



RYDE-EASTWOOD-MACQUARIE PARK (REM) GREEN LINKS MASTERPLAN

Context Analysis Report

October 2020



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1.0 INTRODUCTION

1.1 What are the REM Green Links?

Greater Sydney Overview

The Greater Sydney Region Plan - A Metropolis of Three Cities (2018) will rebalance growth and deliver its benefits more equally and equitably to residents across Greater Sydney. The plan aligns land use, transport and infrastructure planning to reshape Greater Sydney as three unique but connected cities.

Greater Sydney has been divided into five districts: Western City District, Central City District, Eastern Harbour District, North District and South District to realise the Greater Sydney Commission's vision.

City of Ryde falls within the North District, but due to its central proximity it is in many ways a gateway providing connectivity between Central City District (including Parramatta) and onwards to Western City District; as well as Eastern City District (including Sydney CBD) and onwards to Southern District.

Regional overview: Green Grid

The Greater Sydney Commission has developed a city wide vision for a Green Grid. The Greater Sydney Commission's vision for the The Greater Sydney Green Grid, is:

"The Green Grid will provide cool, Green Links to support walking, cycling and community access to open space."

The Green Link is the City of Ryde's local vision which will provide the regional connection through the provision of the missing local "links" to realise the Green Grid across Sydney. The REM Green Links will provide broad regional Green Grid and green transport connection with:

- Ermington, Parramatta and Sydney Olympic Park (Central City District)
- Rhodes, Strathfield, Iron Cove, Inner West and the Sydney CBD (Eastern City District).
- Epping, Chatswood, Lane Cove, North Sydney and other northern suburbs (North District).

Many other local councils are developing similar green links within their local government areas, working towards the greater vision of these links joined together, ultimately forming Sydney's Green Grid.

Local overview: REM Green Links

The Ryde - Eastwood - Macquarie Park (REM) Green Links are envisaged as three interconnected urban green corridors, which function as biodiversity corridors, continuous green transport connectivity (active and mass transport) along activated open spaces, and a platform for cultural engagement and recreation.

The City of Ryde's 20 year vision, as articulated in the Local Strategic Planning Statement (2020) is as follows:

"The City of Ryde will be a liveable, prosperous and connected city, that provides for our future needs while protecting nature and our history. (...) Our well-planned places will enhance the health, wellbeing and resilience of our future community. They will also foster innovation, equity and inclusion."

The name REM Green Links represents the local centres of cultural significance: (West) Ryde, Eastwood and Macquarie Park. 'Green Links' embodies the idea that these centres will be connected by the open space networks, with Green representing the environment and sustainability and 'Links' representing the interconnectivity for ecology, transport, recreation and culture.

What is a 'Green Link'?

A Green Link is a linear open space corridor, typically used for recreation and/or active transport (e.g. walking, running, riding) and may sometimes include connectivity with other forms of green transport (e.g. public transport). As the term implies, it is typically a 'green' or vegetated corridor.

The term 'Green Link' or 'Greenway' is used around the world, and while different places all have a local flavour, generally the following elements are included:

- a central feature is an off-road shared path, continuous over several kilometres
- often feature ecological restoration and/or a biodiversity focus, but always feature vegetation
- sometimes follow the routes of other natural or built infrastructure (such as creeklines, rail corridors), or other forms of grey infrastructure (eg. utility services or passages available due to former roadways/transport corridors)
- some emphasise active and passive recreational use
- present an opportunity to escape from urban areas into nature
- strong (inter)connections to local and regional destinations
- they often invite engagement with local culture, and may feature local history, public art or other interpretive elements

The three Green Links are collectively referred to as the 'Eastwood to Macquarie Park Open Space Corridors' in the Greater Sydney Commission North District Plan. This Masterplan will identify the provision of facilities over the next 20 years to ensure sustainable and efficient use of these corridors, open spaces and green spaces to meet the needs of the community whilst providing transport, biodiversity and environmental outcomes.

REM Green Link vision

The vision for the REM Green Links combines both the Greater Sydney commission vision and Council's vision, utilising the open space networks to achieve the broader vision for the City of Ryde to create a diverse, vibrant, healthy, resilient and connected city, in which nature and history is protected and celebrated. The vision for the REM Green Links is to create:

“recognisable environmental, cultural and green transport corridors linking two of Sydney’s most important rivers and connecting the City of Ryde’s town centres”

Where are the REM Green Links?

Shrimptons Creek Green Link: will form an open space corridor connecting Macquarie Park and West Ryde, running from north -east to south-west through the centre of the City of Ryde and onwards to Meadowbank.

County Green Link: will form a connection between Macquarie Park and Eastwood via Marsfield.

Terrys Creek Green Link: is located on the north-western boundary of the City of Ryde, between Eastwood and Epping. This Green Link will form a connection between Macquarie Park and Eastwood via Lane Cove National Park

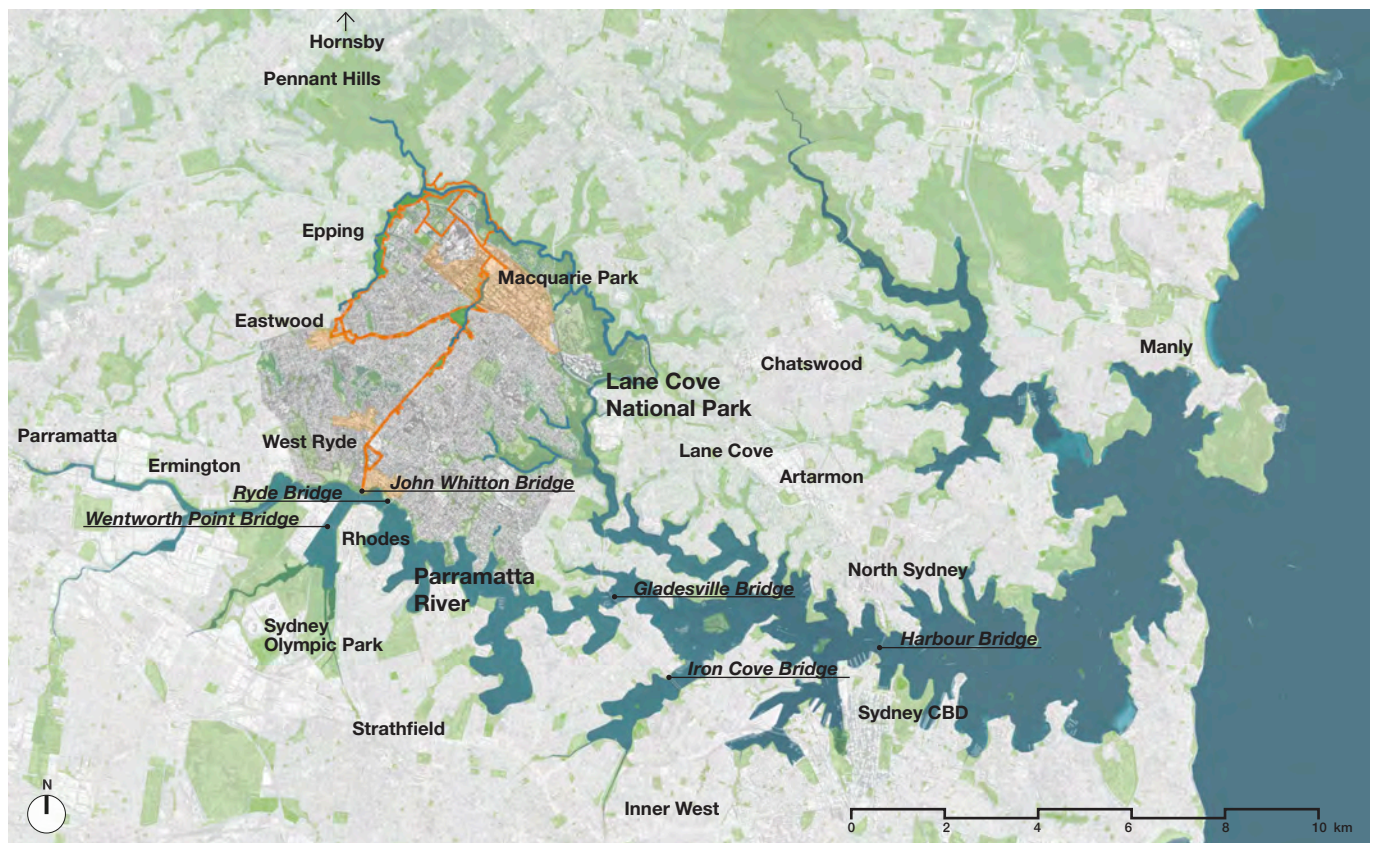


Figure 1. Regional location

The REM Green Links today

Some sections of the REM Green Links are already realised and might just require minor updates, while other sections still need to develop. The Green Links already incorporates several important elements:

- Terrys Creek ecological corridor and path structures, connecting to Lane Cove National Park
- Sections of shared path along Shrimptons Creek
- One section of shared path through County Green Link
- Some well-established bushcare sites
- Other established vegetation with habitat value
- A series of parks incorporating a range of existing passive and active uses

Shrimptons Creek Green Link

This corridor will form the link between Macquarie Park and West Ryde. The northern section, along Shrimptons Creek has a shared path running along it, while the southern part is less well connected. The focus of this Masterplan will be from Kent Rd (Marsfield) to West Ryde, including Santa Rosa Park as an important open space. Plans have already been developed for the section north of Kent Rd (North Ryde) to Macquarie Park, which will be included in this Masterplan.

County Green Link

This corridor will form the link between Macquarie Park and Eastwood and will include the future proofing for a potential green transport connectivity. This Green Link has the potential to be a multi-faceted open space corridor for green transport, recreation and blue and green ecology, providing links to local centres, schools and other networks.

Terrys Creek Green Link

This corridor will form the connection between Eastwood and Macquarie Park (with links onwards to Epping). Terrys Creek is located between Eastwood and Epping and forms an important and well established ecological and recreational corridor linking to Lane Cove National Park. Council has recently completed construction of pathways and a new boardwalk. The focus for this link in this Masterplan will be on access points (including improving amenity at these points), connections to surrounding networks, and a future connection between the City of Ryde and Epping in the City of Parramatta (as identified in Ryde's Local Strategic Planning Statement).



Figure 2. City of Ryde suburbs around the Green Links

1.2 This Masterplan

The Masterplan will guide the City of Ryde on the future development of the Parks, prioritising capital works projects, and manage the natural areas and riparian corridors. The aim of the Masterplan is to provide an advocacy tool that will be used by the City of Ryde to facilitate a whole-of-council and whole-of-government approach to activating these corridors.

Structure

The structure as outlined below is proposed for the the Masterplan report. This report, the Stage 1 Context Analysis, includes the first four sections. Sections 5-9 will be developed following stakeholder and community consultation.

1. Introduces the REM Green Links and explains the purpose, scope and objectives of the Masterplan
2. Provides background information on the strategic context of the Green Links as well as the context around green transport, ecology, recreation and culture
3. Presents an overview of the existing character of the Green Links corridor, divided into six precincts
4. Presents lessons from other Green Links around the world
5. Summarises the outcomes of stakeholder engagement
6. Presents the strategies which guide the Masterplan and future design and implementation
7. Presents the Masterplan, including plans for seven precincts and their interconnectedness
8. Summarises the proposed implementation strategy for the Masterplan
9. Presents guidelines for the design stage, including recommendations on materials, finishes and planting

Scope

It is intended that this Masterplan becomes the principal plan guiding the implementation of physical elements of the Green Links, both built and natural.

The diagram below shows three main elements related to the actualisation of the REM Green Links:

- This Masterplan, which focuses on physical elements (built and natural) of the Green Links, including a staging plan for delivery of the Green Links areas
- Programs currently planned and delivered in the City of Ryde Council, that contribute to realisation of the Green Links vision, including ecology, sustainability education, living arts, green transport and recreation programs
- Management and maintenance of new and existing infrastructure, natural areas, open space, and land owner agreements

While programs and the management and maintenance of the Green Links are not covered by this Masterplan, they are closely linked. For example, in order to plan the physical works proposed in this Masterplan, it is important to consider how the Green Links will be used and managed.

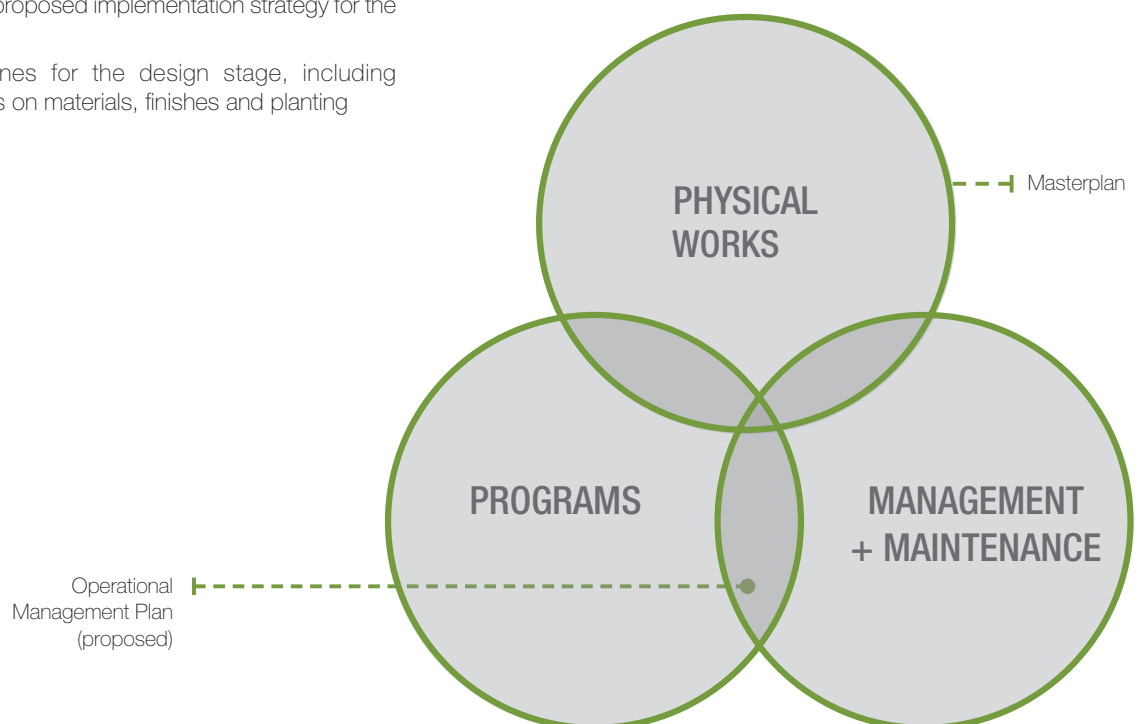


Diagram 1. Relationship between Green Links elements

A staging plan is to be developed as part of this Masterplan for continued delivery of Green Links programs. The staging plan will prioritise new Green Links areas, based on strategic importance, community wishes, cost and available funding.

Objectives

The objectives of the Green Links Masterplan are shown in Table 1. The objectives are a consolidation of objectives, based on:

- Greater Sydney Commission North District Plan (2018)
- Greater Sydney Commission Green Grid North District Plan (2017)
- City of Ryde Local Planning Statement 2020 (2020)
- City of Ryde 2028 Community Strategic Plan (2018)
- City of Ryde Biodiversity Plan (2016)
- City of Ryde Bicycle Strategy (2014)
- City of Ryde Sport and Recreation Study (2017)
- City of Ryde Integrated Transport Strategy (2016)
- Discussion with the City of Ryde and other stakeholders during development of this Masterplan

This overview of consolidated objectives have been marked for their importance per corridor. These objectives will guide the Masterplan development.

The REM Green Links can be a benchmark of blue and green infrastructure that supports habitats and important ecological processes in an urban setting, as well as addressing the local pressures on traffic and public transport, open space, demands for recreation, cultural experience and greater diversity of recreation opportunities.

The Green Links also has the potential to be an exemplar of the Green Grid due to its strategic location between Lane Cove River and Parramatta River, providing connection to education facilities, major business centres (e.g. Macquarie Park and Parramatta) and urban renewal corridors; and its commitment to achieve multiple objectives including ecological, green transport, recreation and cultural objectives

These four main thematic objectives return throughout this Masterplan and are illustrated with the following icons:



environment: the Green Links as blue and green biodiversity corridors



green transport: the Green Links as transport corridor



recreation: the Green Links as a place that meets multiple recreational needs



culture & community: the Green Links as a focal point for community and culture

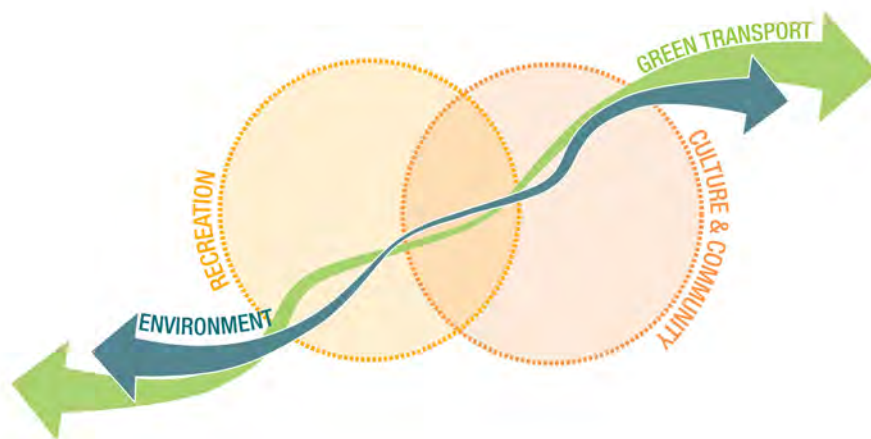


Diagram 2. The Green Links objectives have been organised into four themes, and this diagram illustrates the relationship between these themes. Ecology and Green transport are both ideas that need connectivity along the corridors and create the “spines” of the Green Links; recreation and culture build on this spine, activating places along the corridor.

Table 1. Green Links objectives

REM Green Links Objectives		Importance (high/medium/low)		
		Shrimptons Creek Green Link	County Green Link	Terrys Creek Green Link
Environment	– protect and enhance natural areas including bushlands, waterways and ecosystems	high	medium	high
	– manage and mitigate effects of climate change on people and ecology (green grid)	high	high	high
	– collaborate with volunteers (bush care groups), businesses and the community to care for and enhance natural areas.	high	medium	high
Green Transport	– create safe, continuous and permeable active transport corridors with connections to the surrounding networks	high	high	low
	– explore connectivity and interconnectivity with current and future mass transport options	low	high	low
	– enhance and maintain connections and accessibility to centres, open spaces and places, including improved cycleways and walkways.	high	high	medium
Recreation	– deliver a series of interconnected, high quality open spaces that encourage active lifestyles and social interaction	high	high	medium
	– integrate a range of active and passive recreation opportunities for the community to meet, play, learn and connect.	high	high	medium
Culture & community	– celebrate cultural diversity and promote inclusion	high	high	medium
	– protect, enhance and interpret cultural heritage	high	medium	medium
	– use the Green Links for educational purposes and to share stories and information.	high	high	high
	– provide places that support events	high	medium	low
	– create and enhance community infrastructure along the Green Links and enhance amenity value, design quality, identity and sense of place	high	high	medium





2.0 CONTEXT

2.1 Strategic context

The Masterplan is based on a range of strategic plans, including the Green Grid North District Plan (2017), the Greater Sydney Commission North District Plan (2018) and the Draft Greener Places Design Guide (2020). The City of Ryde's strategic documents and plans form important input at the local scale, such as Ryde's Local Strategic Planning Statement (2020) and the Community Strategic Plan 2028 (2018).

Key reference documents strategic context

Greater Sydney Commission Green Grid North District Plan (2017)
 Greater Sydney Commission North District Plan (2018)
 Government Architect Draft Greener Places Design Guide (2020)
 City of Ryde Local Strategic Planning Statement (2020)
 City of Ryde Community Strategic Plan 2028 (2018)

Urban Growth District

In the Greater Sydney Commission's North District Plan, 92,000 additional dwellings over the next 20 year are expected in the North District to house 196,350 additional people by 2036. 12,786 new housing will be delivered in Ryde before 2021, mostly focussed at Macquarie Park, Meadowbank and North Ryde Station Priority Precincts.

Macquarie Park faces significant change, being identified as areas for mixed use and higher density housing and as one of the urban growth areas, as part of the Eastern Economic Renewal. This area will be further developed into a Health and Education Precinct, providing 79,000 jobs at Macquarie Park in 2036.

Given the increased pressure on open space, Greater Sydney Commission's Green Grid Plan highlights the potential for the area to be better connected: *"Build upon existing Green Links between (...) suburbs including Shrimptons Creek, Terrys Creek and Booth Rd - North Rd - Welby St Green Link" and "Create high quality civic spaces associated with new exemplar sustainable developments at Ryde".*

Urban pressures

The Green Links corridors are located in an area of significant population growth and urban consolidation, which is resulting in increasing population density. Overall, new development is expected to facilitate a population growth of approximately 40,000 new inhabitants by 2036, an increase of 24% since 2018. The fastest growing area is Macquarie Park, with an expected growth of 11% per year.

The significant redevelopment increases pressure on open space. It also increases congestion on roads and transport services particularly at the local levels. This is especially the case given the employment in Macquarie Park and major transport corridors in the City of Ryde area.

Increased urban density typically reduces the ecological value of an area. There is likely to be a reduction in mature trees, dense

shrubs and deep soil areas to some extent, and remaining open spaces are more likely to be well-trafficked, lit at night and hard-surfaced, with smaller planted areas on shallower soils. This disturbance leads to a reduction in habitat value.

Increased urbanisation can also lead to the Urban Heat Island (UHI) effect. The UHI refers to the characteristic excess warmth of urban areas compared to their non-urbanised surroundings. City blocks at night-time can be 10 – 12°C warmer than surrounding woodlands. Causes are modifications in the surface geometry (built environment traps more solar radiation), surface thermal properties (urban building materials have larger surface thermal admittance), surface conditions (less vegetation and water leads to less evaporative cooling), anthropogenic heat (released heat by vehicles, air-conditionings, and other human energy use) and the urban greenhouse effect (the polluted and warmer urban atmosphere causes extra greenhouse-effect).

Particularly in summer urban heating can have negative consequences for human comfort and health, air pollution and energy management (e.g. peak electricity demand in Sydney increases with almost 100% when temperatures increase from 20°C to 40°C). The Green Links can play a role in greening and cooling the city and mitigating the effects of urban heating.

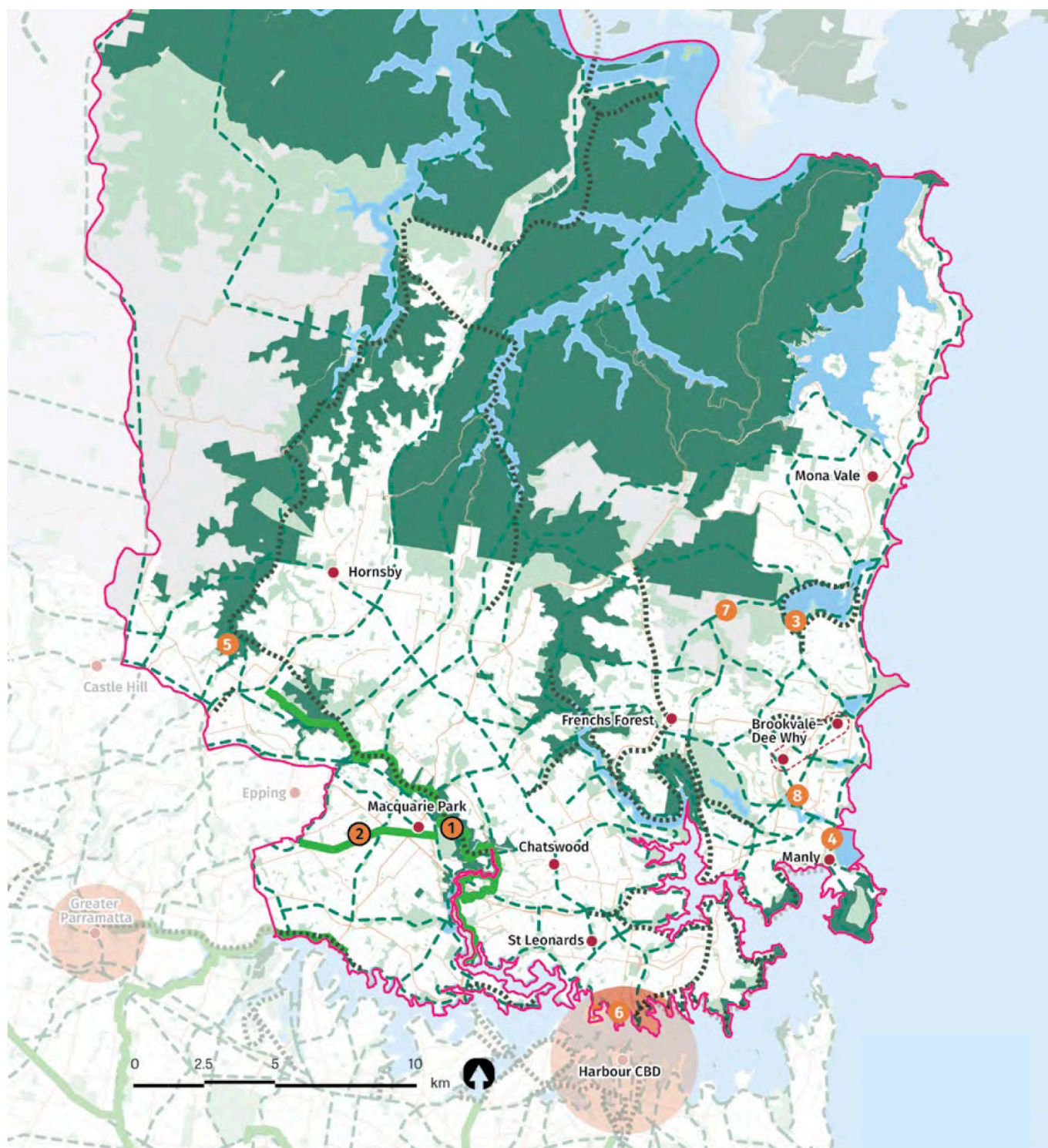
High quality green open space network

There is an increasing recognition that with urban renewal there needs to be investment in high quality, accessible, interconnected and diverse open space networks.

The NSW Government Architect has published a draft green infrastructure policy for NSW – 'Greener Places' (NSW Government Architect, 2020) which defines "high performing" green spaces as multifunctional spaces designed to produce concurrent ecological, social, environmental and economic benefits, and puts forward four principles for delivering green infrastructure:

- 1. Integration:** combine green infrastructure with urban development and grey infrastructure
- 2. Connectivity:** create an interconnected network of open space
- 3. Multifunctionality:** deliver multiple ecosystem services simultaneously
- 4. Participation:** involve stakeholders in development and implementation

The 'Greener Places Design Guide' supports the 'Green Grid' infrastructure strategy (Tyrrell Studio and the NSW Government Architect, 2017), which proposes *"the creation of a network of high quality open spaces that supports recreation, biodiversity and waterway health. The Green Grid will create a network that connects strategic, district and local centres, public transport hubs, and residential areas."* The Green Grid is envisaged as an agricultural, recreational, ecological and hydrological grid.



	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

Figure 3. Greater Sydney Commission North District Green Grid opportunities (2018)

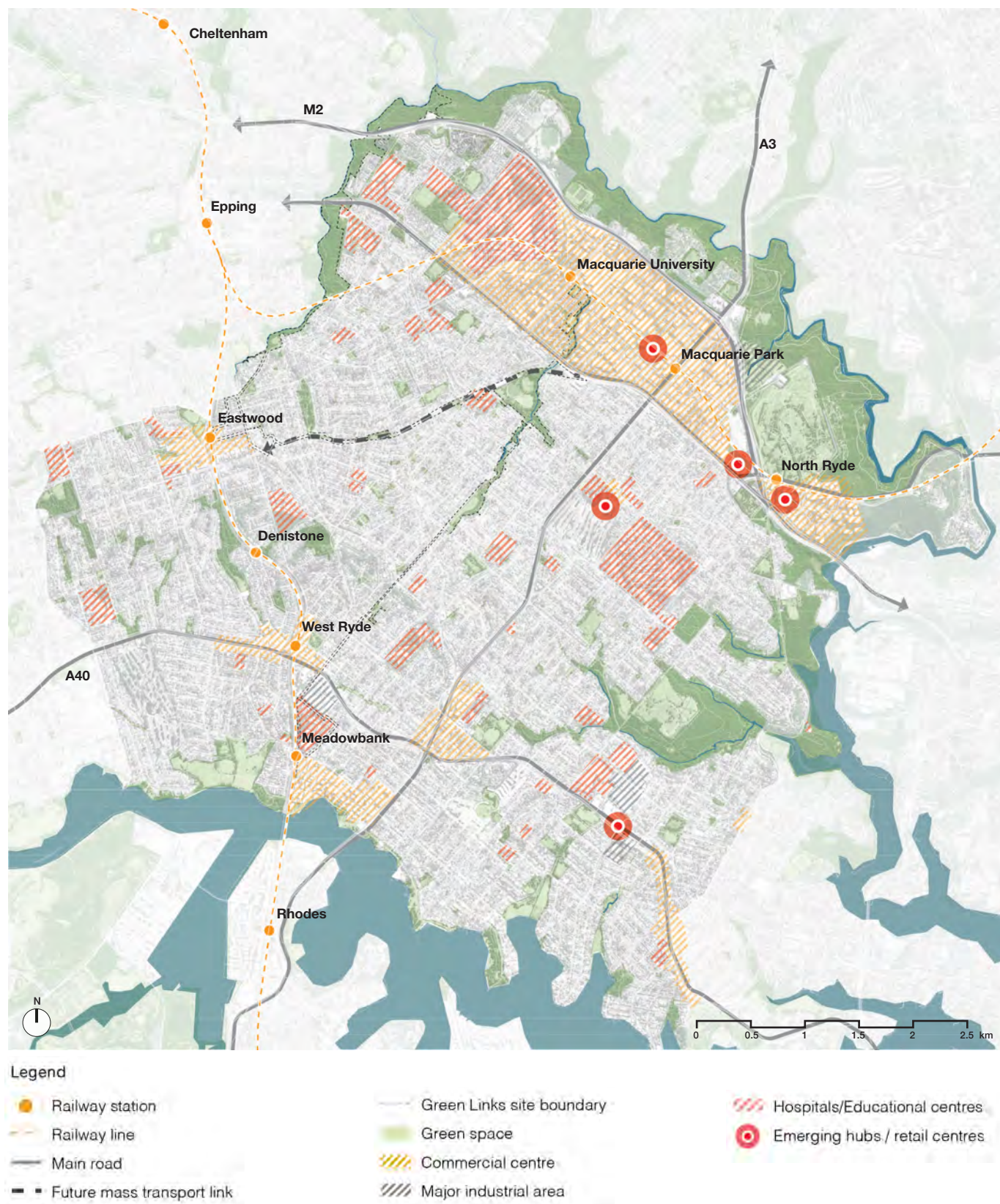


Figure 4. Urban development and infrastructure (based on: City of Ryde Local Strategic Planning Statement (2020))

This approach to open space is illustrated in the NSW Government's 'A Plan for Growing Sydney'. This plan envisions Sydney's open spaces as an interconnected network of open spaces and parks, green streets, bushland reserves, walking tracks and regional parks through the delivery of the Green Grid. The integration of open space, combined with quality urban design outcomes and environmental resilience, are all urban design responses to consider during a period of considerable growth.

Completion of the REM Green Links has been identified as the number two Green Grid priority project in the Greater Sydney Commission's North District Plan (2017) (Figure 3).

Building on existing work

The Greater Sydney Commission and the City of Ryde have set out long term perspectives in their strategic documents for the future development of Sydney and the City of Ryde. These documents all inform the REM Green Links and place this Masterplan within a wider framework.

In turn, this Masterplan will inform the City of Ryde's delivery program through the development of a staging and implementation plan for the short term (1-5 years), medium term (6-10 years) and long term (11-20+ years).

As part of the REM Masterplan process, additional input from stakeholders and the community will be sought through two stages of community consultation.

The diagram below illustrates key documents that will inform this Masterplan, with indication of corresponding time scales for each.

GREATER SYDNEY COMMISSION

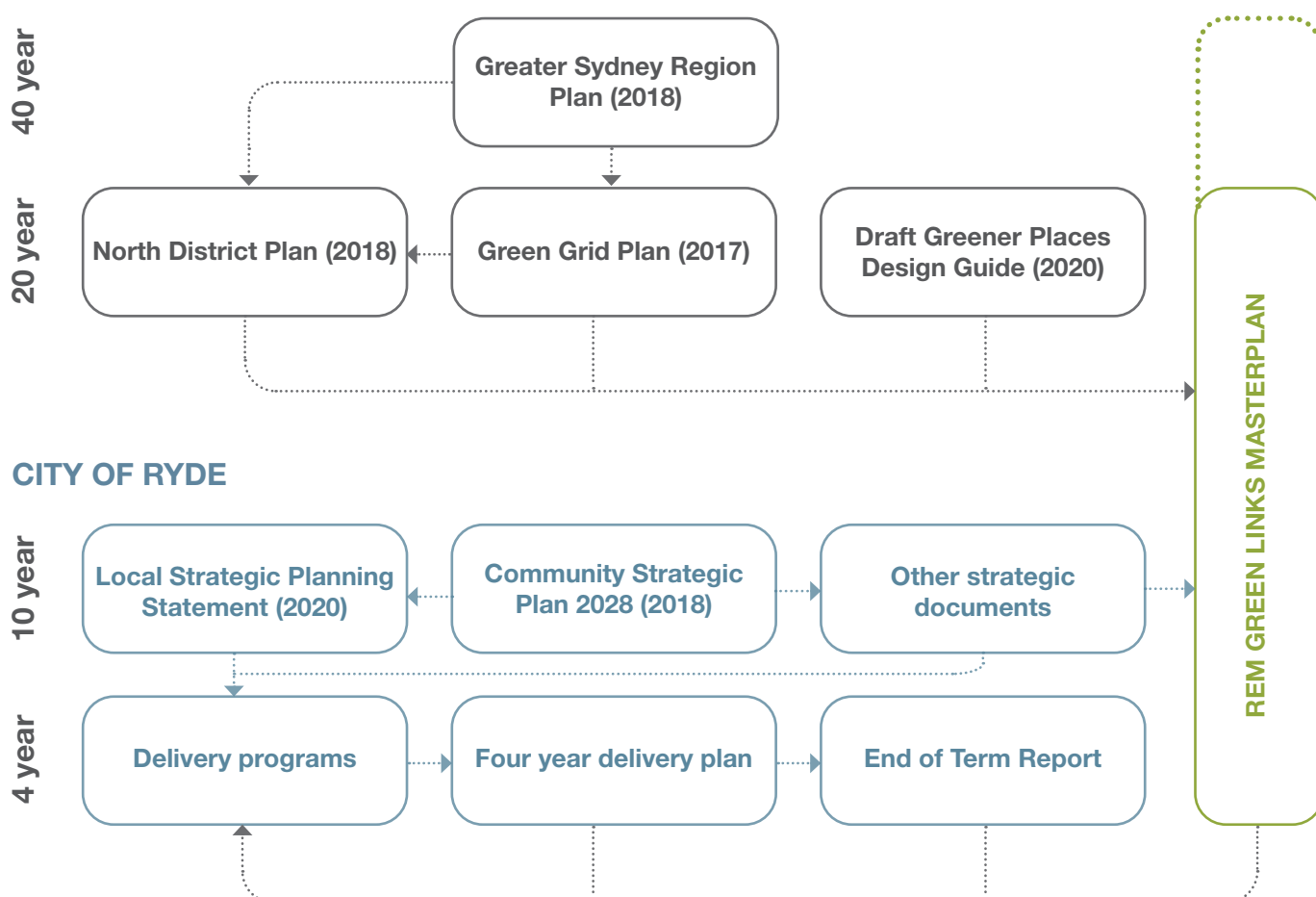


Diagram 4. Strategic Planning documents hierarchy and relation to the REM Green Links Masterplan

2.2 Recreation

In this Masterplan 'recreation' refers to all outdoor recreational activities, including active sports and leisure. The Ryde community have expressed that their open spaces, recreation and sporting facilities are very important to them and are critical for the community living an active and healthy lifestyle. As the City of Ryde changes and grows, it is essential for Council to provide for sport and recreation with facilities and programs that are flexible and adaptable to these changing community needs and expectations.

The Green Links will play a significant role in contributing to a diverse recreational experience for the community through the following key objectives:

- the delivery of a series of interconnected, high quality open spaces that encourage active lifestyles and social interaction
- integrate a range of active and passive recreation opportunities for the community to meet, play, learn and connect

Key reference documents recreation

City of Ryde Sport and Recreation Study 2016-2026 (2017)

City of Ryde Local Strategic Planning Statement (2020)

City of Ryde Bicycle Strategy (2014)

City of Ryde Bike Map (2019)

City of Ryde Cycling Orbitals (2020)

Sport and recreation are key elements to the lifestyle of Ryde residents. Council's vision, as outlined in the Sport and Recreation Study 2016-2026 is:

"Through its role in sport and recreation planning and management, the City of Ryde will contribute to the lifestyle, health and wellbeing and social cohesion of the community."

Additionally, Council's commitment to the open space network is to ensure that:

"...we have ample accessible open space to meet our needs, shared and enjoyed by us all, founded on a healthy natural environment, conserving our rich history, culture and local character and managed sustainable now and for future generations."

Community consultation

The results from Council's previous community consultation for the City of Ryde Community Strategic Plan, has made it clear that people love the city's green spaces and parks, and value the range of services, programs and recreational facilities available to them. A 2015 survey (Sports Recreation and Sports Strategy 2016-2026) ranks the importance of sport and recreation facilities in the City of Ryde. According to the community, the most important elements are:

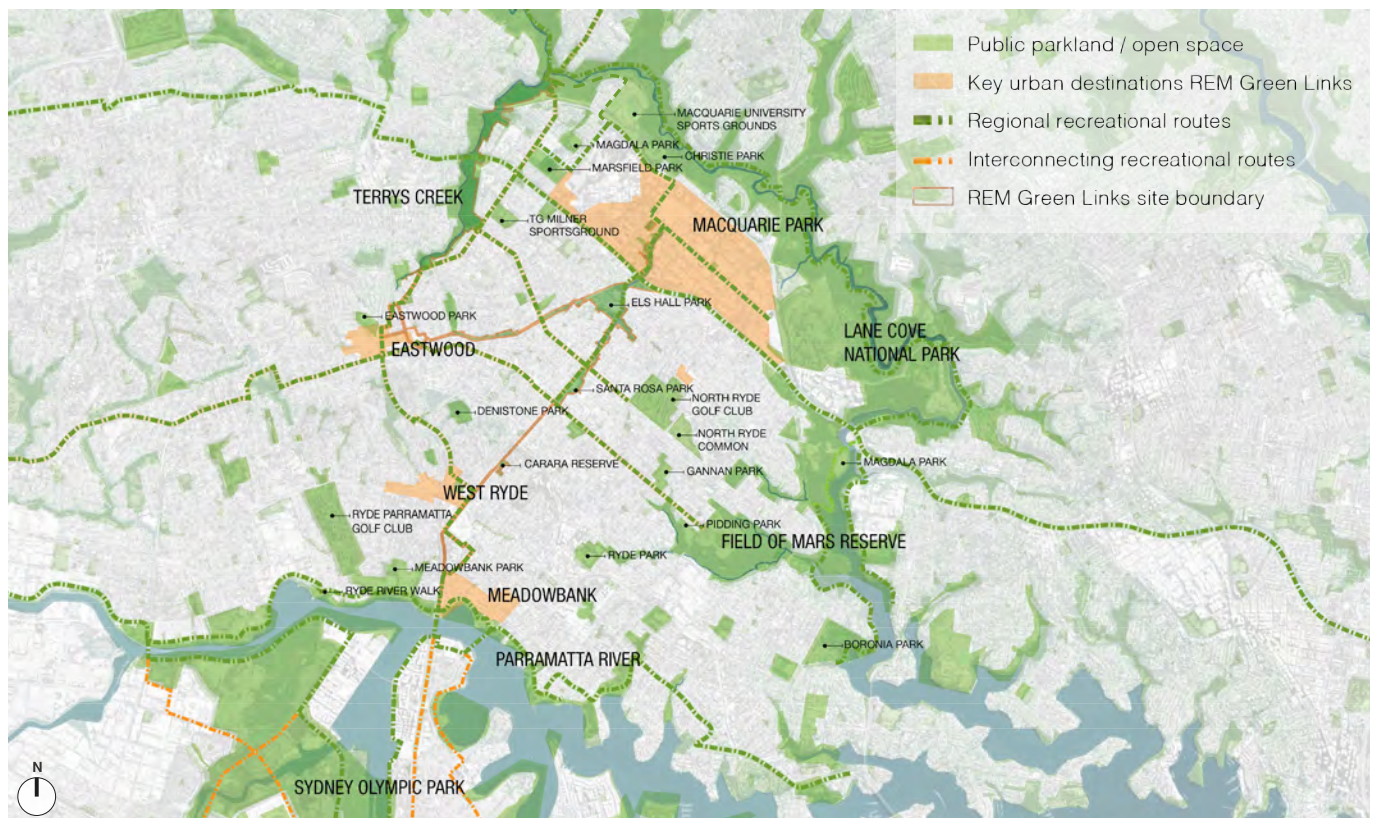


Figure 5. Open space networks and regional recreation links

- parks (87% very important)
- walking and cycling paths in urban areas (72% very important)
- outdoor sports fields (72% very important)
- walking trails in natural areas (63% very important)
- children's playgrounds (63% very important)
- picnic/BBQ facilities in parks (61% very important)

The community wants better access to facilities, programs and services so that they can spend time outside and socialise with others, whether for a casual walk or part of an organised event. As the population ages, opportunities for recreation, learning and remaining active and connected must be available for all generations.

Following the community consultation for the Community Strategic Plan, the following key objectives were formulated to assist in achieving a 'vibrant, liveable, active and healthy' city:

Centres are the focus of vibrant communities

- Protecting the local amenity of neighbourhoods and ensure they are well maintained, regulated, accessible and safe.
- Creating active places and spaces in town and neighbourhood centres and well-connected open spaces that encourage active lifestyles and social interaction.

Providing opportunities and choice for recreation and active learning and living

- Planning for expanded sport, recreation, leisure and library facilities to provide a range of choices for our community to achieve active and healthy lifestyles.
- Maintaining and promoting Ryde's great public spaces, parks, community venues, libraries, sporting facilities and clubs and ensuring they are easy to access and safe, and provide diverse opportunities for everyone to meet, play, learn and connect.

Strengthening community life, connectedness and wellbeing

- Actively consulting with the community on all major developments in and bordering the City
- Continuing to build and enhance services, including those supporting residents at different stages of their lives.

Key recommendations following community consultation for the Sports and Recreation Strategy 2016-2026 are:

- Provision of additional informal leisure and recreation facilities or settings (i.e. Open spaces, bike paths, walking paths and tracks, dog exercise areas, youth facilities, skate parks)
- A multi-disciplinary approach to planning, design and management of informal leisure and recreation facilities or venues

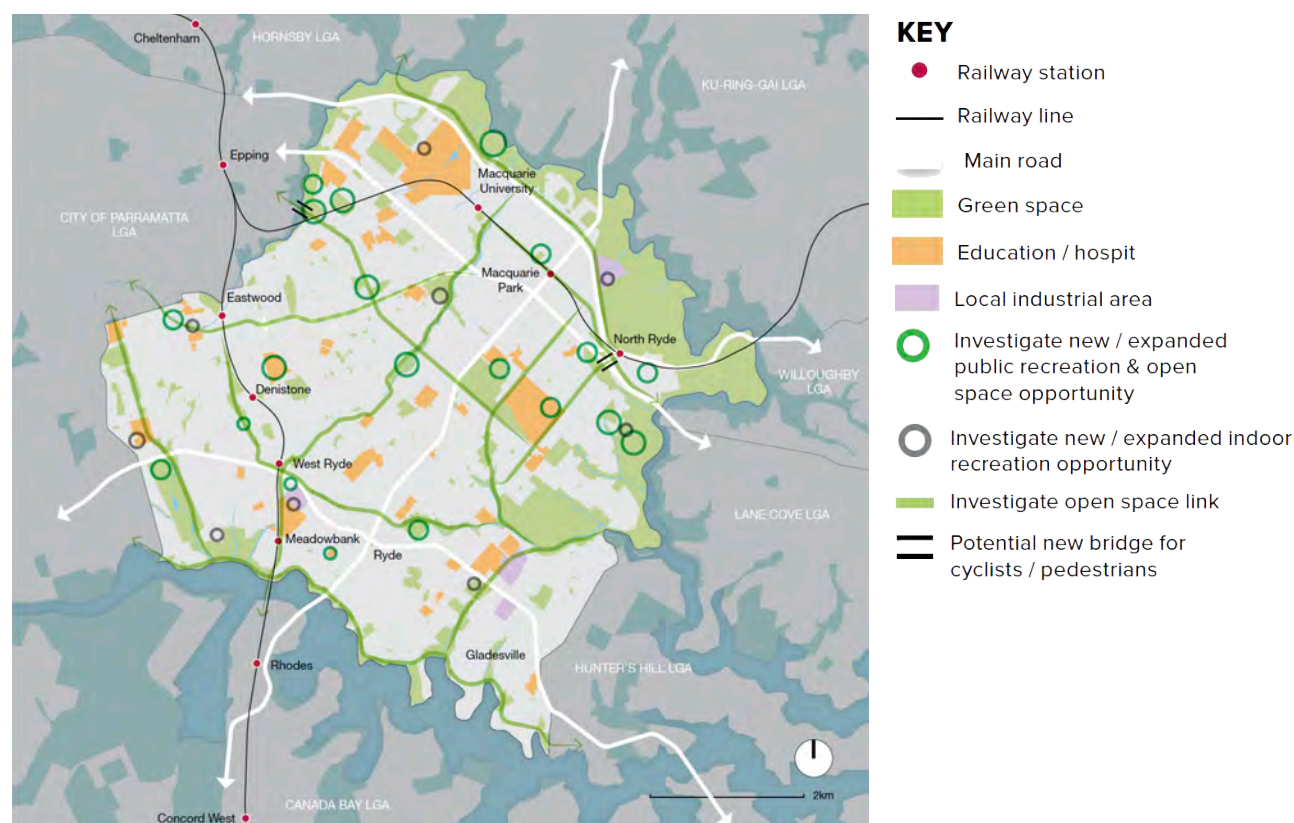


Figure 6. Open Space Structure Plan (source: City of Ryde Local Strategic Planning Statement (2020))

- The requirements of organised sporting groups are balanced with the needs of informal/ independent participants
- Investigating improved transport and access services for leisure and recreation, particularly where seniors are concerned
- Continuing consultation regarding the needs of all residents

Shared path

The Green Links shared paths will play a critical role in achieving the community's wishes and Council's objectives. The three corridors are intended for recreational use as well as active transport and will help cater to demands for activities like walking, walking the dog, cycling and running.

The Green Links also has a strategic position which allows it to connect two popular existing shared paths: the existing Parramatta River Valley Cycleway to the south and the Lane Cove National Park to the north. The latter does not include a shared path but is used for walking and forms part of the Great North Walk. Improved connections will allow more people to access centres, parks, sports facilities and nature reserves.

Open space

The Green Links Masterplan has the potential to improve opportunities for walking and cycling, sports, play, picnic/BBQ and relaxing. These are activities already commonly undertaken along the Green Links and in the parks along its route, and there is the potential to enhance these opportunities by:

- Improving access to existing parks and open spaces: through linking open space the Green Links provides opportunities for the community to more easily access a larger network and greater diversity of passive and active open space.
- Upgrading existing parks to improve recreation opportunities and cater to higher levels of use.
- Providing public access to spaces which are currently inaccessible (e.g. along the County Green Link and the southern side of the Shrimptons Creek Green Link), effectively increasing the area of public open space. Access changes would need to be accompanied by landscape works to make these areas appropriate for public access.

Existing features

As Figure 13 illustrates, there is a good spread of playgrounds along the Green Links. Public toilets are placed approximately every 1.5km. There are a number of cafes spread around the area; mostly concentrated at the town centres. Three dog off leash areas are located along the Green Links, concentrated in the north. Demand for all these facilities will rise with new developments.

The diagram overleaf shows important facilities that people currently seek along the Green Links, including public toilets, cafés, playgrounds and dog parks. It also shows which areas have and don't have access to public parks within 400m.

Below an overview of all existing parks and open spaces along the three Green Links are listed.

Shrimptons Creek Green Link

Parks and open spaces connected by the Shrimptons Creek Green Link, listed from north to south are:

- Elouera Reserve: this park contains a large playground, which has recently been completed. The park also has open lawn spaces and picnic and BBQ facilities
- Cottonwood Reserve: this park is tucked away between existing buildings and forms a connection to Shrimptons Creek shared path from Cottonwood Cres.
- Quangdong Reserve: this park contains an old playground
- Wilga Park: this park has recently been upgraded and contains an amenities building, an amphitheatre, public artwork, open lawn space and picnic and BBQ facilities
- Shrimptons Creek Skate Park: this skatepark along the creek provides a youth space for skating and meeting friends
- Booth Reserve: the shared path runs through this area, which is mainly bushland
- ELS Hall Park: this precinct contains three large sport fields, indoor sporting facilities, exercise stations, amenities buildings, a playground and a dog off leash area
- Greenwood Park: the shared path runs through this area, which is mainly bushland
- Tindarra Reserve: the shared path runs through this area, which contains open spaces which have the potential to be further activated
- Flinders Park: this park along the creek contains a picnic shelter and BBQ facilities. This park requires an upgrade
- Santa Rosa Park: this park contains a dog off leash area, a wetland, a community garden, a small playground, a large oval, an amenities building and bushland. A new masterplan will be developed for this park, which is located centrally in the REM Green Links and the City of Ryde
- Beattie Park: this is a small park with a local playground
- Carara Reserve: this park contains an open lawn area and some large trees and offers a beautiful view over the city
- Anzac Park: this park contains a large playground, a war memorial, seating, open space, picnic and BBQ facilities and an amenities building.

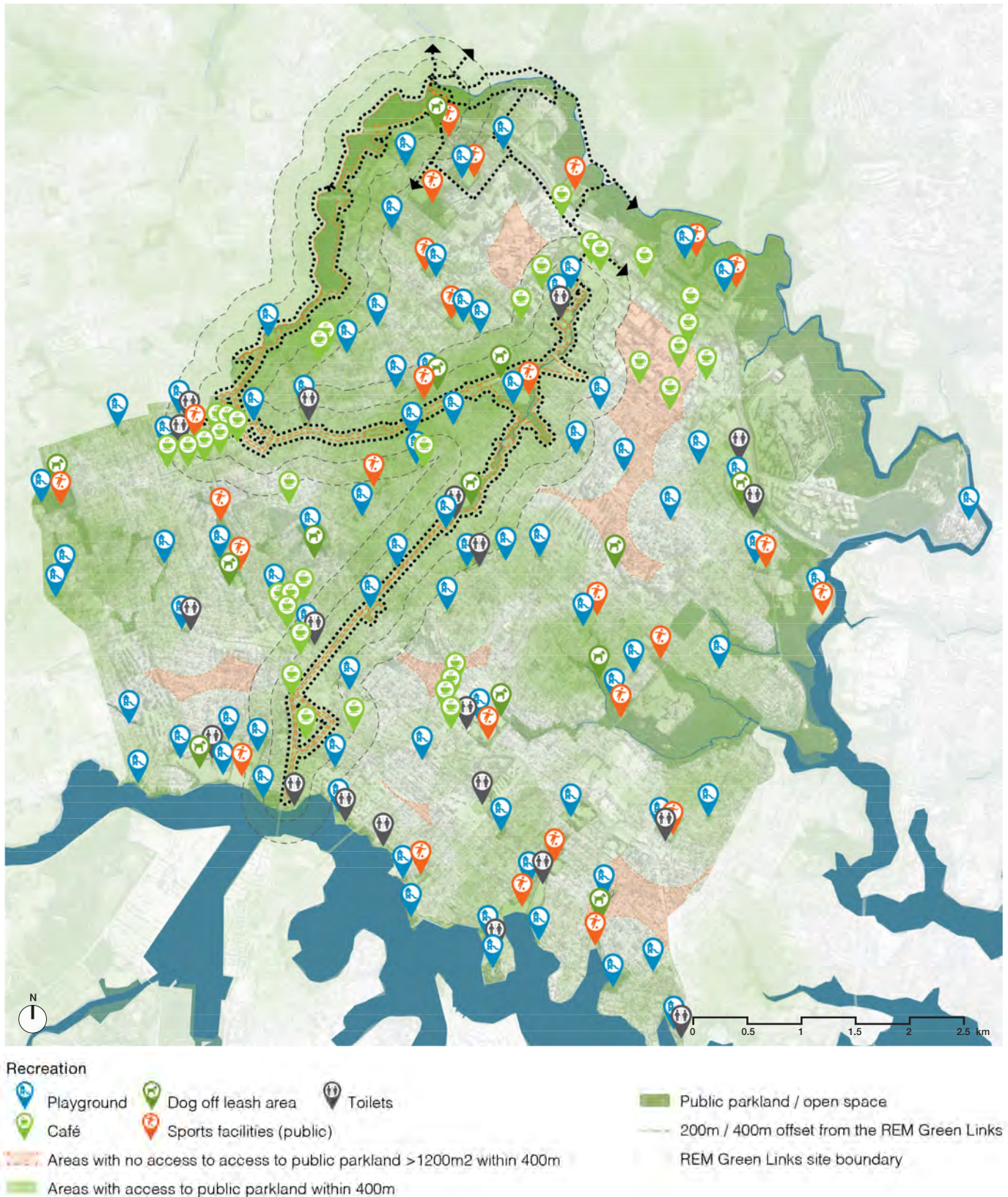


Figure 7. Recreation map (based on: City of Ryde Sport and Recreation Study 2016-2026 (2017), City Of Ryde Toilet Block Amenities Condition Report (2020))

County Green Link

Parks and open spaces connected by the County Green Link, listed from north-east to south-west are:

- Open space between Abuklea Rd - Agincourt Rd: this lawn space has the potential to be further activated, by providing facilities and amenity.
- Open space between North Rd - Grove St: this lawn space has the potential to be further activated, by providing facilities and amenity along the shared path
- Open space between Grove St - Orange St: this lawn space has the potential to be further activated, by providing facilities and amenity along the shared path
- Open space between Orange St - Graham Ave: this lawn space has the potential to be further activated, by providing facilities and amenity along the shared path

- Jim Walsh Park: this park contains a playground, a wetland, picnic and BBQ facilities and a large open lawn space. This park will play an important role in the open space network and would require an upgrade.

Terrys Creek Green Link

Terrys Creek is a large nature reserve and forms a continuous connection to Lane Cove National Park. Two parks are connected through this Green Link:

- Forrester Park: this park contains a large open space, surrounded by large trees. forms the largest park along this corridor. This space has the potential to be further activated and to mark the entry to Terrys Creek, by providing facilities and amenity
- Moore Park: this park has limited facilities and could be upgraded to provide more amenity, especially as it will located along the Green Link.

Table 2. Recommendations for recreation in alignment with the City of Ryde's key goals for a healthy and active community

Recommendations for recreation		Relevance (high/medium/low)		
		Shrimptons Creek Green Link	County Green Link	Terrys Creek Green Link
Activate existing open spaces	– Examine ways to get the most out of existing open spaces and facilities to meet the sport and recreation needs, whilst recognising the role and connection to natural and cultural environmental areas, while maintaining the amenity of our neighbourhoods.	high	high	low
Interconnected open spaces	– Delivery of a series of interconnected, high quality open spaces that encourage active lifestyles and social interaction	high	high	low
	– integrate a range of active and passive recreation opportunities for the community to meet, play, learn and connect	high	high	medium
Accessible and inclusive spaces	– Provide fair and equitable allocation of recreation facilities and work closely with the community to provide for their changing sport and recreation needs	high	high	medium
	– Focus on the distribution and accessibility of passive recreation opportunities across the city	high	medium	medium
	– Provide sport and recreation facilities for the whole community through a balance between the provision of structured and unstructured opportunities	high	medium	low
	– Design sport and recreation facilities to maximise access for people of all abilities. This will include the design of physical access to sport and recreation facilities, and the planning of programs to eliminate barriers to access and participation.	high	medium	low
Include the community	– Respond to the changing needs of the diverse community by creating flexible sports and recreation areas that can adapt to the future needs and preferences of the community	high	medium	low
	– Proactive engagement with community to inform this Masterplan, management strategies and priority setting	high	high	medium
	– Continue to advocate the benefits of a healthy and active lifestyle by promoting the variety of sport and recreation facilities and programs along the Green Links.	high	medium	medium

2.3 Environment

Throughout the City of Ryde's consultation for the preparation of the 2028 Community Strategic Plan, 'people emphasised the city's natural environment, green open spaces and parks as the thing they love the most about Ryde.' Protecting bushland and open space and expanding green spaces, tree coverage, parks and their facilities are therefore key priorities for the community of the City of Ryde.

Key reference documents ecology

City of Ryde Local Strategic Planning Statement (2020)

City of Ryde Biodiversity Plan (2016)

City of Ryde Resilience Plan (2016)

Biodiversity vision

In accordance with the vision of community of the City of Ryde as outlined in the 2028 Community Strategic Plan and the vision in the Ryde Biodiversity Plan 2016, this masterplan will:

"demonstrate environmental and sustainability leadership and assist in the management, enhancement and protection of natural areas and biodiversity along the REM Green Links."

This Masterplan will reflect Council's priority to:

Protect natural areas:

- Reduce impacts on natural systems including waterways, soil and native vegetation
- Strengthen the health of natural corridors

Resilient green infrastructure:

- Address long term climate-related risks and impacts including: extreme weather patterns, bushfires, drought, flooding and a changing climate.

Promote sustainable living:

- reduce environmental footprint
- connect people to nature through walking and cycling journeys
- Interpret the natural values and environmental stewardship projects within the corridor to educate the community and encourage involvement and collaboration
- Demonstrate the City of Ryde's role as active environmental leaders in ecologically sustainable development
- Enhance environmental stewardship through collaboration with volunteers groups such as bushcare, citizen science programs, tree planting days and business sponsorship and participation

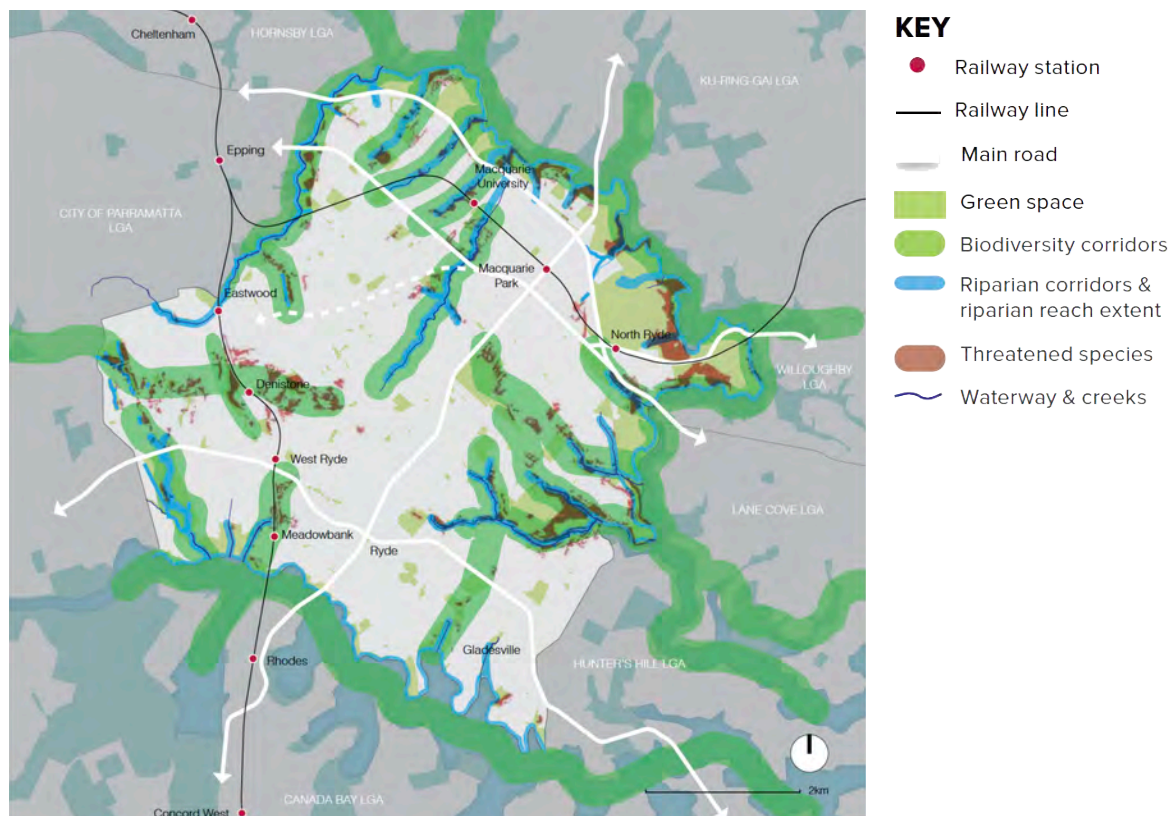


Figure 8. Environmentally Sensitive Land Structure Plan (source: City of Ryde Local Strategic Planning Statement (2020))

Ecology

Despite the historic loss of natural vegetation over time, the City of Ryde has retained some significant bushland areas, some of which are located along the REM Green Links. The Ryde Biodiversity Plan (2016) identifies biodiversity values, threats and wildlife corridors on a local and regional scale. It acknowledges that the wildlife corridors provide ecological connectivity between existing bushland reserves, but also have the potential to be enhanced through revegetation of infill areas, such as those along the REM Green Links. The diagram overleaf illustrates these potential links.

Ryde Biodiversity Plan is based upon five interconnected themes that inform this Masterplan.

1. **Native Vegetation:** protecting and managing Ryde's native vegetation which provides habitat for plants and animals
2. **Urban Waterways:** restoring waterways and surrounding environments that provide a unique riparian environment, support a range of species, and serve as the backbone for connectivity across the LGA.
3. **Corridors and Connectivity:** connecting the landscape along corridors to larger habitat patches allows for the movement of species and/or genetic interchange among native flora and fauna, maintaining biodiversity.
4. **Public Spaces:** some Council reserves support large areas of vegetation and biodiversity and are key to promoting biodiversity and community interaction with nature.
5. **Urban Habitat:** protecting and managing biodiversity in the urban landscape through stewardship of biodiversity, its management and protection.

The challenge for the REM Green Link corridors is to ensure that identified endangered ecological communities, threatened and locally rare flora and fauna species are not detrimentally impacted and opportunities to enhance habitat are incorporated.

Wildlife Corridors

Terrys Creek and Shrimptons Creek are two of five regional wildlife corridors extending from the Lane Cove River. Ryde Biodiversity Plan (2016) identifies Terrys Creek Green Link as regionally significant and Shrimptons Creek Green Link as locally significant. A local connection also extends from the Terrys Creek regional corridor and includes Forsyth Park, Forrester Park and Jim Walsh Park. The County Green Link is currently not a wildlife corridor but there is an opportunity, following revegetation and habitat enhancement measures, that it could form a local corridor.

Connectivity and its significance is influenced by the level of discontinuity between bushland areas interrupted by roads and development and the size and width of bushland fragments within the corridor. Disjointed wildlife corridors, especially in urban areas, place increasing pressures on local native flora and fauna species.

Shrimptons Creek Green Link

Shrimptons Creek Green Link forms a fairly contiguous local wildlife corridor in the centre of Ryde Local Government Area and includes Elouera Reserve, Wilga Park, Quandong Reserve, Booth Reserve, ELS Hall Park, Greenwood Park, Tindarra Reserve, Flinders Park and Santa Rosa Park (Ryde Biodiversity Plan p. 20). Ryde Biodiversity Plan (2016) identifies Shrimptons Creek Green Link as locally significant.

According to surveys undertaken by Applied Ecology between 2008 and 2018, native flora species richness has either remained relatively static (e.g. ELS Hall Park) or has increased for all reserves. Over this time, Wilga Reserve has experienced a significant increase in native species richness. Meanwhile exotic species richness has increased for all reserves.

The majority of reserves along Shrimptons Creek contain woody weed or mixed exotic and native weedy mesic vegetation. Degraded and at times highly dense vegetation is typical along the creek line and its eroded / degraded banks. Narrow reserves with a high edge to area ratio also tend to have high numbers of weed (partly from garden escapes) unless intensively managed. Some reserves including ELS Hall Park, Tindarra Reserve and Flinders Park also include planted or remnant trees within an open cut grassed space.

Areas of bush regeneration are helping to improve the condition of bushland in some reserves such as Booth Reserve and areas of revegetation are helping to increase the extent of bushland and habitat in other reserves such as ELS Hall Park, Wilga Park and Santa Rosa Park. The mature revegetation that is visible in Santa Rosa Park and Wilga Park are testament to the length of time Council has been engaged in bushland restoration on these sites. Considerable weed control has also been undertaken along the lower section of Shrimptons Creek in Santa Rosa Park which also has a newly constructed rain garden at the upper end of Shrimptons Creek that is creating additional habitat. The riparian zone in the lower end of Wilga Park is also in good condition.

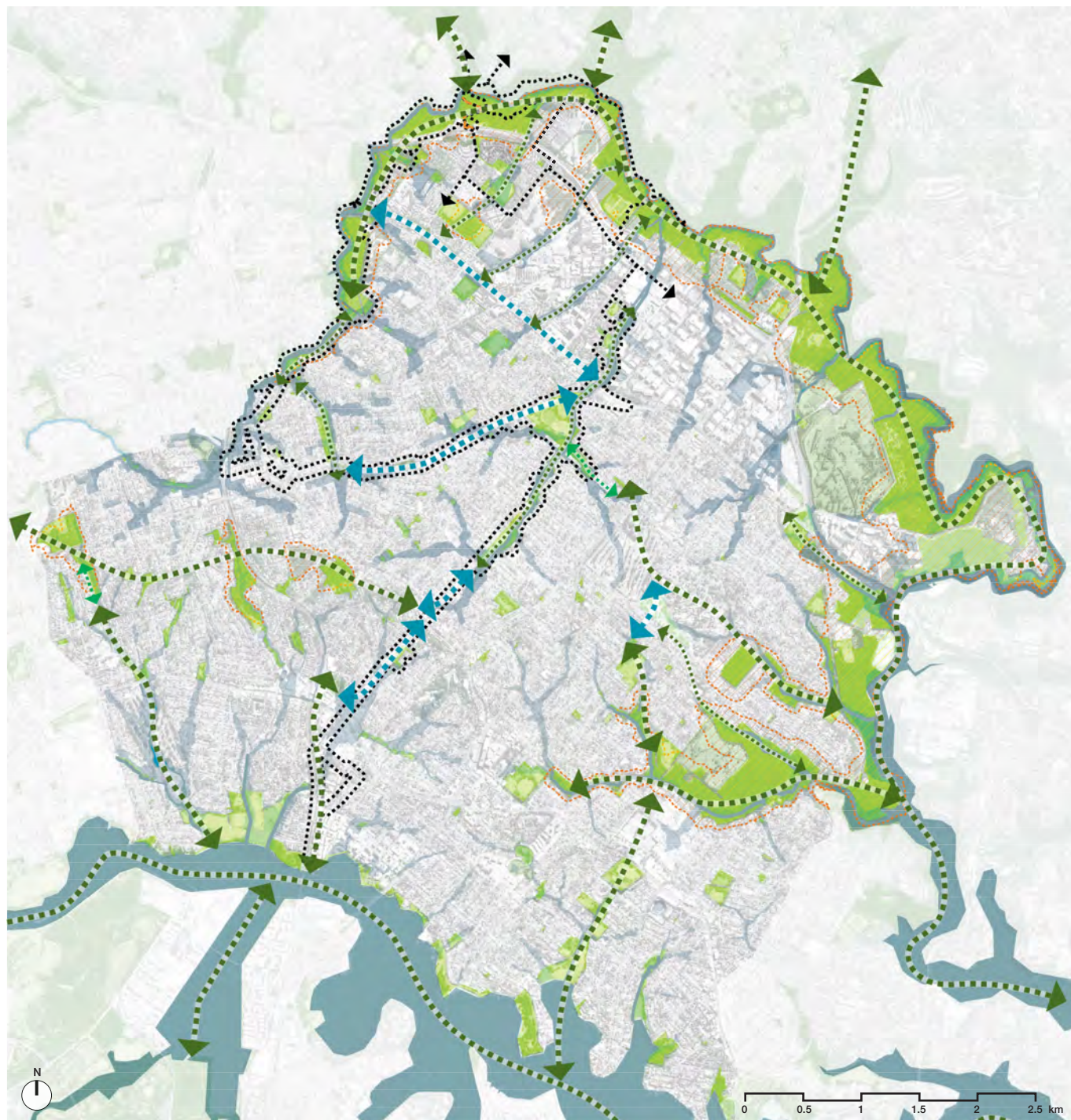
County Green Link

The reserves located along the County Green Link are limited to two. Jim Walsh Park is also considered part of the Terrys Creek Green Link and has been discussed in relation to that corridor. Giraween Reserve has not been surveyed for flora and fauna, therefore no data is available. According to the Ryde Biodiversity Plan (2016), Giraween Reserve has low conservation significance value, a high threat value and is of moderate conservation priority.

The corridor largely consists of the County Road land reservation (envisioned road that was never realised), a length of grass expanse which presents opportunities for local biodiversity improvements.

Terrys Creek Green Link

Terrys Creek Green Link consists of reserves on the eastern side of Terrys Creek. A similar area is managed by the City of Parramatta on the north-western side of the creek and the corridor, in total consists of over 40ha of continuous bushland south of the M2 motorway.



Legend

- | | |
|---|--|
| Bushfire prone land (incl. buffer zones) | — Riparian corridors |
| Flood risk land | - - - Regional ecological connections |
| Green Links boundary | - - - Local ecological connections |
| Green space / parkland | - - - Opportunities for ecological connections |

Figure 9. Ecological constraints and opportunities for connectivity (based on: City of Ryde Bushfire Prone Land Map (2017), City of Ryde Flood Risk Map (2016); City of Ryde Local Strategic Planning Statement (2020); City of Ryde Biodiversity Plan (2016))

Table 3. Biodiversity Conservation Priority (Ryde Biodiversity Plan, 2016)

<i>Reserve and Green Link</i>	<i>Conservation priority</i>	<i>Conservation Significance Value</i>	<i>Threat Value</i>	<i>Endangered Ecological Community</i>
Terrys Creek Green Link				
Forrester Park	Very High	High	High	Blue Gum High Forest in the Sydney Basin Bioregion Sydney-Turpentine-Ironbark Forest
Pembroke Park	Very High	High	High	
Jim Walsh Park	Moderate	Moderate	High	Blue Gum High Forest in the Sydney Basin Bioregion
County Green Link				
Giraween Reserve	Moderate	Low	High	
Shrimptons Creek Green Link				
Booth Reserve	High	Moderate	High	Sydney-Turpentine-Ironbark Forest
ELS Hall Park	High	Moderate	High	Sydney-Turpentine-Ironbark Forest
Santa Rosa Park	High	Moderate	High	
Wilga Park	High	Moderate	High	
Eloura Reserve	Moderate	Moderate	Moderate	
Flinders Park	Moderate	Low	High	
Quandong Reserve	Low	Moderate	High	

The reserves along Terrys Creek Green Link subject to this masterplan are located south of Epping Rd in the upper creek catchment. A Flora and Fauna Assessment of the reserves was conducted in 2017 by Applied Ecology. They found Terrys Creek Green Link has high overall flora species diversity, despite the areas of narrow, degraded reserves at the top of the catchment.

The Flora and Fauna Assessment (2017) analysed changes to species richness over a 10 year period using data from surveys undertaken in 2007 and 2017 and found that species richness had increased for all reserves studied along Terrys Creek including Forrester / Forsyth Reserves which increased by 52% and Pembroke Park which increased by 29%. These results are influenced by Council site management and seasonality / weather conditions at the time of the survey.

Much of the corridor consists of good bush abutting the riparian corridor. The riparian zone is dominated by large privet trees (a weed) that offer refugia and cool, deep shade to birds. The relatively large connected area has allowed the establishment and/or persistence of species absent in smaller, disjunct reserves. Fauna "highlights" include comparatively abundant (and breeding) populations of Swamp Wallabies and Long-nosed Bandicoots, high bushland bird diversity and several established pairs of Powerful Owls (The Flora and Fauna Assessment, 2017).

Terrys Creek contains eight different vegetation communities including two critically endangered ecological communities listed under State and Commonwealth legislation that have the highest conservation value

- Blue Gum High Forest in the Sydney Basin Bioregion in Forrester Park and Jim Walsh Park
- Sydney Turpentine Iron-Bark Forest in Forrester Park

A description of the vegetation communities are contained in Table 3.

Although some plant communities along Terrys Creek are not identified as endangered, they still have high conservation value as they are connected vegetation remnants within a highly urbanised environment. The structure and function of these remnants can vary over time due to impacts such as weed inundation and can be rehabilitated with appropriate site management.

The biodiversity conservation priority in the Ryde Biodiversity Plan (2016) is based on biodiversity conservation significance and threats to those values. The diagram overleaf indicates the biodiversity conservation priority and significance in the Ryde Biodiversity Plan.

Water Quality

Water quality is a major factor in the health of riparian corridors. It impacts whether people and their dogs can touch the water, what species can live in or beside the water, the density and type of weeds, and the resulting habitat and visual presentation for users of the Green Links.

Although the Green Links Masterplan cannot influence water quality from catchments upstream of the study area, existing sewer lines or stream meanders and confinement, the plan can consider how to improve the water quality within the corridor through water sensitive urban design, erosion management, the management of pollution sources and vegetation community composition and weeds along the creeks.

The City of Ryde Council has already been proactive in monitoring biological (macroinvertebrates) and chemical water quality to inform works, programs and projects to improve water quality in Terrys Creek and Shrimptons Creek.

The environmental and ecosystem health data assists in monitoring the effect of future developments, creek restoration, stormwater management, bushland rehabilitation and general urban influenced activities within the catchment through Rapid Riparian Assessments along the creek banks.

Outcomes from the Water Quality Monitoring Program influence recommendations on stormwater infrastructure plans, creek rehabilitation, regulation, environmental health monitoring, bush regeneration, planning, education, water sensitive urban design and other relevant aspects of Council operations and mandates that affect creek health (source: City of Ryde Water Quality Monitoring Report (Spring 2018 and Autumn 2019)).

Shrimptons Creek

The surrounding land uses along Shrimptons Creek comprises a mix of residential, commercial and light industrial. The creek flows through a thin riparian corridor, with a mix of native and exotic species. The creek bed is predominately bedrock and sand/silt. During Autumn 2019, there was a large degree of development on both banks of the creek which caused deterioration of water quality. This included the Wilga Park upgrade. In the 2017/18 period, Shrimptons Creek was in the fair category for water quality for both seasons. It remained in the fair category for Spring 2018, then moved to the poor category for Autumn 2019.

Over the past two years Council has undertaken numerous works in the catchment to aid in water quality improvement including:

- establishment of 173 metres of riparian and corridor planting within Shrimptons Creek
- Council and Sydney Water have rectified major pollution incidences from surrounding commercial properties and grease trap overflows from Macquarie Shopping Centre into Shrimptons Creek
- Council has created three instream riffle structures to enhance water quality directly within Shrimptons Creek at Wilga Park. Debris islands and general rubbish have also been regularly removed
- gross pollutant trap cleaning has occurred quarterly at the core site CR1S Shrimptons Creek in Wilga Park. The testing sites comprise CR1SA Shrimptons Creek at Kent Rd which includes a gross pollutant trap.

(Source: City of Ryde Water Quality Monitoring Report (2018 and 2019))

Terrys Creek

According to the City of Ryde Water Quality Monitoring Report (2018 and 2019), Terrys Creek water quality was historically fair in 2017/18 and remained fair for the 2018/19 period. No faecal coliform exceedances occurred and no historic highs or lows were recorded. In June 2018, City of Ryde completed a creek restoration and flood mitigation project at the Abuklea Rd tributary that leads to Terrys Creek. This project aimed to:

- protect the creek from any further slumping or scour of the tributary edges
- alleviate pressure in high rainfall events
- remove weedy vegetation and replace with native plants

One of the monitoring sites along Terrys Creek is located in Foresters Park within the REM Green Links. This site (CRT3A) is downstream of Terrys Creek Waterfall, where dense vegetation covers both banks and consists of a mixture of native and introduced species. The bank is comprised of sediment (mostly sand and silt) and river rocks, which create areas of broken water (Source: City of Ryde Water Quality Monitoring Report (2018 and 2019)).

Bushfire Management

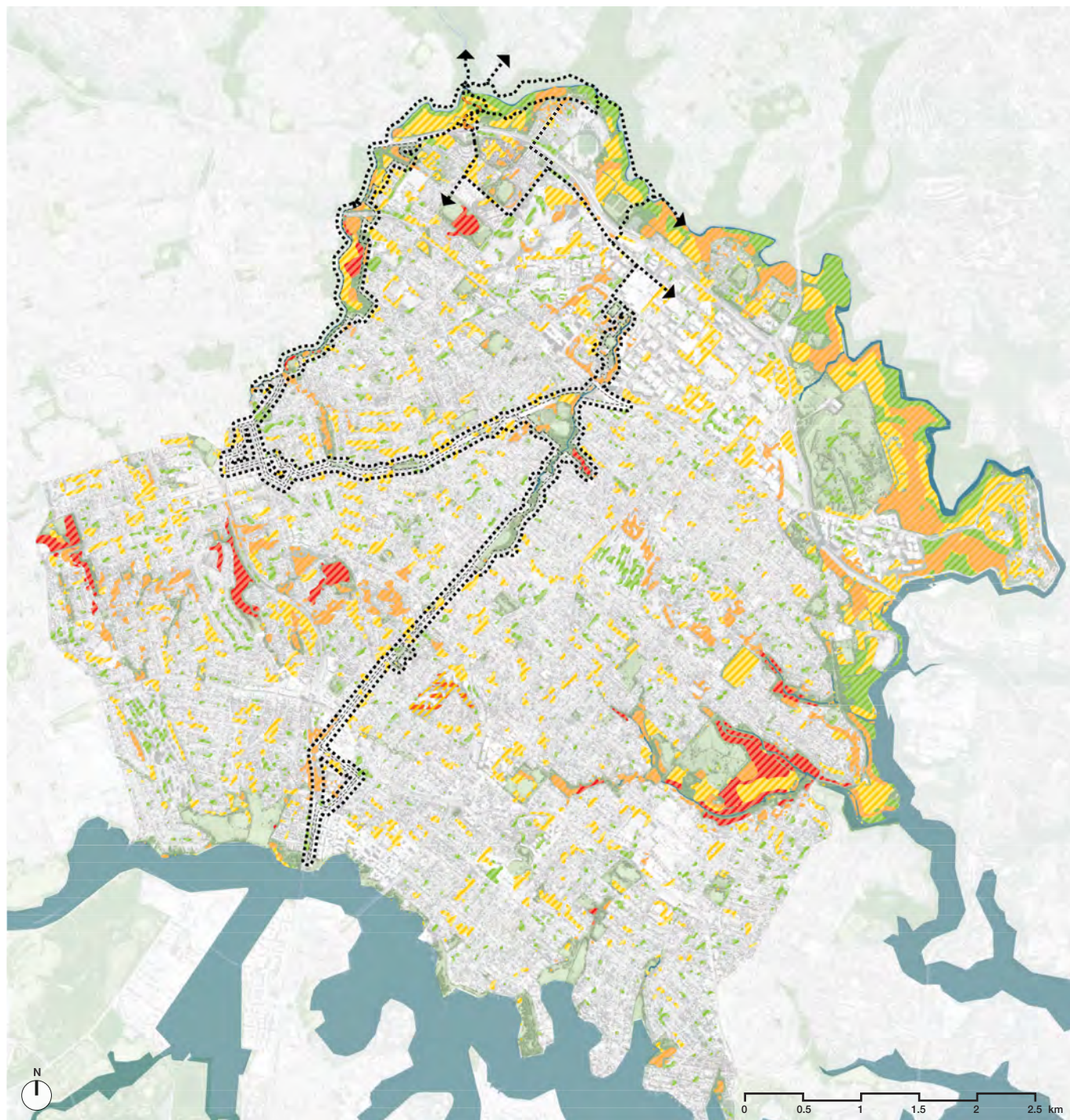
Under the Environmental Planning and Assessment Act 1979, bushfire hazard must be considered at the strategic planning phase. Maintaining asset protection zones is an ongoing legal obligation for landowners and Council should not encourage further plantings that exceed canopy cover limits on public or privately owned land.

Planning for vegetation embellishment along the Green Links needs to be undertaken at a refined level. Furthermore, consultation with the NSW Rural Fire Service, emergency management professionals and ecologists should occur in the planning process for vegetation embellishment in bush fire prone areas.

The Masterplan is designed to protect life, property and environment from bushfire and to reduce risks for existing development by following the principles below:

1. Considering bush fire risk at the macro-scale, looking at fire runs, topography, especially steep slopes, vegetation, weather and the amount of development interfacing vegetation and areas of isolation;
2. Ensuring revegetation and landscaping does not increase bush fire risk in areas identified or adjoining bush fire prone land through
 - careful plant selection of less fire prone plants,
 - planting layouts that can minimise fire spread and
 - the retention or creation of appropriate asset protection zones.
3. Considering fire-fighting access, evacuation potential and the current location of fire hydrants
4. Retaining water in the landscape where possible and promoting moist environments where appropriate
5. Excluding inappropriate development in high bush fire risk areas
6. Considering remnant bushland and narrow vegetation corridors for suitable asset protection zones that may be less than for larger bushland parcels.

Within the site boundary of the Green Links Masterplan, bushfire prone lands are mainly concentrated in Lane Cove National Park and Terrys Creek. The above principles should be applied in these areas and considered for interconnecting open space networks.



Biodiversity conservation priority



Figure 10. Biodiversity conservation priority areas (based on: Ryde Biodiversity Plan, 2016)

Table 4a. Recommendations for environment

Recommendations for environment		Relevance (high/medium/low)		
		Shrimptons Creek Green Link	County Green Link	Terrys Creek Green Link
Protection	– Protect native vegetation and maintain connectivity between reserves and along the corridor	high	low	high
	– Control and regulate access with fencing / delineation and signage for endangered ecological community remnants subject to high levels of disturbance	high	low	high
	– Consider rationalisation of pathways that dissect and fragment bushland areas	medium	high	low
	– Improve management along the interface between natural areas and parkland / sportsfields for better environmental outcomes	high	low	high
Restoration	– Continue targeted restoration within reserves that fall within the corridors to enhance connectivity and habitat values	high	low	high
	– Focus bush regeneration programs within high priority bushland areas that are considered to have a high opportunity for conservation	high	low	medium
	– Enhance identified vegetation communities with vegetation species that belong to those communities as identified by the NSW Scientific Committee and City of Ryde native species lists for vegetation communities / Planting Guide.	high	medium	high
	– Use locally sourced stock from agreed providers	high	medium	medium
	– Promote public involvement in restoration activities e.g. bushcare groups and schools	high	low	high
	– Promote regeneration by avoiding unnecessary mowing	high	medium	medium
Weeds	– Do not plant recognised weeds identified in the City of Ryde Local Priority Weed Management Plan 2019-2024	high	medium	high
	– Weed removal in the corridors by restoration and bushcare practices	high	low	medium
Education	– Educate the community surrounding the corridors about weeds to encourage reduction of weed incursions	high	low	low
	– Install interpretative signage for the community to educate them about WSUD, flora and fauna, anthropogenic impacts in the reserve and what they can do to recognise them and help make a positive difference	high	low	medium
	– Provide education and signage to encourage compliance with Companion Animal Act and the City of Ryde's Wildlife Protection Zones	high	low	high
	– Install free dog waste bag stands and garbage bins in strategic and accessible locations to encourage responsible behaviour and minimise impacts on native fauna and water quality.	high	medium	medium
	– Do not identify nesting sites of rare or threatened birds to the public in education programs	high	low	high
	– Develop threatened species and endangered ecological community interpretative signage / materials and facilitate educational programs in key bushland reserves	high	low	medium
Pests / diseases	– Ensure all proposed works along the REM Green Links avoid the spread of pests, pathogens and disease within native bushland	high	low	high
	– Follow relevant threat abatement plans, statements of intent and hygiene guidelines.	high	medium	high

Table 4b. Recommendations for environment

Recommendations for environment		Relevance (high/medium/low)		
		Shrimptons Creek Green Link	County Green Link	Terrys Creek Green Link
Water	– Apply WSUD to all relevant projects	high	medium	high
	– Revegetate banks with native species where appropriate	high	low	medium
	– Stabilise creek banks where required to limit the potential for erosion	high	low	high
	– Provide rubbish bags and bins away from the water way, along the tracks	high	low	medium
	– Continue Gross Pollutant Trap maintenance and rubbish removal as currently conducted to help maintain and improve Rapid Riparian Assessment results	high	low	high
	– Continue monitoring macroinvertebrate, water quality and riparian condition at current sites along Terrys Creek and Shrimptons Creek	medium	low	medium
Fire	– Apply necessary mosaic fire regimes to maintain the appropriate floristic and structural diversity for each vegetation community (where feasible) and ensure the ongoing persistence of sensitive species, as per the Ryde Biodiversity Plan 2016 Appendix A and the recommendations of the Applied Ecology Flora and Fauna Surveys 2017 (p. 236)	low	low	high
Fauna habitat	– Enhance fauna habitat for targeted species where appropriate with habitat boxes, hollow creation, translocated hollows, and other measures that also provide 'stepping stones' along the corridors, particularly in areas with little or no hollows	high	low	high
	– Do not remove areas of known weedy habitat until adequate replacement habitat has been created nearby. Ensure shrubby weed control occurs in a staged manner to prevent over disturbance to existing refuge sites	high	medium	high
	– Retain a range of vegetation around waterways to ensure a more diverse range of frog habitats	high	low	high
	– Ensure that supplementary plantings include a range of food resources for native species appropriate to that vegetation community.	medium	low	high
	– Retain standing stags and dead limbs on trees and fence around trees that may be subject to limb drop where there is a risk of injury	medium	low	high
	– Ensure old structures such as culverts, bridges are surveyed for microbats before removal	high	medium	high
	– Protect habitat by controlling run-off entering sites if it has the potential to detrimentally change water, nutrient or sediment levels or cause erosion.	high	low	high
	– Undertake restoration works to enhance aquatic habitat e.g. frog breeding sites and native fish habitats) on high conservation value waterways / corridors	high	low	high
Fire	– Consider shielded lighting and/or amber coloured lighting to minimise disturbance for bats and microbats. Where possible, investigate the use of timers or motion sensors to turn off lights when not required	high	medium	low
	– Undertake a transition to more suitable lighting for fauna around public reserves	high	medium	medium

Source: City of Ryde Biodiversity Plan (2016), Applied Ecology Flora and Fauna Survey (2018)

2.4 Green transport

In this Masterplan the term 'Green Transport' refers to connectivity and interconnectivity achieved via active transport and sustainable mass transport options (current and future). Active transport includes walking, cycling and other non-motorised transport. Mass transport includes public options such as bus, train, metro and ferry. Improvements in accessibility and connectivity of 'Green Transport' are key drivers for this Masterplan. Green transport objectives are to:

- create continuous and permeable active transport corridors with connections to the surrounding networks
- explore increased connectivity and interconnectivity with current and future mass transport options
- maintain and enhance connections and accessibility to centres, open spaces and places, including improved cycleways and walkways.

These objectives will support achieving the vision of Council and the community to create a connected and accessible City of Ryde.

Key reference documents green transport

NSW Transport Future Transport Strategy 2056 (2018)
 City of Ryde Integrated Transport Strategy 2016-2031 (2016)
 City of Ryde Local Strategic Planning Statement (2020)
 City of Ryde Bicycle Strategy (2014)
 City of Ryde Bike Map (2019)
 Connect Macquarie Park & North Ryde Annual Report 2018-2019 (2019)

Green transport vision

The vision for green transport in the City of Ryde has two key layers.

At a LGA scale, the vision is to be regionally connected and locally accessible with "a traffic and transport system that supports economic growth and local amenity by stimulating land development, influencing the use of sustainable transport and promoting safety and equity." City of Ryde Integrated Transport Strategy 2016-2031 (2016).

Connect Macquarie Park & North Ryde is a business led organisation already actively encouraging the community to change their travel behaviour in order to increase the efficiency of transport, reduce traffic congestion and decrease drive-alone vehicle travel for the journey to work in Macquarie Park and North Ryde. This includes promoting cycling and improved cycleways and mass transport connections.

At a local level the vision is to create a connected and accessible city "where it is easy, safe and convenient for people to get to work, visit friends or shops, or use local facilities and services. Walking, cycling and public transport are easy to use and well connected throughout the city." City of Ryde Community Strategic Plan 2028 (2018). This ties into the Greater Sydney Commission broader vision for a Metropolis of Three Cities (2018) "where most residents live within 30 minutes of their jobs, education and health facilities, services and great places."

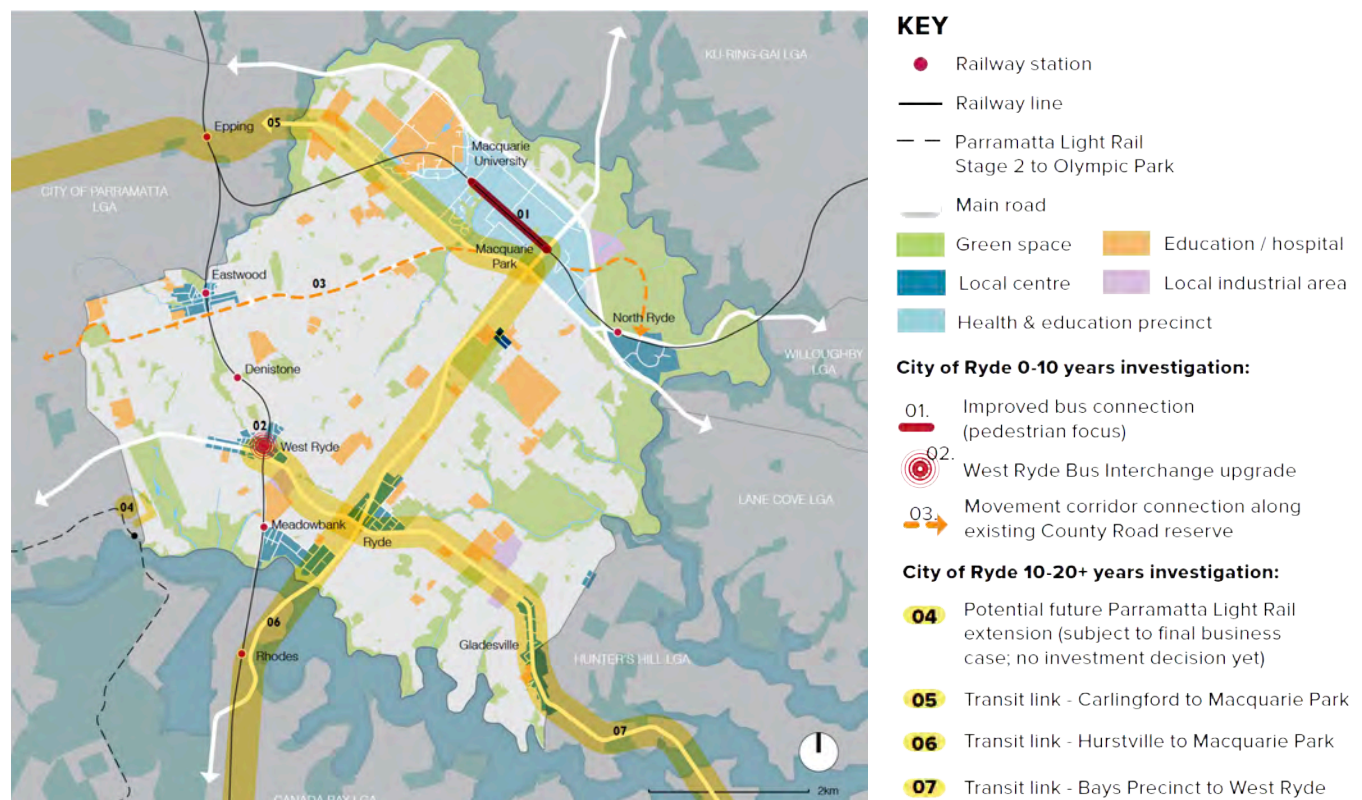


Figure 11. City of Ryde Led Transport Investigations Structure Plan (source: City of Ryde Local Strategic Planning Statement (2020))

Responding to this green transport vision the Masterplan will reflect Council's priority by:

Improved access to suburbs, workplaces and major destinations:

- Improve connectivity and interconnectivity with current mass transport options within the City of Ryde and beyond.
- Plan for improved connectivity and interconnectivity with future mass transport options within the City of Ryde and beyond.
- Promoting sustainable transport and reducing reliance on cars

Improving access to local centres, recreation assets and reduce the travel footprint:

- Planning for increased use of active and public transport options, and improved pedestrian access and mobility
- Continuing investment in the road network, footpaths, cycleways and walkways

Increased popularity

Green transport is gradually becoming more popular in higher density suburbs of Australian cities (Zander et al, 2014). Some of the important factors driving an increase in green transport in the City of Ryde are:

- Increasing congestion and limited opportunities for additional road capacity, encouraging the development and use of alternative transport modes

- Increasing recognition of the roles of active transport in public health
- Increasing recognition of the roles of green transport in environmental sustainability
- Improving provision of active transport infrastructure and end-of-trip facilities
- Availability of a wider range of bikes and scooters, including cargo bikes, e-bikes, folding bikes and share bikes, suitable to a broader range of people and purposes
- Improved public transport connectivity, including the metro connection at Macquarie Park
- Coronavirus disease (COVID-19) has led to an increased use of active transport. Recent counts show that cycling numbers have doubled along some of the regional active transport routes during the lockdown period. Numbers seem to have returned to pre-covid numbers of the most recent months.

In response to the current and forecast change and growth across greater Sydney, and associated demand for green transport, the NSW State Government released "Future Transport Strategy 2056" (Transport for NSW, 2018), which is an overarching strategy, supported by a suite of plans to achieve a 40 year vision for a transport system for Sydney.

Future Transport Strategy 2056 outlines six outcomes to guide investment, policy and reform and service provision. Some of the key objectives relevant to the REM Green Links are:

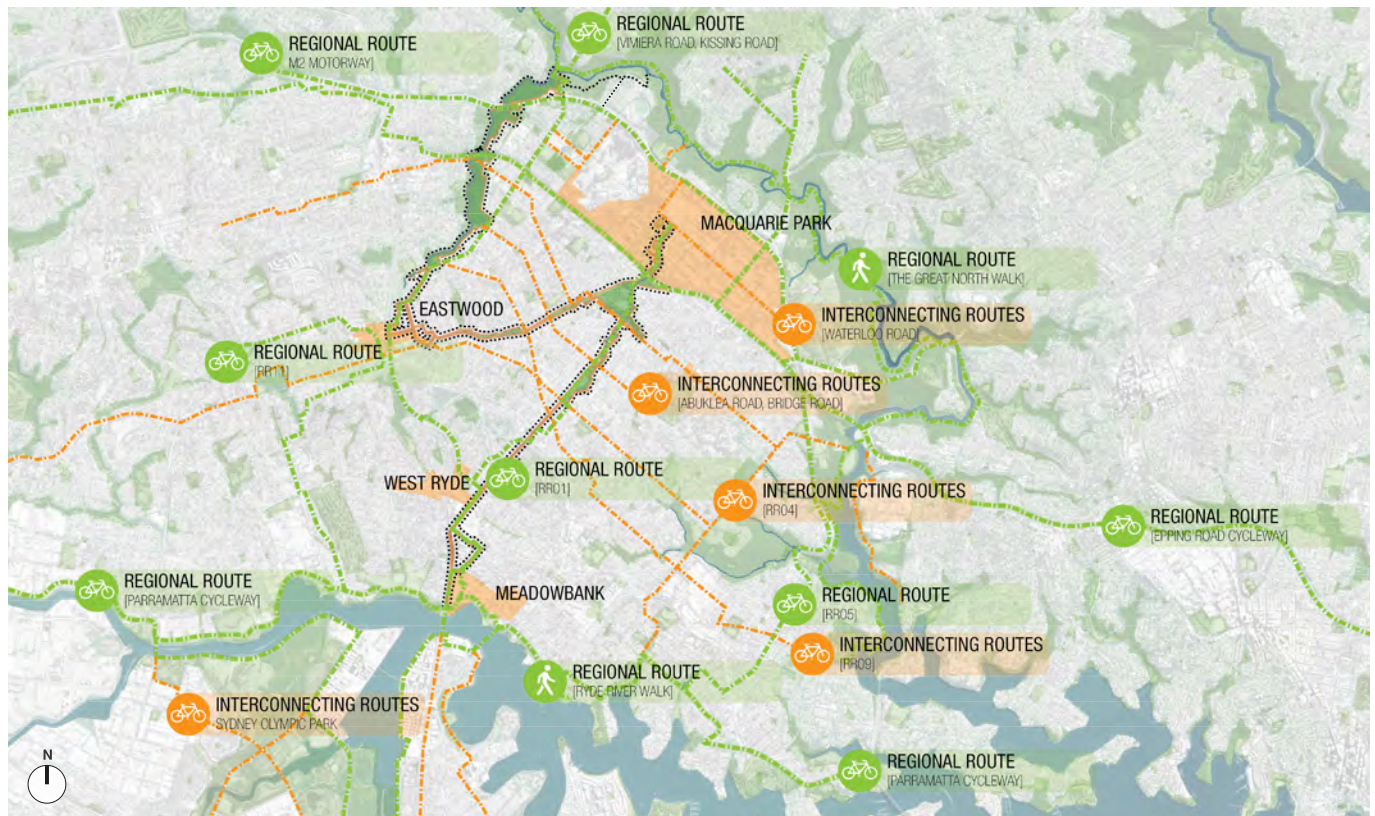


Figure 12. Regional active transport links (based on: City of Ryde Cycling Orbitals (2018); Open Street Map (2020))

Activating centres

Successful places include attractive spaces where people can meet and enjoy their leisure time, such as town squares, libraries and community centres, parks, sportsgrounds and waterways. Being able to access these spaces easily by active or public transport encourages people to be more physically active and increases social interactions in communities.

Encouraging active travel & using public transport

To encourage more people to use public transport better connections, flexible services and increased out of hour peak frequency should be achieved.

One in eight NSW residents ride a bicycle in a typical week. More people travelling by active transport will improve overall network outcomes in addition to delivering positive health, wellbeing and environmental outcomes. Increasing the number of people using active transport for short trips to their local and city centres will require safe, well connected infrastructure such as bike paths and walking routes.

It is important that the Green Links routes are safe and accessible, and designed for all ages and abilities with frequent seating and shade. Other factors that encourage active transport include safe crossings, lower traffic speeds, safe, separated cycling paths and before and after trip facilities such as secure bicycle storage.

Sustainability

Moving people from private vehicles to more sustainable transport modes will reduce congestion and the transport sector's emissions intensity, improve air quality and support better health and wellbeing.

Well planned centres and cities will enable a shift from private cars to public transport and active transport modes such as walking and cycling.

Managing the transport system's cost-effective transition to a low emissions environment and managing its climate change risks will also help deliver the NSW Government's Climate Change Policy Framework and its aspirational target of zero net emissions by 2050.

Active transport constraints and opportunities

While the City of Ryde provides a network of formal and informal cycle routes, the cross-city terrain can be quite difficult to navigate. The current cycling network lacks in some coherency and there are a number of obvious missing links. This is illustrated by Strava's users heatmap (Figure 14) and City of Ryde's Bike Map (Figure 15).

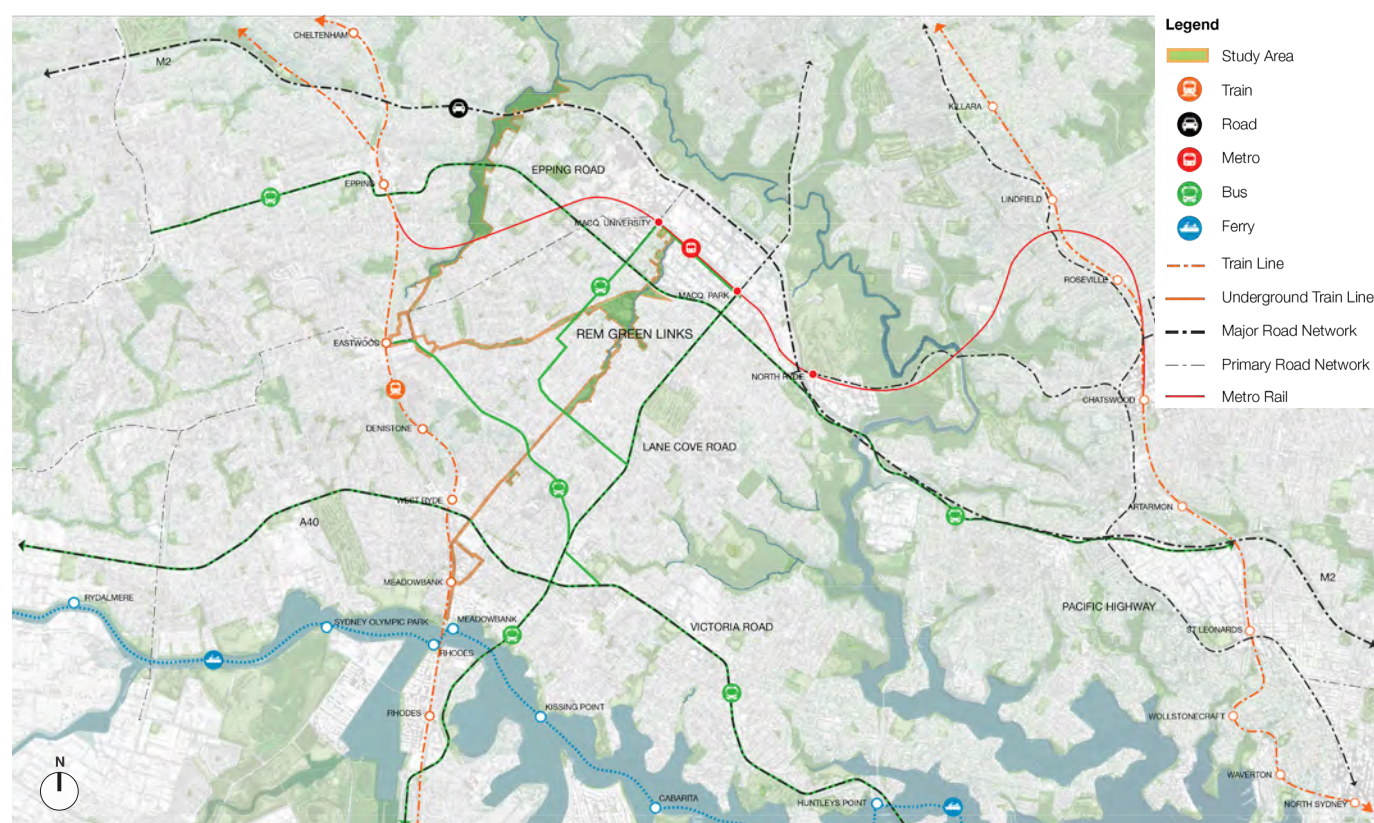


Figure 13. Regional infrastructure links (based on: City of Ryde Integrated Transport Strategy 2016-2031 (2016))

The REM Green Links will form key connectors in a network of regional active transport routes. Several existing and proposed routes traverse the region east west, including the Parramatta River Valley Cycleway / Ryde River Walk, the Epping Rd shared path and the Great North Walk through Lane Cove National Park. The Green Links will help transform these routes into a connected network, linking up local centres and destinations (Figure 15).

Trip generators include schools, parks and town centres with their community centres, local shops, services and public transport connections. The town centres are located at the end/start points of the Green Links; Eastwood, Macquarie Park and West Ryde.

A range of schools are spread in the area, with some schools adjacent or within 400 metres of the Green Links.

Shrimptons Creek Green Link

The Shrimptons Creek Green Link connects West Ryde to Macquarie Park. The northern section connects Santa Rosa Park to Greenwood Park, ELS Hall Park and Booth Reserve via a shared path along the creek line. South from Santa Rosa Park an off-road shared path will be explored, which will connect to an on-road section on Hermitage Rd and further towards West Ryde station and Meadowbank. As the Strava Heatmap clearly illustrates; the existing shared path is well-used and provides a clear continuous connection. The southern section is a clear missing link.

At West Ryde, an off-road active transport connection along the rail corridor will provide a safe and continuous connection south to Meadowbank and Rhodes. To the north this route will connect to Denistone, Eastwood and Epping. It is important to note the gradients south of Blaxland Rd towards Goodwin St are steep, with an average gradient of 11.5%.

Several schools are located near the Green Link corridor. This Masterplan will explore improvements to interconnectivity with the surrounding active transport networks and improving safety, particularly at crossings.

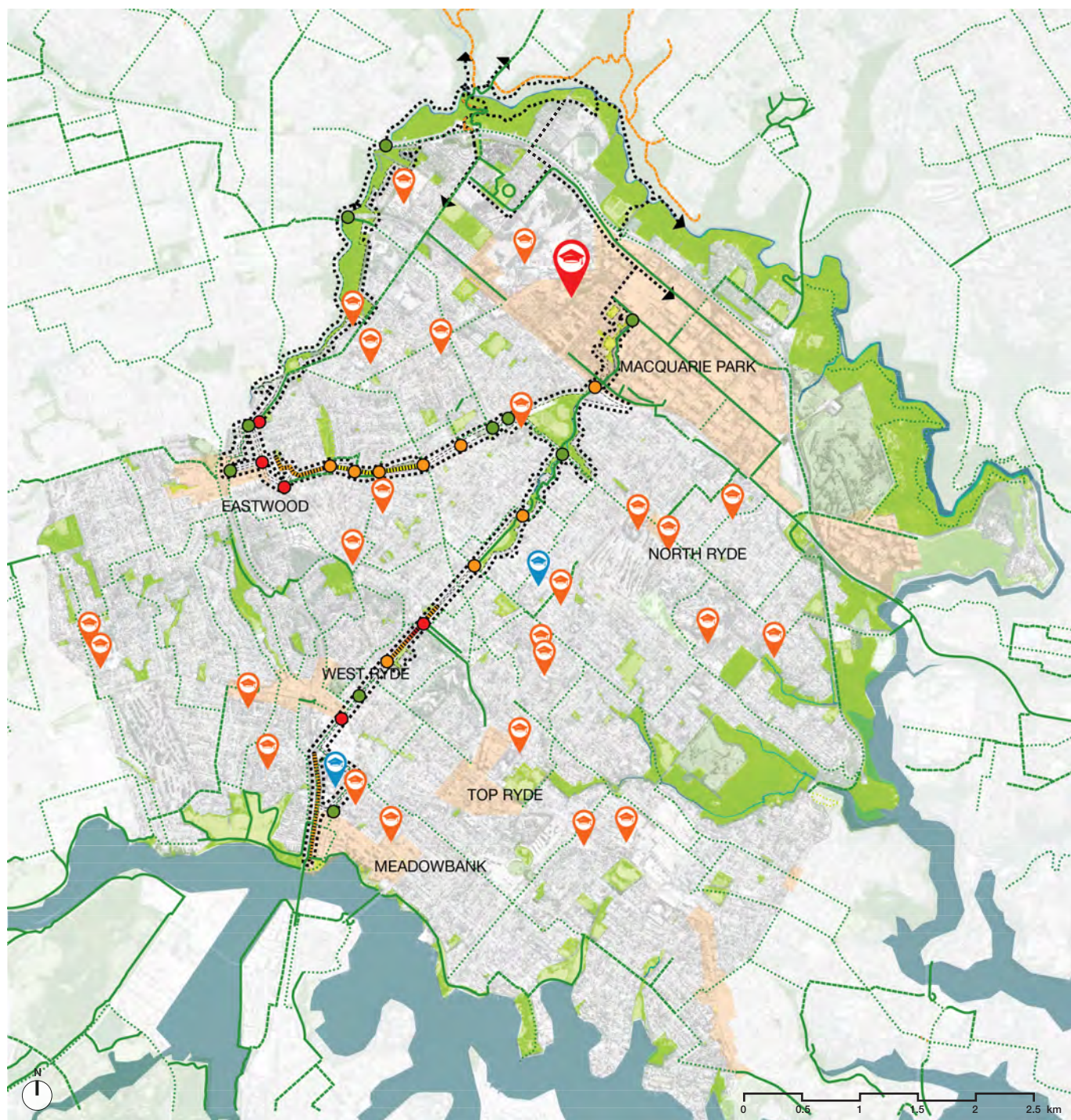
Most crossings along this corridor are relatively safe. The most critical crossing that will require an upgrade is the Blaxland Rd crossing. The busy road has 4 lanes and there is a blind corner and no crossing options. In Table 5 all Green Links crossings are examined and initial recommendations for upgrades have been made. Figure 14 illustrates the crossings and their safety.

County Green Link

This route will provide a safe and continuous connection between Macquarie Park and Eastwood, which can be used by commuters working at Macquarie Park, children that attend Kent Rd Public School, or people that use the recreation and sporting facilities along this Green Link.



Figure 14. Strava heatmap showing where people ride, walk and run. The brighter colours indicate higher intensity of use, e.g. the white lines are more used than the red lines (source: Strava (2020))



Active transport

- | | | |
|----------------------|------------------------------|---------------------------------|
| School | Macquarie University | New school / education precinct |
| Town centres | On-road bike lane | Informal on-road bike route |
| Public parkland | Off-road mountain bike route | |
| Off-road shared path | | |
-
- | | |
|---|----------------|
| Green Link crossings (safe/moderate/unsafe) | |
| ~5% gradient | 5-10% gradient |
| 10-15% gradient | >15% gradient |

Figure 15. Active Transport map (based on: City of Ryde Bike Map (2020))

This route runs through a relatively quiet suburban area, which will make it a safe route. An on-road bike path runs through Woorang St and continues to an off-road shared path between Grove St and Orange St. The other sections of this Green Link do not exist yet and will run through the green open space corridor (County Green Link), which is a land reservation originally intended future a road/transport connection.

Terrys Creek Green Link

A bushtrack runs through Terrys Creek and connects to Lane Cove National Park. As illustrated by the Strava Heatmap, not many people use this bushtrack. Providing clear access points could improve usage and popularity of this corridor. It is important to note that this corridor is an important ecological corridor, so balancing active transport and recreational needs with environmental protection will be critical for this Green Link.

Vimiera Rd forms an important on-road active transport connection, that provides access to Terrys Creek for pedestrians and connects to Lane Cove National Park and Kissing Point Rd. Towards Eastwood, at Balaclava Rd and Blaxland Rd, this route becomes harder to navigate. Heading south towards Eastwood, cyclists cannot continue onto Balaclava Rd, due to a raised kerb on the roads centreline. The alternative is to ride on the pedestrian side walk and use the traffic lights to cross the road.

Public transport

The Green Links have strong connections with public transport, including rail (West Ryde, Eastwood, Meadowbank), metro (Macquarie Park), bus (Victoria Rd, Epping Rd or Lane Cove Rd) and ferry (Meadowbank, Kissing Point).

The public transport connections may serve as destinations for Green Links users and vice versa. For example, commuters could ride or walk to a station along the Green Links. They may also serve as hopping off points for visitors to access the Green Links. In particular in areas where gradients may be too hard for some, people might prefer to hop on the train from West Ryde to Eastwood and continue their journey from there.

Trains are relatively well used for commuting, school and university trips. Challenges involve the intensification of residential development around station catchments and encouraging greater bus usage. Macquarie Park is a key location for employment and education trips and its sparseness limits the benefits of its stations. The new Sydney Metro Northwest has reduced the need for private car use for employees living in the north west of the City of Ryde.

A key challenge is to facilitate efficient mass transport connections from Macquarie University Station into the rest of the City of Ryde to maximise this new infrastructure for the broader community, in particular the Eastwood to Macquarie Park connection through the County Green Link.

Diagram 5. Cyclist count at Shrimptons Creek Path, south of the Epping Road Underpass

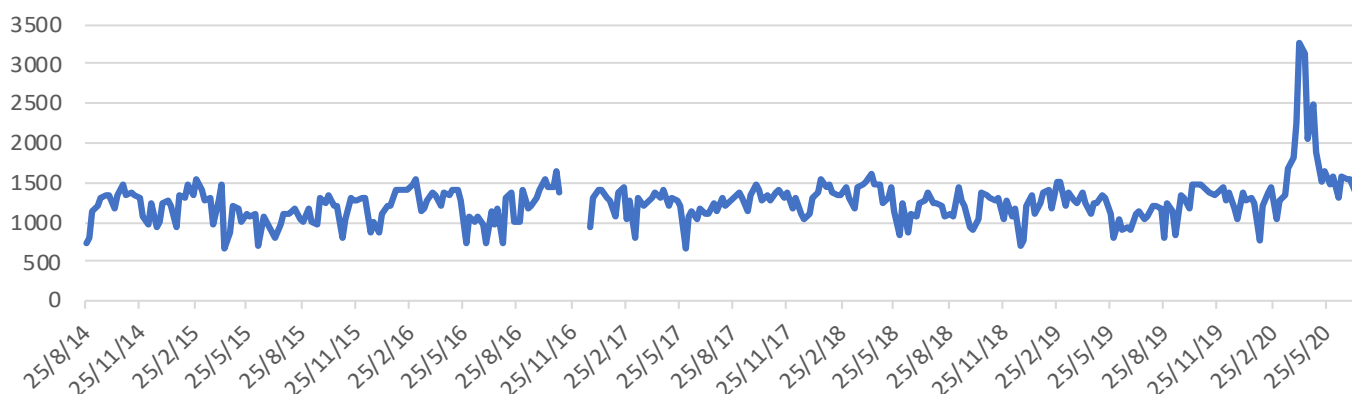


Diagram 6. Cyclist count at Parramatta Valley Cycleway, west of John Whitton Bridge

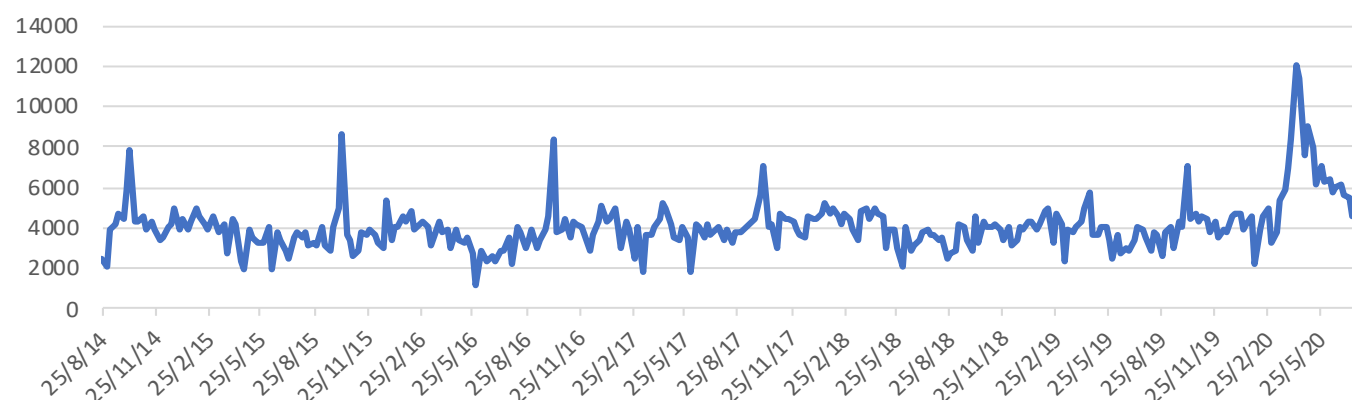


Table 5. Road crossings along the REM Green Links

<i>Green Link and street crossing</i>	<i>Traffic volume</i>	<i>Crossing type</i>	<i>Safe?</i>	<i>Upgrade recommended / notes</i>
Shrimptons Creek Green Link				
<i>Waterloo Rd</i>	High	Traffic signals	Yes	No
<i>Epping Rd</i>	High	Underpass	Yes	Improve sight lines, lighting and sense of safety
<i>Kent Rd</i>	Low	Zebra	Yes	No
<i>Bridge Rd</i>	Low	Zebra	Yes	Provide a safe crossing/connection for path to eastern side of the creek
<i>Quarry Rd</i>	Moderate	Refuge	Yes	No
<i>North Rd</i>	Moderate	None	No	As this section of the route does not exist yet, no crossing is provided. Safe crossing options should be explored.
<i>Blaxland Rd</i>	High	None	No	This crossing is particularly dangerous, as there is a blind corner and no crossing options.
<i>Goodwin St</i>	Moderate	None	No	As this section of the route does not exist yet, no crossing is provided. Safe crossing options should be explored.
<i>Victoria Rd</i>	High	Traffic signals	No	Traffic signals are for cars or pedestrians. No signals for cyclists are provided
<i>To West Ryde Station</i>	Moderate	Roundabouts	Yes	No
<i>Constitution Rd / Angas St</i>	High	Overpass	Yes	No
County Green Link				
<i>May St / Ethel St</i>	High	Zebra	Yes	Pedestrian crossing only; consider a safe crossing for cyclists from/to the station
<i>Ethel St / Blaxland Rd</i>	High	None	No	Dependant on the preferred route option, a safe crossing is required.
<i>Graham Ave</i>	Low	None	No	As this section of the route does not exist yet, no crossing is provided. Measures to improve safety at crossing should be explored.
<i>Orange St</i>	Low	None	No	Measures to improve safety at crossing should be explored (e.g. speed reduction vehicular traffic)
<i>Grove St</i>	Low	None	No	Measures to improve safety at crossing should be explored (e.g. speed reduction vehicular traffic)
<i>North Rd</i>	Low	None	No	As this section of the route does not exist yet, no crossing is provided. Measures to improve safety at crossing should be explored.
<i>Abuklea Rd</i>	Moderate	None	No	As this section of the route does not exist yet, no crossing is provided. Measures to improve safety at crossing should be explored.
<i>Herring Rd</i>	Moderate	Roundabout and zebra	Yes	A safe crossing for Kent Rd Public School should be examined. Note that the crossing follows a descent and people might be riding fast.
<i>Kent Rd</i>	Low	Roundabout	Yes	No
Terrys Creek Green Link				
<i>M2 motorway</i>	Very High	Underpass	Yes	Consider lighting
<i>Epping Rd</i>	Very High	Underpass	Yes	Consider lighting
<i>Balacava Rd</i>	Moderate	None	No	A raised kerb on the centre of the road prevents crossing - consider rearrangement.
<i>Blaxland Rd</i>	High	Traffic signals	Yes	Pedestrian crossing only; consider including a bike crossing

Table 6. Recommendations for green transport

Recommendations for green transport		Relevance (high/medium/low)		
		Shrimptons Creek Green Link	County Green Link	Terrys Creek Green Link
Integration	– Maximise walking and cycling and improve access to public transport by considering the scale, orientation, structure and permeability of developments in centres	high	high	low
	– Prioritise investment in public and active transport at major employment or mixed-use development or in areas that would benefit from enhanced accessibility	high	medium	low
	– Complement land use development with parking policies that encourage public and active transport use	high	medium	low
	– Integrate active transport networks with key public transport stops/stations through route location design and the provision of end of trip facilities	high	high	low
Active transport	– Provide a legible connected and accessible layered network of cycle facilities	high	high	low
	– Prioritise pedestrian movements over other transport modes in local centres	high	high	low
	– Provide appropriate and sufficient end of trip facilities in new residential, retail and commercial developments	high	medium	low
	– Provide cycling facilities, including bike racks at bus stops and metro/rail stations and at ferry wharfs	high	high	low
	– Provide safe cycling routes within one kilometre of all public schools	high	high	low
	– Use walking and cycling programs to encourage more people to use active transport	medium	medium	low
	– Discourage over-supply of off-street parking in key centres where public transport, walking and cycling are encouraged to manage any impacts within adjacent residential areas	high	medium	low
	– Provide safe crossings	high	high	low
Public transport	– More efficiently integrate transport modes at public transport interchanges by reducing interchange times and increasing interchange convenience	medium	medium	low
	– Prioritise Park and Ride capacity outside of major train stations and bus tops that have large walk up catchments	medium	medium	low
	– Create a simple and direct bus network with equitable access for all users between Macquarie Park and Eastwood	low	high	low
	– Improve the competitiveness of public transport travel times to be equal or less than private vehicles in peak times in key corridors	low	medium	low
	– Invest in public transport by leveraging off new development and to shape a sustainable land use	medium	medium	low

2.5 Culture & community

In this Masterplan 'culture & community' refers to the social and cultural infrastructure, including community facilities and activities, art and cultural heritage.

Throughout the City of Ryde consultation for the preparation of the 2028 Community Strategic Plan, a strong emphasis is put on providing facilities for a growing and diverse population and on valuing cultural heritage. In 2016, around 50% of City of Ryde's population were born overseas, compared to 36.8% for the rest of Greater Sydney. The diversity and welcoming atmosphere of different cultures is a highly valued aspect of Ryde. The community sees local events and activities, history and heritage, public art and facilities for people to get together as important and adding to the City's vibrancy.

Catering for this diverse community, while acknowledging the rich history of this area is a challenge for this Masterplan. An important step in this process is including the community in the decision making process.

Key reference documents ecology

City of Ryde Local Strategic Planning Statement (2020)

City of Ryde Community Strategic Plan 2028 (2016)

Culture & community vision

In accordance with the vision of the City of Ryde, as outlined in the Ryde Local Strategic Planning Statement (2020), this Masterplan will ensure that:

"Heritage and places of cultural significance that are valued by the community – including historic buildings, landscape items and places with natural and Aboriginal significance – will be well managed, conserved and positively promoted to enhance the community's sense of place."

and that *"Social and cultural infrastructure (including libraries, community services and events) will be strategically located to ensure all community members can enjoy them."*

This Masterplan will reflect community priorities (as outlined in the City of Ryde Community Strategic Plan), including:

An engaged, connected community

- Working with stakeholders, partners and the community to support all members of the community and promote social inclusion.
- Through our community network and with State agencies, appropriately supporting all members of the community and providing access to available services and facilities.

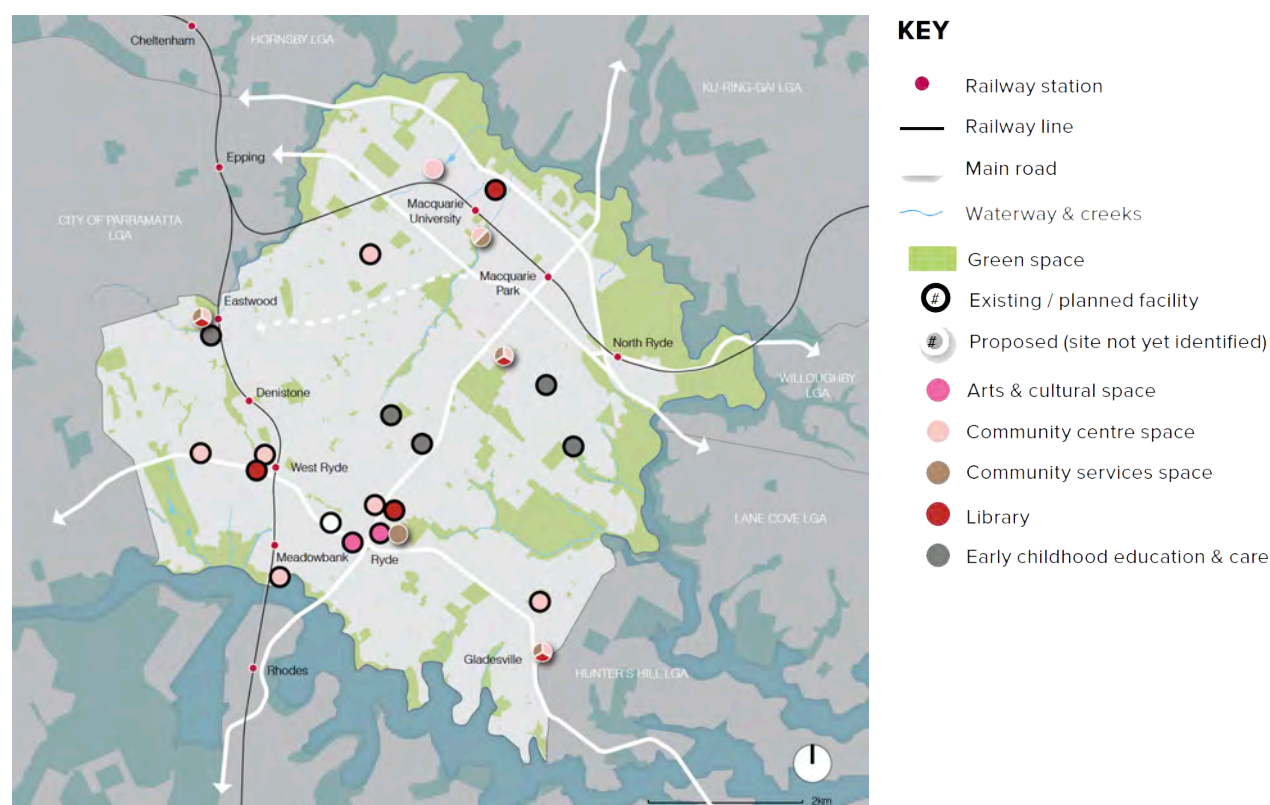


Figure 16. City of Ryde Community Facility Structure Plan (source: City of Ryde Local Strategic Planning Statement (2020))

Celebrating culture and heritage

- Continuing to enhance our events program to provide opportunities to celebrate diversity and heritage and promote inclusion.
- Protect, enhance and interpret cultural heritage
- Provide places that support events

Accessible community facilities

- Planning for and enhancing cultural and community facilities to meet increased demand and ensure equitable access for all sections of the community
- Create and enhance community infrastructure along the Green Links and enhance amenity value, design quality, identity and sense of place

Historical significance

The City of Ryde has a long and treasured history, which is reflected in its landscape and built environment. The original inhabitants of the Ryde area were the Wallumedegal people, and the area still contains several places of Aboriginal significance, including rock engravings, middens, and burial sites.

European settlement of the area dates from 1792, which saw the development of an agricultural landscape, proceeded by industry and residential urbanisation over the course of the 20th century as technology developed and the population grew. Today, Ryde has become home to one of Australia's leading high-tech business precincts, as well as being home to an increasing number of residential communities.

The City of Ryde includes over 170 legislatively protected heritage items, five heritage conservation areas, and two archaeological sites, all of which embody the history of the local area.

Aboriginal country

Aboriginal people lived for thousands of years in what we call the City of Ryde. When the first Europeans settled at Sydney Cove in 1788 the traditional owners of this area were the Wallumedegal. That name was told to Captain Arthur Phillip, first governor of the convict colony of New South Wales, by Woollarawarre Bennelong who came from the clan called the Wangal on the south side of the river.

It is likely that the name Wallumedegal or Wallumattagal was derived from wallumai the snapper fish, combined with matta, a word used to describe a place, usually a water place, as with Parramatta and Cabramatta. That would mean they were the snapper clan and the fish was their totem, just as burra (the eel) was the totem of the Burramatta or Boromeda-gal or clan at Parramatta and cobra (the white grub of the shipworm) that of the Cobragal at present Liverpool and Cabramatta.

Wallumedegal territory followed the north bank of the Parramatta River from Turrumburra (Lane Cove River) in the east to Burramatta at the head of the river to the west. The northern boundary would

logically be the Lane Cove River and the northern neighbours therefore the Cameragal or spear clan. Further east, opposite the Cameragal, were the Cadigal, a harbour-dwelling clan, which occupied the present Eastern Suburbs and City of Sydney, from Inner South Head to Darling Harbour.

The Wallumedegal survived for generations in a rich environment of river flats, creeks and mangrove swamps, fishing with pronged spears and handlines, feasting on shellfish, hunting birds and small game, and collecting a variety of edible bushfood plants. They spoke the same language as the Port Jackson and coastal clans, from Botany Bay to Broken Bay. The dialect of the sea coast, wrote Marine Captain Watkin Tench, was spoken at Rose Hill (Parramatta). The dialect of the same language west of Parramatta is now called Darug.

The first encounters between the foreigners in boats and the river people in February 1788 were friendly, with laughter and mimicry on both sides. Their lives changed forever the following November when armed marines built an earthwork fort at Parramatta.

This action displaced the family of the Burramattagal elder Maugoran and his wife Gooroobera, who were forced to move down the river to The Flats, near Meadowbank. Then in April 1789 came the smallpox epidemic, which Bennelong said killed half the Indigenous population. Smallpox might account for the fact that no Wallumedegal are identified in history, unless, which is possible, either or both of Maugoran's wives, Gooroobera or Bidgee Bidgee - mother Tadyera who died of dysentery, were Wallumedegaleon (wallumedagaliang), or women belonging to the clan.

The most enduring symbol of the Aboriginal presence in the City of Ryde is the grave of Bennelong and Nanbarry, two key figures in the history of early Sydney.

The section above is adapted from the City of Ryde website and is an abstract from the paper, Wallumedegal : An Aboriginal History of Ryde, written by Keith Vincent Smith who was recommended by the Warawara Department of Indigenous Studies at Macquarie University. Since 1993 he has established a track record as a researcher and author of Aboriginal history and anthropology. (<https://www.ryde.nsw.gov.au/>)

Colonial history

On the 3rd January 1792, the first land in the Ryde area was granted to eight marines, along the northern bank of the river between Sydney and Parramatta. The area was named by Governor Phillip the 'Field of Mars', Mars being the ancient God of war, named to reflect the military association with these new settlers. Today's Field of Mars Reserve is the remnant of a district which once extended from Dundas to the Lane Cove River. These grants were followed soon after by grants to ten emancipated convicts in February 1792, the land being further to the east of the marines grants, thus the area was called Eastern Farms or the Eastern Boundary. By 1794 the name Eastern Farms had given way to Kissing Point, a name believed to have originated from

the way in which heavily laden boats passing up the Parramatta River bumped or 'kissed' the rocky outcrop which extends into the river at today's Kissing Point.

Further grants were issued in 1794 and 1795, gradually occupying most of the foreshores between Meadowbank and Gladesville.

Some of the grants were at the North Brush, north of the Field of Mars settlement, in the area of Brush Farm and Eastwood. Most of the Grants were small, from thirty to 100 acres.

By 1803 most of the accessible land had been granted. Settlement was based along the Parramatta River and overlooking ridges. Governor King recognised that most of the smaller settlers had insufficient land for their stock but it was not possible to grant them larger allotments. In 1804 it was decided that a 'traditional English common' - a large area of public land for use by local inhabitants - would be set aside. Six commons were gazetted.

The Field of Mars Common, an area of approximately 5,050 acres located north of the Field of Mars and the Eastern Farms, covered most of the Ryde municipality. The village itself comprised only a modest scattering of houses in a few streets around the church, surrounded by farms, orchards and some large estates. Nevertheless, the name was well-established by 12 November 1870 when the Municipal district of Ryde was officially proclaimed.

The section above is adapted from the City of Ryde website. (<https://www.ryde.nsw.gov.au/>)

Existing features

As described, the City of Ryde has a very diverse and multi-cultural population. Some of the existing sections of the Green Links provide some community and cultural facilities, but along most of the Green Links corridors there is an opportunity to provide more cultural provisions and to express the sense of place and community through art.

As illustrated by figure 14, there is a divide of areas with and without limited heritage value and items. This divide is roughly along Blaxland Rd and Victoria Rd. Areas to the south of this line have more protected heritage than the area north of this divide. In fact, the only major heritage items to the north of this divide are Macquarie University, Macquarie Cemetery, North Ryde Public School, Lane Cove National Park, Field of Mars Reserve and Wallumatta Nature Reserve.

The areas south of the divide have lots of heritage listed buildings, items and protected areas. Particularly in the town centres. Eastwood has the highest concentration of heritage items in the City of Ryde.

Community centres and facilities are spread more evenly through the City and are mostly concentrated around the town centres. Macquarie Park has limited community facilities, which given its expected growth, might need some consideration. The Green Links can play an important role in providing this space for the community.

The existing cultural and community features along the three Green Links are described below, including some opportunities.

Shrimptons Creek Green Link

The northern section of Shrimptons Creek, at Wilga Park, contains a public art piece and an amphitheatre. This space can be used for events and community gatherings.

At the Epping Rd underpass there is an opportunity to enhance the space by providing art opportunities and lighting art.

ELS Hall Park, with Ryde Community Sports Centre (currently leased by the YMCA), forms an important community space and attracts visitors from the whole local government area.

Santa Rosa Park houses two existing community buildings (currently leased by a scout group and the Australian Air League Ryde Squadron). The Habitat, a community garden also operates within Santa Rosa Park. This space, at the centre of the City of Ryde, will play an important community role. There is a potential for an event space, public art and potentially a community centre / café.

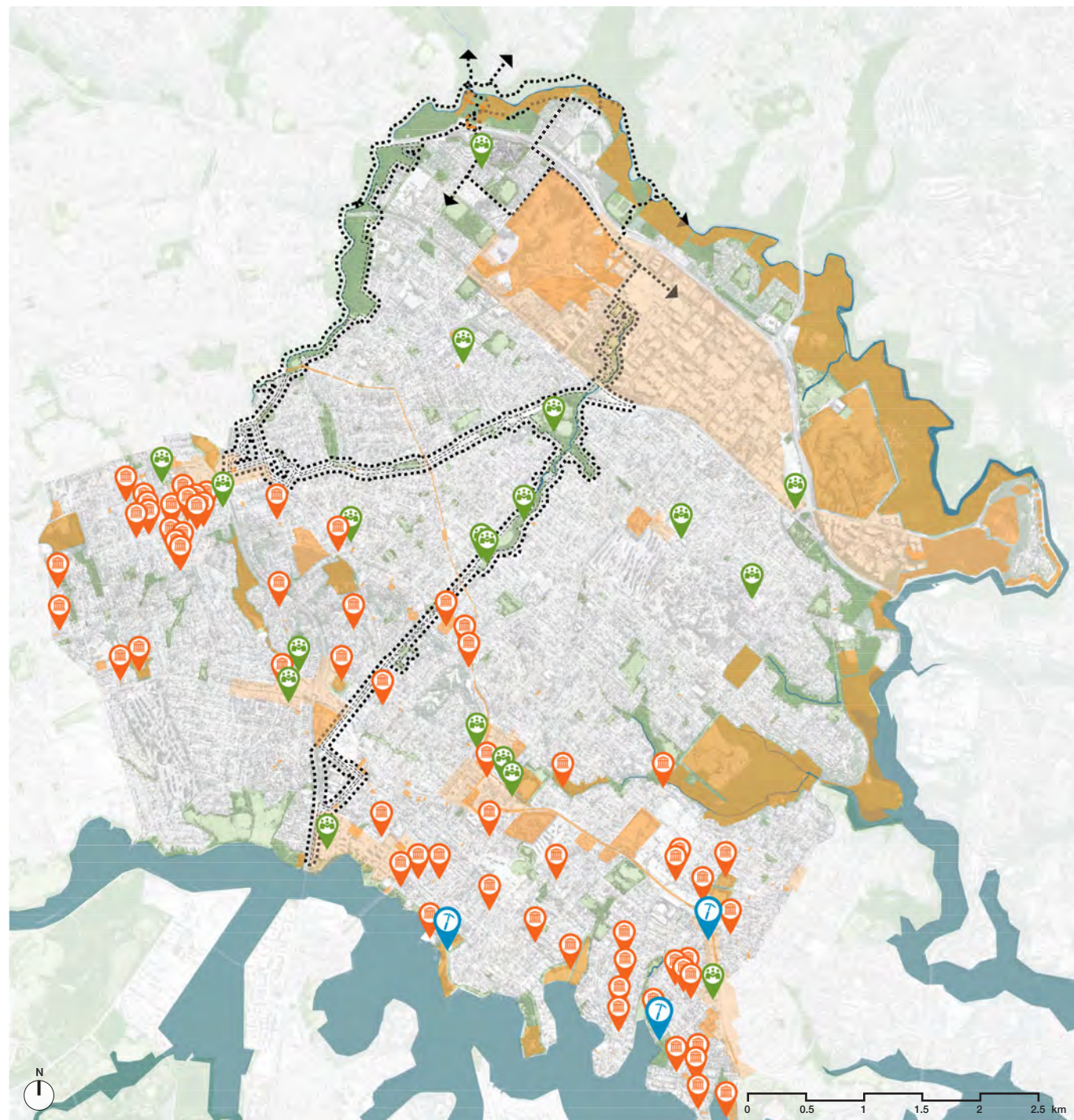
Towards the south, limited facilities are available along the route. At West Ryde and Meadowbank more cultural and community initiatives and spaces are concentrated.

County Green Link & Terrys Creek Green Link

Both corridors have limited community, cultural or art facilities along them. Eastwood forms the node for both Green Links with a high concentration of community and cultural facilities.

The underpasses of the M2 motorway and Epping Rd along Terrys Creek are used by street artists. Potentially there could be a space with a legal street art wall to further accommodate this group of users.

Following community consultation, it will become clear what the wishes and opportunities for these links are.



Culture & community






-  Potential heritage item (City of Ryde Heritage Review (2019))
-  Community facility / centre
-  Archaeology (Ryde LEP, 2014)
-  Heritage (Ryde LEP, 2014)
-  Town centre

Figure 17. Culture and community map (based on: Ryde Local Environmental Plan (2014), City of Ryde Heritage Review (2019))

Table 6. Recommendations for culture & community: The recommendations will be reflective of the needs of the community and responds to one of the City of Ryde's key objectives to create for a healthy, safe and connected community. The community and stakeholder consultation process will play an important role in realising the following recommendations:

Recommendations for culture & community		Relevance (high/medium/low)		
		Shrimptons Creek Green Link	County Green Link	Terrys Creek Green Link
Recognition of Indigenous Australians	<ul style="list-style-type: none"> Respect the Cameraygal and Wallumedegal as the traditional owners of this land. Include and consult the Indigenous Community and support their right to self-determination and ongoing cultural and spiritual values and connections. 	high	high	high
Cultural diversity	<ul style="list-style-type: none"> Value a multicultural society and celebrating the traditions, practices, language and lifestyles that diverse cultures bring to the community. Work for community harmony through respect, understanding and inclusion. 	high	high	low
Equity	<ul style="list-style-type: none"> Increase opportunities for the most disadvantaged members of the community. Recognise and respond to the many forms and factors that affect people's quality of life through services, programs and events. 	high	high	low
Community participation	<ul style="list-style-type: none"> Recognise the importance of meaningful engagement with the community on decisions that impact people's lives. Encourage active involvement in the Green Links Masterplanning process. 	high	high	medium
Social inclusion	<ul style="list-style-type: none"> Create the conditions for people to enjoy life and have the opportunity to interact through play, sport, events and other gathering along the Green Links. 	high	medium	low
Promote public art and protect cultural heritage:	<ul style="list-style-type: none"> Explore opportunities to enhance spaces, connect with the community, and tell stories of a place through public art. 	high	high	medium
	<ul style="list-style-type: none"> Provide places that support events 	high	medium	low
	<ul style="list-style-type: none"> Protect, enhance and interpret cultural heritage 	high	medium	high

2.6 Whole-of-government approach

Funding

This Masterplan follows a whole-of-government approach, with Metropolitan Greenspace Program funding and funding for planning via Department of Planning, Industry and Environment and local government to realise the Greater Sydney Commission's Green Grid and North District Plan vision.

Input and involvement with relevant Government departments, agencies and consent authorities (eg. Sydney Water, RMS, NSW Transport, Department of Planning, Industry and Environment) will be sought to realise the project outcomes and maximise the opportunities for these corridors to provide broad range of community and environmental benefits.

Land ownership

The diagram below illustrates land ownership along the Shrimptons Creek Green Link, County Green Link and Terrys Creek Green Link. The southern section of the Shrimptons Creek Green Link is not included in the diagram overleaf, as no data was made available. The major landowner within the Shrimptons Creek Green Link is City of Ryde, with some sections owned by Sydney Water Corporation, NSW Roads and Traffic Authority and the NSW Department of Planning, Industry and Environment. This Masterplan will propose that the off-road shared user path towards West Ryde will utilise the Sydney Water Corporation owned lands. Adjacent properties are mostly privately owned.

Major landowners at the County Green Link include Roads and Traffic Authority of NSW and Transport for NSW with some of City of Ryde lands. Properties adjacent to the open space corridor are mostly privately owned.

The major landowners within the Terrys Creek Green Link is City of Ryde and NSW National Parks and Wildlife Service. A section is owned by Transport for NSW. The adjacent properties towards the edges are mostly privately owned.



Figure 15. Property map (cadastre info & data provided by the City of Ryde, 2020)



The open space corridor for future green transport connection between Eastwood and Macquarie Park





3.0

GREEN LINKS PRECINCTS

3.1 Overview

For the purposes of this Masterplan, the REM Green Links have been divided into seven precincts, which are defined by their unique character, spatial coherence and roadcrossing locations. The diagram overleaf illustrates the boundaries of the Green Links and the precinct location.

Shrimptons Creek Green Link

The vision for Shrimptons Creek Parklands, as outlined in the Shrimptons Creek Plan of Management (2012), is to recognise the importance of this creek line as a Green Link, connecting Macquarie Park to West Ryde and more broadly Lane Cove River to Parramatta River. This corridor should be maintained and appreciated as a natural area with safe recreational access and act as an ecological buffer to the creek from adjacent urban areas. The parklands will provide clear connections to adjacent environments and networks without compromising their natural character. This corridor links Elouera Reserve, Wilga Park, Quandong Reserve, Booth Reserve, ELS Hall Park, Greenwood Park, Tindarra Reserve, Flinders Park and Santa Rosa Park and has the potential to further connect to Beattie Park and Carara Reserve.

The following precincts for this Green Link have been defined:

- **Macquarie Park Precinct:** From Waterloo Rd to the Epping Rd underpass.
- **ELS Hall Precinct:** From the Epping Rd underpass to Kent Rd, including ELS Hall Park, Greenwood Park and Booth Reserve.
- **Santa Rosa Precinct:** From Kent Rd to Blaxland Rd, including Santa Rosa Park, Tindarra reserve and Flinders Park.
- **West Ryde Precinct :** From Blaxland Rd to West Ryde and the connection to Ryde River Walk/Parramatta River Valley Cycleway at Meadowbank.

County Green Link

This Green Link is named after the County Rd Corridor road reservation (reserved for future road which was not realised). This corridor links Macquarie Park to Eastwood.

The vision for this link is to provide a connected green open space network for recreation, active transport, ecology, culture, while providing a spatial allowance for short term and long term green transport options through the corridor. The following precincts for this Green Link have been defined:

- **Woorang Precinct:** From Kent Rd to Graham Ave.
- **Eastwood Precinct:** From Graham Ave to Eastwood station.

Terrys Creek Green Link

Terrys Creek forms an important regional biodiversity corridor, connecting to Lane Cove National Park. While recreational paths and boardwalks are provided through this area, the main focus is environmental; to protect and enhance the existing ecology.

- **Pembroke Precinct:** From Forrester Park and the M2 motorway, east of Terrys Creek and along Pembroke Park and Lucknow Park.
- **Browns Waterhole Precinct:** From north of the M2 motorway underpass to Macquarie Park, via Browns Waterhole.

The following sections (3.2-3.8) introduce each precinct, describing the existing character, features, uses and key opportunities and constraints.

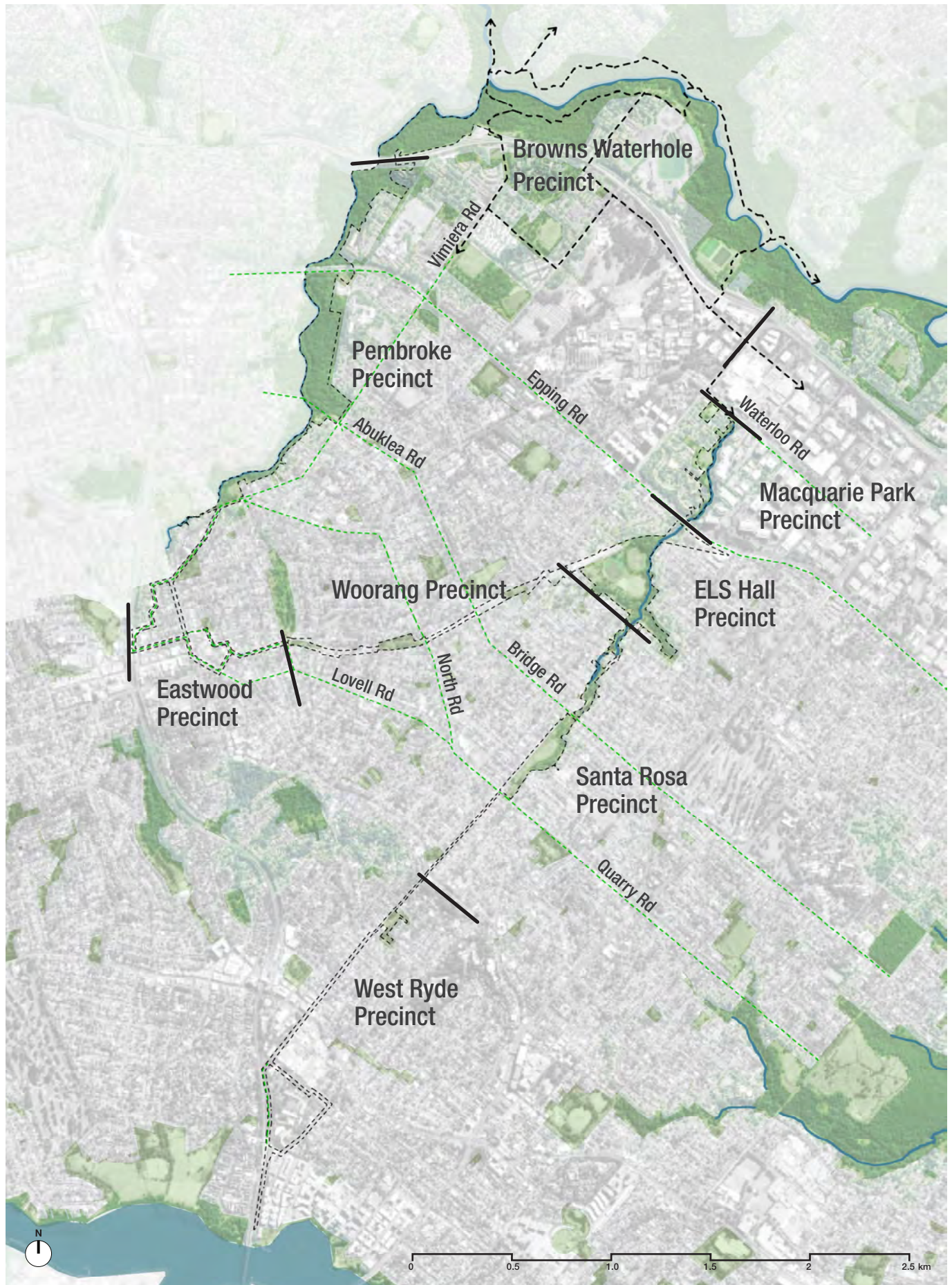


Figure 16. Precincts (black lines show divide), site boundary (black dashed line) and interconnecting networks (green dashed lines)

3.2 Shrimptons Creek Green Link

3.2.1 Macquarie Park Precinct

The Macquarie Park Precinct is the most northern section of the Shrimptons Creek Link and runs from Waterloo Rd to the Epping Rd underpass. This precinct consists of the creek, an existing shared path, open space parkland, a skate park and bushland.

The urban areas adjacent to this precinct are rapidly changing and plans for Macquarie Park redevelopment are well underway. This area is highlighted as one of the urban and economic growth areas of the region. One of the adjacent developments, The Ivanhoe Estate, is an integrated social housing development, including residential properties, community facilities, a high school, retail and green space. Once completed, The Ivanhoe Estate will include 950 social housing and 128 affordable housing dwellings.

The Green Link open space network is also being upgraded, including connections to Waterloo Rd Link. Recently construction works at Wilga Park have been completed.

Existing masterplans have already been developed for this precinct, which have been adopted by Council. These existing plans will be used as the basis for this Masterplan. No cost plans or staging plans will be developed for this precinct.

Environment

The Shrimptons Creek Green Link forms an important biodiversity corridor for regional scale fauna movement. The riparian zone in the lower end of Wilga Park is in good condition and areas of bush regeneration are helping to improve the condition of bushland, such as at Wilga Park.

This precinct has experienced a significant increase in native species richness over the last decades. Meanwhile exotic species richness has increased for all reserves.

The surrounding land uses along Shrimptons Creek comprise is a mix of residential, commercial and light industrial. The creek flows through a thin riparian corridor. The large degree of development on both banks of the creek which caused deterioration of water quality. However, Council has undertaken numerous works in the catchment to aid in water quality improvement.

At the moment several gross pollutant traps have been placed along the creek. However, there is a great opportunity to include more WSUD features in the streetscapes to capture pollutants further upstream, before entering the creek.

Green Transport

The start of the Shrimptons Creek shared path links to Waterloo Rd, which will be developed as a Green Link. This link is well connected to public transport (metro and buses) and to Macquarie Park, providing easy access and connectivity for businesses, students and the broader community.

An existing shared path runs from Macquarie Park along the Shrimptons Creek to ELS Hall Park, via the Epping Rd underpass.

This path is well used by local residents and people that work at Macquarie Park. The path is in this section is 3m wide and follows the property boundary lines, before it continues to wind its way through the corridor and through the native bushland.

Several access points connect to the shared path from the surrounding area. A future bridge will connect the eastern side of the creek to the Shrimptons Creek Green Link as well.

The underpass under Epping Rd requires consideration to improve safety as it currently is quite narrow, has limited site lines, low overhead clearance and is at time flood affected. Particularly the southern end of the underpass is dangerous. The space itself doesn't feel inviting or safe. There is an opportunity to incorporate a lighting strategy or public art to improve vision and safety of this space.

Recreation

The main recreational use in this area is walking and cycling along the shared path. A few moments along the route offer other recreation opportunities:

- The large open lawn space at Wilga Park offers opportunities for sport and play and people use the stage for yoga and play.
- The current and future proposed skate park also forms an important recreational space for youth.
- Along the shared path several passive spaces are situated that can be used for picnics or informal play. These spaces have the potential to be further activated, while retaining the informal character.

Culture & community

A wide range of users from different backgrounds and ages use the open space along the Shrimptons Creek, both residents and people that work at Macquarie Park and study at Macquarie University.

The recently completed Wilga Park provides opportunity for community and cultural events to take place to celebrate community culture and diversity. An amphitheatre like space is created with terraced seating enclosing a lawn. This space has a public art piece on the lawn and a podium with art integrated on it.

Graffiti artist use the current small and dated skate park for street art. This space forms a gathering space for youth. It is intended that the existing small skate park will be decommissioned during the Ivanhoe Estate redevelopment. A new and improved skate park will be built nearby in the Green Link corridor as a component of the Ivanhoe Estate redevelopment which will better meet the needs of the community.

A distinct feature is the underpass under Epping Rd. This forms an interesting space which might lend itself to activation and public art, but currently lacks amenity.



The start of the Shrimptons Creek Link at Waterloo Rd, Macquarie Park



Recently upgraded Wilga Park with public art, an outdoor stage and event area



The existing shared path through native vegetation along the creek



Shared path along open space, with views to Macquarie Park



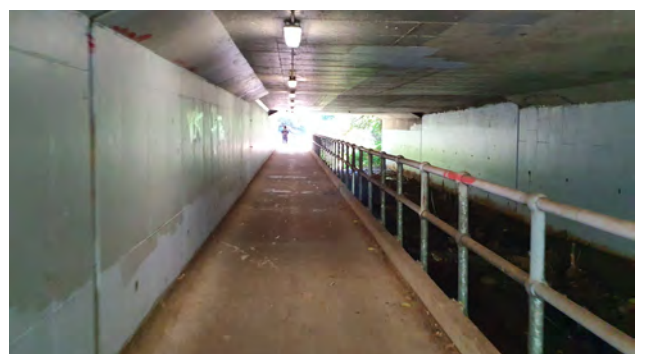
Existing skate park between the shared path and the creek to be decommissioned with a new skate park to be relocated in the Green Link corridor



Shrimptons Creek (there are bush care initiatives along creek and its banks)



Gross Pollutant Traps along the creek



Epping Rd underpass - shared path adjacent to the creek. Opportunity for art and community murals

3.2.2 ELS Hall Precinct

The ELS Hall Precinct consist of a section of the Shrimptons Creek Green Link, from the Epping Rd underpass to Kent Rd, and includes ELS Hall Park, Booth Reserve and Greenwood Park. The Shrimptons Creek shared path continues along the corridor towards Santa Rosa Park, while several paths along and into ELS Hall Park connect to the County Green Link (connecting to Eastwood).

ELS Hall Precinct forms a node in the Green Links network and plays a central role for the community, offering community sport facilities and clubs, childcare centres, public parklands, playground and a public school.

Existing masterplans have already been developed for this precinct, which have been adopted by Council. These existing plans will be used as the basis for this Masterplan. No cost plans or staging plans will be developed for this precinct.

Environment

This section of the Shrimptons Creek Green Link is partially made up of Sydney Turpentine-Ironbark Forest, with small linear pockets in ELS Hall Park and Booth Reserve, and a larger remnant in Greenwood Park. Sydney Turpentine-Ironbark Forest is listed as an endangered ecological community and is subject to numerous threats within urban areas.

Areas of bush regeneration are helping to improve the condition of bushland in Booth Reserve and Greenwood Park and areas of revegetation are helping to increase the extent of bushland and habitat in ELS Hall Precinct.

The Shrimptons Creek Green Link contains significant weed incursion along its length, with a wide variety of weed species present throughout. The linear nature of the creek corridor leaves the vegetation vulnerable to weed invasion due to its high edge to area ratio. Stormwater runoff from urban areas typically contains high nutrient loading, further favouring introduced species over native vegetation.

Almost all of Booth Reserve and Greenwood Park are subject to flooding, with flood depths in Booth Reserve exceeding 2m in 100 year ARI events. Much of ELS Hall Park is also subject to flooding, with depths ranging from 0.25m or less on the playing fields to over 2m along Shrimptons Creek below. Greenwood Park is susceptible to flood depths of up to 1.5m in 100 year ARI events.

The risks to park users during flood events are high, particularly in events which cause a rapid rise in water levels in Shrimptons Creek. There are five (5) stormwater outlets directly to Shrimptons Creek, and at least four (4) additional outlets feeding tributary waterways within the site area. In severe rain events, this can lead to high volumes of water flowing through the stormwater system and entering waterways at high speed.

Green Transport

The shared path continues along the creek and also connects to ELS Hall and all facilities. Usage is similar as to the Macquarie Park precinct, but with a stronger community focus. This route is popular for walking and cycling.

The existing shared path along the creek is approximately 3m wide, which works well for the current level of use. Some of the connecting paths are 2.0 to 2.5m wide and have narrow points and blind spots.

There are several options to connect to ELS Hall Park and to the future County Green Link, including a steep on-road connection via Scott St. The path structure lacks a hierarchy and clarity. It is not clear which routes to use. There is an opportunity to improve this link.

Considering the expected urban growth in this area, there is a great potential for people to live, work and go to school/university locally. Improving the Shrimptons Creek Green Link and providing clear strong connections for active transport, allows people to move around on their bikes or by foot and leave the car at home.

Recreation

Given the scale of ELS Hall Park and its location as a central node in the Green Links network, this park plays an increasing role as a regional park. However, at the moment it reads as a confused collection of disparate elements and lacks coherency as a regional park.

A recent ELS Hall Park, Greenwood Park and Booth Reserve Masterplan for this area has been developed and several areas have already been upgraded. A new shared path, a regional playground, new parking facilities and a dog off leash area have recently been constructed. This park also offers a wide range of indoor and outdoor sporting facilities.

The recent ELS Hall Park, Greenwood Park and Booth Reserve Masterplan also identifies potential to expand the parklands. The Green Links Masterplan presents the opportunity to formally integrate the lands not currently owned by Council (ie. other government agencies) into the parklands for recreation purposes.

Culture & community

ELS Hall Park provides sports, play and leisure opportunities for its diverse community, but there is no expression of culture or heritage through public art. Given the central role this park plays within the Green Links network and its community, it would be worth considering how art, culture and heritage could be integrated within the park.

The indigenous heritage could be celebrated both at ELS Hall Park and along the shared path and Shrimptons Creek.



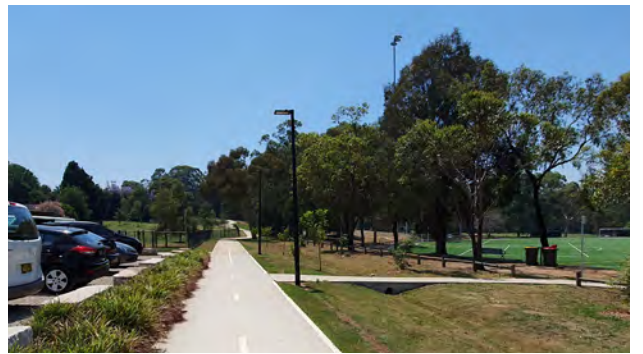
Epping Rd underpass and shared path at the southern side



The underutilised open space between Shrimptons Creek and Epping Rd



South facing view over a sports oval at ELS Hall Park



New shared path north of ELS Hall, running along the dog off leash area, regional playground, car park and sports fields



Bush care site east of Shrimptons Creek, between the creek and Epping Rd



ELS Hall Park: lighting, grass and synthetic sports fields, spectator areas, amenities buildings, sport centre, club facilities and pathways and car parking areas



The shared path in Booth Reserve along Shrimptons Creek Green Link



Crossing in Greenwood Park connecting to Trevitt Rd and further along the Shrimptons Creek Shared Path

3.2.3 Santa Rosa Precinct

The Santa Rosa Precinct is bound by Kent Rd to the north and Blaxland Rd to the south and is comprised of three distinct areas; the Shrimptons Creek Green Link, Santa Rosa Park and to the south the Sydney Water reservation zone.

Environment

The Shrimptons Creek Green Link continues into Santa Rosa Precinct, linking up Tindarra Reserve, Flinders Park and Santa Rosa Park.

Blaxland Rd forms the most southern point of this precinct and runs along the crest of the hill, forming the natural watershed of the Shrimptons Creek catchment to the North. The creek starts at Santa Rosa Park. To the south all pre-existing creeks have been removed and stormwater pipes drain the water from this catchment towards Parramatta River.

Areas of bush regeneration are helping to improve the condition of bushland in Santa Rosa Park. Considerable weed control has also been undertaken along the lower section of Shrimptons Creek in Santa Rosa Park which also has a newly constructed rain garden and detention at the upper end of the creek that is creating additional habitat. A viewing deck with information signage is provided at this location as well.

Green Transport

The northern section of this precinct, along Shrimptons Creek, has an off-road shared path, with a few narrow sections. The continuity of the shared path is interrupted at the road crossings at Kent Rd and Bridge Rd and further south two additional crossings will be required at Quarry Rd and North Rd.

Between Tindarra Reserve and Flinders park cyclists and pedestrians using the shared path are required to use a short on-road route via Ford St.

From Bridge Rd there are two shared paths entering Santa Rosa Park on either side of Shrimptons Creek. Access for pedestrians and cyclists over Bridge Rd to the Eastern Side of the creek in Santa Rosa Park is an issue that requires attention.

South of Santa Rosa Park there is no clear continuation of the shared path. The currently fenced off open space corridor, which commences at Quarry Rd, provides the opportunity for the continuation of the Shrimptons Creek Green Link towards West Ryde.

Recreation

Santa Rosa Park is a popular destination for local residents and has the potential to be a regional destination within the LGA.

An old (approx 25 years) playground is in the southern corner of the park. A regional playground will be located and developed for the park as a component of the Green Links Masterplan, making the old playground redundant.

In the south-eastern corner of Santa Rosa Park there is a car park and the community garden 'The Habitat' is located, with both a veggie garden and native garden. The community can buy seedlings here, or obtain gardening advice, volunteer their time or attend educational workshops. Consideration could be given to potential expansion of the community garden. An amenities building is also located in this area.

Central at the arrival into the park is a community building, currently leased by a scout group. Consideration could be given to removing the fence, rehabilitation of the surrounding area to creating a space that provides a more welcoming entry to the park and other community facilities (eg. potential community centre, cafes etc). This space could form a welcoming entry to the park, with a café and/or a community centre. Fencing will be removed; the surrounding area should be rehabilitated, and a review of the building's function, form, purpose and/or refurbishment to be considered.

North of the building is an unlit sport field, which is also used as a dog off leash area (unfenced) which is available outside of sporting use. This leads to user conflicts; people sporting in the park, cyclist using the shared path and dogs running around.

At the northern entrance of the park, hidden in the bush vegetation, there is another smaller community building currently leased by the Australian Air League Ryde Squadron. This building is old some consideration may be required for future structure and/or upgrades, function and purpose.

Along the creek are several opportunities to activate open spaces by improving amenity. The oval and community buildings have the potential for greater sport and recreational uses.

Culture & community

Santa Rosa Park forms the centre of this precinct and plays an important role within the community. It is used locally and has a strong community feel, which should be further developed to create more openness and legibility. The community garden and nursery is another important place that draws people to the park.

Some consideration could be given to the look, feel, future structure and/or upgrades, function and purpose of the central building at the southern entrance of the park, concentrating more community activity in the park. The oval and the community buildings have the potential for greater community uses and community events.



Shrimptons Creek shared path on the southern side of Tindarra Reserve with bushland and open space along it, which could be activated



A narrow section of the shared path at Tindarra Reserve



Shrimptons Creek shared path through native vegetation in Santa Rosa Park



Bridge Rd crossing and path network between Flinders Park and Santa Rosa Park are somewhat misaligned and requires some attention



Santa Rosa Park oval used for sport, recreation and dog off leash area outside of sporting use.



Community building with fenced compound at the southern entrance of the park, currently leased by the scouts



The habitat community gardens



Quarry Rd crossing south of Santa Rosa Park, facing the fenced off open space corridor

3.2.4 West Ryde Precinct

The West Ryde Precinct includes an open space land reservation owned by Sydney Water from Blaxland Rd to Goodwin St, including Carara Reserve. South of Goodwin St on-road connections will provide connections to West Ryde and Meadowbank.

Environment

Blaxland Rd forms the ridgeline and watershed divide, with to the north the catchment forming Shrimptons Creek and to the south water being collected in stormwater pipes, which run towards Parramatta River.

Urban developments and associated clearings of native vegetation have formed a barrier for ecology. The ecology map in section 2.2 highlight flood prone areas. These areas also mark the location of where creeks originally would have run. All water courses in this precinct have been put underground in pipes.

Despite the loss of ecology, the gardens, streetscapes and surrounding parklands still contain pockets of valuable ecology, including mature trees. Some of these areas are listed as high / moderate biodiversity conservation priority. Particularly along the rail corridor between West Ryde and Meadowbank a relatively large area of high value bushland can be found.

There is a potential to create the missing link through the Sydney Water owned green corridor and create an ecological connection between Santa Rosa Precinct and the biodiversity corridor along the railway.

Green Transport

Key destinations in the precinct include:

- West Ryde Station (and centre)
- Meadowbank Station (and centre)
- Meadowbank Wharf
- John Whitton Bridge crossing over the Parramatta River providing connectivity to the south/western side of the river (including Rhodes and Sydney Olympic Park).
- Ryde River Walk/Parramatta River Valley Cycleway

This section of the Shrimptons Creek Green Link forms a missing link in the open space and active transport corridor. The northern section, from Blaxland Rd to Goodwin St has the space for an off-road shared path connection through the green open space corridor. Gradients are very steep in this section (average of 11% over 400m).

South of Goodwin St on-road connections will be required to connect to West Ryde station and Meadowbank. The roads are wide and the local suburbs are relatively quiet, which could provide achievable safe on-road connections.

Between West Ryde and Meadowbank a continuous and safe active transport corridor could be created along the railway line.

This precinct includes two major road crossings:

- Blaxland Rd Crossing: this road consists of four lanes and the crossing has limited overview, and no refuge.
- Victoria Rd Crossing: this road consists of six lanes and the crossing is regulated with traffic signals. When moving south on Hermitage Rd, there are no pedestrian or cyclist traffic signals.

Recreation

Within this precinct there are limited opportunities for recreation. The northern section is in a suburban setting and sections of the open space corridor are fenced off. These spaces could be activated by providing connections and opportunities for recreation, such as picnic facilities and playgrounds.

The southern section connects to West Ryde station and Ryde River Walk / Parramatta Valley Cycleway, along which many playgrounds, parks and sporting facilities are located. There is some interconnection with other parks nearby eg. ANZAC Park with a recent playground upgrade.

Culture & community

The West Ryde Precinct is not yet developed as a Green Link and has limited access and use by the community. As a result, there is limited expression of culture or heritage, particularly in the northern section.

The more densely urban area at West Ryde and Meadowbank have a diverse community and a rich history.

The John Whitton Bridge is one of the highlights with heritage value, which can be experienced from the underpass at Meadowbank Wharf and from the shared path bridge crossing over the entire width of the Parramatta River.



From Blaxland Rd south onto Benson Lane; steep gradients and a beautiful view of Parramatta River Valley



Fenced off open space corridor at the end of Benson Lane



Carara Reserve forms a continuation of the open space corridor



Hermitage Rd as one of the potential on-road connections to West Ryde and Meadowbank



From Carara Reserve to West Ryde and Meadowbank the Green Link will continue as an on-road route



On-road connection to Meadowbank with an overpass crossing Constitution Rd



John Whitton Bridge underpass at Meadowbank Wharf



Ryde River Walk/Parramatta Valley Cycleway at Meadowbank, facing the John Whitton Bridge

3.3 County Green Link

3.3.1 Woorang Precinct

Woorang Precinct runs through the suburbs between Macquarie Park and Eastwood, from Kent Rd to Graham Ave/Welby St. The open space corridor has in the past been referred to as County Rd Corridor. This corridor exists in large part as a result of being a special land reservation set aside for a future potential regional road/transport connection which has not been realised.

Environment

The area within corridor has some large trees, but mostly consist of open lawn space. The highest point is located halfway the corridor, at Waratah St, forming the watershed. A small creek runs towards Jim Walsh Park, between Grove St and Orange St and it resurfaces again in Jim Walsh Park, where it forms a small wetland with significant habitat value.

In this area adjacent private gardens include a mix of different vegetation styles and street trees are primarily semi mature deciduous trees (London plane tree).

The large open space at the top of the hill in the easement, has a stand of mature trees with a selection of native Blue Gums with low to moderate biodiversity.

Jim Walsh Park at the southern end of the precinct has a high biodiversity value with significant stands of Sydney Blue Gum Forest.

This corridor has the potential to link Shrimptons Creek to Terrys Creek, via Jim Walsh Park. New trees can be planted to provide shade and urban cooling. Particularly in some of the completely 'empty' spaces, such as the area east of Abuklea Rd.

Green Transport

Key destinations in and along the precinct include:

- Kent Rd Public School; providing a safe active transport connection through this corridor could enable children that live in the surrounding suburbs to ride to school
- Jim Walsh Park: one of the few larger public spaces in this precinct
- Kotara Park Tennis Courts; Abuklea Rd is one of the inter-connecting on-road active transport connections.
- On-road connections Eastwood Train Station (and centre); this is discussed on the next page.

This precinct is an important future connection for green transport between Macquarie Park and Eastwood. The property map in section 2.6 shows that some lands through this Green Link are owned by Transport for NSW and Roads and Traffic Authority of NSW.

An important consideration for green transport through this corridor are the levels. As the route runs up the hill towards at Waratah St, gradients can get quite steep. The average gradient on both sides of the ridgeline is 3.8% and the maximum elevation gain is 32m. There are several sections with a gradient between 7-10%.

Recreation

Most of the open space corridor is currently a maintained grass area which is fenced off, limiting recreational opportunities within this precinct. The open space west of Abuklea Rd is used by kids for informal play e.g. to ride down the hill. The space is completely empty and open, without any trees or facilities.

There is a great opportunity to open up these open spaces and to provide facilities to activate the space, such as:

- play areas
- picnic and BBQ facilities
- café along the route
- sporting facilities

It is also important to also retain the existing 'quiet' character of certain spaces, which will allow for passive recreation.

Culture & community

This suburban precinct currently lacks a strong sense of place or identity. The Green Links Masterplan can contribute to developing the identity of this area. As the cultural backgrounds of the community is very diverse, it will be important to provide spaces that cater to the wide range of users. Important in this process will be community engagement, public art and public events.

Links to Aboriginal communities and uses can be explored and used in designing the Masterplan. People have been living in this region for many thousands of years - an incredible source of knowledge an inspiration.



Large (underutilised) open space between Abuklea Rd and Herring Rd



Facing West towards Woorang St, an on-road section of the shared path



At the end of Woorang St, facing west towards the fenced off open space corridor



At Grove St, facing east into the fenced off open space corridor



Entrance to a relatively new section of shared path between Grove St and Orange St



At Orange St, facing west toward the fenced off open space corridor



At Graham Ave, facing east into the fenced off open space corridor



At Graham Ave, facing towards Jim Walsh Park, a potential future link

3.3.2 Eastwood Precinct

Eastwood is one of the key destinations for the REM Green Links to connect to and was highlighted as priority corridor in the Greater Sydney Commission North District Plan. This precinct forms the node between the County Green Link, Terrys Creek, and the connection towards Denistone and onwards.

Environment

In this area street trees in the Eastwood town centre are mix of mature native trees along First Ave and newly planted native trees in the median on Rowe St as part of street upgrades.

Jim Walsh Park at the northern end of the precinct has a high biodiversity value with significant stands of Sydney Blue Gum Forest. There are a significant number of mature Brush Box to the surrounding areas of Eastwood oval.

In this area, the streetscapes include a mix of different vegetation styles. For example:

- large and well established trees, particularly along First Ave and in the adjacent private gardens east of Blaxland Rd
- areas with relatively little vegetation, particularly at Eastwood Centre

Green Transport

Key destinations in the precinct include:

- Jim Walsh Park
- Eastwood town centre (and schools)
- Eastwood Train Station
- Eastwood Oval (west of the train station)
- Future link South to Denistone Station (and centre)
- Sommerset Park via Vimiera Rd

This precinct currently has several on-road connection options, but none are clearly marked or provide a clear continuous connection to Eastwood centre. Creating this (on-road) active transport link is critical for the success of this Green Link corridor.

There are a few options that can be explored:

- At Jim Walsh Park, Welby St connects down Edgar St, Blaxland Rd and to Rowe St (or one of the roads parallel to the north), which continues to Eastwood centre: this option will require a separated path along Blaxland Rd, as this is a busy regional road. The intersection of Blaxland Rd and First Ave will be a major crossing point as both roads consists of four lanes and the crossing has limited overview because of the sweeping corner on Blaxland Rd, and very little existing refuge within the current intersection structure.
- Alternatively, a route via Aster St, Fig Place and the alley towards Blaxland Rd could provide a safe connection. From here Ethal St runs towards Eastwood Station. Blaxland Rd crossing will be a challenge for this option.

The link towards the interconnecting active transport link of Vimiera Rd should be explored as well. This will provide access further north and to Terrys Creek.

Eastwood Station forms an important destination and connector in this precinct, for commuting and recreation. Providing connections to the station provides the opportunity to include the train and bus in the green transport links. As this area is quite hilly, some people might use the train to avoid steep climbs.

Recreation

The centre of Eastwood is a popular recreational destination and with its many restaurants and cafés it's a lively and interesting town that attracts visitors from all over Sydney.

Eastwood Park is well-used by the community for sport and recreation purposes.

Within this precinct, its mainly about improving green transport connectivity. The area already provides many facilities. Community consultation will provide more detail on requirements for this precinct.

Culture & community

Eastwood is a lively and very culturally diverse town. There are particularly strong Chinese and Korean community identities in Eastwood. The community often has daily tai chi sessions in the mall and buskers often perform in the town centre. There are multiple long standing and multi-cultural sporting clubs in the area.

An annual 'Granny Smith' festival, Eastwood Public School Spring Fair and street food festivals bring people from all around Sydney to Eastwood.

Eastwood has existing community facilities with libraries, multicultural community centres, Country Women's Association, and youth organisations. The library runs regular art exhibitions and also houses community groups. There are also active bushcare and environmental groups in Eastwood.

Including a wide diversity of community and cultural groups in the Green Links community consultation process will provide ample opportunity to further engage with community, arts and culture.



From Jim Walsh Park an on-road bike path continues onto Welby St



On-road bike path on Welby St



On-road route via Aster St



Potential connection to Eastwood via Fig Place and an alleyway towards Blaxland Rd



Blaxland Rd Crossing into Ethel St



Ethel St towards Eastwood Centre and Station; including some mature trees in the streetscape



Eastwood Station (eastern side) and Railway Parade



Tai Chi at Eastwood mall

3.4 Terrys Creek Green Link

3.4.1 Pembroke Precinct

Pembroke Precinct consists of reserves on the eastern side of Terrys Creek (forming the western boundary of the LGA) and continues north under Epping Road and to the M2 motorway underpass. A similar area is managed by the City of Parramatta on the western side of the creek. The corridor consists of over 40ha of continuous bushland south of the M2, with good connectivity to the Lane Cove National Park via an underpass at the M2. The riparian zone is dominated by a diverse mix of native trees that offer habitat and deep shade to wildlife/bird species in the corridor. Local connections extend through the National Park through Lucknow Park, Forrester Park and Pembroke Park which in turn links to the Epping Aquatic Centre and the TG Millner Sports Ground Reserve.

Ecology

Terrys Creek forms an important regional biodiversity corridor, linking to the Lane Cove National Park. The relatively large area combined with connectivity has allowed the establishment and/or persistence of species absent in smaller, disjunct reserves in the area. Fauna “highlights” include apparently comparatively abundant (and breeding) populations of Swamp Wallabies and Long-nosed Bandicoots, high bushland bird diversity and several established pairs of Powerful Owls. A total of approximately 90 animal species have been observed in the corridor (Flora and Fauna Study (2017))

Several opportunities were identified where habitat enhancement of streetscapes and existing bushland areas may support improved connectivity between local corridors and regional corridors across Ryde. The primary role for these areas of opportunity would be to enhance a series of stepping stones between corridors for the more mobile fauna species. Any enhancement of these areas should be carried out in line with the City of Ryde Urban Forest Plan (2013).

Wildlife Protection Areas are in place at Terrys Creek Green Link; Forrester Park, Forsyth Park, Pembroke Park, Lucknow Park and Somerset Park to better protect the unique native wildlife in this high conservation bushland corridor.

Green Transport

Terrys Creek includes a bushtrack and several connections to the surrounding streets and tracks. The bushtracks link to the walks in Lane Cove National Park.

There is an opportunity to improve facilities at access points into the reserve, including the provision of bike racks, water stations and information signage.

Recreation

This precinct is mainly used for walking, running and enjoying nature.

Immediately adjacent to Terrys Creek, at Forrester Park, a large open space is used for sports and recreation as well. This park has the potential to be further activated by providing passive park enhancements such as picnic areas and play spaces.

There is an opportunity to improve information signage at the southern entries to Terrys Creek. At the moment it is unclear if cyclists / mountain bikes can access the track. At the northern end of the track, at Browns Waterhole it is clearly marked.

Culture

The community has rated the natural and green spaces as the number one most valued aspect of living in the City of Ryde. Though probably not well-known by most, Terrys Creek is well loved by locals and invaluable as a biodiversity corridor into the centre of the Lane Cove National Park. The creek is gradually being restored as a place of natural beauty and as a functioning ecosystem, with a few paths providing recreational access through the reserve and to Lane Cove National Park.

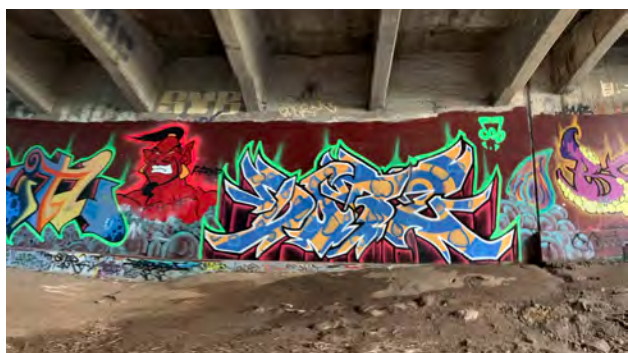
There are stories to be told here about Aboriginal connections to the River, settlement history and recent community efforts to restore native vegetation.



M2 motorway underpass connecting to Lane Cove National Park (ecological and recreational)



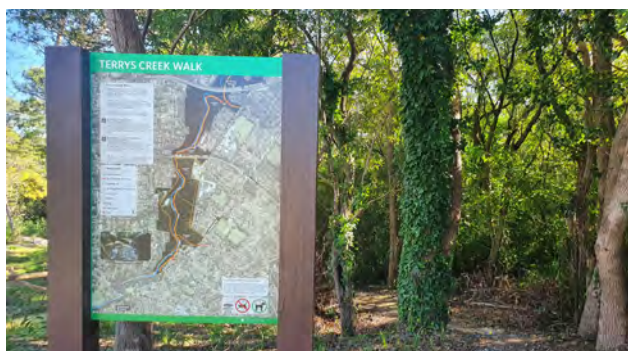
Epping Rd underpass is an ecological pinch point in the corridor and could be improved to encourage safe passage through for fauna



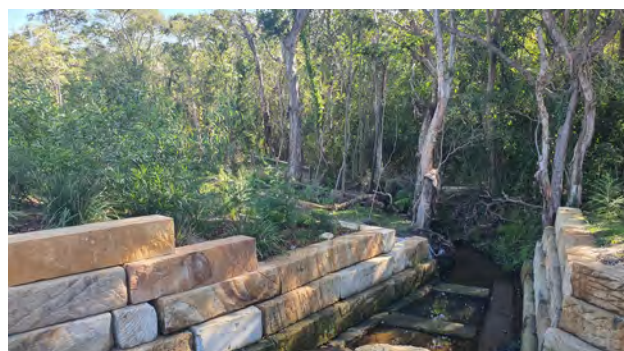
Graffiti artwork at the Epping Rd underpass



Terrys Creek Waterfall



Signage at the entrance of Terrys Creek walk



Recent works at Terrys Creek include bank stabilisation at the stormwater outlet to Terrys Creek



Forrester Park: the access points to Terrys Creek could be further activated at this park



Jim Walsh Park: a potential link to Terrys Creek (ecological and recreational)

3.4.2 Browns Waterhole Precinct

The Browns Waterhole Precinct runs from north of the M2 motorway underpass to Macquarie Park, via Browns Waterhole, which forms a node in the regional recreational network providing connections to the Great North Walk, Terrys Creek Walk, Lane Cove National Park, Vimiera Rd and Kissing Point Rd. Browns Waterhole is a wide, shallow section of the Lane Cove River, downstream of a concrete weir. There is a concrete shared cycle/footpath crossing over the top of the weir, linking Kissing Point Road, South Turramurra to Vimiera Rd, Macquarie Park. The focus of this precinct will be on connections to the surrounding networks and in particular the connections to Macquarie Park.

Ecology

Browns Waterhole Precinct connects Terrys Creek to Lane Cove National Park, both important regional biodiversity corridors. There is an opportunity to enhance ecology through a series of stepping stones between corridors for the more mobile fauna species. Any enhancement of these areas should be carried out in line with the City of Ryde Urban Forest Plan (2013).

Apart from enhancing and protecting biodiversity in this precinct, it is important to minimise disturbance by people. This can be achieved by providing clearly marked routes, provide dense barrier vegetation where access should be prevented, and prohibiting certain types of recreational use.

Green Transport

North of Vimiera an underpass under the M2 motorway provides connection to the concrete path that runs down to Browns Waterhole and back up to Kissing Point Rd, South Turramurra. This is one of the key connections for cyclists and pedestrians to cross Lane Cove National Park and the M2 motorway, connecting the City of Ryde with Kur-Ring-Gai Council.

At the north side of Vimiera Rd an off-road bike path connects to Macquarie University. On-road connections (Waterloo Rd and Epping Rd) provide connections to Macquarie Park.

There is an opportunity to improve information and wayfinding signage.

Recreation

On the western side of Browns Waterhole, there is a picnic table and small clearing with a view over this section of the river. From Browns Waterhole several recreational routes connect to the surrounding suburbs, Lane Cove National Park and Terrys Creek:

- Terrace Ave Track along Terrys Creek. This route is for pedestrians only.
- Browns Waterhole Track between Vimiera Rd and Kissing Point Rd. This concrete path is for cyclist and pedestrians. A dirt track also connects to Eastcote Rd in North Epping.
- Busaco Trail south of Lane Cove River connecting to Busaco Rd. This is a fire trail and can be used by pedestrians and mountain bikes. This trail is one of the connections to Macquarie Park.
- Lane Cove Valley Walk (Great North Walk) through Lane Cove National Park. This path can be used by pedestrians and mountain bikes.

Culture

The community has rated the natural and green spaces as the number one most valued aspect of living in the City of Ryde. Lane Cove National Park is probably the best known and most used National Park in Ryde. This appreciation of and connection to nature through recreation is an important cultural aspect for residents of the City of Ryde.

There are stories to be told here about Aboriginal connections to the River, settlement history and recent community efforts to restore native vegetation.



Information signage at Browns Waterhole



The concrete shared cycle/footpath crossing over the top of the weir at Browns Waterhole, linking Kissing Point Road to Vimiera Rd



Two concrete paths south of Kissing Point Rd, towards Browns Waterhole



The Busaco Trail (bushfire trail) connecting Browns Waterhole with Busaco Rd, Macquarie Park



The end/start of Busaco Trail (bushfire trail) connecting Browns Waterhole with Busaco Rd, Macquarie Park



Busaco Rd facing south towards Macquarie Park



M2 motorway underpass at Busaco Rd offers an opportunity for lighting (art)



Bike path connection to Macquarie Park from the northern end of Vimiera Rd





4.0 BENCHMARK STUDY

4.1 Cooks to Cove Greenway



Overview

The Cooks to Cove GreenWay connects the Bay Run at Iron Cove to the Cooks River Foreshore path. The GreenWay was first conceptualised in 1998 by enthusiastic local community advocates who saw the potential for an environmental, cultural and sustainable transport corridor, including active (non-motorised) transport and public transport (light rail) along the route of the former Dulwich Hill Goods Line. In 2016 and 2018 NSW funding was made available to realise this vision.

Guided by a Masterplan and Implementation Plan, the corridor will open in phases through to anticipated completion in 2030.

LOCATION

INNER WEST, SYDNEY

YEAR

1998 - 2030

SIZE

5.5 KM

BUDGET

\$25 MILLION AUD

Lessons for the REM GreenLinks

- The GreenWay runs through a densely populated inner city area with new urban developments. It offers valuable open space for the community.
- The community has played a central role, from conception through to the Masterplan and detailed design. Opposing views or interests have been resolved through community consultation and negotiation.
- It connects two regional active transport networks: Bay Run and Cooks River Foreshore path. The GreenLinks connects Parramatta River with Lane Cove River.
- The project focuses on 'missing links' and includes a few on-road sections, similar as to the REM GreenLinks.





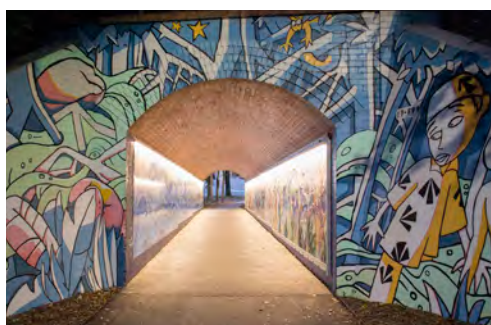
Active & Sustainable Transport

The GreenWay is both an active transport and transit corridor, including a 5.5km shared path along the lightrail corridor. The GreenWay shared path connects the Bayrun with the Cooks River shared path.



Ecological Corridor

The GreenWay forms an ecological corridor in which 16 urban bush care sites are established and maintained by community volunteers and council bush care/biodiversity specialists.



Arts & Culture

Natural and cultural qualities of the GreenWay are celebrated through art and community culture, including events, such as the annual GreenWay art prize, GreenWay day of action and Carols and movie nights.



Multi-Purpose Recreation

The parks along the GreenWay are linked and activated. The park includes tennis courts, netball courts, basketball courts, exercise equipment and a playground, but is dominated by informal open turfed areas.



Sustainability Education

The GreenWay is used as an outdoor classroom to teach primary, secondary and tertiary students about urban sustainability challenges in the 21st century.

4.2 Parramatta River Valley Cycleway



Overview

In the 1990's, Parramatta Council initiated a project to provide a shared path along the length of the Parramatta River, at the centre of the Parramatta CBD and the local government area. With the support of State and Federal Government agencies, over the last decade the project has delivered the shared vision of a dedicated pathway along the rivers foreshore. In 2019, the final link of the Parramatta Valley Cycleway (PVC) was completed, allowing cyclists and pedestrians to travel on a separated path for nearly 20 kilometres along the river foreshore, connecting Parramatta Park to Sydney Olympic Park.

LOCATION

PARRAMATTA, SYDNEY

YEAR

1990 - 2019

SIZE

20KM

BUDGET

UNKNOWN

Lessons for the REM GreenLinks

- A key learning from the project was the need to provide separated cycle and pedestrian access. With the steadily increasing number of users as well as future increases in residential development along the river, conflict and concerns have arisen, which required the retro-fitting of a separated pedestrian pathway to the corridor. Understanding the needs of the users is a critical factor in ensuring that projects maintain long-term viability and comfort for all users.
- This project re-connects the community with the river, providing access along its foreshore and protecting and enhancing its ecology.
- The project focusses on 'missing links' and includes a few on-road sections, similar as to the REM GreenLinks.
- The foreshore path connects several other regional active transport links.
- Provides connectivity to Parramatta business centre, similar as the Green Links to provide connectivity to Macquarie Park business centre.





Active & Sustainable Transport

The cycleway includes: 13km of dedicated riverside shared paths (3 metres wide); 1.5km of elevated boardwalks through intertidal and ecologically sensitive zones; 12 bridge crossings, including three new pedestrian and cycle focused crossings across the Parramatta River, promoting active transport. The cycleway and end of journey facilities at Parramatta Station, such as the free secure bike shed, further promotes mixed mode green transport.



Ecological Corridor

Water-sensitive urban design initiatives, such as elevated boardwalks through intertidal and ecologically sensitive zones.

Provides residents and visitors with access to the river and the broader natural environment.



Arts & Culture

Building a vibrant and active local community. A number of events are hosted on the foreshore including markets at Ermington and Dragon Boat Racing.



Sustainability Education

Environmental awareness and education opportunities, the Parramatta River Catchment Group runs awareness campaigns and is involved with education groups.



Multi-Purpose Recreation

Recreation opportunities are provided that help build a sense-of-place, including multiple playgrounds and fitness stations.

4.3 Narrabeen Lagoon Trail



Overview

The Narrabeen Lagoon Trail is a multi-use recreational walking and cycling loop trail, located in a densely populated area of Northern Sydney. It runs through bushland, parks and passes by amenities such as parking areas, other recreational activities and cafes/restaurants. The trail has been undergoing development since 2010 with the final stage of the trail opening in 2015. Completion of the final section means that the 8.5 km trail fully circumnavigates Narrabeen Lagoon linking the suburbs of Narrabeen and Cromer from both directions, providing a trail for pedestrian and cyclist use that is entirely off-road.

LOCATION
NARRABEEN, SYDNEY

YEAR
2010-2015

SIZE
8.5KM

BUDGET
\$11.4 MILLION AUD

Lessons for the REM GreenLinks

- A key lesson of this project is that by modifying a recreational trail to 8.5km loop increased more than tripled usage. This highlights the importance creating the 'missing links' and providing a clear and continuous path.
- Creating an accessible loop trail away from motorised traffic can lead to increased trail use and potentially total physical activity.
- The off-road path encouraged physical activity by children and people that otherwise were physically inactive, improving their overall health.
- The benefits of environmental changes such as these can accrue to those most in need of support for being physically active.





Active & Sustainable Transport

The Narrabeen lagoon Trail is a 8.5km multi-use recreational walking and cycling trail. The loop includes several bridge crossings and sections of paved and unpaved paths.



Ecological Corridor

An elevated boardwalk minimises the impact on ecology, while providing continuous access along the foreshore. Endangered vegetation communities are protected and new native vegetation has been planted.



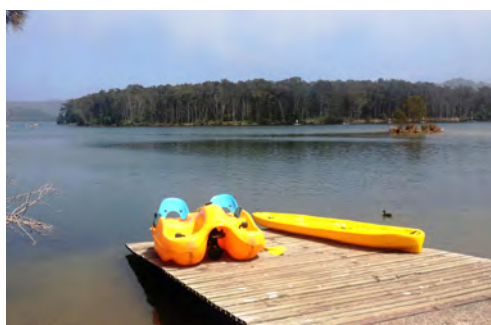
Arts & Culture

The trail brings visitors past cultural heritage and historical icons, including aboriginal heritage interpretation, military history, the Never Been Beaten Lime and Cement Works.



Multi-Purpose Recreation
































































































Recreation opportunities, such as look-outs, playgrounds and parks are provided along the route.



Multi-Purpose Recreation

Recreation opportunities such as kayak launch decks, picnic areas, dog off leash areas etc. are provided along the route.

4.4 Summary table

Example	Elements	Why is it a good example for the REM GreenLinks?
Cooks to Cove GreenWay	    	A local example with both on- and off-road sections, connecting open space for people and nature. A strong community based project.
Parramatta River Valley Cycleway	    	Another local example in which the river is re-embraced and a path connects the neighbourhoods along the river.
Narrabeen Lagoon Trail	    	An example illustrating the importance and effectiveness of a clear and continuous path (no missing links) and the health benefits
Atlanta Beltline	    	Three classic examples of linear trails in similar urban contexts.
Chicago 606	    	
Indianapolis cultural trail	    	
The High Line	    	A high quality outcome integrating locally native ecology and strong public art and education programs
Superkilen	    	Creative integration of multiple recreational uses into a relatively small space
Bishan Park	    	The naturalised stream is a good precedent for the Shrimptons Creek
Rose Fitzgerald Kennedy Greenway	    	An example where a strong public art program has played a key activation role
LA River Revitalization	    	An example attempting to create an ecological corridor around a restored waterway
Playa Vista parks	    	A high quality example of a series of parks which integrate a variety of uses into relatively small areas
Prince Alfred Park	    	A local example of a highly active park with a busy shared path running through it
Plan del Verde de la Biodiversidad de Barcelona	    	An high quality example of an urban biodiversity strategy which is driving the redesign of city streets
Glenorchy Art and Sculpture Park	    	A high quality example of a linear park with a strong arts and cultural theme
La Promenade Plantée	    	La Promenade Plantée features high quality design, which creates a varied, interesting experience
City of Adelaide bike art trail	    	An example of public art which highlights and celebrates bicycle facilities as well as local culture
Windsor St linear reserve	    	A small-scale example of urban habitat restoration in a streetscape context
Highbury Aqueduct Reserve	    	Highbury Aqueduct Reserve is located on the eastern outskirts of Adelaide, along the River Torrens. It is a linear reserve approximately 14 km long, along a former open channel.

4.5 Learnings for the REM Green Links

This report contains three of the most relevant examples for the REM Green Links Masterplan, but other examples from around the world also provide learnings for this Masterplan. Across the nineteen global examples which are included in Appendix A: Benchmark Study, the following common key success factors have emerged as themes:

‘High-performing’ infrastructure

As cities around the world face greater densities and increased pressures on open space, the concept of “high-performing” public spaces has emerged to describe spaces which generate multiple social, environmental and economic benefits to local communities. The benchmark examples, especially the Atlanta Beltline, Chicago’s 606 and the Indianapolis cultural trail, Superkilen, Playa Vista Parks, and local heroes Prince Alfred Park and Sydney Park wetlands, represent “high-performing” infrastructure which meet multiple objectives. As the Narrabeen Lagoon Trail illustrates, is when completing the route and creating the missing links, usage can increase significantly.

Trail as a destination in itself

A key message from the examples is that linear trails are seen as not just movement corridors but as seen as linear open space which, when done well, are significant attractions in their own right. The most popular recreational activities in urban areas are walking and riding, and attractive destinations that target these activities can encourage participation. Destination trails, such as the Narrabeen Lagoon and Parramatta Valley Cycleway can also have public health and economic benefits.

Community, culture and placemaking

Strong community involvement helps to create an outcome which works in the local context and delivers strongly on social benefits. Cultural activity and placemaking also encourage ongoing community participation, as seen at the Cooks to Cove Greenway, Atlanta Beltline, the Chicago 606 and the Highline.

Environmental sustainability principles

Public spaces have a role in both creating habitat in which urban ecosystems can flourish and in creating opportunities for people to connect with nature close to where they live. Where environmental sustainability principles underpin design, projects deliver strongly on environmental benefits, such as at the Narrabeen Lake Trail, Parramatta River Valley Cycleway and Singapore’s Bishan Park.

Staged implementation

Linear open space infrastructure is typically large-scale with relatively long lengths of the corridor. They also cross other transport and infrastructure corridors (necessitating consideration of connectivity and accessibility) and a diverse range of adjacent land uses.

Development in multiple stages with a clear vision and objectives ensures a desired quality of the infrastructure, despite this complexity and scale.

High-quality outcomes have been achieved by projects delivered in multiple stages, where each stage, while being a short section of a longer trail, is a complete piece of infrastructure in itself integrating all the elements of the project. A short section delivered well can also attract further funding and publicity for the next section, most famously at New York’s Highline and also in the Cooks to Cove GreenWay, Indianapolis and Atlanta.

