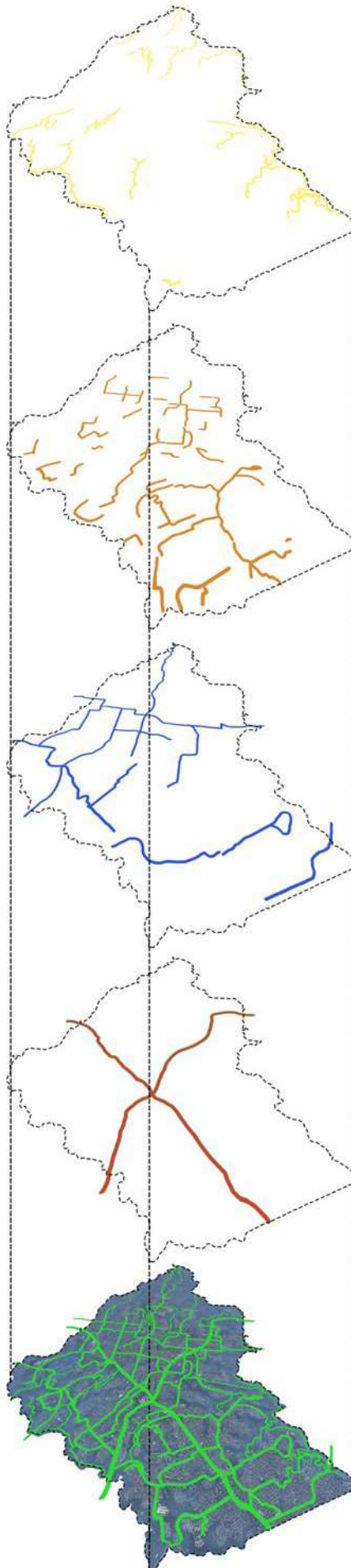
Network Hierarchy

Draft routes – regional

In this example of regional routes, the Pacific Highway corridor is the main spine of the route however it deviates in and around centres encompassing the rail corridor for an optimised journey. The table highlights the opportunities and the key layers it engages with across Ecological, Hydrological, Recreational, Cultural and Active Transport/Public Domain considerations.

Possible opportunities and improvements across all regional routes

- Parking - extension of Clearways along Pacific Highway in the future;
- Paving - local centre core paving upgrades;
- Street Tree Planting - Integrate new street trees where appropriate;
- Street Furniture - Introduce seating and bins around bus stops in high traffic areas;
- Lighting - Install upgraded street lighting and awning lighting where applicable; and
- Powerlines - underground aboveground powerlines where possible.

Link example

Pacific Highway, Gordon

Description of link example

The north-south Regional Green Grid connection favours lowerorder connections adjacent to the Pacific Highway. The northern segment includes; Millewa Avenue (Wahroonga); Warrawee Avenue (Warrawee); Brentwood Avenue (Warrawee) and Rohini Street (Turramurra). This segment is characterised by 2-3 storey mixed use developments in the Local Centres and 2 story general residential dwellings. The central segment travels along the Pacific Highway. Being the main arterial road connection through the Ku-ring-gai LGA it distributes traffic from Hornsby LGA to Willoughby LGA and beyond towards North Sydney and Sydney City. The Pacific Highway is predominantly characterised by mixed use and high density residential development. The southern segment includes; Werona Avenue (Gordon and Killara), Lindfield Avenue (Lindfield), Strickland Avenue (Lindfield) and Hill Street (Roseville).

Ecological	Hydrological	Recreational	Cultural	Active Transport & Public Domain
	●			●

Legend

- Regional connections
- Suburb connections
- Local connections
- Links
- Trails
- Private open space
- Parks and playing fields
- National parks / nature reserves
- Local centre
- Neighbourhood centre
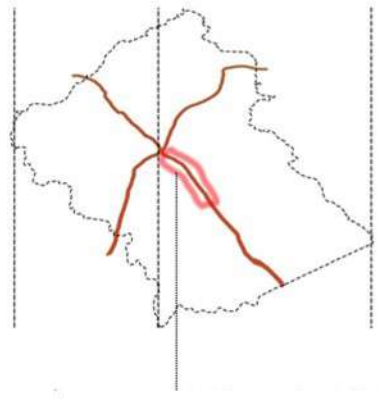
Link example –
Pacific Highway, Gordon
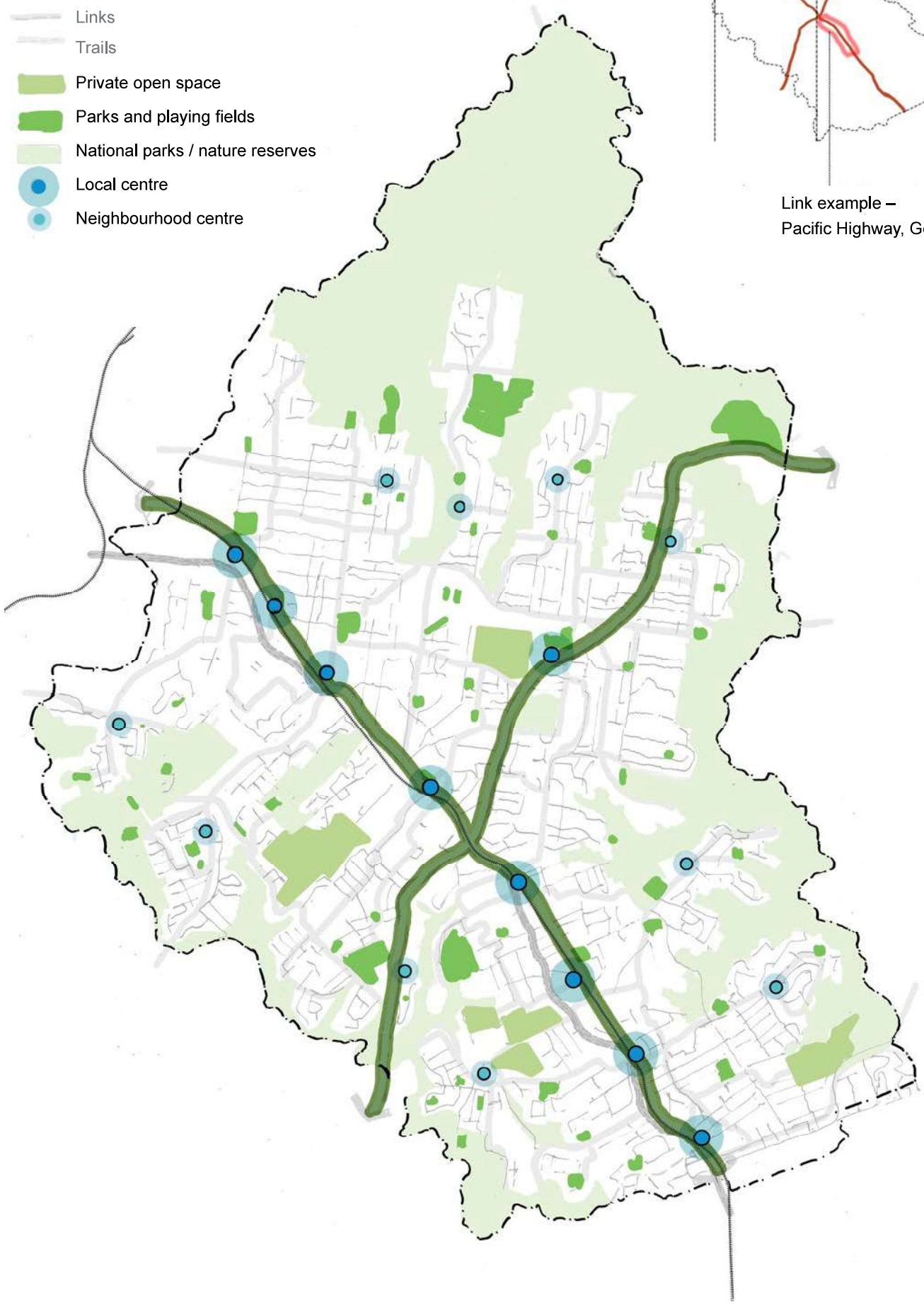
Draft routes – suburban

Suburban routes have been selected to provide connections along routes that link key destinations and are desirable to walk along. Determining which road was selected over another included reviewing movement mapping showing the frequency of use by people walking or cycling. Topography, existing footpaths, and multiple destinations along a route such as schools or shops helped to determine its selection.

Possible opportunities and improvements across all suburban routes

- Traffic Calming - Introduction of traffic calming initatives which incorporate landscaping, changes in material and street trees;
- Street Tree Planting - Integrate new street trees where appropriate;
- Lighting - Install upgraded street lighting and awling lighting where applicable; and
- Powerlines - underground aboveground powerlines where possible.

Link example

Park Avenue, Gordon

Description of link example

This connection links the Gordon Local Centre (inc. Police Station and Library) to Gordon East Public School. It is characterised by Park Avenue, Rosedale Road, Sage Road, Eucalyptus Street, Horace Street and Link Road which connects to Mona Vale Road and St Ives Local Centre. Theconnection has a low-density residential character whith steep topography in parts. Footpaths exist along this connection.

Ecological	Hydrological	Recreational	Cultural	Active Transport & Public Domain
🟢	🔵			⚪

Legend

- Regional connections
- Suburb connections
- Local connections
- Links
- Trails
- Private open space
- Parks and playing fields
- National parks / nature reserves
- Local centre
- Neighbourhood centre
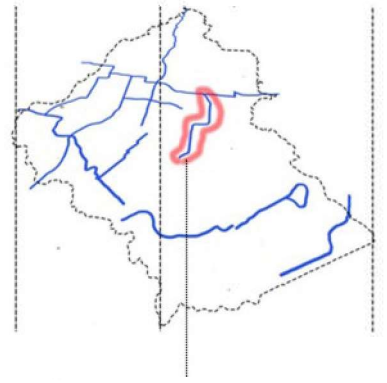
Link example –
Park Avenue, Gordon
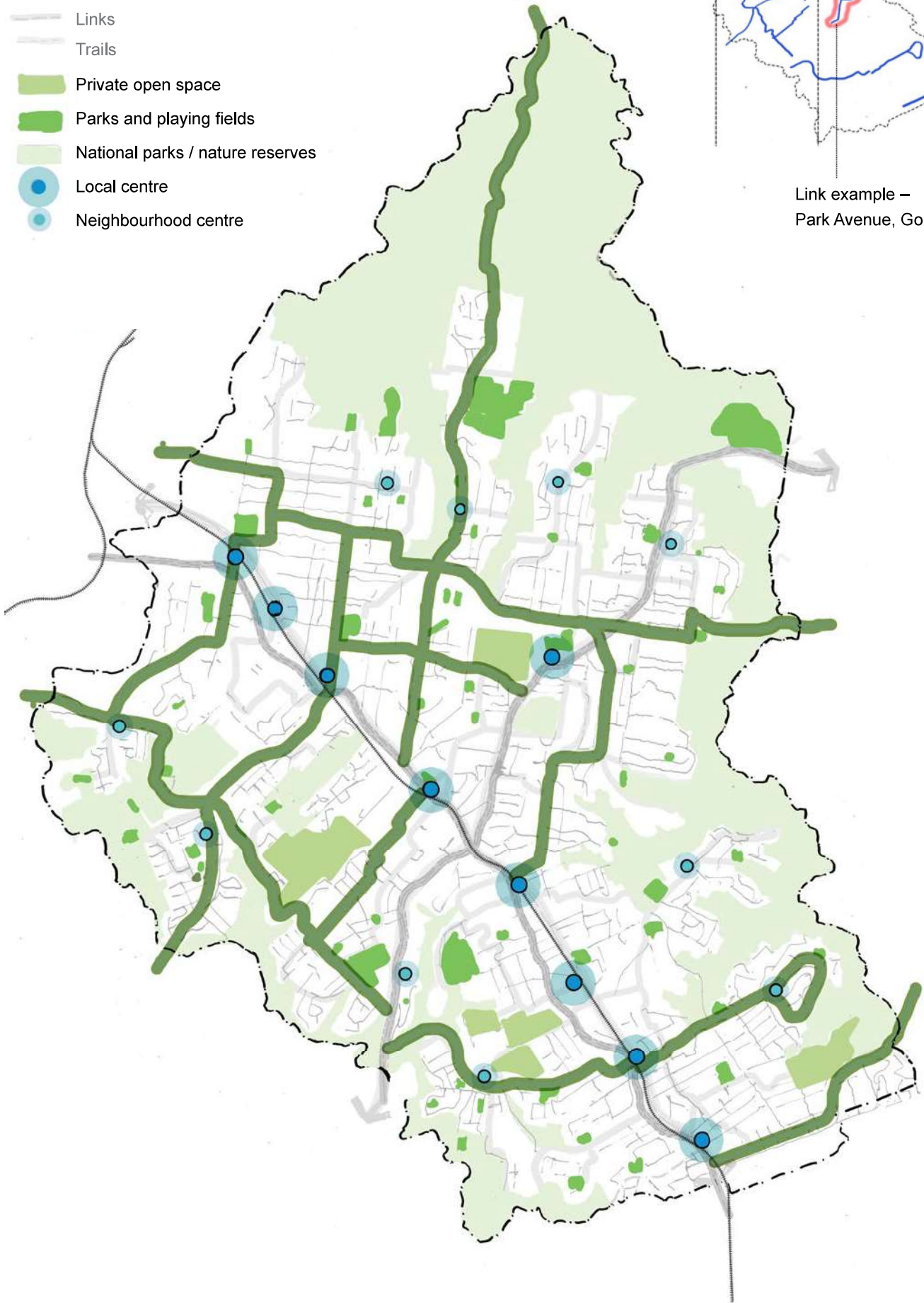
Draft routes – local

Local links are more fine grain and may be as straightforward as "How do I get from the park to the coffee shop?". They also provide the missing links between larger scale routes. These routes are a key driver for active transport and encouraging people to avoid taking the car for a short trip. This promotes a healthy lifestyle and social cohesion – getting active improving physical health outcomes and stopping to chat with a neighbour improving mental and social outcomes.

Possible opportunities and improvements across all local routes

- Parking - opportunities to consolidate and provide additonal car parking where appropriate. Local connections are generally associated with Local and Neighbourhood Centres;
- Traffic Calming - Introduction of traffic calming initatives which incorporate landscaping, changes in material and street trees;
- Street Tree Planting - Integrate new street trees where appropriate;
- Wayfinding signage - Improving the relationship of and connection to existing trails;
- Lighting - Install upgraded street lighting and awling lighting where applicable; and
- Powerlines - underground aboveground powerlines where possible.
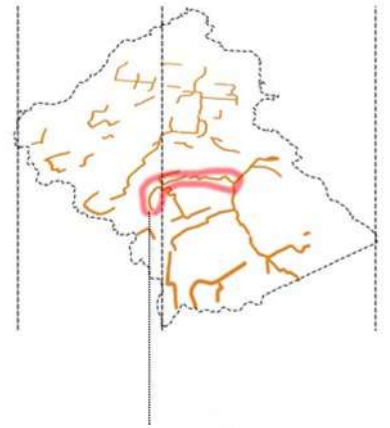
Link example

St John's Avenue, Gordon

Description of link example

This connection links Gordon Local Centre, Gordon Train Station and Gordon Recreation Ground with Gordon Golf Club to the west and Terrum-Bine Reserve, Rocky Creek, Kalang Reserve, Killara Park and Koola Park to the east.

Ecological	Hydrological	Recreational	Cultural	Active Transport & Public Domain
●	●	●		●

Legend

- Regional connections
- Suburb connections
- Local connections
- Links
- Trails
- Private open space
- Parks and playing fields
- National parks / nature reserves
- Local centre
- Neighbourhood centre

Link example –
St John's Avenue, Gordon
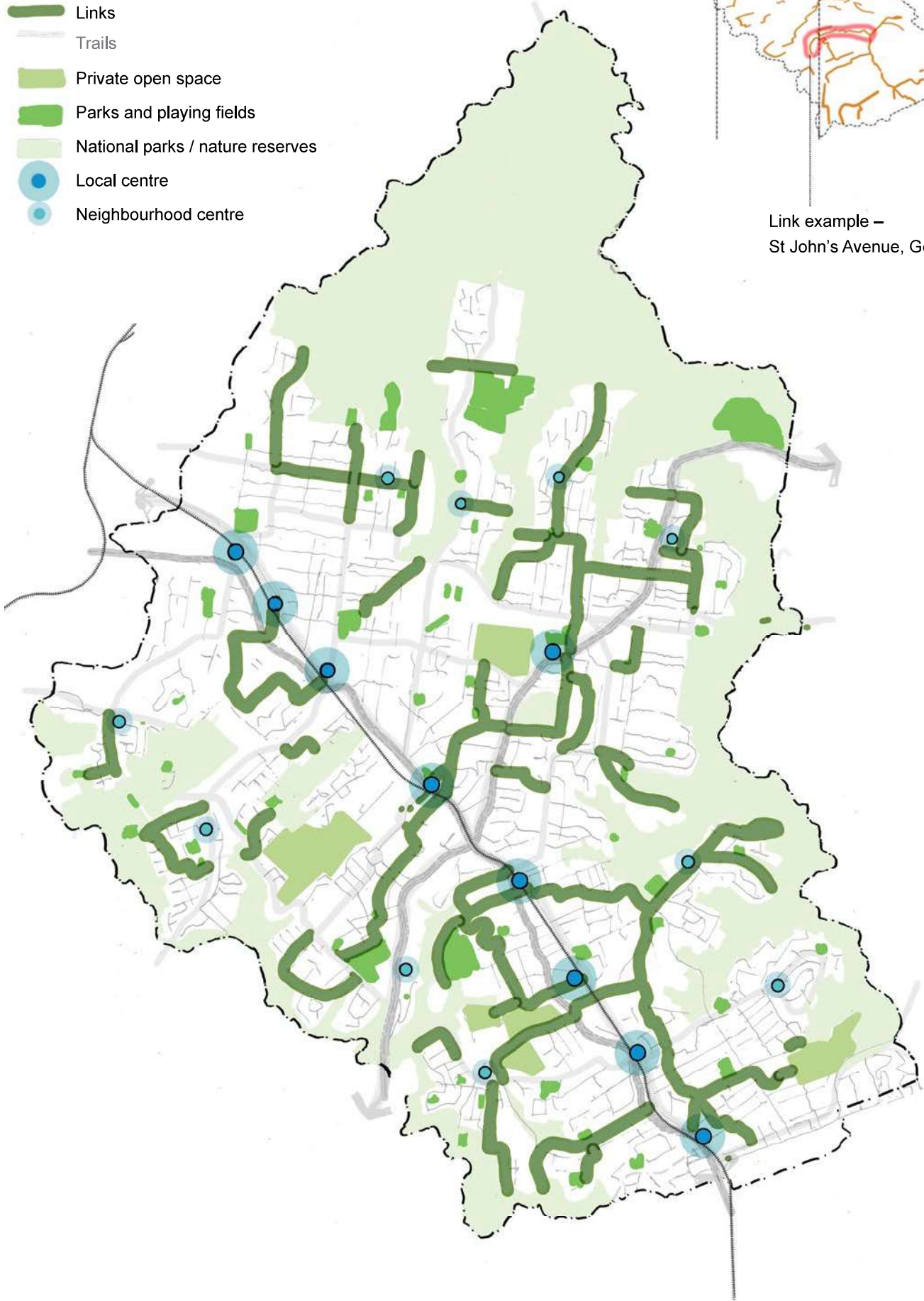
Draft routes – trails

Trail connections are tracks through natural areas. Many of these are existing and may only require minimal interventions to improve them such as resurfacing and interpretive signage. These include walking tracks, fire trails and designated bike tracks. Fire trails are managed in accordance with National Parks and Wildlife Service guidelines.

Possible opportunities and improvements across all trail routes

- Wayfinding signage - Improvements to entry and wayfinding signage to better identify trail entries; and
- Entry statement - at entries introduce a consistent materials pallette which signifies a trail entry;
- Interprative signage - Introduction of interprative elements which provide historic and cultural information associated with the trails; and
- Accessibility - Were possible and appropriate explore potential improvements to or the introduction of accessible footpaths and boardwalks for part or all of a trail.

Link example

Blackbutt Creek Track, Gordon

Description of link example

Blackbutt Creek has some of the tallest Blackbutts, along with attractive Turpentines and Peppermint woodland. The track follows the creek along the reserve, home to numerous endangered flora and fauna species, including the Powerful Owl. It crosses Blackbutt Creek and winds along the fire trail to Falls Creek before connecting up with St Johns Avenue.

Ecological	Hydrological	Recreational	Cultural	Active Transport & Public Domain
●	●	●	●	

Legend:
- Regional connections
- Suburb connections
- Local connections
- Links
- Trails
- Private open space
- Parks and playing fields
- National parks / nature reserves
- Local centre
- Neighbourhood centre
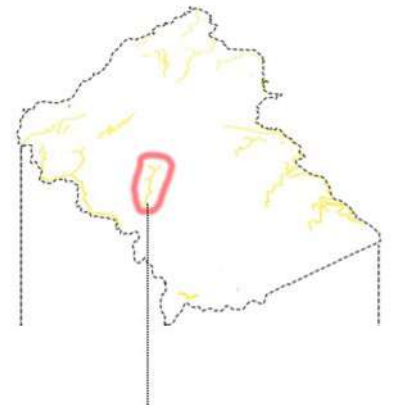
Link example –
Blackbutt Creek Track, Gordon
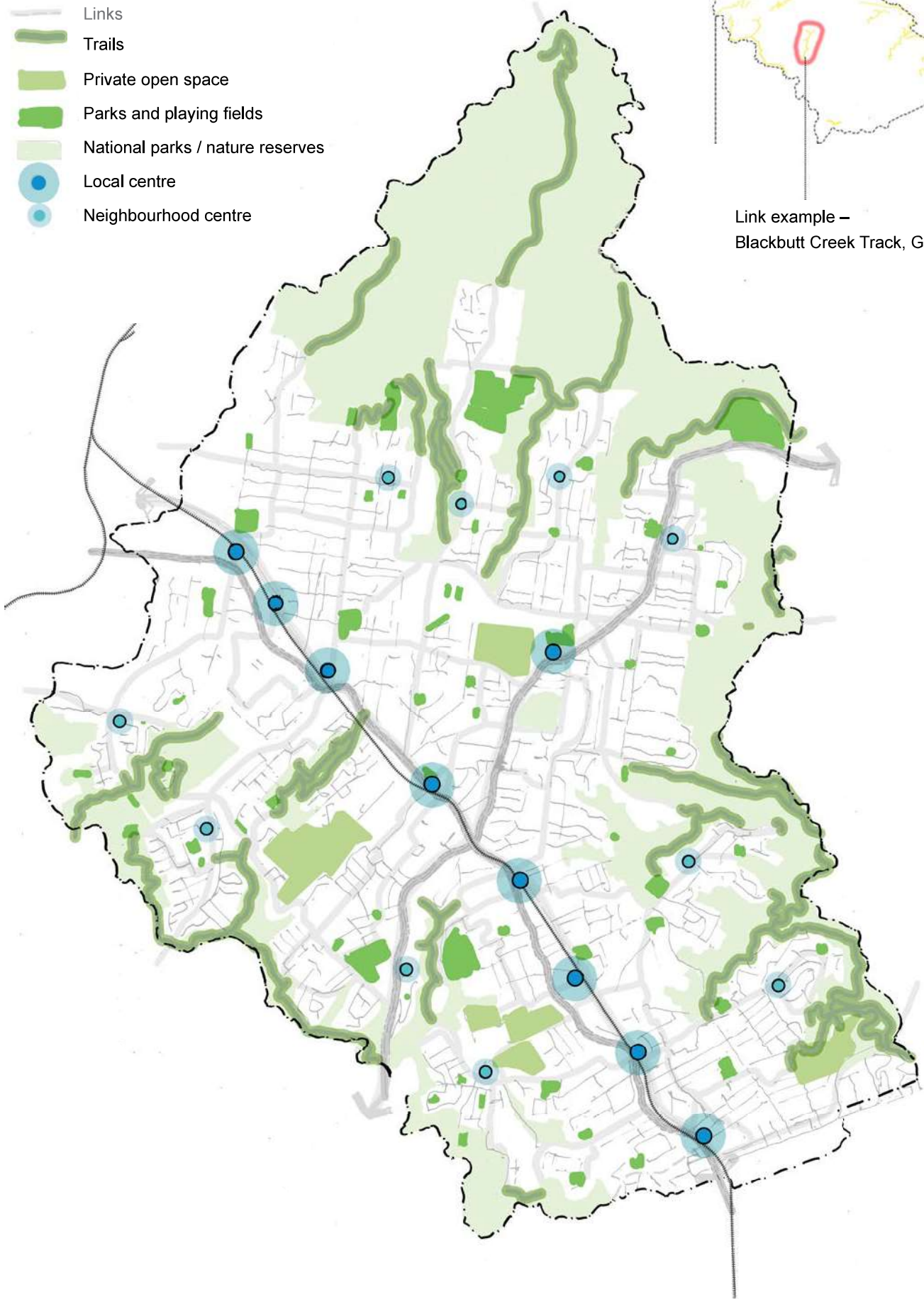
What will it look like

Transforming these routes into green corridors will include the following key components;

Street trees

Street tree planting - new trees will be planted on streets where there are opportunities, focussing on those areas with low canopy cover.

Footpaths and bike lanes

Whilst the aim is to work with routes that already have existing infrastructure, where new footpaths, shared paths or bike lanes need to be built this will be co-ordinated with street tree and under planting, passive irrigation, traffic calming, and any changes to electricity assets.

Verge gardens

Verge and median planting - wherever possible, layered, biodiverse native planting will be incorporated

Cable bundling

Aerial cable bundling or undergrounding of power - where undergrounding of power is cost-prohibitive, aerial cable bundling will be incorporated to provide increased opportunity for canopy trees.

Rain gardens

Water sensitive urban design treatments - rain gardens to capture and filter stormwater run-off, passive irrigation such as breaks in kerbs, and swales
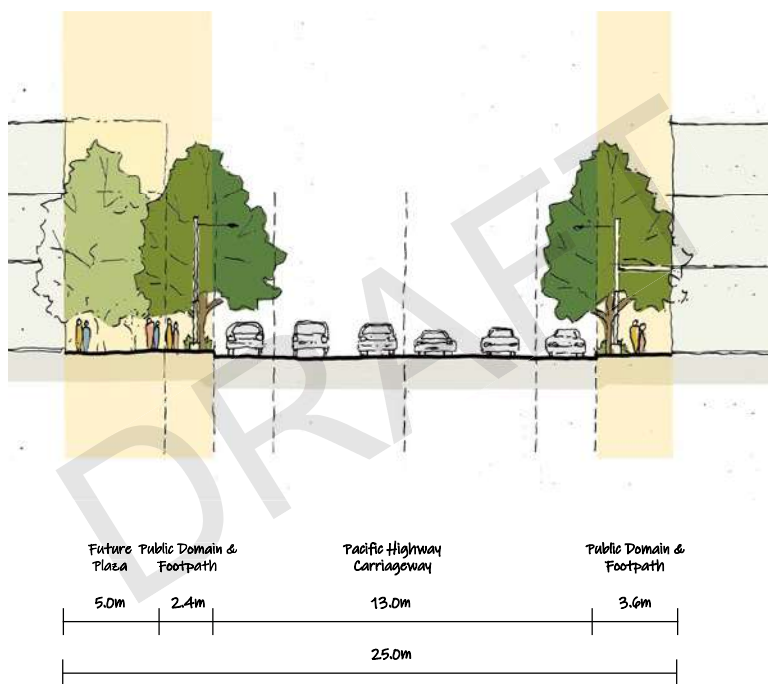
Signage

Interpretive signage - signs along routes that highlight culturally significant information around first nations history wand native fauna and flora

Typologies

The opportunities along routes are explored through sectional sketches. These typologies are representative of what could be achieved at the varying scales based on the infrastructure constraints and existing conditions.

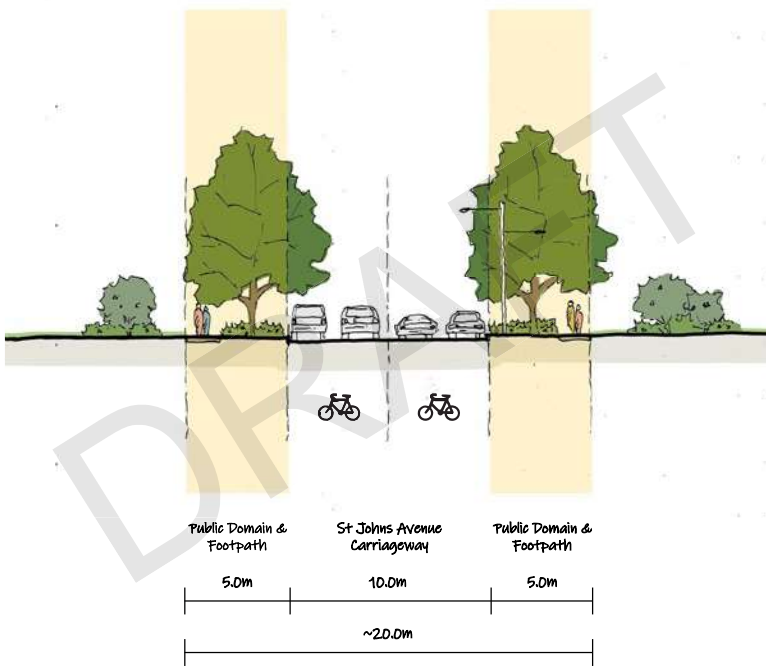| Future Plaza	Public Domain & Footpath	Pacific Highway Carriageway	Public Domain & Footpath
5.0m	2.4m	13.0m	3.6m

25.0m

Regional

Regional routes are primarily guided by the public domain plans for local centres and would include many of the elements within the suite of green grid components. Shared paths, separated bike lanes, street tree planting, passive irrigation, street furniture, understorey planting, signage and undergrounding of power.

Public Domain & Footpath	Park Avenue Carriageway	Public Domain & Footpath
4.8m	10.0m	5.5m

~20.3m
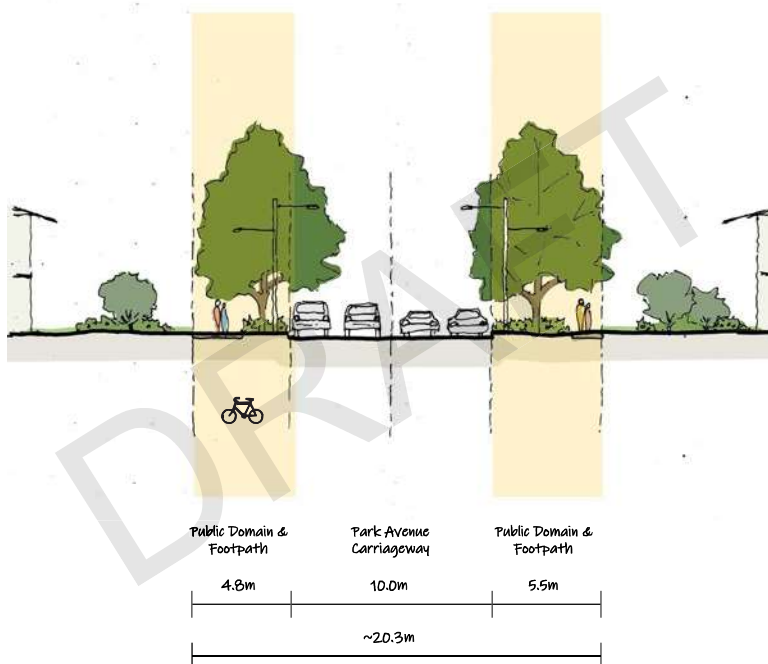
Suburban

Suburban routes typically have existing trees and footpaths, but wherever possible these will be enhanced to fill in the gaps - additional tree planting, understorey planting and interpretive signage. Where possible, more intensive infrastructure interventions will be made - incorporating bike lanes, planting blisters and WSUD elements.

Public Domain &
Footpath

St Johns Avenue
Carriageway

Public Domain &
Footpath

5.0m

10.0m

5.0m

~20.0m

Local

Local routes may be limited to tree planting, understorey planting, and signage.

Natural Reserve Residential
Interface

Varies

Zone of
Influence

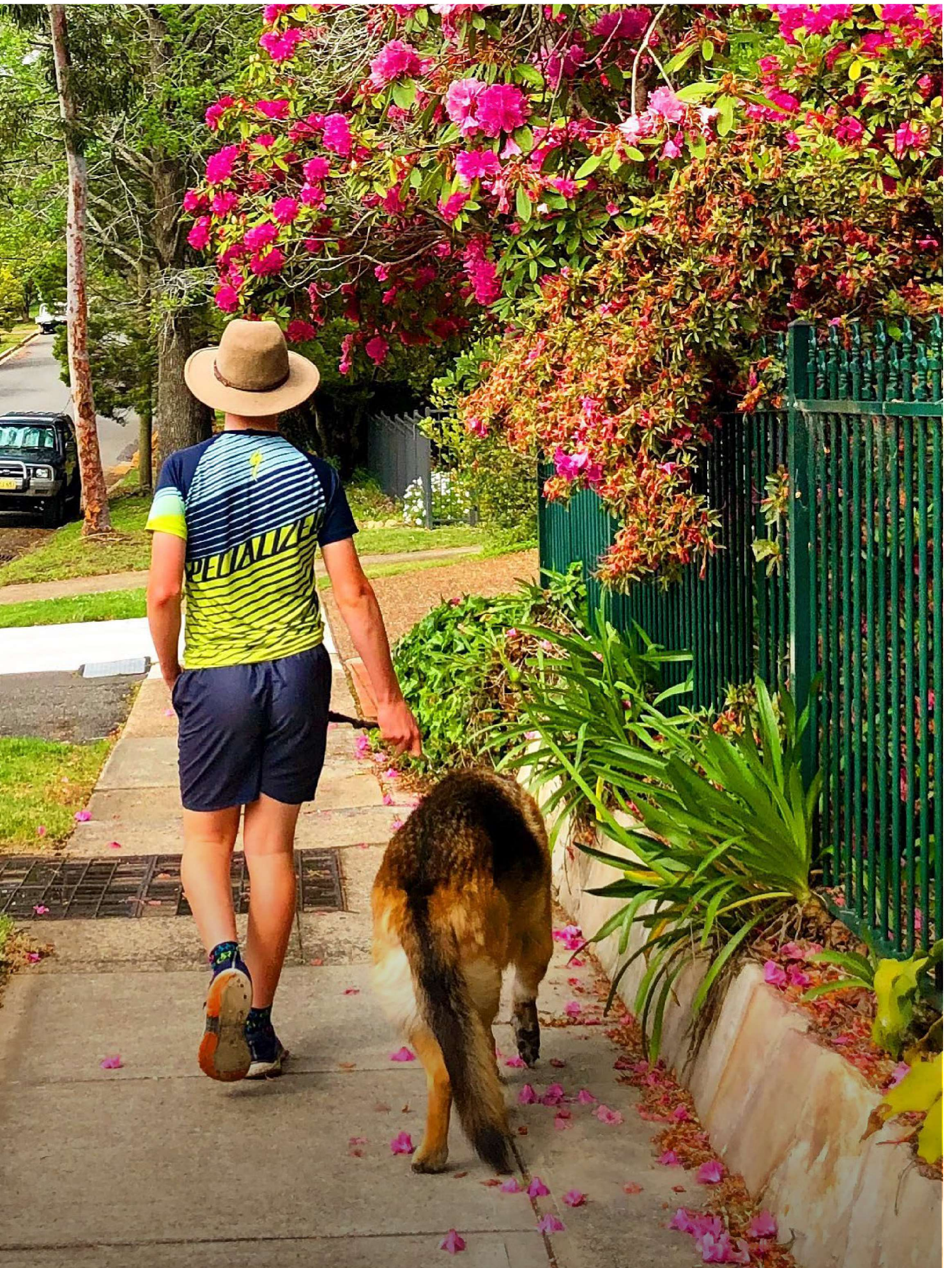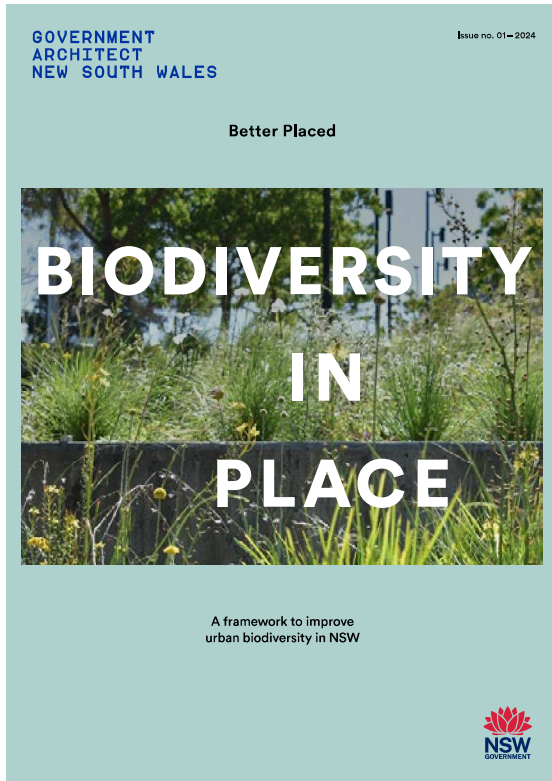Natural Reserve Residential
Interface

Trail

Trails may include path upgrades and signage.

Next steps

Goals

The goals of the Ku-ring-gai Green Grid Strategy include;

Include more green infrastructure - implementing the Biodiversity in Place framework

In order to improve biodiversity in our urban areas, we need to move away from monoculture plantings and turf verges. The Biodiversity in Place Framework from the Government Architect NSW provides the tool-kit to making these changes possible. The Green Grid provides the opportunity to incorporate layered planting into our streetscapes and public places.

Walking and Cycling are the preferred method of transport for short trips - get more of our residents walking and cycling

To help improve health outcomes for the community by increasing physical activity and reducing carbon emissions, we want to provide the infrastructure for more comfortable walking and cycling journies. People will have greater opportunity to make short trips by active transport rather than getting into the car.

More street trees for a comfortable journey - street trees provide a multitude of benefits, shade being a critical factor for a walking trip

To support more walking and cycling trips, the journey needs to be comfortable. Street trees provide shade, cooling effects and a pleasant aesthetic. The Green Grid will focus on enhancing these most popular routes.

Connecting biodiversity and riparian corridors - creating vegetated links to connect gaps in corridors

Ku-ring-gai has an abundance of biodiverse areas, however urban development has left them fragmented. By linking these areas again by vegetated corridors we can improve outcomes for species diversity and movement. More habitat and food sources enable fauna and flora species to flourish.

Community engagement

Community engagement is fundamental to achieving sustainability and biodiversity goals. We need to work with the community to ensure our target areas are the right locations for achieving well-being for residents and our environment. An engaged community supports stewardship an investment in the environment.

Public exhibition of this draft strategy document forms the first phase of our community engagement. Once the Strategy is adopted, we will undertake more targeted consultation on a ward-by-ward basis to further refine the proposed routes and inform the action and implementation plan.

This will involve targeted communication between staff and the community, meeting in local parks to discuss how people get around their suburb and where they would like to see improved access to make their journey more comfortable.

Action & implementation

The action and implementation plan provides specific actions for implementing the projects identified for the Green Grid. This includes resourcing and funding implications.

Finalisation and prioritisation of routes will be a collaborative process driven by community engagement. We will work with the community to determine the most feasible and desirable locations for improving walking and cycling trips. Routes that contribute to multiple layers

- hydrology, ecology, biodiversity, cultural amenity and accessibility will be allocated the highest priority rating.

The finalised implementation and action plan will include a breakdown of the location of the routes in priority order and the associated infrastructure required to enhance the route (specific actions). Responsible teams will be assigned along with time-frames for delivery and funding mechanisms.

Conclusion

Next steps for the project which will occur concurrently with the public exhibition of the draft strategy include;

- Continued first nations collaboration

- Liaison with neighbouring councils

- Further ground truthing to confirm routes

- Community engagement

- Concept development and costing for a pilot project

The incorporation of this information along with the feedback received from the public exhibition will form the finialised strategy that will then be reported back to Council for adoption.