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Public spaces in the Illawarra-Shoalhaven Region: Opportunities for a Recreational Grid

July 2020

> For residents to really feel the full benefits of streets, parks and public facilities these should be coordinated, connected and well- managed. This requires forethought, diagnostics and leadership and the engagement of local communities to develop relevant strategies. ”
>
> - Maimunah Mohd Sharif
> Under-Secretary-General and
> Executive Director of UN-Habitat

Report title: Public spaces in the Illawarra-Shoalhaven Region: Opportunities for a Recreational Grid

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Prepared by

Cred CONSULTING

With precedent studies from

turf

Acknowledgment of Country

We acknowledge the Traditional Custodians of the land and pay respect to Elders past, present and future. We honour Australian Aboriginal and Torres Strait Islander peoples' cultural and spiritual relationships to place, and their rich contribution to our society. To that end, all our work seeks to uphold the idea that if we care for Country, it will care for us.

This study considers the opportunity to connect communities to public spaces through a recreation grid which forms part of the blue and green grid for the Illawarra-Shoalhaven Region. There are future opportunities to align with an OCHRE Grid (Opportunity, Choice, Healing, Responsibility, Empowerment) aimed at building much needed networks that will endure "because if culture is a map across the landscape, it's not just the individual places that are important, it's actually how you get to those places and everything in between – to deliver places that are very much Country-centred, that talk to the deep history of country." - Dillon Kombumerri

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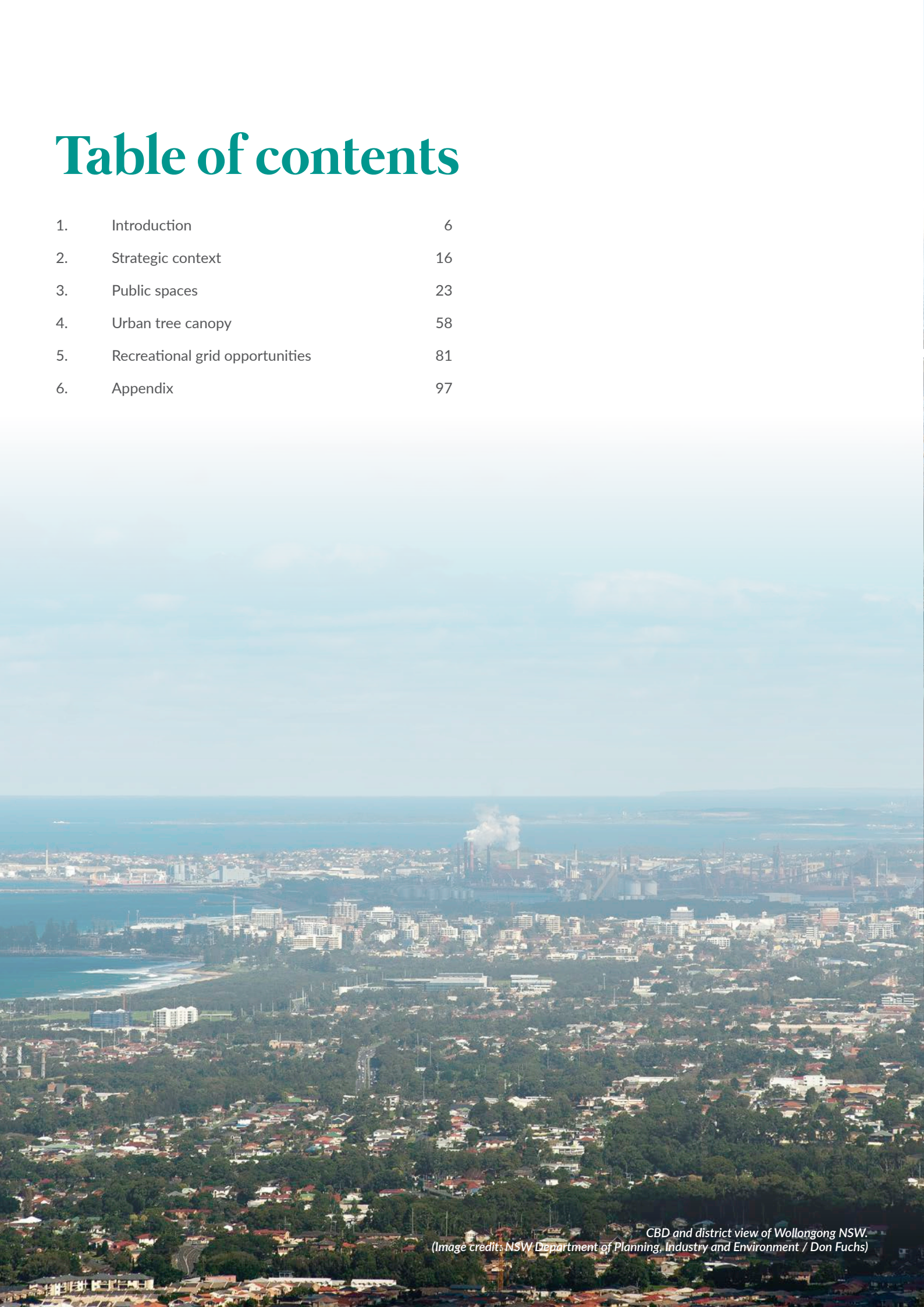


CBD and district view of Wollongong NSW.
(Image credit: NSW Department of Planning, Industry and Environment / Don Fuchs)

01

Introduction

People walking for fitness at Blue Mile Wollongong NSW (*Image credit: NSW Department of Planning, Industry and Environment / Don Fuchs*)

1. Introduction

This study investigates and analyses access to public spaces throughout the Illawarra-Shoalhaven Region (the Region) and identifies opportunities to improve access to them through the creation of a Recreational Grid to improve health, wellbeing, and recreational outcomes for the Region.

This study aims to inform the review of the Illawarra-Shoalhaven Regional Plan, and in particular Goal 3 'A Region with communities that are strong, healthy and well-connected'.

It also responds to the intent of two of the Premier's Priorities:

- Greening Our City seeking to increase the tree canopy and green cover across Greater Sydney by one million trees by 2022.
- Greener Public Spaces aiming to increase the proportion of homes in urban areas within 10 minutes' walk of quality green, open, and public spaces by 10% by 2023.

While the Premier's Priority of Greening Our City relates to Greater Sydney only, the intent and principles are worthwhile considerations in our Regional context. The Greener Public Space applies across the State.

This section defines the project purpose and methodology including defining public spaces, recreational grid and geographical and demographic considerations around access to public space

1.1. Purpose

The purpose of this study is to:

- Audit and map all existing and planned public spaces throughout the Illawarra-Shoalhaven Region (the Region).
- Audit the tree canopy in all areas of the Region and provide analysis of canopy in urban areas.
- Assess the walking catchment within 800m of existing and planned public spaces throughout the Region and identify gaps.
- Identify opportunities to inform a review of the Illawarra-Shoalhaven Regional Plan 2015 and the creation of a Recreational Grid, forming part of a Blue and Green Grid, for the Region.

This study aims to:

Provide a regional approach linking local and NSW Government's State level policies

Provide insights for the Regions' councils and other State Agencies guidance on where there may be gaps in the recreational grid or low levels of tree canopy cover

Provide a baseline database for public space in the Region.

Provide a better understanding of opportunities and constraints to accessing existing public space across the Region

Inform the review of the Regional Plan, in particular a place-based approach to the metro centres of Wollongong, Shellharbour and Nowra

Provide a holistic view of walking and cycling links across the Region

Ultimately allow for the development of a Blue-Green Grid and for Blue and Green data to be depicted together on a map

1.2. What is public space?

The NSW Government defines public spaces using the United Nations definition of:

"Public spaces are all places publicly owned or of public use, accessible and enjoyable by all for free and without a profit motive."

They include our open spaces, streets and public facilities.

Quality green, open and public spaces are important to everyone. They are our free parks, gardens and sports fields, walkable shaded streets, plazas, libraries, museums and galleries, which form the heart of our communities. Our public spaces make life more welcoming and accessible. They delight and connect people. They support our health and well-being, environmental resilience and prosperous local economies. They're at the heart of everyday life.

1.3. Scope of this study

For the purposes of this study, three types of public space are defined and analysed (see Figure 1).

- Public open space
- Public recreational facility, and
- Public cultural place.

This study also assesses urban tree canopy, as trees help to create comfortable, shady streets and cool public spaces an important part of creating recreational grid.

Public space sub-categories and inclusions within the scope of this report

Public open space

- Passive recreational space
- Sports space
- Natural space
- Linear and linkage
- Waterway
- Civic/urban plaza

Public recreational facility

- Showground
- Sports complex
- Sporting field/oval
- Indoor leisure centre
- Recreation club
- Swimming pools aquatic centre
- Outdoor courts
- Skate park
- Mountain bike park
- Equestrian

Public cultural place

- Arts centre (performing or creative)
- Gallery
- Library
- Museum
- Community theatre
- Community Centre / Venue
- Outdoor event space

Urban tree canopy

- % of tree canopy cover for urban areas at a suburb level
- % of tree canopy cover in the LGA by landuse type

Figure 1 - Public space types and tree canopy data that is included in the analysis within this report.

1.4. What is the Recreational Grid?

The Illawarra-Shoalhaven Recreational Grid is a network that improves access to public spaces in the Region.

Sydney Green Grid principles

The Sydney Green Grid identifies 3 principles for the Recreation Grid, which are relevant to the Region:

1. Increase access to public space

- Improve connectivity to key regional destinations, foreshores, beaches and bays and continue to invest in the improvements of major parks and infrastructure.
- Improve public domain and create new open space destinations as a benefit of key development and infrastructure projects.
- Improve access to open space across major roads and infrastructure barriers.
- Create new open space as a part of urban renewal, infill and infrastructure and continue to invest in revitalising existing parks.
- Improve the diversity of recreation opportunities.

2. Encourage sustainable transport connections and promote active living

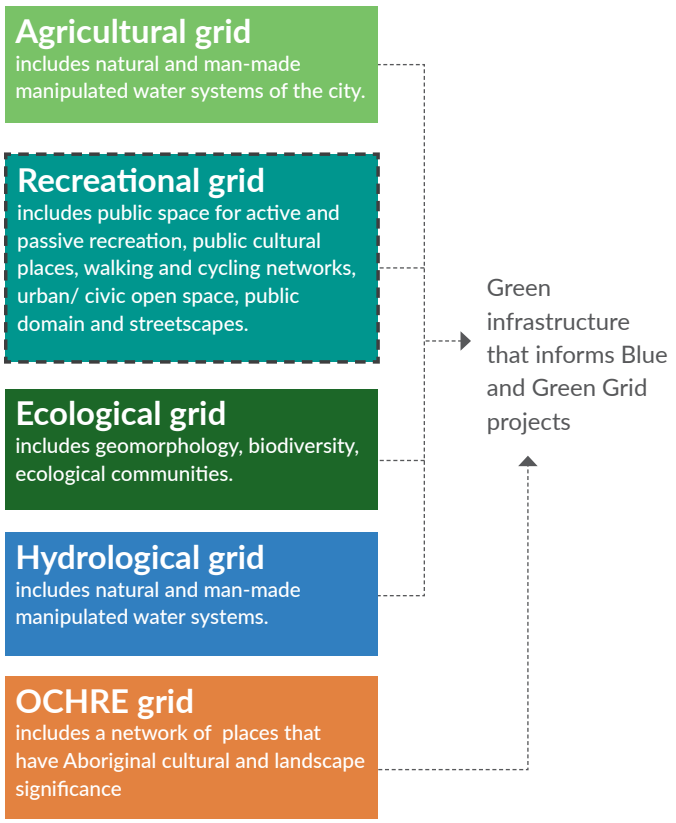
- Promote and improve the pedestrian environment to increase the enjoyment of traveling on foot and by bike.
- Encourage active and healthy living.
- Align the open space network with longer term transport plans.
- Protect priority green corridors and create a network of walking trails, cycle paths, and open spaces along the river and creek corridors.
- Enhance connectivity and legibility of recreation trails.

3. Create a high quality and active public realm

- Create vibrant, multi-functional and enduring public spaces.
- Provide a variety of dynamic spaces that are pedestrian friendly, support street life and community activity and are places for social interaction and recreation.
- Integrate key civic spaces or destinations with public transports opportunities and existing development.

Where the Recreational Grid fits in

The Recreational Grid is one of the layers of the Green Infrastructure that make up NSW's Blue and Green Grid.



"Developing vibrant towns and streetscapes with a pedestrian-friendly laneway network that connects to open space is essential for usability and access. Defining a pedestrian, cycle, and green network can connect urban centres to local and regional open space."

– Draft Greener Places Design Guide, Government Architect, NSW

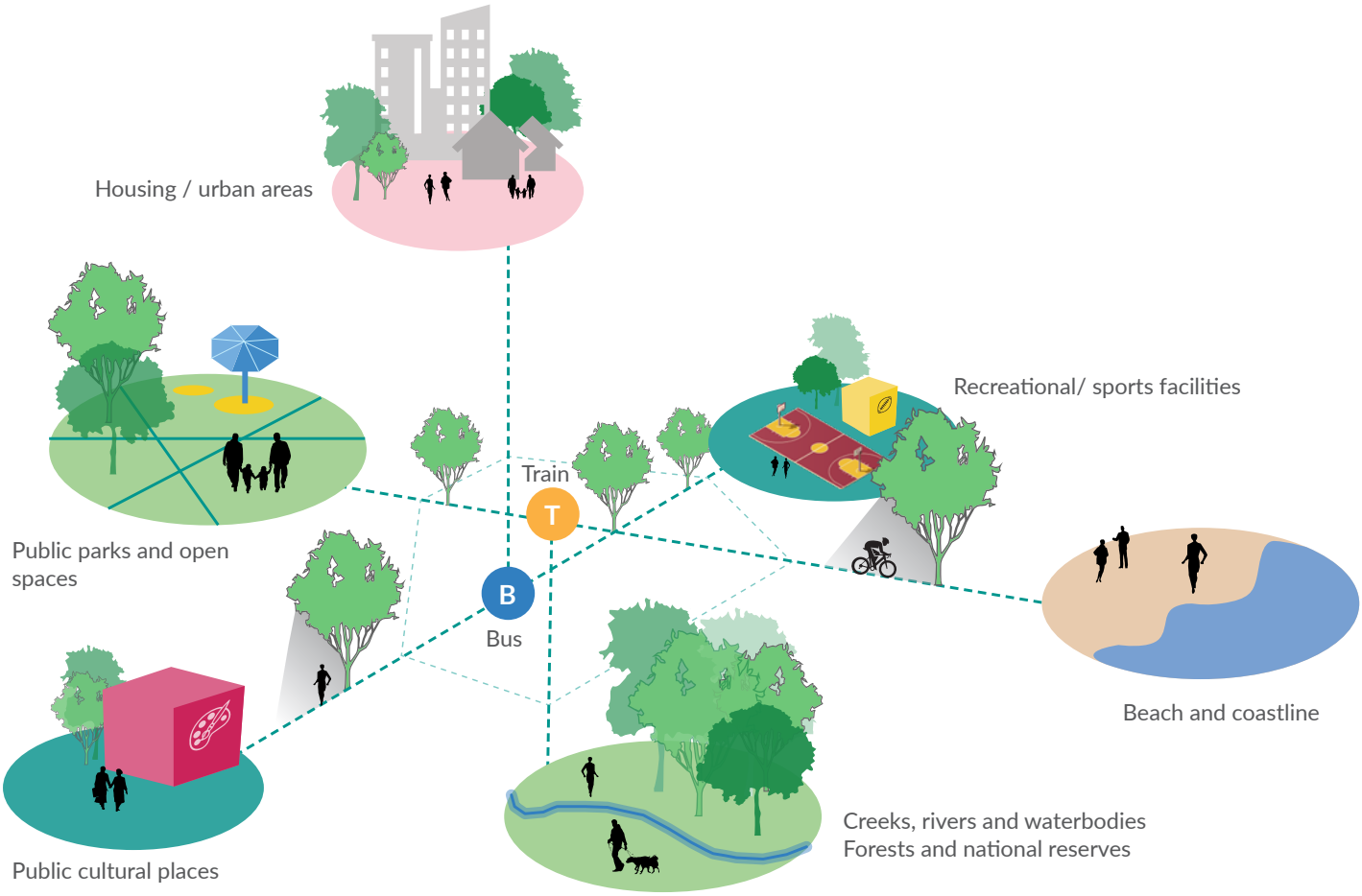


Figure 2 - Diagrammatic illustration of the Recreational Grid

1.5. Methodology

The methodology used to inform this study included the following research. Detailed inclusions/exclusions for each of the audit categories, and rationale for this, is provided in Sections 3, 4 and 5 of this report.

1. Defining public space

Meeting with Shoalhaven, Shellharbour, Kiama, and Wollongong councils (the councils) and the Department of Planning, Industry and Environment (the Department) to define public space, urban areas and agree to inclusions and exclusions to the audit.

2. Context analysis

Review of NSW Government, the councils', and Illawarra-Shoalhaven Joint Organisation plans and strategies to understand opportunities, alignment, and potential for regional collaboration.

3. Audit public space

More detailed information about inclusions in audits are provided in Section 3.

Public open space & public recreational facility GIS data mapping

Source data aggregated from:

- Council GIS layers (Council parks)
- Council and Office of Sport infrastructure audit (sports facilities and public recreational facilities)
- Open source data (Six maps for national parks, google maps for walking trails)

Urban tree canopy GIS data mapping

- Open source LiDAR point clouds (via ELVIS - Elevation and Depth - Foundation Spatial Data)
- Data checking and cleaning via ArcGIS (manual)

Public cultural places GIS data mapping

Source data aggregated from:

- Create NSW database (2018)
- Desktop research to validate database: council websites, strategies, Google searches

4. Gap analysis

Walking catchment analysis showing 800m walking distance around all public spaces, applying a broad assumption that railways and major roads are barriers to movement. Analysis of tree canopy cover including what percentage of urban areas have optimal tree canopy cover of 35% to 40% (target set by Wollongong Urban Greening Strategy) & in urban areas more than 15% in CDBs (target set by draft Greener Places Design Guide, 2020).

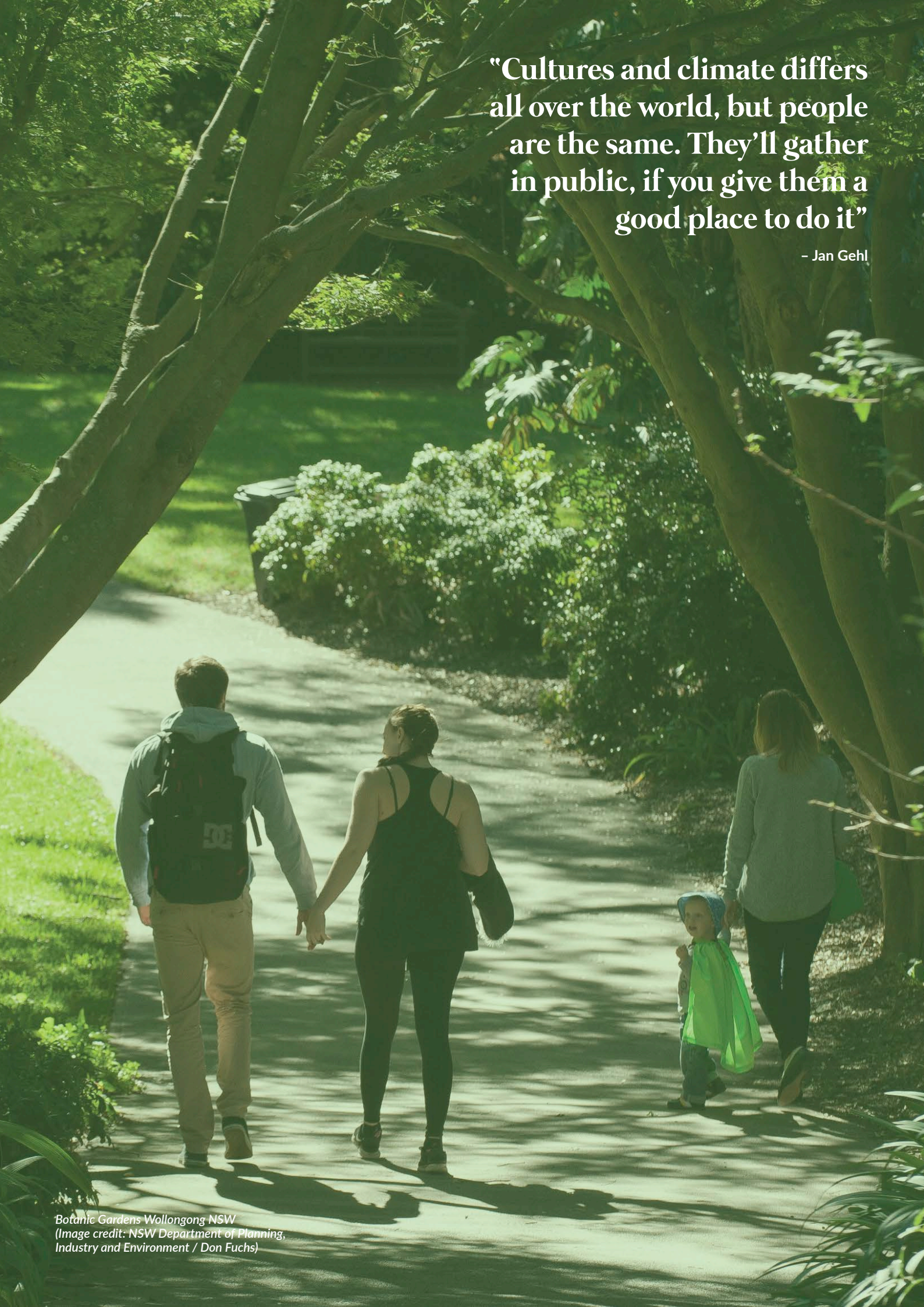
5. Opportunities analysis to inform a Recreational Grid for the Region

High level desktop audit and access mapping to identify areas with good access to public space, as well as areas that have gaps in access. Identification of high level regional & LGA opportunities through analysis and meetings with councils.

Next steps

Further consultation and collaboration with councils to define detailed opportunities for the Recreational Grid in individual LGAs and across the Region.

Provision of Recreational Grid GIS audit for use by councils in future strategy development such as walking and cycling or urban greening strategies.



"Cultures and climate differs all over the world, but people are the same. They'll gather in public, if you give them a good place to do it"

– Jan Gehl

Botanic Gardens Wollongong NSW
(Image credit: NSW Department of Planning, Industry and Environment / Don Fuchs)

1.6. The Illawarra-Shoalhaven Region

Diverse geography & urban areas

The Region includes the four local government areas (LGAs) of Wollongong, Shellharbour, Kiama and Shoalhaven. The defining feature of the Region is widely recognised as its landscape including it spectacular escarpment, coastline, waterways, lakes and rural hinterlands have contributed to the Region's rich biological diversity and natural resources.

The Region has a total land size of 578,086ha, with approximately 4.2% (or 24,162ha) of that area being "urban areas". For the purposes of this study, "urban areas" is defined as urban land zoned for residential, business, industrial, village or tourist purposes. A full list of the land zones that have been classified as urban areas can be found on page 60.

As shown in Figure 3 and Figure 4:

- Wollongong LGA is bounded by Sutherland Shire in the north, the Tasman Sea in the east, Lake Illawarra and Shellharbour LGA in the south, and Wingecarribee Shire, Wollondilly Shire and Campbelltown LGA in the west. Approximately 14.1% of the LGA is zoned as an urban area.
- Shellharbour LGA is bounded by Wollongong LGA in the north, the Tasman Sea in the east, Kiama LGA in the south and Wingecarribee Shire in the west. Shellharbour LGA is 14,839 ha with its urban areas representing 19.5% of the LGA.
- Kiama LGA is bounded by Shellharbour LGA in the north, the Tasman Sea in the east, Shoalhaven LGA in the south and Wingecarribee Shire in the west.
- Shoalhaven LGA is bounded by the Wingecarribee Shire and Kiama LGA in the north, the Tasman Sea and Jervis Bay Territory in the east, the Eurobodalla Shire in the south, and the Queanbeyan-Palerang Regional Council area and the Goulburn Mulwaree Council area in the west.

As shown in Figure 4, the Region has a number of centres which are priority areas for communities to access public space:

- Metro Wollongong
- Shellharbour and Nowra major regional centres
- Dapto and Warrawong major centres
- Kiama, Ulladulla, Vincentia, and Kiama regional centres, and
- Corrimal, Fairy Meadow, Figtree, Unanderra, Warilla, Albion Park centres.

Across the Region, there are also emerging residential growth areas. These areas may not have easy access to the lakes, rural hinterlands and nature of the Region. Particularly for those residents who are transport disadvantaged (young people, children, and seniors).

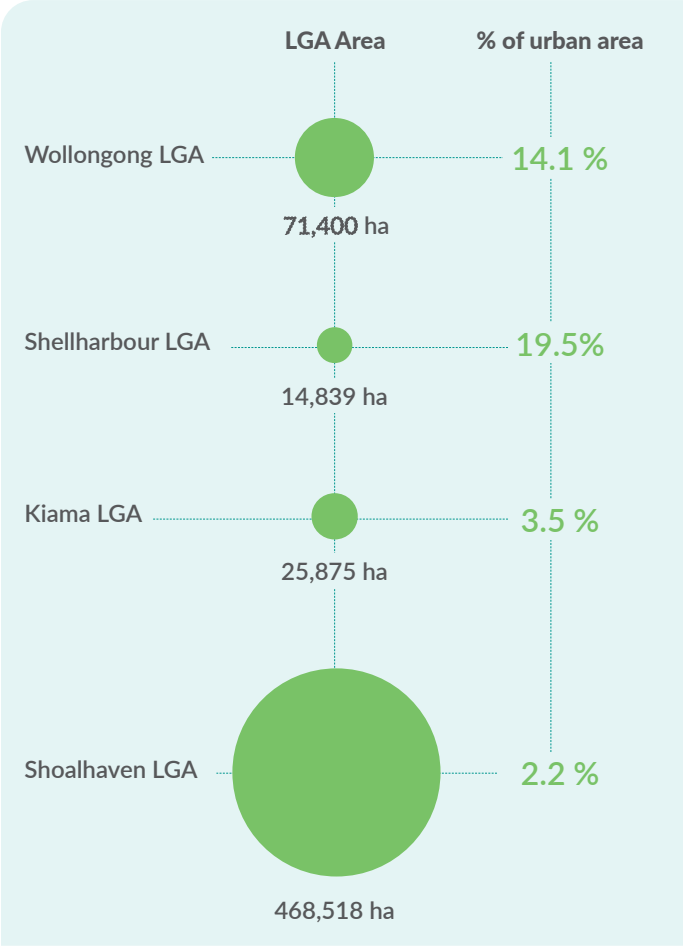


Figure 3 - Land zoned as urban in the Illawarra-Shoalhaven Region

Centres identified through the *Illawarra-Shoalhaven Regional Plan 2015* as areas for increased urban housing activity (see Figure 4) include the:

- Northern corridor –Thirroul, Corrimal and Fairy Meadow
- West Lake Illawarra corridor –Figtree, Unanderra, Dapto and Oak Flats
- East Lake Illawarra corridor –Warrawong, Warilla and Shellharbour Centre
- Metro Wollongong, and
- Southern centres – Kiama, Gerringong,Berry, Nowra-Bomaderry, Huskisson and Ulladulla. West Lake Illawarra.

New release areas include: West Dapto, Calderwood, Tallawarra, Tullimar Village, Shell Cove, South Gerringong, Dunmore, and Spring Creek.

Figure 4 - Illawarra Shoalhaven Region Study Area

Diverse community needs

According to the *Illawarra-Shoalhaven Regional Plan 2015* the population is expected to grow to 463,150 by 2036 - an increase of 60,400 from 2016.

Population growth is likely to result from a natural increase as well as the sustained migration of young families and retirees looking to take advantage of the local lifestyle and more affordable housing prices. In areas such as Shellharbour LGA and in Wollongong LGA's southern suburbs, there is likely to be increasing medium and high density housing, which may result in reduced access to private open space and greater reliance on public space for exercise, recreation and connection to nature.

Based on past trends, the make-up of the population will change over the next 20 years also, with moderate growth in most age groups, except in the 65 and over group, where there will be higher forecast growth, particularly in the Kiama and Shoalhaven LGAs.

Access to public space can differ dependent on your age, your income level, and your level of mobility and fitness, as well as there are unique geographical differences across the Region such as topography, that are important to consider.

As shown in Figure 5 there are demographic similarities and differences across the Region:

- Wollongong LGA has a comparatively younger and more diverse population than regional NSW. The area also has the highest proportion of residents without car ownership, indicating a need for good active transport links to public spaces and centres. The area's southern suburbs are the most highly disadvantaged and will experience the highest growth where the share of the LGAs population will increase from 42% to 47%.
- Shellharbour LGA is characterised by a younger population. The area has a higher proportion of residents speaking a language other than English at home compared to regional NSW. It has a comparatively low SEIFA (meaning there are more areas of disadvantage).
- Kiama LGA's population is characterised by an older population with a much higher median age (47), higher median household incomes, and a higher SEIFA index than regional NSW (meaning it is less disadvantaged overall).
- Shoalhaven LGA has an older population and the lowest SEIFA score in the Region, with socially disadvantaged areas in Nowra, St Georges Basin, Sanctuary Point, Ulladulla. It has a higher Aboriginal and Torres Strait Islander population.

Making the case for public space

The United Nations makes the following case for public space to support equity across socio-economic, groups, gender, and age groups:

as the banner of urban civility

improves public health

enhance environmental sustainability

are tools for gender and agefriendly cities

promote income, investment and wealth creation

are our urban meeting places

enhances urban safety

increases transportation efficiency

offer ideal opportunities to generate citizen involvement, promote equity and social inclusion

make for great cities

(Source: United Nations)

Comparison matrix of demographic characteristics across the Region

Figure 5 - Demographic differences across LGAs within the Region

02

Strategic context

Harbour activity at Wollongong Harbour NSW.
(Image credit: NSW Department of Planning, Industry and Environment / Don Fuchs)

2. Strategic context

This section considers the relevant plans, policies and strategies that inform public space and recreational grid priorities and opportunities for the Region.

2.1. Strategic drivers

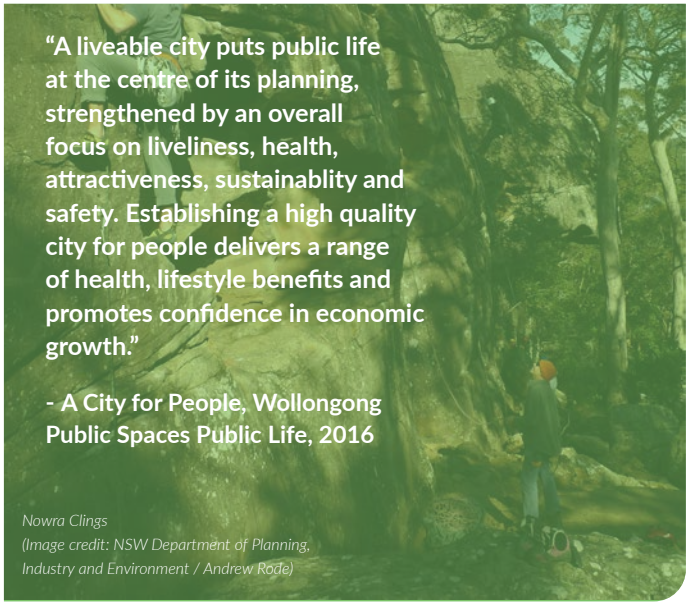
A range of global to local strategies have been assessed to draw out relevant themes that can inform and help identify future recreational grid priorities and opportunities for the Region. These themes include:

- Work in partnership & collaboration across government agencies and with communities
- Public spaces help to create more liveable neighbourhoods and communities – places for people to meet, interact, relax and play
- Create an interconnected network of public spaces that is multifunctional, flexible and versatile
- Access to quality public cultural space improves vibrancy and creativity and improved quality of life
- Improve liveability, and physical and mental health through quality and activated public space
- Plan great public spaces that are accessible to everyone regardless of where they live, their income or their ability
- Increase tree canopy in our public realm to help to mitigate the urban heat island effect, support biodiversity, a healthy environment and create more comfortable public spaces
- Connect natural areas and waterways to support habitat and biodiversity in urban areas & connect people to nature
- Our centres drive the local economy and provide places for people to connect and need shade and greening. Public spaces help bring economic, environmental, social and cultural value to our centres and residents

"The ability of residents to gain access to public space within an easy walk from home, workplaces, and schools is an important factor for quality of life. The geographic distribution of open space is a key access and equity issue for the community."

- Draft Greener Places design Guide, Government Architect, NSW

(Image credit: Shellharbour City Council)



"A liveable city puts public life at the centre of its planning, strengthened by an overall focus on liveliness, health, attractiveness, sustainablity and safety. Establishing a high quality city for people delivers a range of health, lifestyle benefits and promotes confidence in economic growth."

- A City for People, Wollongong Public Spaces Public Life, 2016

Nowra Clings
(Image credit: NSW Department of Planning, Industry and Environment / Andrew Rode)

United Nations Global Public Space Toolkit

"Public spaces are all places publicly owned or of public use, accessible and enjoyable by all for free and without a profit motive"

The *UN Global Public Space Toolkit* provides guidance and principles to plan for public spaces. It acknowledges that public spaces are a vital ingredient of successful cities, and urban areas. They help build a sense of community, civic identity and culture. Public spaces facilitate social capital, economic development and community revitalisation. Having access to public spaces does not only improve the quality of life but is also a first step toward civic empowerment and greater access to institutional and political spaces. The liveliness and continuous use of public space as a public good leads to urban environments that are well maintained, healthy and safe, making the city an attractive place in which to live and work.

A number of Policy Directions for Public Space are provided in the report, with the following five being most relevant to this study.

1. The Right to the City. By recognising and developing the positive potential of their public spaces, cities can enhance safety and security, create economic opportunity, improve public health, create diverse public environments and public democracy.

2. The Charter of Public Space. A useful working definition and description of public space is the one adopted by the Charter of Public Space: 'Public spaces are all places publicly owned or of public use, accessible and enjoyable by all for free and without a profit motive. Public spaces are a key element of individual and social well-being, the places of a community's collective life, expressions of the diversity of their common, natural and cultural richness and a foundation of their identity. The community recognises itself in its public places and pursues the improvement of their spatial quality.'

3.Urban Planning for City Leaders (UPCL). UN Habitat has put forward a list of recommended steps to be followed in securing better public spaces in cities. Four broad categories of intervention are presented:

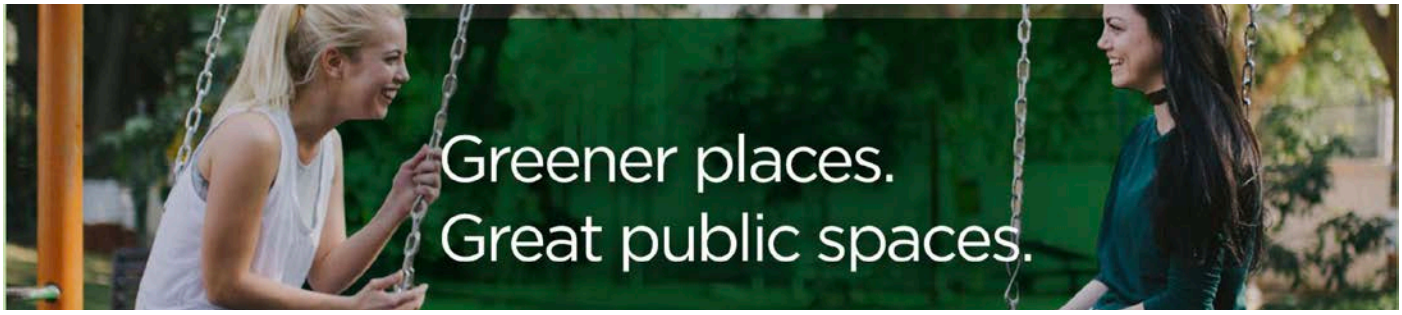
- Secure sufficient public space in advance
- Plan a system of public spaces
- Reap the benefits of well-designed streets, and
- Plan green public spaces.

4. The Street as Public Spaces – Drivers of Prosperity. Furthermore, the issue of the street as an important public space has been explored in depth in a technical report entitled Streets as Public Spaces – Drivers of Prosperity (2013). The research looked at 30 cities spread globally, and found evidence to prove that prosperous cities are those that have allocated sufficient land to street development (with proper layout) including sufficient crossings along an appropriate, lengthy network. Cities that have failed to integrate the multi-functionality of streets tend to have less infrastructure development, lower productivity and a poorer quality of life. The report also shows that the lack of street connectivity increases social exclusion and generates inequalities in various spheres of life, especially access to basic services.

5. Public Space and the Sustainable Development Goals. The UN's Open Working Group charged with drafting the *2016-2030 Sustainable Development Goals* proposed Goal 11 'Build cities and human settlements that are inclusive, safe, resilient and sustainable.' One of the targets set out in the 2030 goal, is "by 2030, provide universal access to safe, inclusive and accessible, green and public spaces, particularly for women and children, older persons and persons with disabilities". The importance of this work cannot be underestimated, as the *Sustainable Development Goals* are the new global agenda for international development cooperation.

"Public spaces are all places publicly owned or of public use, accessible and enjoyable by all for free and without a profit motive"

Figure 6 - Benefits of public spaces from *United Nations Global Public Space Toolkit* *(continued on p19)*



Premier's Priority - Greener public spaces

Increase the proportion of homes in urban areas within 10 minutes' walk of quality green, open and public space by 10% by 2023.

Why is this important?

Quality green, open and public space is for everyone – these spaces include parks, green spaces, plazas, libraries, streets, landscapes, museums, and public transport. Great public spaces that delight communities are especially important in growing cities and towns.

Walkable, connected and accessible public spaces promote healthier lifestyles and bring people together. A network of welcoming and connected public spaces will create communities where people love to live.

Premier's Priority - Greening our city

Increase the tree canopy and green cover across Greater Sydney by planting one million trees by 2022.

Why is this important?

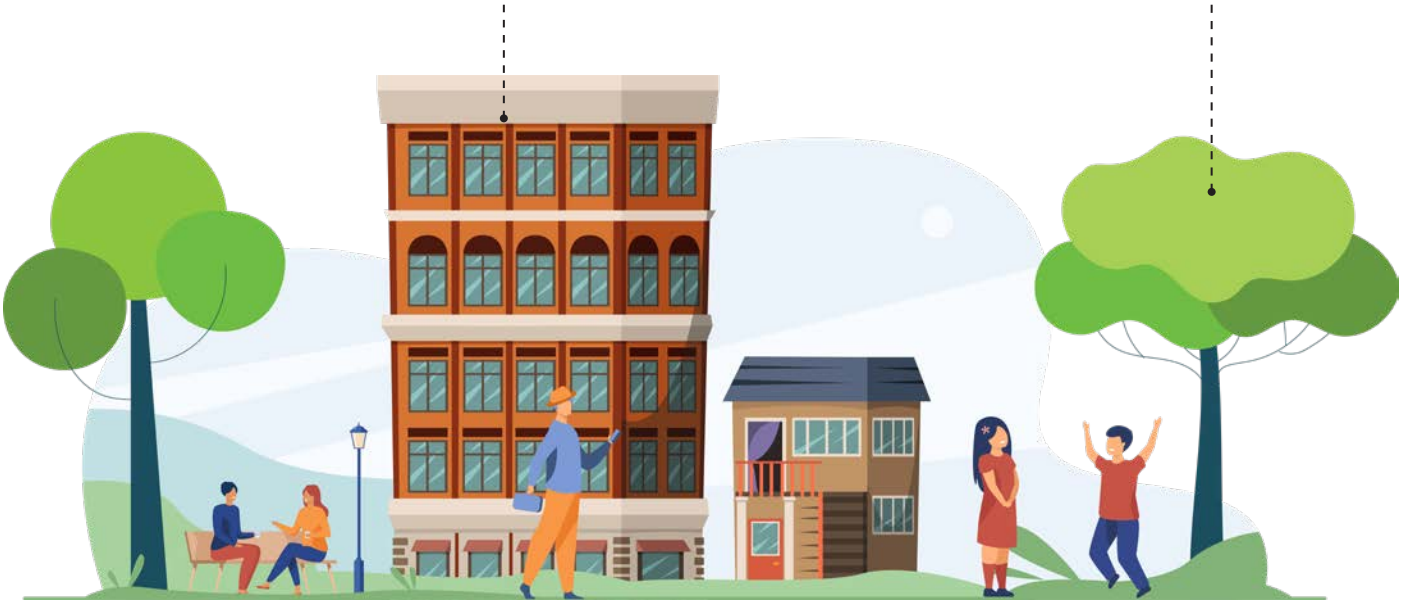
Trees play an important role in creating great open spaces for communities, enhancing the experience of outdoor recreation and exercise. Green canopy enhances the amenity of local parks and streets and is crucial in providing vital shade that reduces ambient temperatures and mitigates the urban heat island effect.

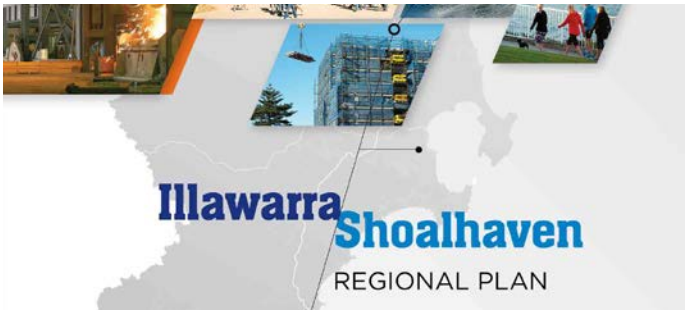
Trees improve local character and enhance property values. They extend habitat, increasing the biodiversity of cities serving as a home for animals and birds. Air quality is improved by removing fine particles from the air and trees mitigate the impact of climate change, acting as a storehouse for carbon dioxide.

While this Premier's Priority relates to Greater Sydney, there is still merit in considering the intent in context of the Illawarra-Shoalhaven Region.

10% increase in proportion of homes in urban areas within 10 minutes' walk of quality green, open and public space by 2023

Increase the tree canopy and green cover planting by one million trees by 2022





Illawarra-Shoalhaven Regional Plan, 2015

The vision for the Illawarra-Shoalhaven Region is for a sustainable future and a resilient community, capable of adapting to changing economic, social and environmental circumstances. Residents will be able to access a range of lifestyle choices; connect with the stunning landscapes and biodiversity; access well-established and emerging work opportunities; enjoy a strong network of centres; and experience high quality education and health facilities.

To achieve this vision, we have set down goals for:

- a prosperous Illawarra-Shoalhaven
- a region with a variety of housing choices, with homes that meet needs and lifestyles
- a region with communities that are strong, healthy and well-connected
- a region that makes appropriate use of agricultural and resource lands, and
- a region that protects and enhances the natural environment.

The Plan identifies that there will need to be:

- Opportunities for people to be physically active where they work and in their neighbourhoods will be accommodated through the design and location of recreational facilities, sporting infrastructure, parks and public buildings. Opportunities will also be taken, wherever possible, to reconnect neighbourhood communities with the surrounding landscape. Walkways, cycle ways and public transport will be provided to make access to these places easier.
- The redevelopment and expansion of sporting and active recreation infrastructure will be necessary as the region grows so that it retains its appeal as an attractive place to live, work and visit.
- Revitalisation opportunities including Wollongong and Nowra Centres.

Greener Places, Government Architect NSW

Greener Places guides the design, planning, management and delivery of Green Infrastructure in urban areas. This includes the *Draft Urban Tree Canopy Guide*, which restates the target set in the Greater Sydney Regional Plan of increasing Greater Sydney's tree canopy to 40% (>25% in medium density and >40% in suburban areas).

The *Draft Open Space for Recreation Guide* recognises the importance of open space for recreation and outlines approaches to planning for open space including benchmarking, hierarchy and functional classifications and criteria for open space and recreation facilities. The benchmarking approach outlined in the *Draft Open Space for Recreation Guide* is outlined further in the benchmarking section of this report.

Adopting a strategic approach to greening, the policy outlines 4 guiding principles:

- Integration: green infrastructure, urban development and grey infrastructure
- Connectivity: creating a network of open spaces
- Multi-functionality: establishing multiple ecosystems, and
- Participation: involve stakeholders.

The *Draft Recreation for Open Space Guidelines* recommend 9 Strategies for providing open space and recreation

1. Improve the provision and diversity of open space for recreation
2. Understand the demands on existing open space, and plan for open space in new and growing communities
3. Improve the quality of open space for better parks and facilities
4. Use open space to connect people to nature
5. Link to the network of green infrastructure
6. Encourage physical activity by providing better parks and better amenity
7. Provide open space that is multi functional and fit for purpose
8. Design versatile, flexible spaces, and
9. Consider life-cycle costs, management, and maintenance.

This matrix diagram summarises the key strategic divers from a range of strategic and policy documents relevant to this project.

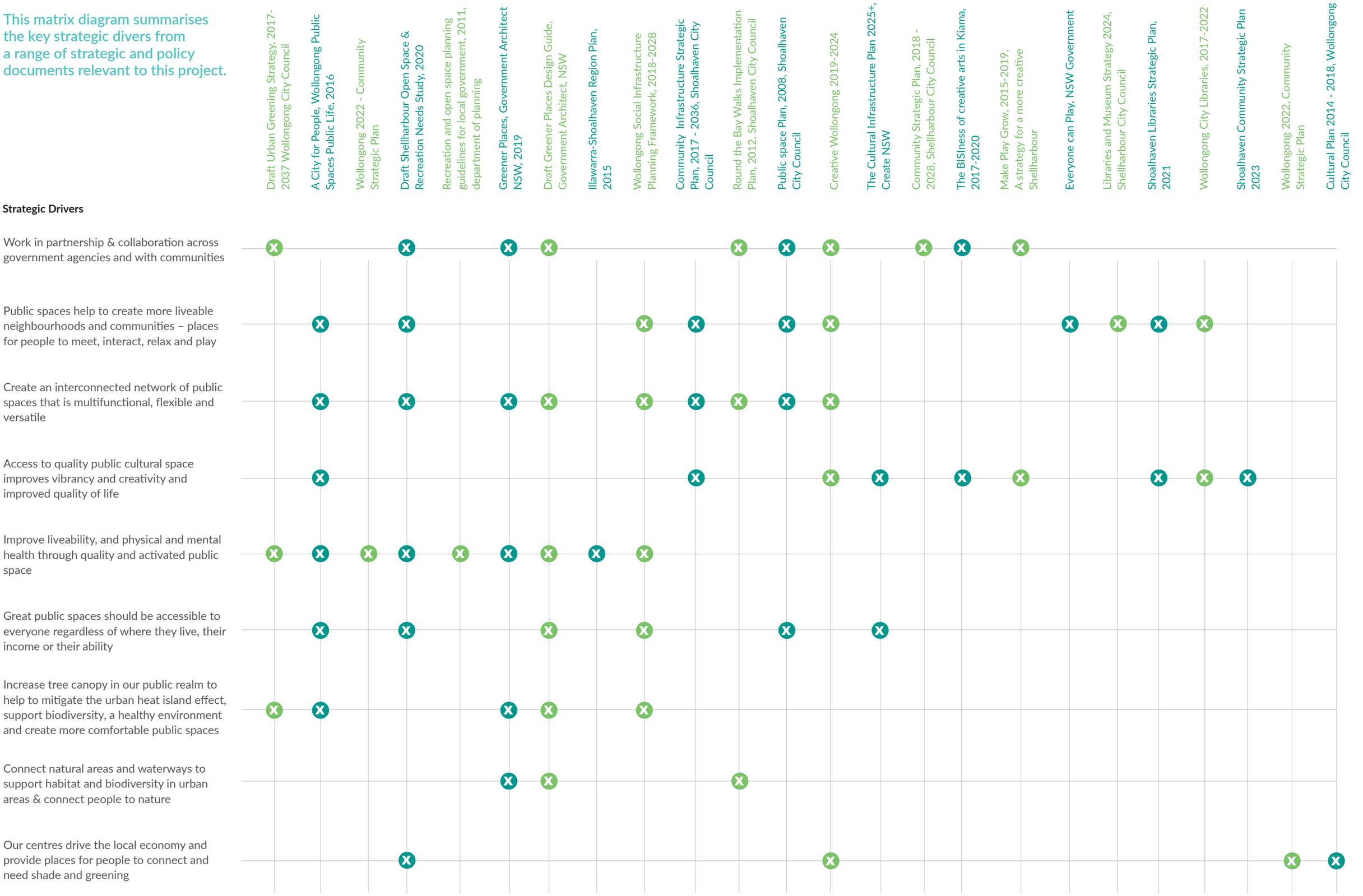


Figure 7 - Summary of relevant themes from a range of policy and strategy documents

03

Public space audit & analysis

Two women along the Coastal Walk Kiama NSW *(Image credit: NSW Department of Planning, Industry and Environment / Don Fuchs)*

3. Public spaces

This section provides an audit of existing and planned public spaces including public open space, public recreational facilities, and public cultural places. It also provides an analysis of 800m walking catchments around each public space, to identify where areas may have a lower provision of access than others.

Methodology: Audit and distribution

An audit and GIS mapping of all public spaces has been completed using a range of available data sources including:

- Council databases, plans and strategies
- Open source data, and
- Office of Sport audits as provided by each of the councils.

Public open space

Councils provided GIS layers of parks and open spaces, which was brought together with NSW Gov GIS layers of state owned parks, national park and reserves to build a holistic picture of all green spaces across the region.

While schools and some other privately owned infrastructure also forms part of a green space network in the region, auditing and assessing these spaces was not within scope, and their presence in the future cannot be 'guaranteed' to be publicly accessible or planned for in the same way that Council owned or government owned spaces can be.

The audit of public open space has been analysed by both function and hierarchy.

Functions

Public open space functions are based on work from Government Architect NSW as defined below:

Primary function	Definition
Passive recreation	Primary function is as a park/open space for informal recreation
Sports space	Primary function is to support formal and informal sports activities
Natural space	Primary function is to support biodiversity + terrestrial fauna. Usually zoned E2.
Linear and linkage	Primary function is to connect one open space are to another with recreational green links (who manages it open space or traffic/transport)
Waterway	Not audited, but shown on maps
Civic space/plaza	Public space in urban areas including elements of public domain

Hierarchy

For consistency across all council areas, public open space is categorised by its size in accordance with the 2012 NSW Department of Planning *Recreation and Open Space Planning Guidelines*. This hierarchy definition may differ to how councils classify their parks in their open space strategies.

Category	Size
Regional/City-wide	5+ha
District	2-5ha
Local level 1	0.5 to 2ha
Local level 2	0.1 to 0.5ha

Public recreational facilities

Audits of public recreation facilities were provided by each of the councils in Excel format. For the purposes of this analysis, they were then categorised into the following groups:

- Showground
- Sportsfields/ovals
- Sports complex
- Indoor leisure centre
- Recreation club
- Swimming pools aquatic centre
- Outdoor courts
- Skate park
- Mountain bike park, and
- Equestrian.

Cycle ways

All existing and planned cycleways have been provided by councils in GIS format (as current at June 2020).

Public cultural places

The audit of public cultural places includes publicly accessible (generally publicly owned) cultural and community facilities. Public cultural places that are not publicly accessible (e.g. production studios, radio stations, workplaces) or are only accessible by buying a ticket to an event (e.g. a theatre) have not be included. The audit includes:

- Aboriginal cultural infrastructure
- Arts centre (performing or creative)
- Gallery
- Library
- Museum
- Community theatre (only if has public programs)
- Community centre / venue, and
- Outdoor event space.

Methodology: 800m walking catchment gap analysis

Regional and LGA walking catchment maps

An 800m (approximately a 10minute walk) walkable catchment has been mapped around all public spaces. The purpose of this analysis is to respond to the Premiers Priority, rather than setting this walking catchment as a benchmark across the Region, where only 4.2% of the area is zoned as urban area.

The walking catchment maps take into consideration barriers such as highways, major roads, train lines, creeks and water bodies but does not consider steep terrain/topography (outside the scope of this brief).

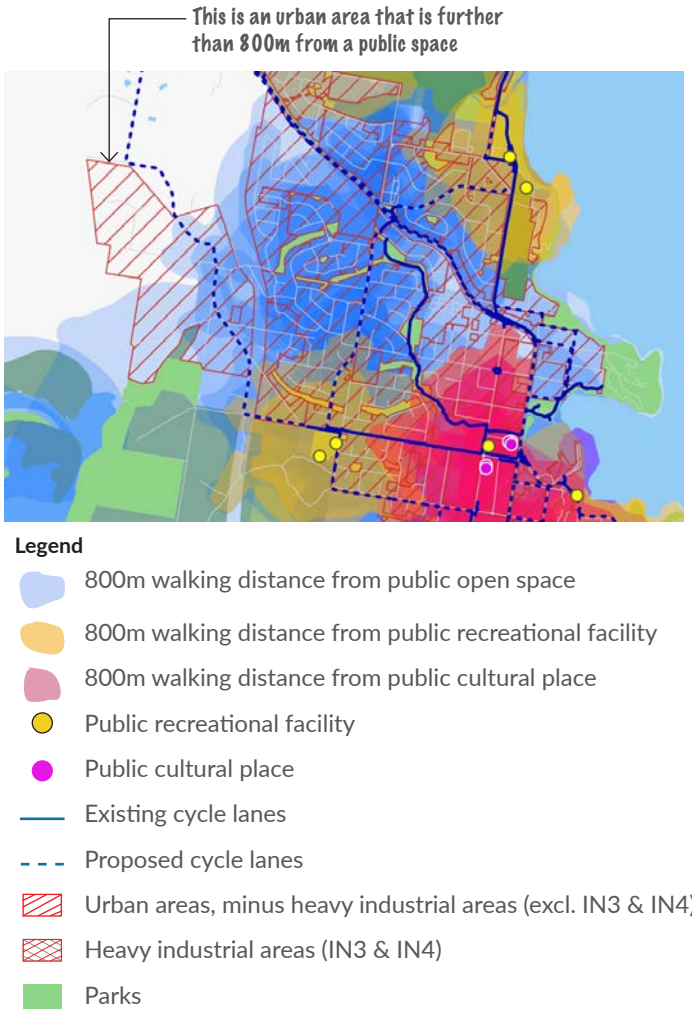
The 800m walking catchment analysis brings together the individual audits of public open space, public cultural places and public recreational facilities and the 800m walking catchments around them - to gain an insight into which areas have good access to a range of public spaces, and those that don't.

Urban areas walking catchment maps

The urban area maps take a closer look at 800m walking catchment analysis in key centres across each of the council areas.

How to read the urban area walking catchment maps

The 800m walking catchment maps combine 11 layers of information to show which parts of the Region's centres do not have access to a public space within 800m (or 10 minutes walk) walking distance.



3.1.1. Key findings

Audit and distribution of all public spaces

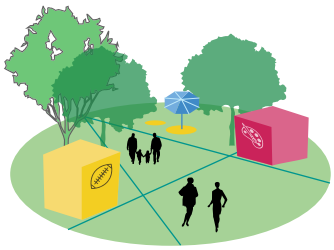
In the following pages, Figure 8, Figure 10, Figure 9, and Figure 11 provide maps of all public space in the Region. The public space audit indicates that:

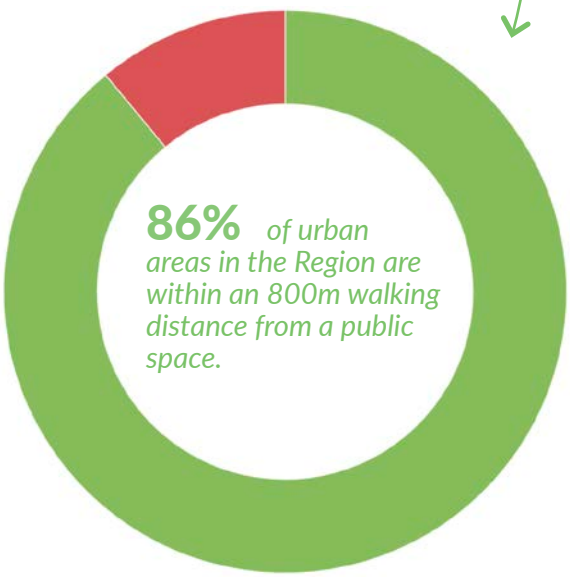
- Of all public space types across the Region, the largest proportion by far is 'natural space' (86%) particularly in the Shoalhaven and Wollongong LGAs.
- There is a higher provision of public recreation facilities than public cultural places across the region with strong clusters of public recreational facilities in Fairy Madow and Corrimal in Wollongong LGA; Albion Park in Shellharbour LGA; Kiama; Nowra and Ulladulla in Shoalhaven LGA.
- There is a clustering of public spaces (including public recreational facilities, public open space and public cultural facilities) along the coastline and in centres.
- There is a clustering of sportsfields around Wollongong Centre, Shellharbour City Centre, Coastline along Kiama and in Nowra.
- There is a clustering of public cultural places along the coastline in Wollongong, Shellharbour and Kiama, and a clustering in Nowra and Ulladulla.
- There are disconnected cycleways along the Region's coastline and lack of cycleways that connect communities east to west.

800m walking catchment gap analysis

Figure 12 shows an 800m walking catchment around all public spaces in the Region. Overall, the Region has the following gaps in 800m walking distance to public space:

- Overall - 96% (Kiama LGA), and 71% (Shoalhaven LGA) of urban areas are within an 800m walking distance from a public space.
- There is a lack of public space and a lack of connectivity to existing public spaces in new urban release areas and estates across the Region.
- Major infrastructure like highways and railway lines act as barriers for accessing public space and centres.
- Public space tends to be clustered along the coastline, where historically people have lived.
- A potential lack of connection between new communities in urban release areas in the west of the region and existing centres along the coastline.
- There are gaps throughout the Region disconnecting the foreshore from providing a continuous public open space link.





This calculation excludes Heavy industrial areas (IN3 & IN4) from the urban area

Regional map: all public spaces

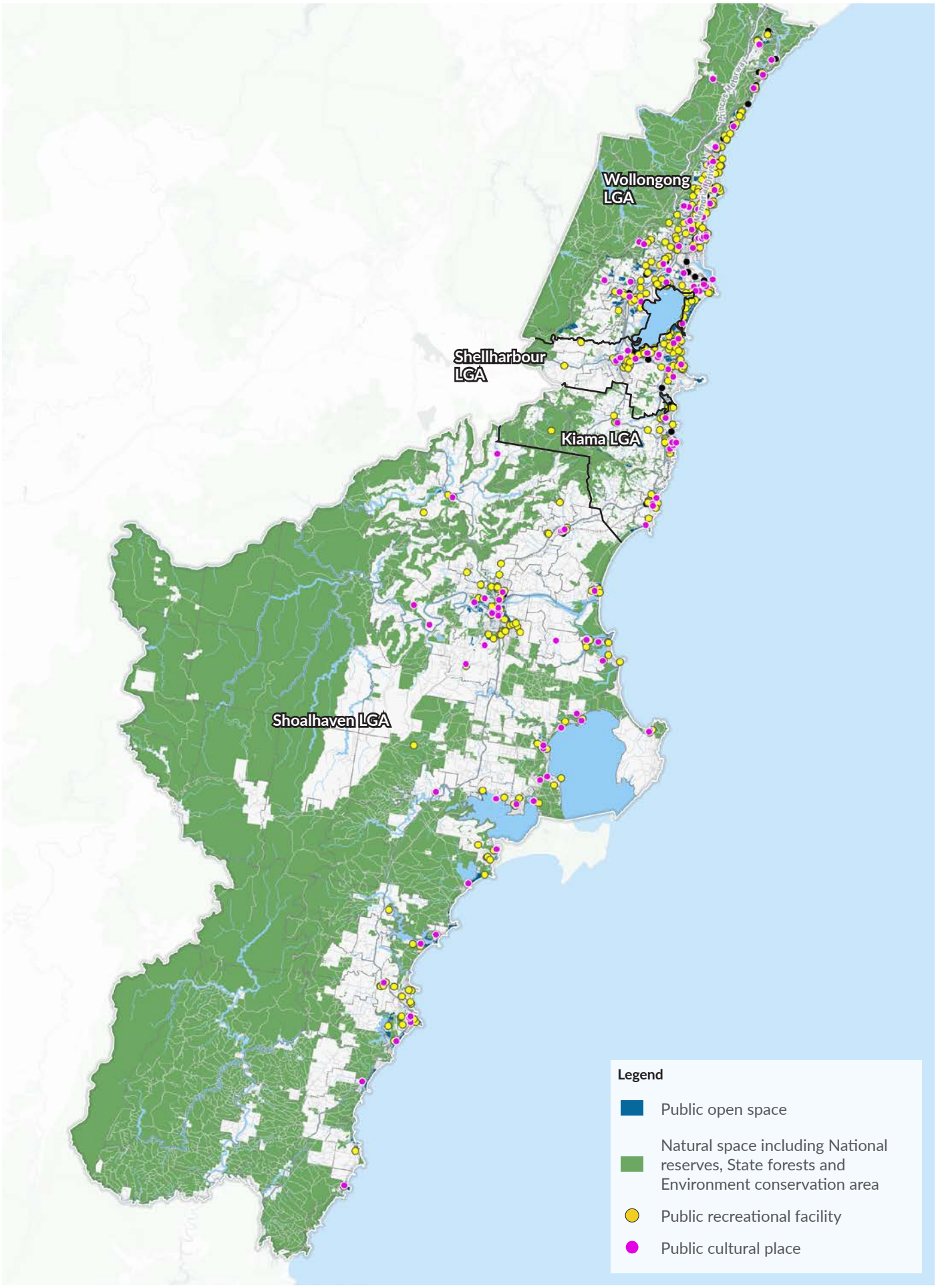


Figure 8 - Audit of all public spaces in the Illawarra-Shoalhaven Region - showing the significant natural areas

Regional map: public open space

Figure 9 shows all public open space by hierarchy in the Region, it shows:

- A large amount of natural space including national reserves, state forests and environmental conservation areas across the Region. A concentration of vast natural space in Wollongong and Shoalhaven LGAs.
- A clustering and distribution of public open space along the coastline.
- A clustering of regional public open space in Wollongong, Dapto, Nowra and Albion Park suburbs.
- A distribution of local level 1 and 2 public open spaces across the Region with clustering around centres.

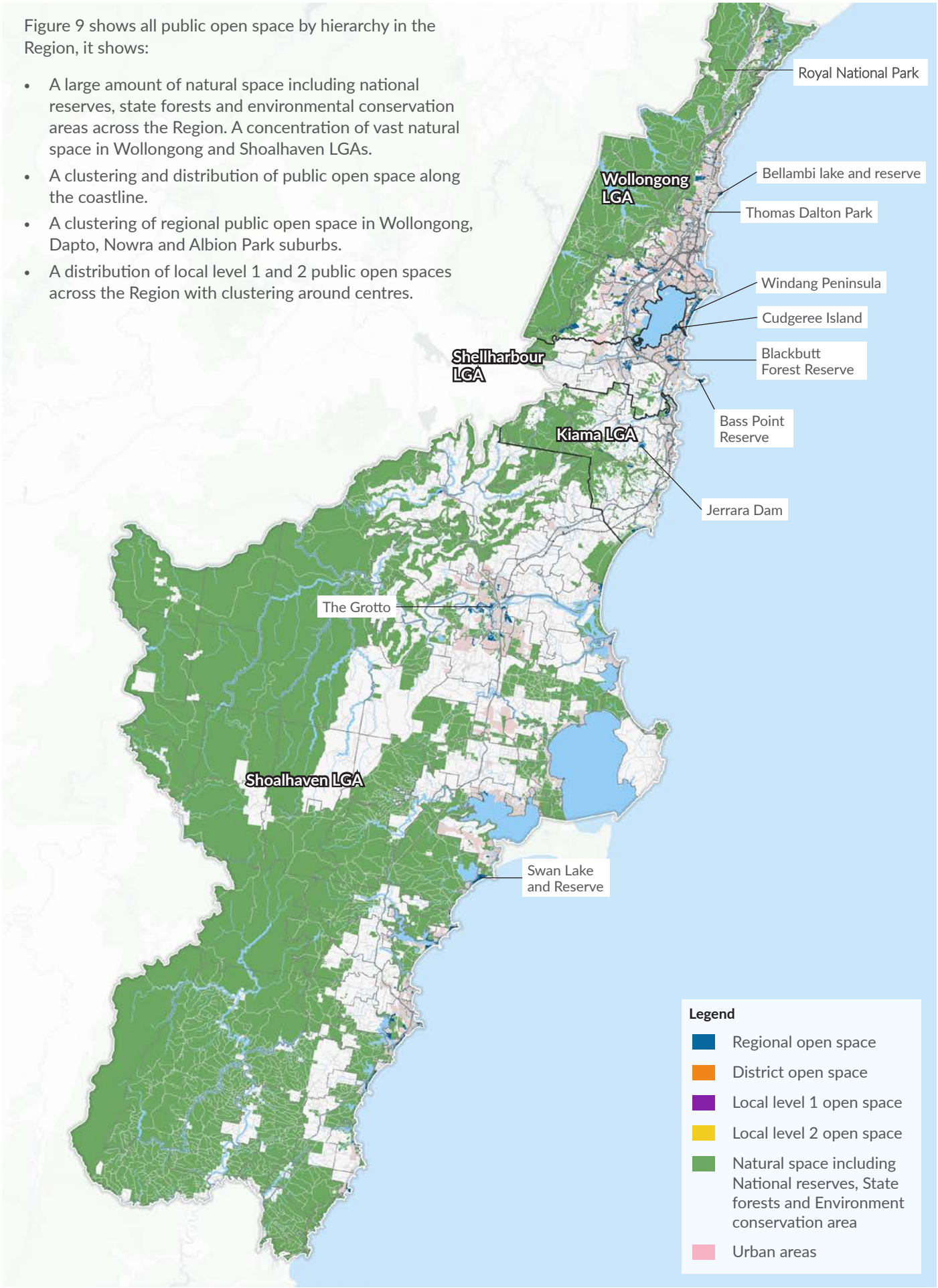


Figure 9 - Audit of public open spaces in the Illawarra-Shoalhaven Region by hierarchy

Regional map: public recreational facilities

Figure 10 shows all public recreation facilities in the Region and highlights some of the regional spaces, it shows:

- A high provision of public recreational facilities in Fairy Madow and Corrimal in Wollongong LGA; Albion Park in Shellharbour LGA; Kiama; Nowra and Ulladulla in Shoalhaven LGA.
- A clustering of public recreational facilities along the coastline in Wollongong and Shellharbour LGAs.
- A significant network of planned cycleways in Wollongong and Shoalhaven LGAs improving connection to the recreational facilities.

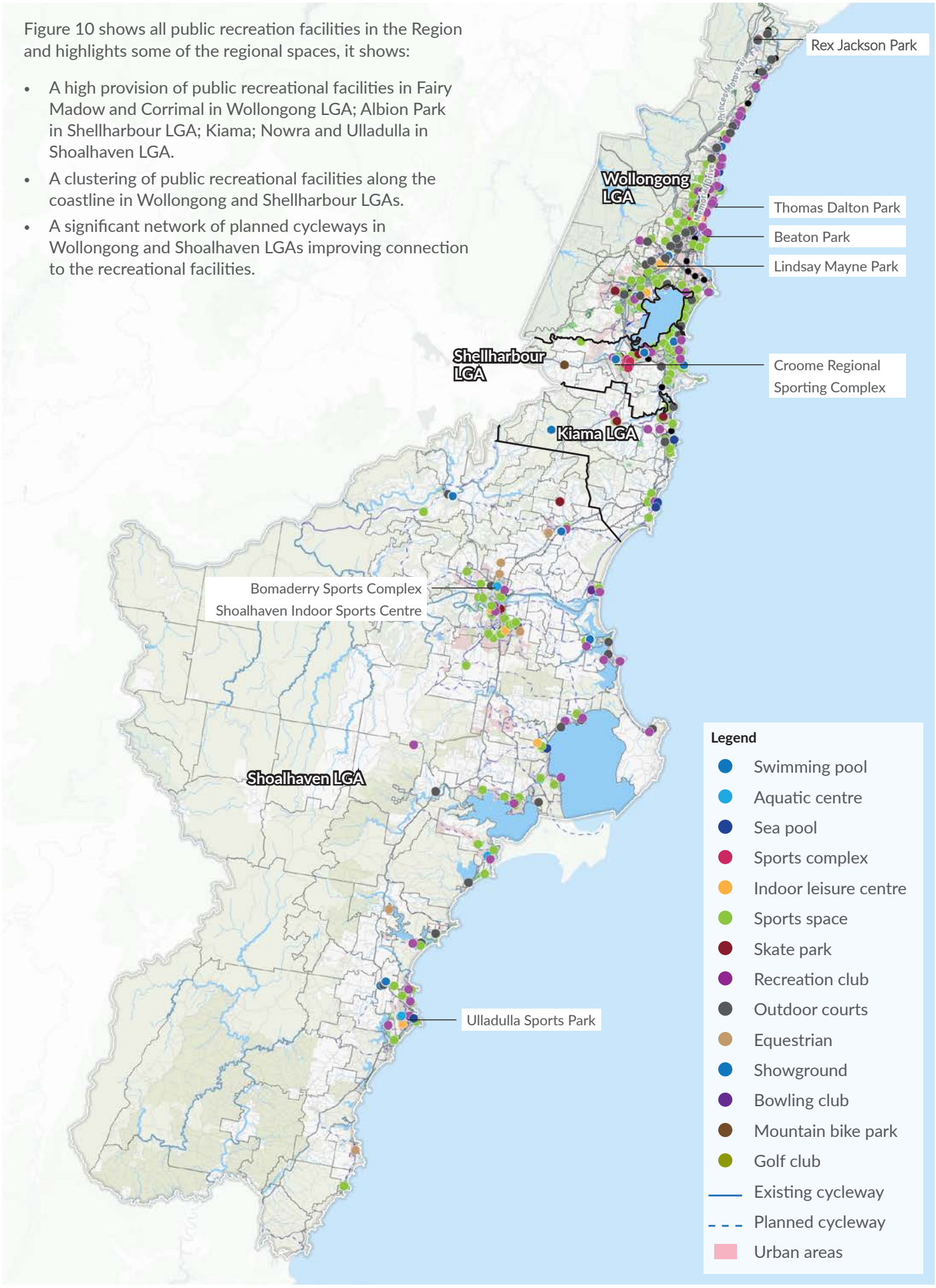


Figure 10 - Audit of public recreational facilities in the Illawarra-Shoalhaven Region

Regional map: public cultural spaces

Figure 11 shows all public cultural places in the Region, it shows:

- A clustering of public cultural places in Nowra and Ulladulla in Shoalhaven LGA.
- A clustering of public cultural places in Wollongong and Port Kembla in Wollongong LGA.
- A clustering of public cultural places in Shellharbour City Centre.

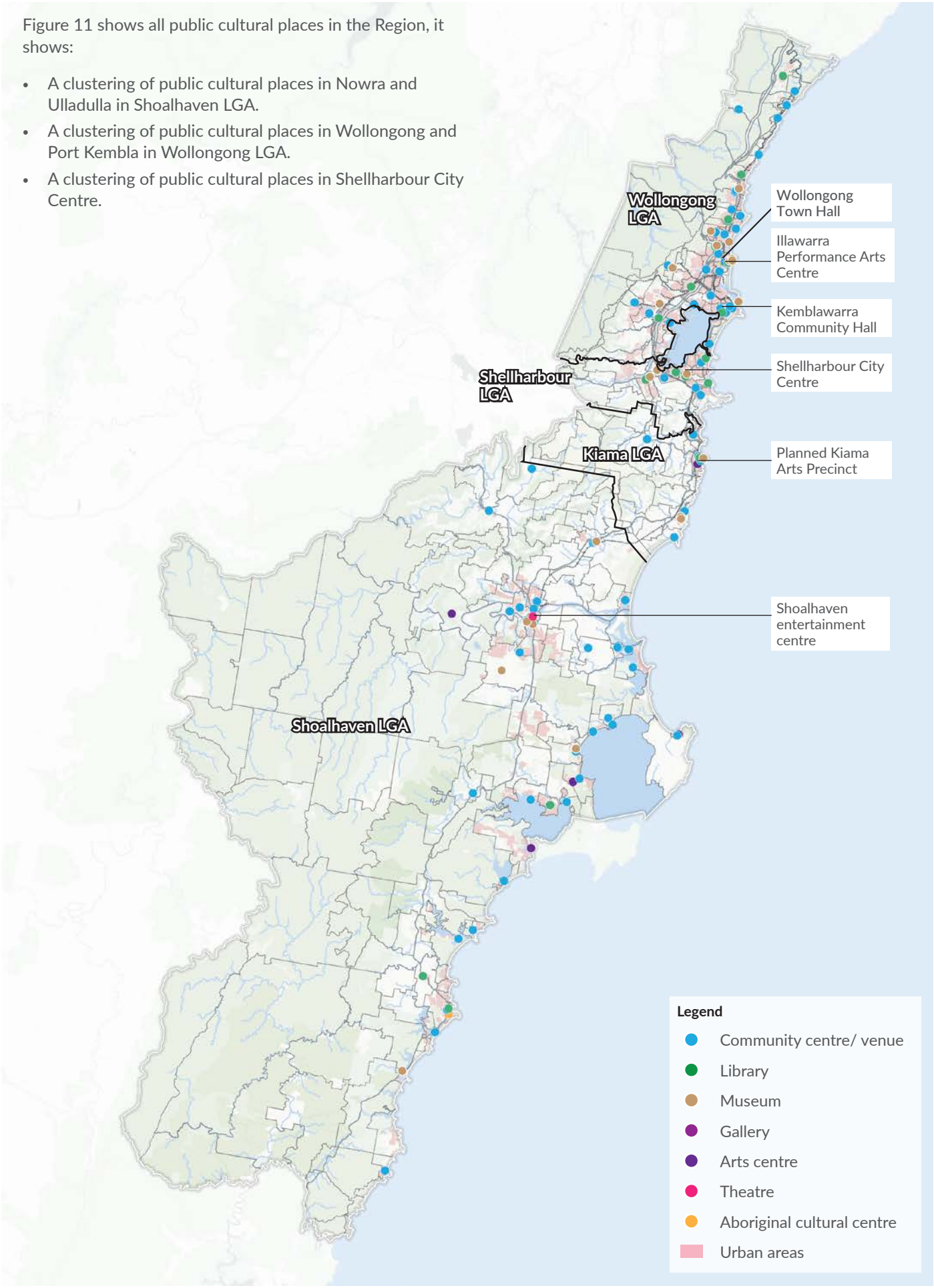


Figure 11 - Public recreational cultural places in Illawarra-Shoalhaven Region

Regional map - all public spaces: 800m walking catchment

Figure 12 shows a 800m walking catchment analysis to all public spaces in the Region, it shows:

- Clustered public spaces in centres and along the coastline.
- Limited or no 800m walking access to public space in new urban release areas and estates across the Region.
- Major infrastructure like highways and railway lines act as barriers for accessing public space and centres.
- A disconnected foreshore in terms of pedestrian access.

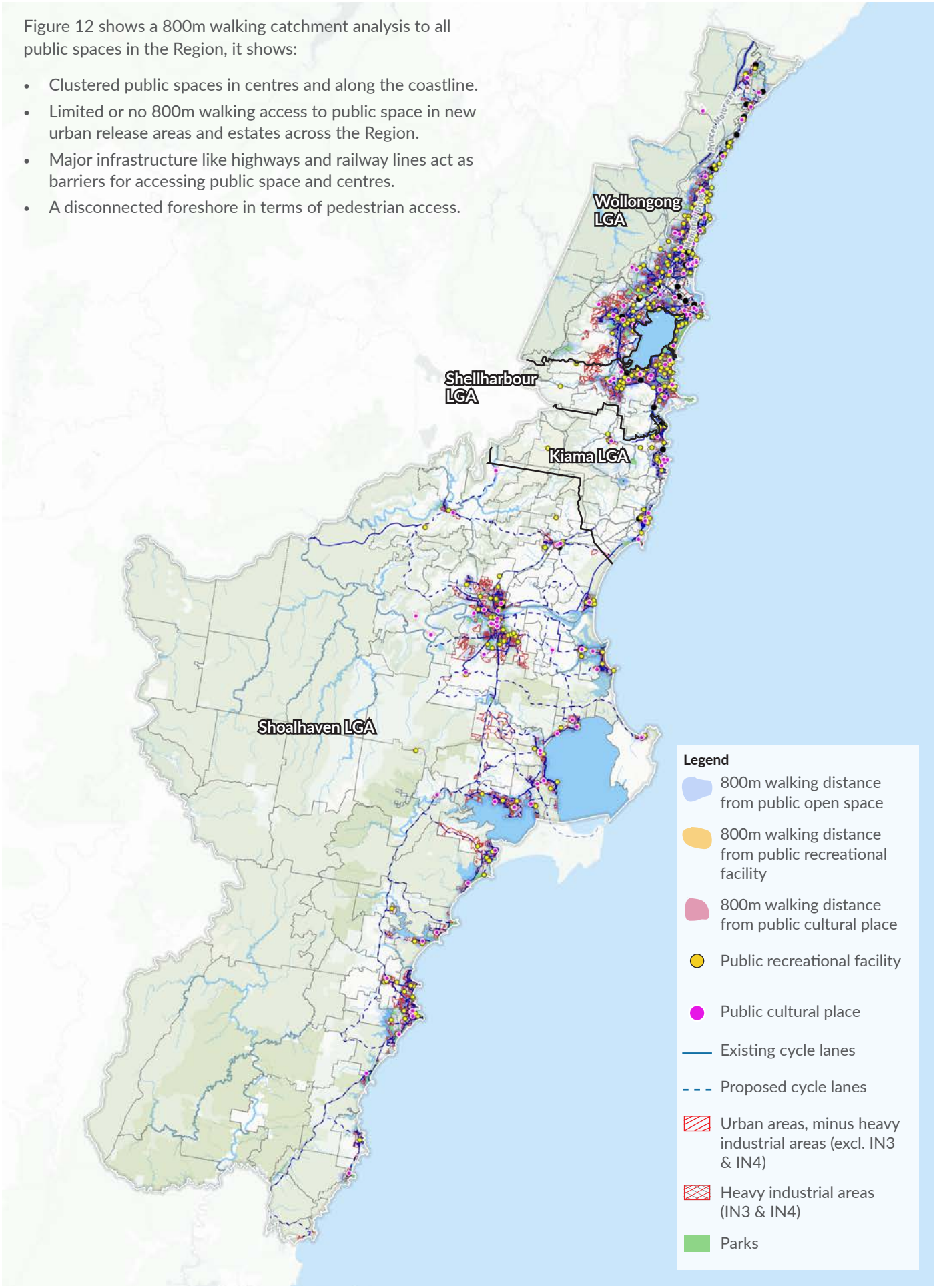


Figure 12 - 800m walking catchment to all public space in Illawarra-Shoalhaven Region

3.2. Wollongong LGA

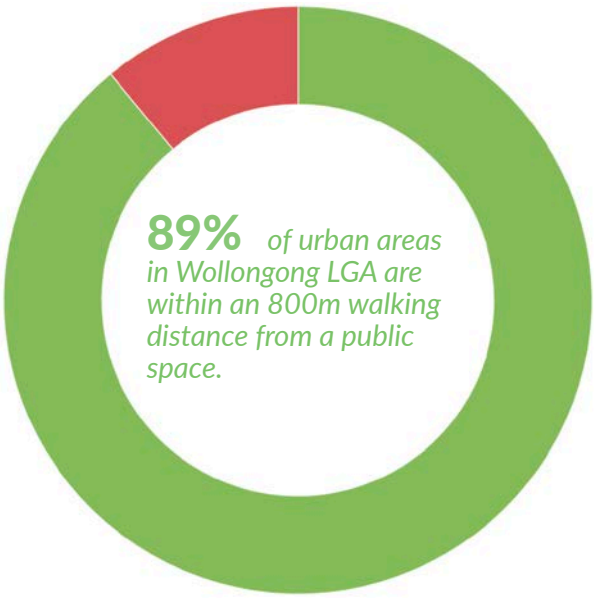
3.2.1. Key findings

Audit and distribution of all public spaces

Figures Figure 14, Figure 13 and Figure 15 provide maps of all public spaces in the Wollongong LGA. The public space audit indicate that:

- There is a clustering of Council's public space along the Wollongong City coastline and in the Wollongong, Unanderra and Dapto suburbs.
- There is a lack of spaces in new release areas being developed, Unanderra and Wollongong suburbs.
- The LGA has a total of 2772 ha of public open space (excluding natural spaces). Out of that, 63 % is regional open space, 17 % is district open space, 6 % is local level 1 open space, and 14 % is local level 2 open space.
- There is a clustering of sportsfields around Wollongong Centre. The Wollongong Sportsground and Sporting Facilities Strategy indicated that the City has 67 designated sportsgrounds and these occupy 332.8 hectares, representing 13.2% of Council's public space.
- The Wollongong area offers regional facilities, including major cultural venues. Most cultural places including galleries and Aboriginal cultural infrastructure is clustered in the Wollongong City Centre, while other places like community centres are more dispersed throughout the LGA.
- There is a clustering of cultural facilities in Helensburgh, Wollongong City Centre, Port Kembla, and Dapto.
- Public cultural places in the Dapto, Port Kembla and Figtree areas is distributed is dispersed across a large area. Recreational clubs comprise a high proportion of social infrastructure within this catchment and there is limited availability of creative/arts facilities while noting that Dapto Ribbonwood Centre offers spaces for exhibition and performance.
- There is a high proportion of small scale social infrastructure facilities located in the Balgownie to Stanwell Park area.
- It should also be noted that Council is planning for a new community centre and library in Warrawong and Helensburgh.

This calculation excludes Heavy industrial areas (IN3 & IN4) from the urban area



800m walking catchment gap analysis

Figure 16 shows an 800m walking catchment around all public spaces in the Wollongong LGA. Overall, Wollongong has the following gaps in 800m walking distance to public space:

- Areas of Helensburgh, Bulli, Wollongong, Warrawong, West Dapto, Yalla, Cordeaux Heights, Avondale and Marshall Mount suburbs.

Figures Figure 17, Figure 18, Figure 19, Figure 20 and Figure 21 take a closer look at Wollongong's urban areas including Towradgi-Woonona-Thirroul-Coledale; Mount Kembla; Wollongong CBD-Gwynneville; Dapto - West Dapto; Port Kembla - Primbee.

They show:

- Public recreational facilities are clustered along the coast line (e.g. Bulli, Thirroul, Austinmer).
- Intensity of public space provision increases the closer you get to Wollongong CBD (e.g. Towradgi and Corrimal).
- Challenges to access public spaces caused by the rail corridor and Memorial Drive.
- Challenges accessing public spaces in Dapto/West Dapto for communities living between the Princes Highway and Motorway.
- Some older suburbs do not have easy connection to public cultural places or public recreational facilities. For example, Mount Saint Thomas, Coniston and Mangerton are all older style suburbs where rail and major road corridors create barriers to surrounding public cultural places and public recreational facilities to the east and west.

Wollongong LGA map: public open space

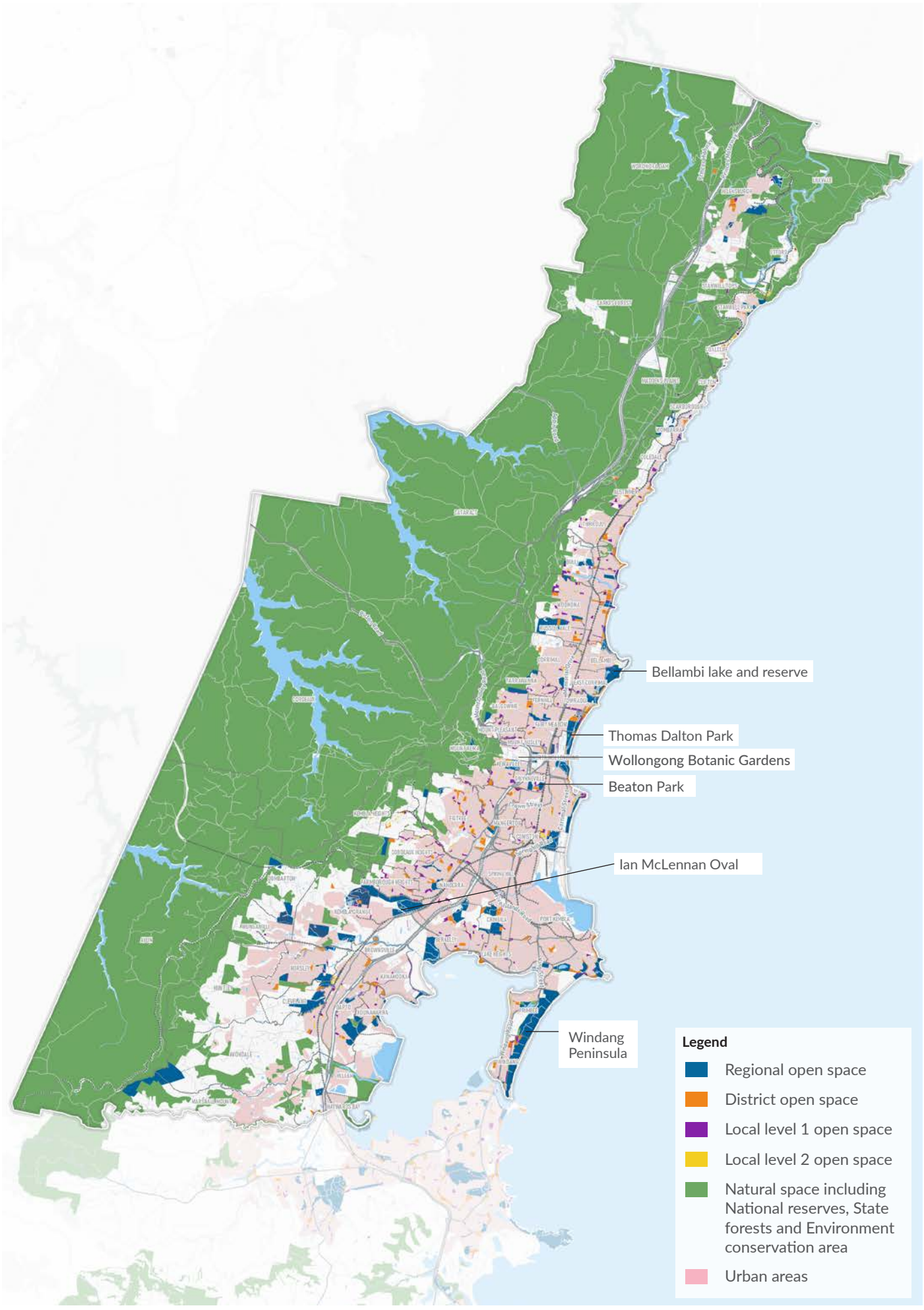


Figure 13 - Audit of public open space in Wollongong LGA by hierarchy

Wollongong LGA map: public recreational facilities

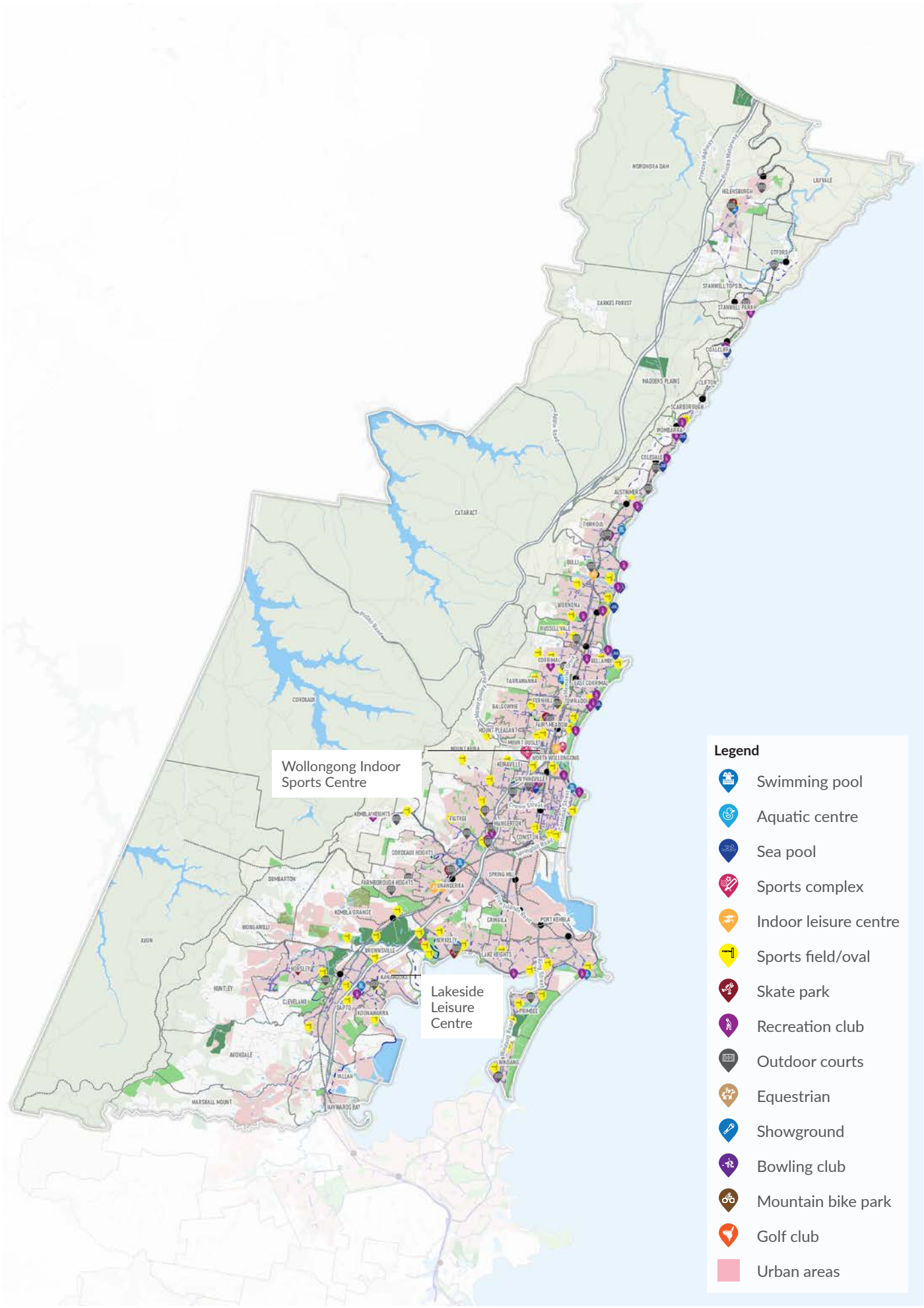


Figure 14 - Audit of public recreational facilities in Wollongong LGA

Wollongong LGA map: public cultural spaces

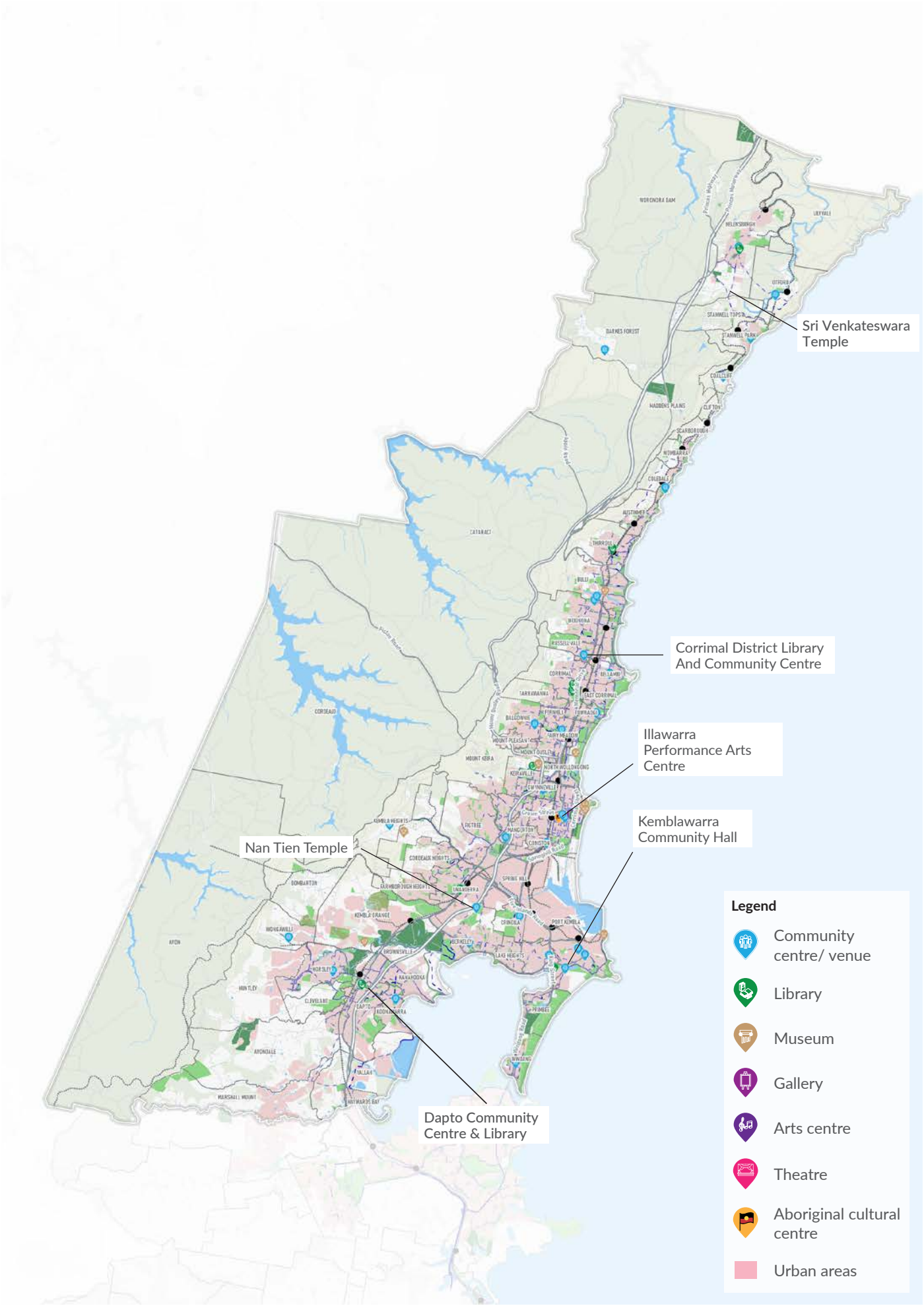


Figure 15 - Audit of public cultural places in the Wollongong LGA

Wollongong LGA map - all public spaces: 800m walking catchment

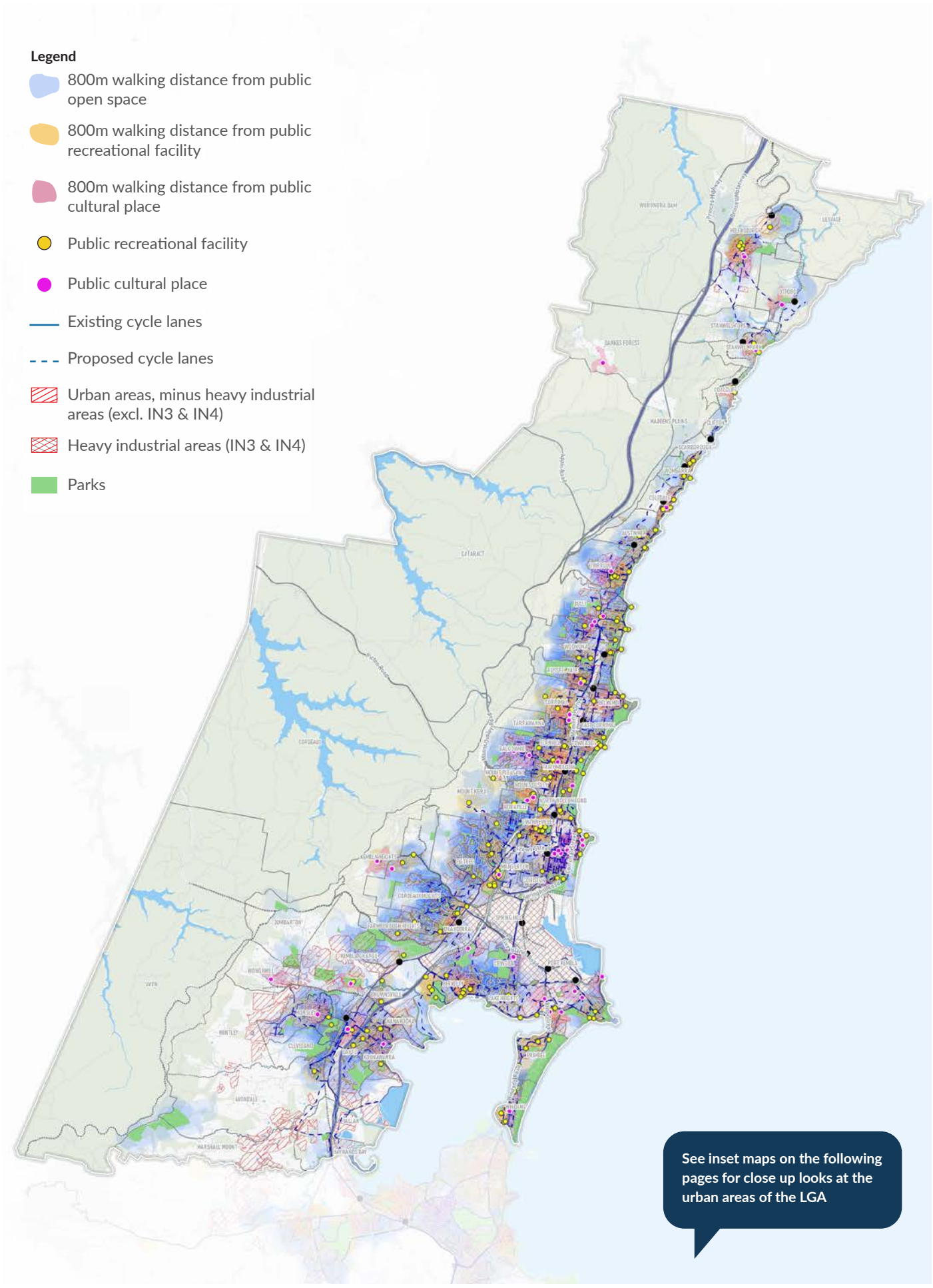


Figure 16 - Wollongong LGA - Public space 800m walking catchment

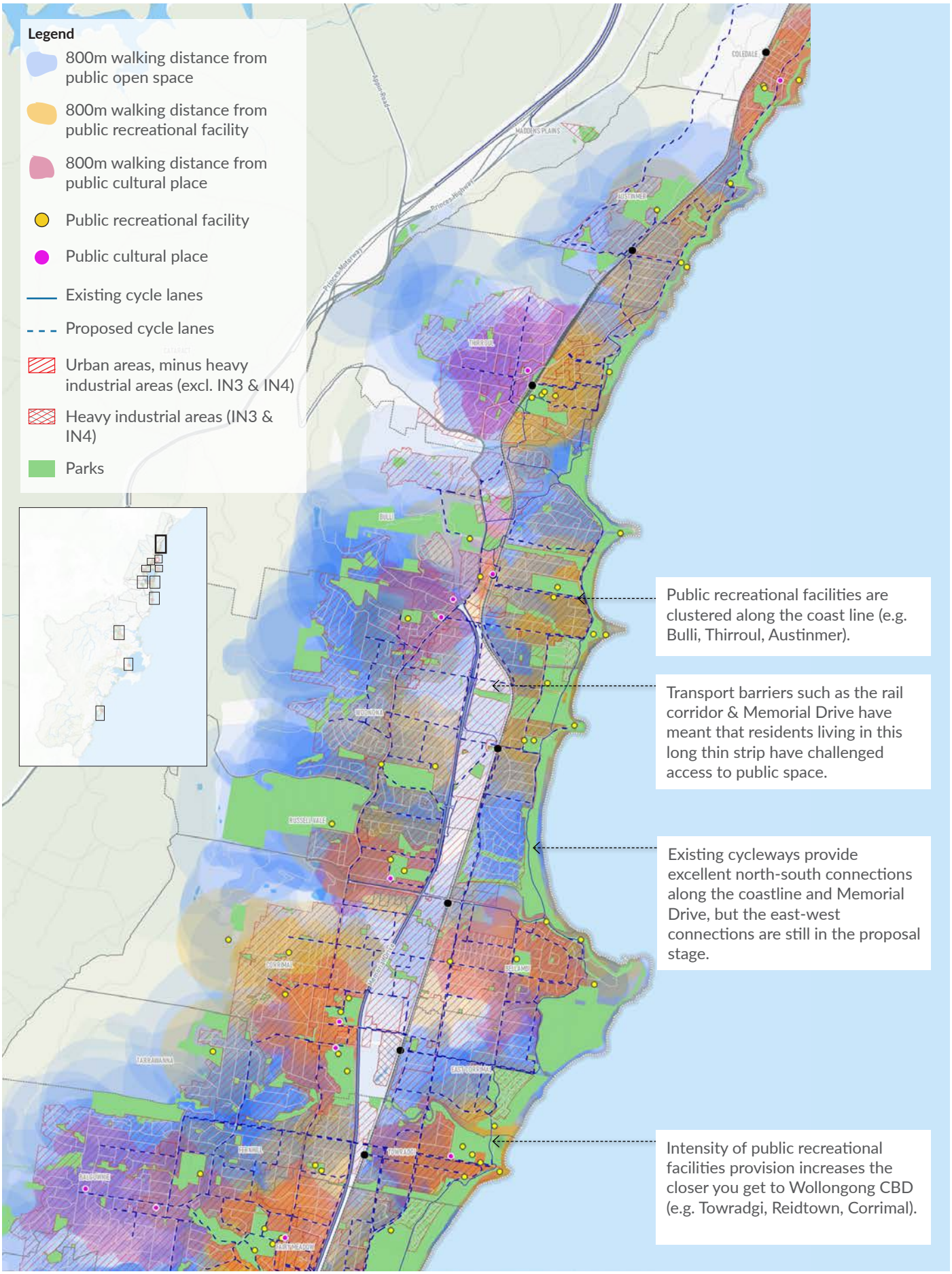


Figure 17 - Public space 800m walking catchment, Wollongong urban areas: Towradgi - Woonona - Thirroul - Coledale

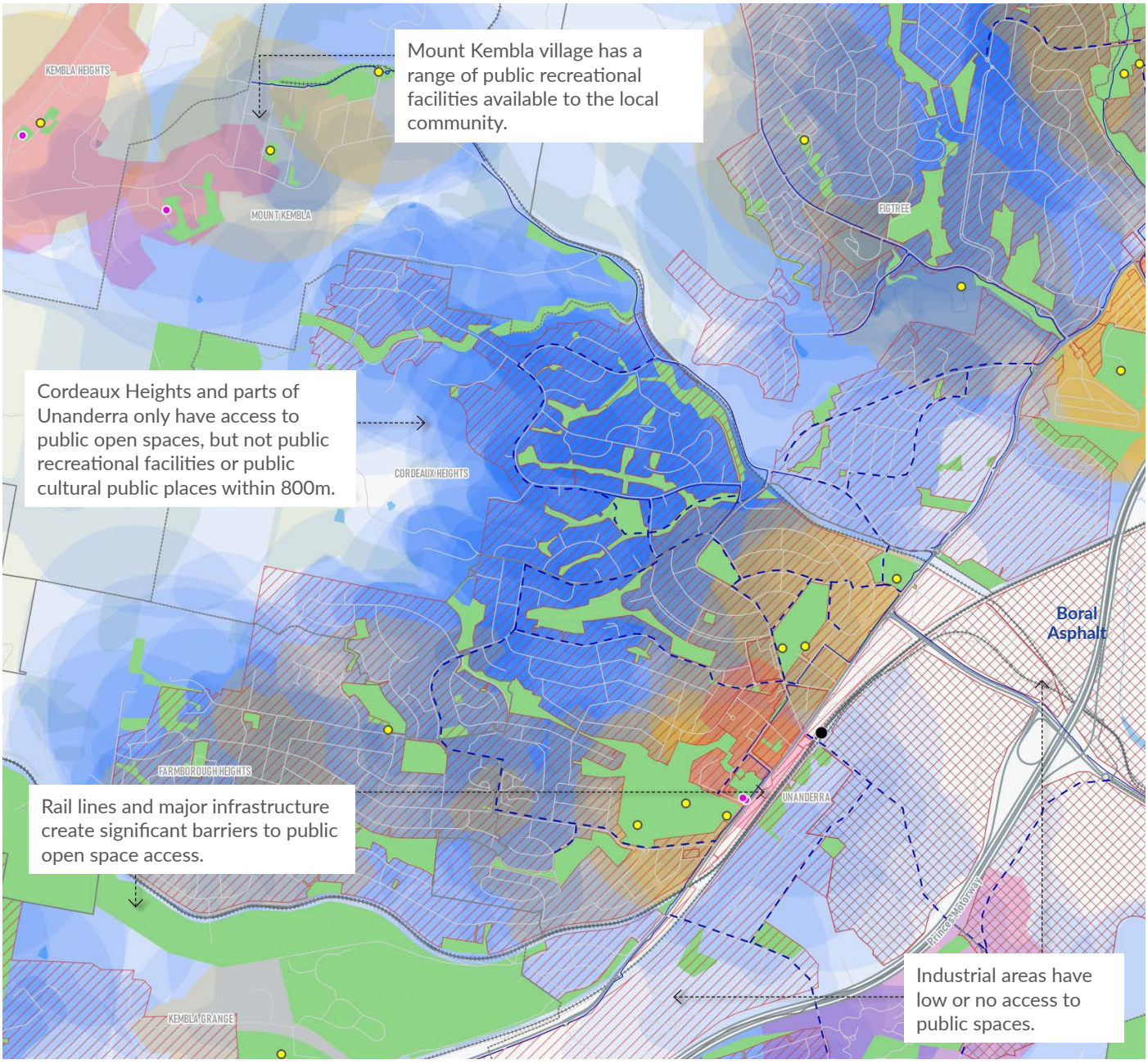
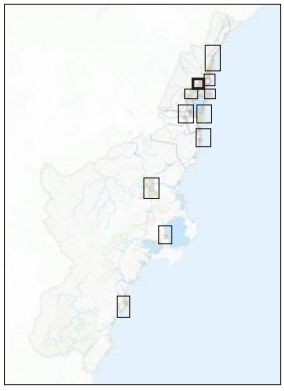


Figure 18 - Public space 800m walking catchment, Wollongong Urban areas: Unanderra

Legend

- 800m walking distance from public open space
- 800m walking distance from public recreational facility
- 800m walking distance from public cultural place
- Public recreational facility
- Public cultural place
- Existing cycle lanes
- Proposed cycle lanes
- Urban areas, minus heavy industrial areas (excl. IN3 & IN4)
- Heavy industrial areas (IN3 & IN4)
- Parks



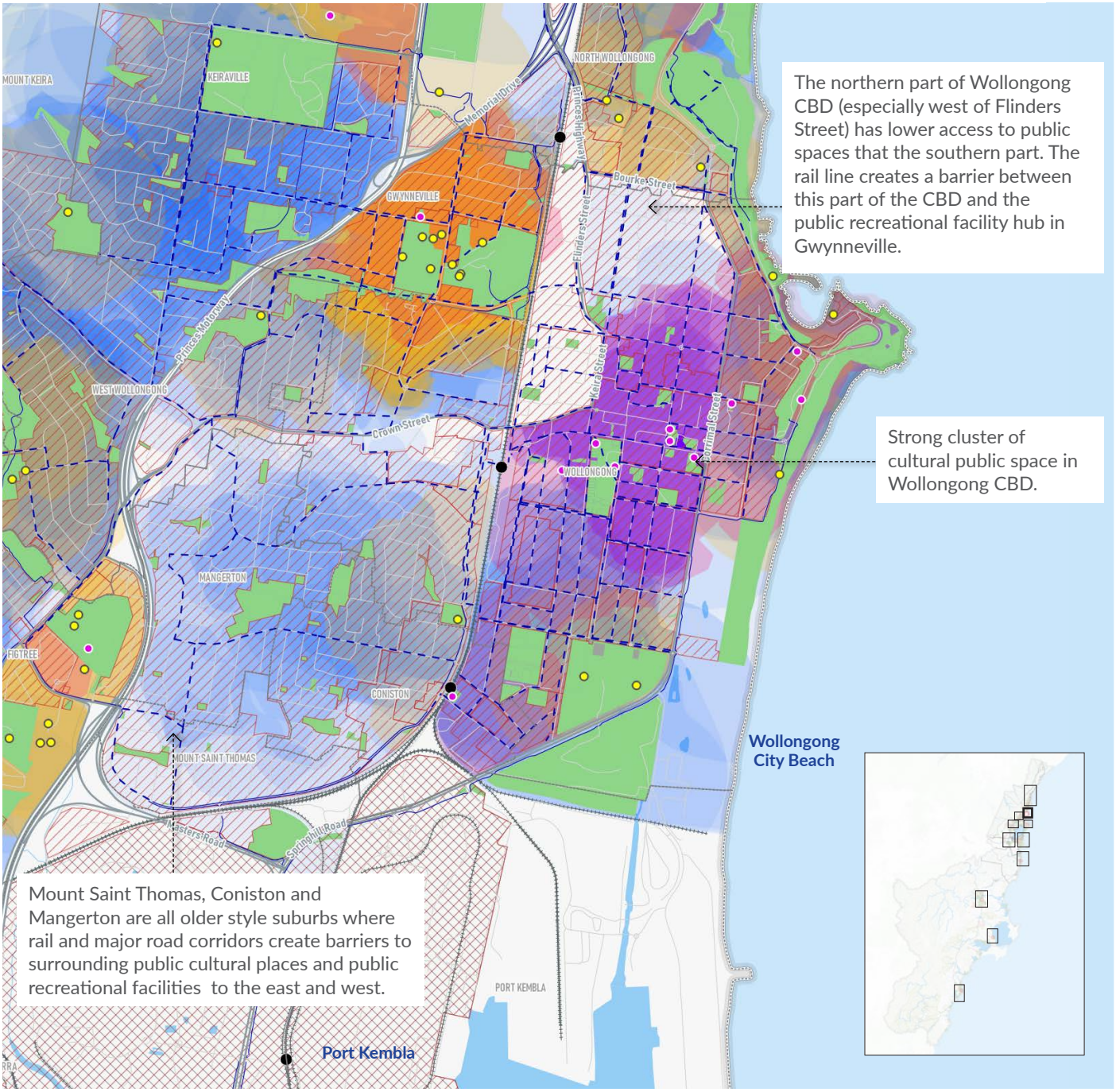


Figure 19 - Public space 800m walking catchment, Wollongong Urban areas: Wollongong CBD - Gwynneville

Legend

- 800m walking distance from public open space
- 800m walking distance from public recreational facility
- 800m walking distance from public cultural place
- Public recreational facility
- Public cultural place
- Existing cycle lanes
- Proposed cycle lanes
- Urban areas, minus heavy industrial areas (excl. IN3 & IN4)
- Heavy industrial areas (IN3 & IN4)
- Parks

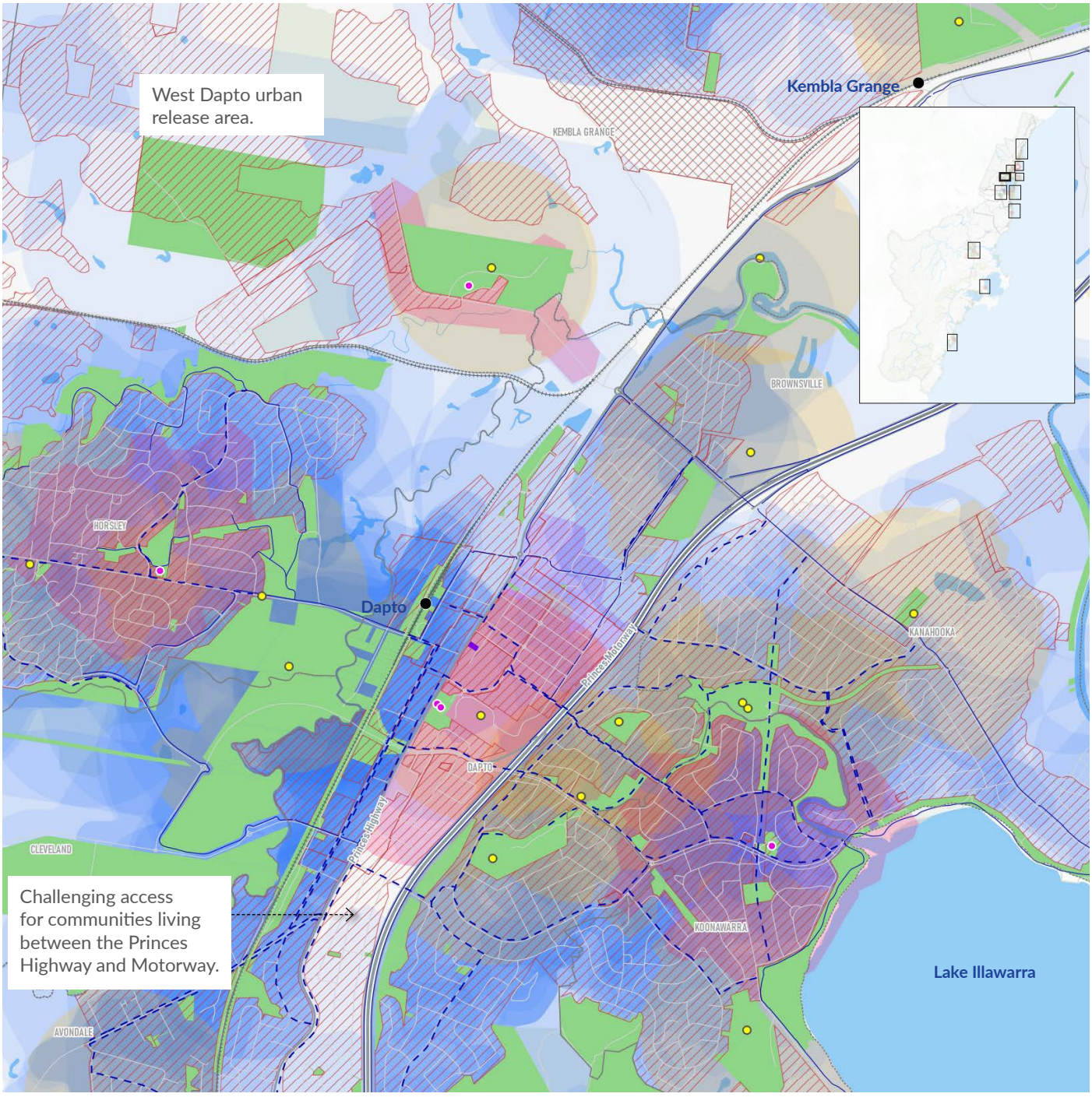


Figure 20 - Public space 800m walking catchment analysis, Wollongong Urban areas: Dapto - West Dapto

Legend

- 800m walking distance from public open space
- 800m walking distance from public recreational facility
- 800m walking distance from public cultural place
- Public recreational facility
- Public cultural place
- Existing cycle lanes
- Proposed cycle lanes
- Urban areas, minus heavy industrial areas (excl. IN3 & IN4)
- Heavy industrial areas (IN3 & IN4)
- Parks

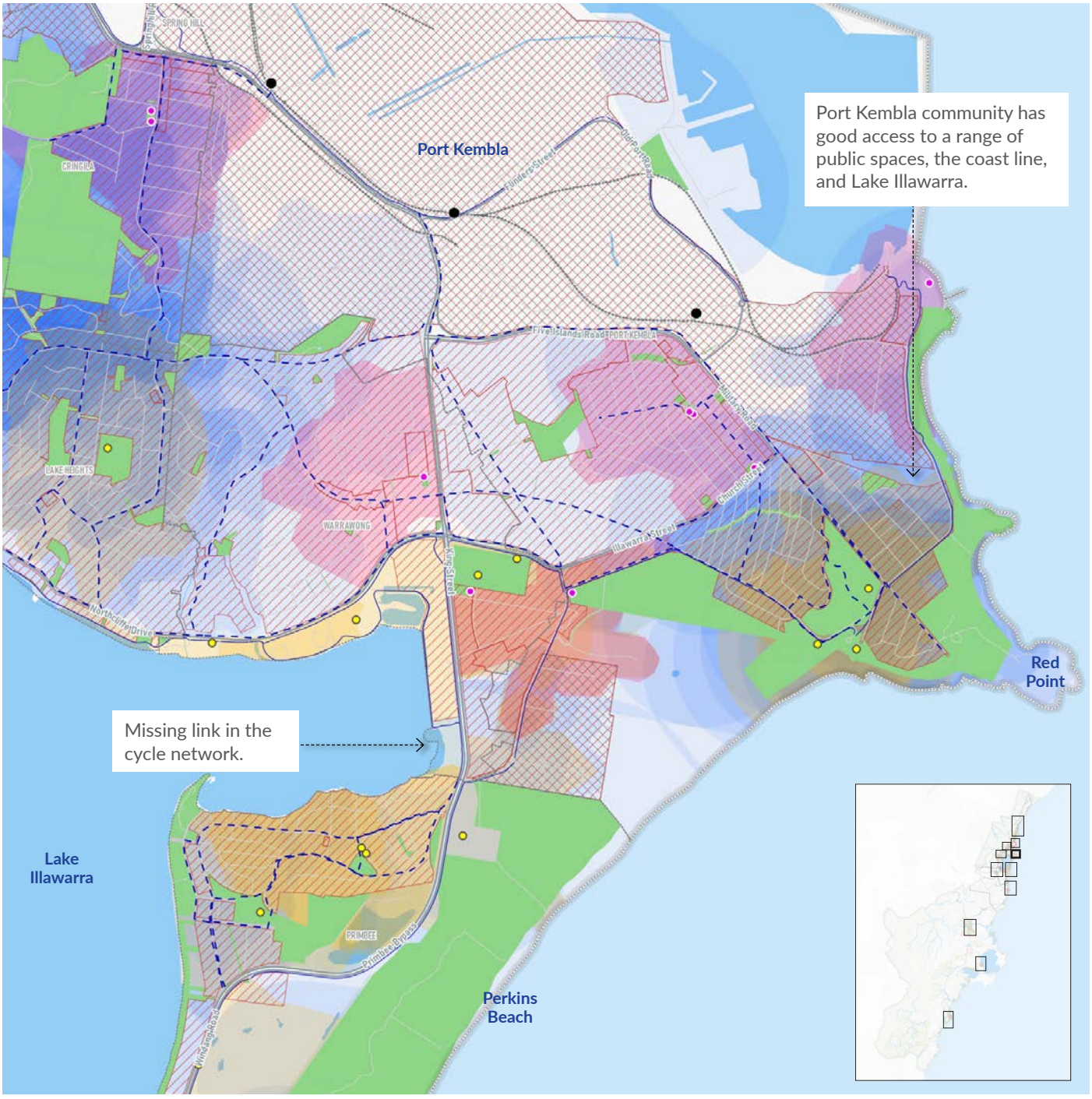


Figure 21 - Public space 800m walking catchment analysis, Wollongong Urban areas: Port Kembla - Primbee

Legend

- 800m walking distance from public open space
- 800m walking distance from public recreational facility
- 800m walking distance from public cultural place
- Public recreational facility
- Public cultural place
- Existing cycle lanes
- Proposed cycle lanes
- Urban areas, minus heavy industrial areas (excl. IN3 & IN4)
- Heavy industrial areas (IN3 & IN4)
- Parks

3.3. Shellharbour LGA

3.3.1. Key findings

Audit and distribution

Figures Figure 22 and 24 provide maps of all public space in the Shellharbour LGA. The public space audit indicates that:

- There is a good range and spread of recreational facilities including sporting fields/ovals and a clustering of sportsfields in Albion park and Shellharbour suburbs. There are beaches and recreation clubs along the coastline.
- The LGA has a total of 935.50 ha of public open space (excluding natural spaces). Out of that, 63% is regional open space, 18% is district open space, 4% is local level 1 open space, and 14% is local level 2 open space.
- As indicated in the Shellharbour Open Space and Recreation Needs Study currently passive recreational open space is not evenly distributed across the LGA, with approximately 75% of open spaces (or 90% of park areas) located in the eastern precincts. The eastern precincts house all higher tier city-wide parks located in their boundaries.
- Public cultural places are spread across the LGA. There is a clustering of public cultural places in Shellharbour Civic Centre, which has a range of cultural and community venues, civic space and public open space. Also, there is a clustering of public cultural places in Oak Flats and Albion Park.
- There are bicycle lanes that connect the LGA through the North-South corridors and coastline. However, the cycleways don't extend to the coastline of new areas such as Shell Cove, instead joining the highway to connect to southern suburbs.

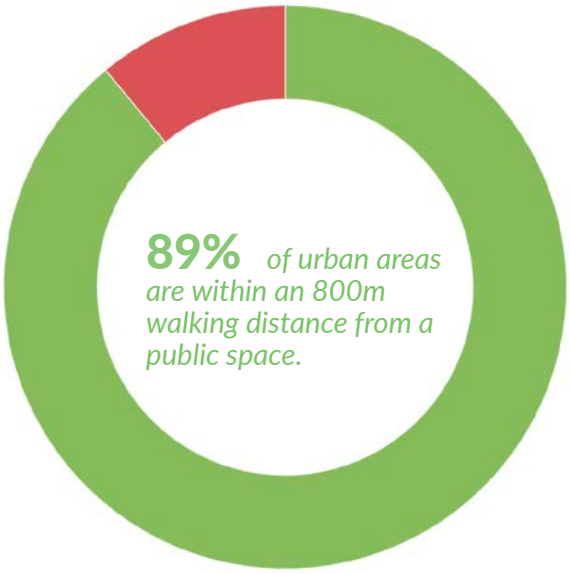
It should be noted that Council has plans to make improvements to a number of specific active facilities, as well as constructing new sports fields in Calderwood and Shell Cove.

The Shellharbour LGA is home to over 95 sports fields, including more than 31 courts (suitable for netball, basketball and tennis), as well as a regional multi-use sports facility in the form of Croom Regional Sporting Complex, which includes Shellharbour City Stadium.

The Shellharbour LGA has a strong connection to water, bounded to the east by the South Pacific Ocean, and to the north-east by Lake Illawarra. Residents in the area has access to extensive amounts of ocean and lake foreshore, as well as access to multiple beaches, river systems and bays providing a range of opportunities for boating and other water sports. Shellharbour's strong water-based culture is supported by two surf-life saving clubs, plus a variety of rowing, sailing, swimming and surfing clubs.

Shellharbour hosts four public pools for swimming, including the open-access Beverley Whitfield Ocean Pool.

This calculation excludes Heavy industrial areas (IN3 & IN4) from the urban area



Walking catchment gap analysis

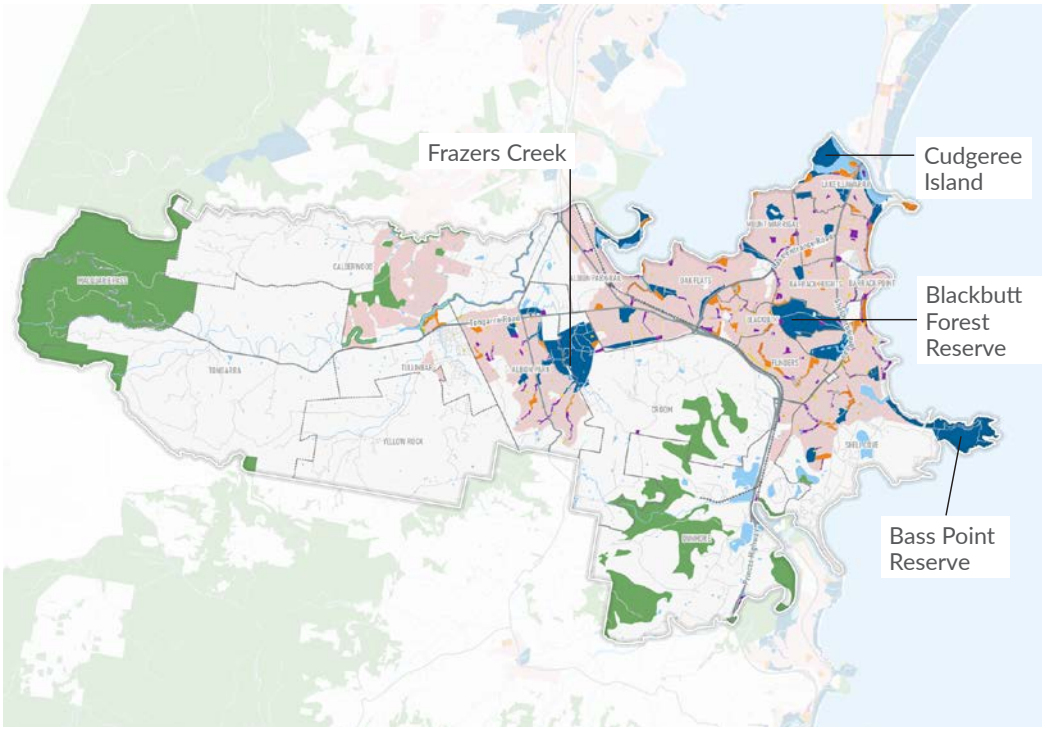
Figure 25 shows an 800m walking catchment around all public spaces in the Shellharbour LGA. Overall, Shellharbour has the following gaps in access to public space:

- Lack of public space and connectivity to existing open spaces in Calderwood, Dunmore, Tullimbar, Shell Cove, Albion Park, Oak Flats, and Warilla.

Figures Figure 26 & Figure 27 take a closer look at Shellharbour's urban areas of Calderwood - Tullimbar - Albion Park; Shellharbour City Centre - Barrack Point - Shell Cove, and shows:

- Calderwood urban release area is undergoing significant development and access to quality public space and connections to the coast and coastal communities should be a priority.
- The highway and rail corridor create significant physical barriers for these communities wanting to access to Lake Illawarra.
- Shellharbour City Centre has excellent access to public spaces.

Shellharbour LGA map: public open space

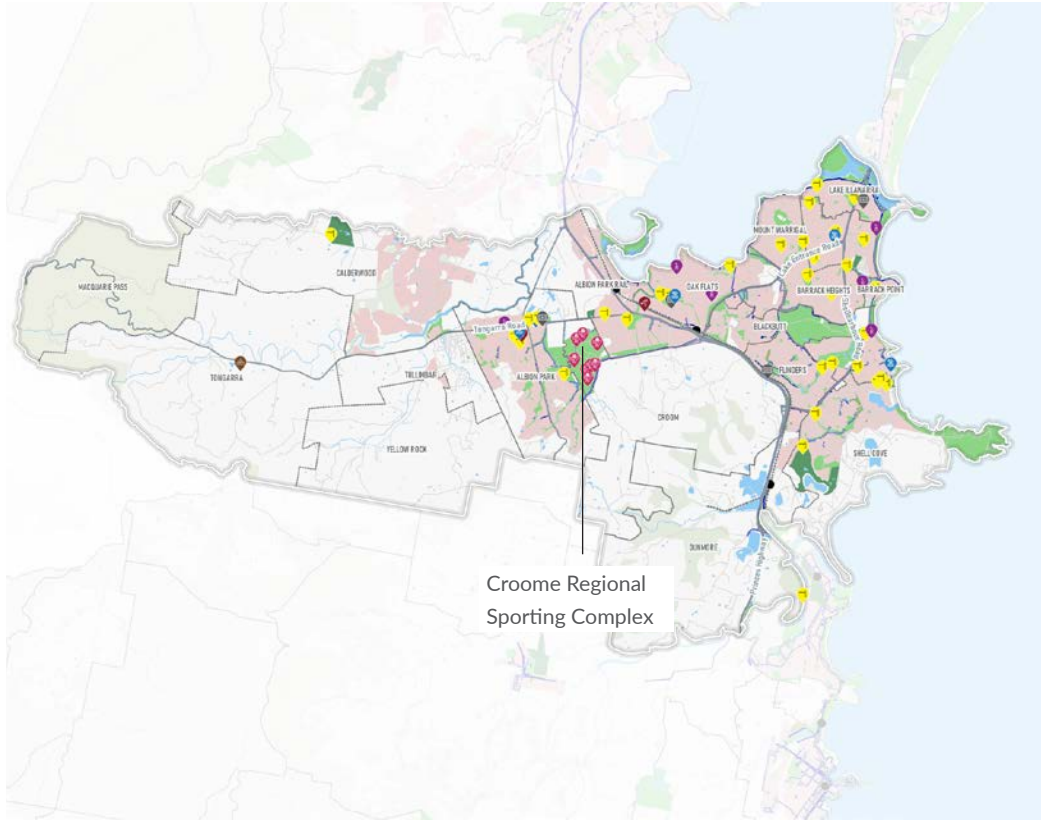


Legend

- Regional open space
- District open space
- Local level 1 open space
- Local level 2 open space
- Natural space including National reserves, State forests and Environment conservation area
- Urban areas

Figure 23 - Audit of public open space in Shellharbour City Council LGA by hierarchy

Shellharbour LGA map: public recreational facilities



Legend

- Swimming pool
- Aquatic centre
- Sea pool
- Sports complex
- Indoor leisure centre
- Sports field/oval
- Skate park
- Recreation club
- Outdoor courts
- Equestrian
- Showground
- Bowling club
- Mountain bike park
- Golf club
- Urban areas

Figure 22 - Audit of public recreational facilities in Shellharbour City Council LGA

Shellharbour LGA map: public cultural spaces

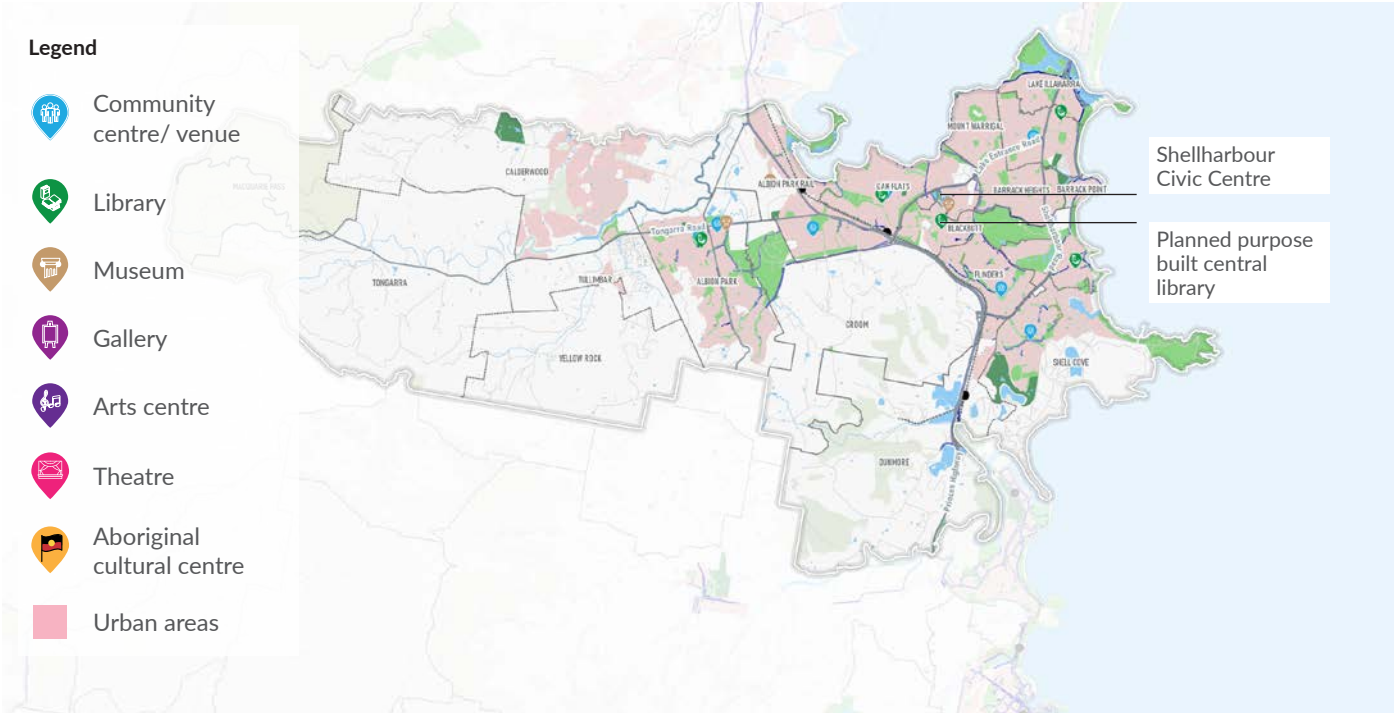


Figure 24 - Audit of public cultural places in Shellharbour City Council LGA

Shellharbour LGA map - all public spaces: 800m walking catchment

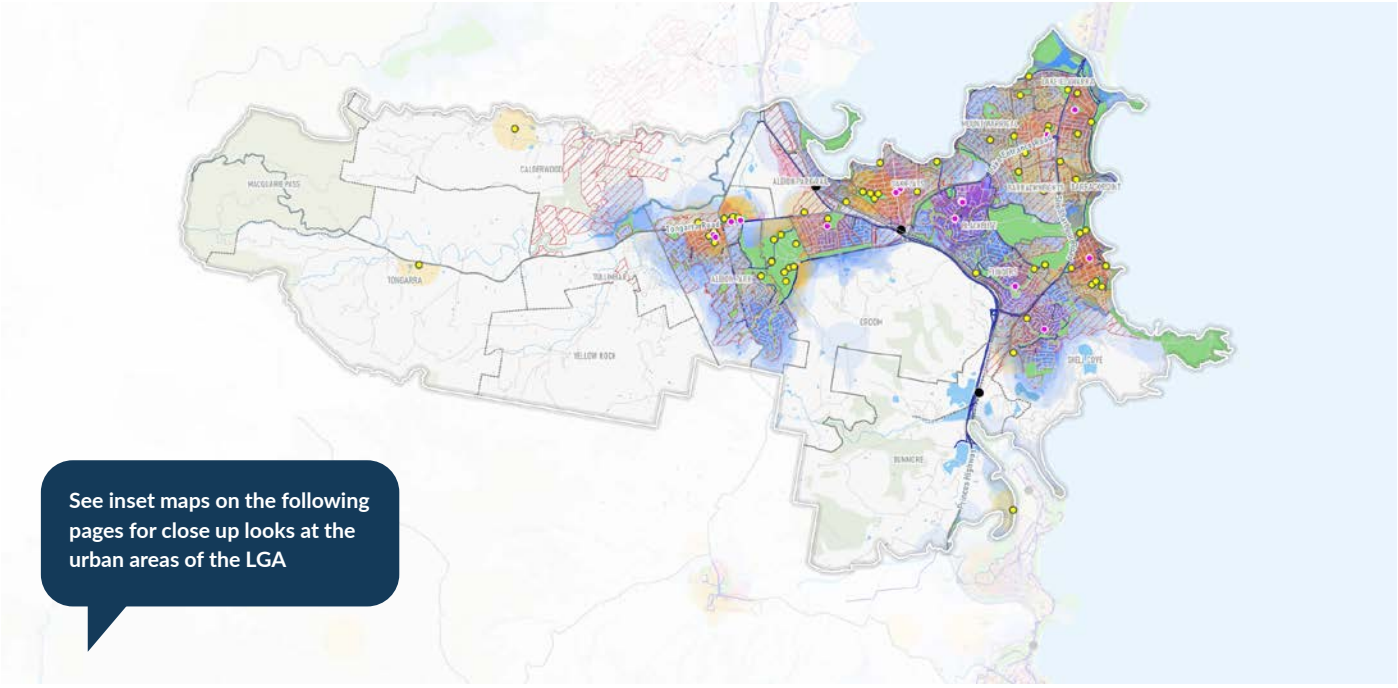


Figure 25 - Shellharbour City Council LGA - Public space 800m walking catchment

Legend

- 800m walking distance from public open space
- 800m walking distance from public recreational facility
- 800m walking distance from public cultural place
- Public recreational facility
- Public cultural place
- Existing cycle lanes
- Proposed cycle lanes
- Urban areas, minus heavy industrial areas (excl. IN3 & IN4)
- Heavy industrial areas (IN3 & IN4)
- Parks

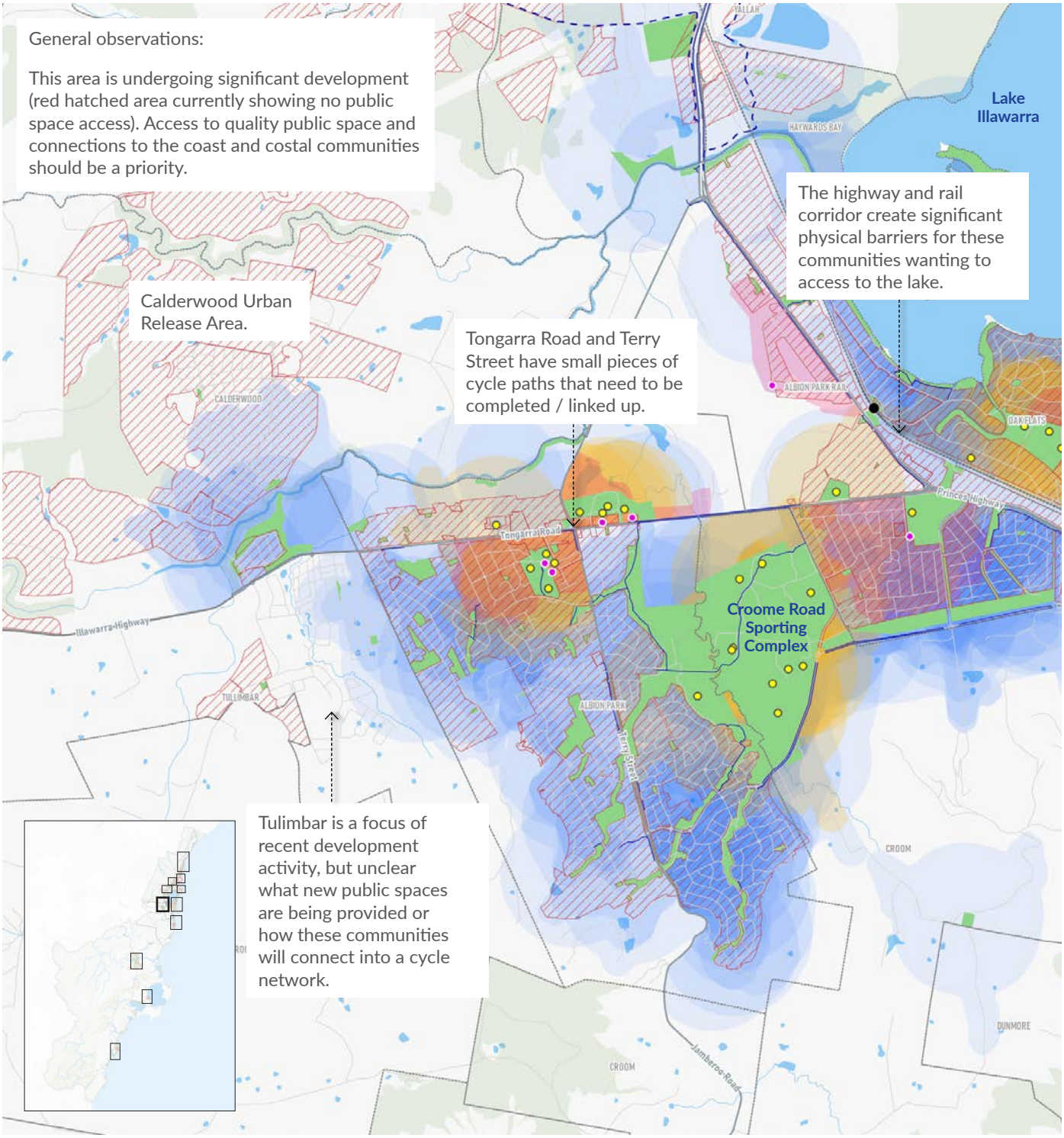


Figure 26 - Public space 800m walking catchment, Shellharbour urban areas: Calderwood - Tullimbar - Albion Park

Legend

- 800m walking distance from public open space
- 800m walking distance from public recreational facility
- 800m walking distance from public cultural place
- Public recreational facility
- Public cultural place
- Existing cycle lanes
- Proposed cycle lanes
- Urban areas, minus heavy industrial areas (excl. IN3 & IN4)
- Heavy industrial areas (IN3 & IN4)
- Parks

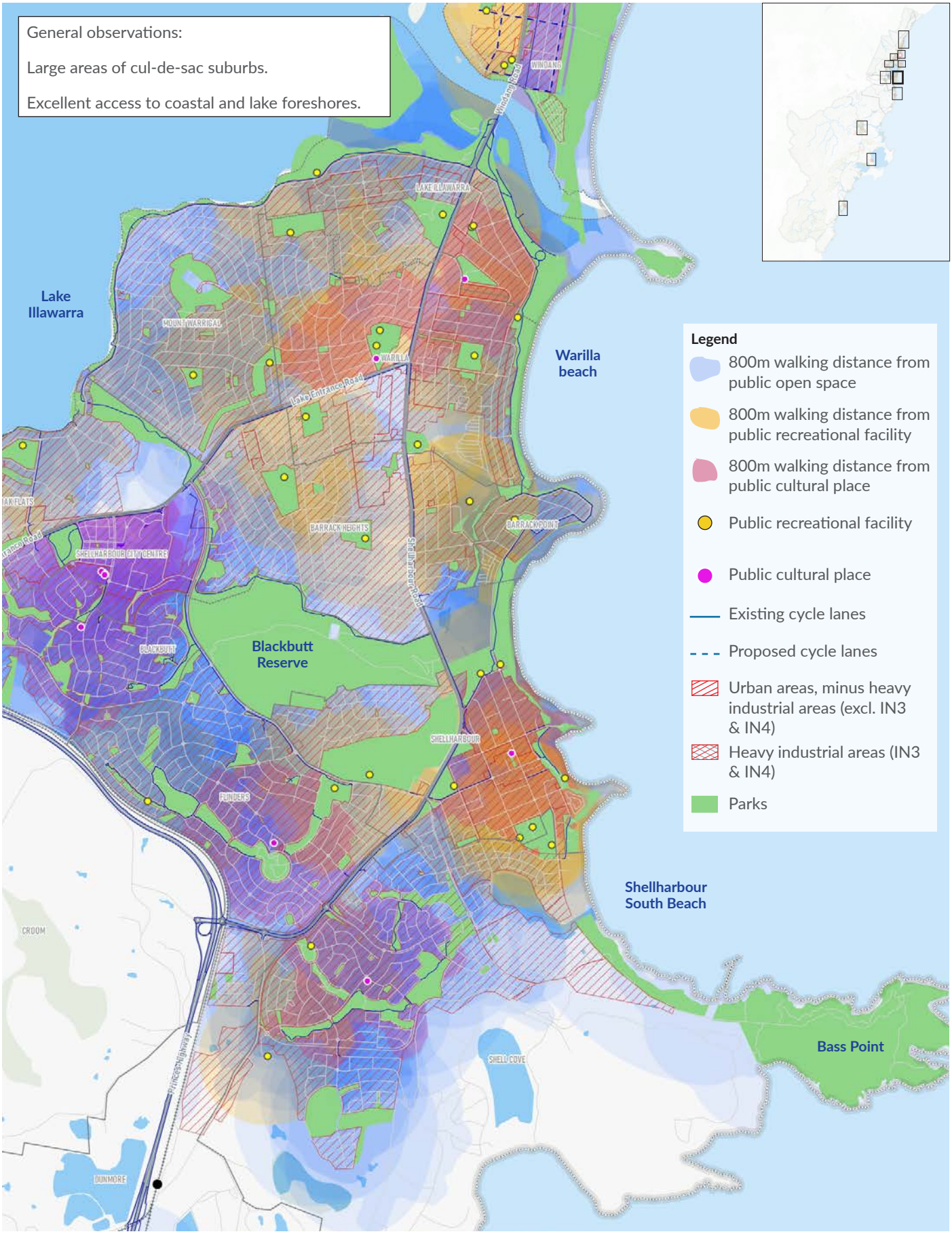


Figure 27 - Public space 800m walking catchment, Shellharbour City Centre - Barrack Point - Shell Cove

3.4. Kiama LGA

3.4.1. Key findings

Audit and distribution

Figures Figure 28, Figure 29 and Figure 30 provide maps of all public space in the Kiama LGA. The public space audit indicates that:

- There is a clustering of open space along the entire coastline in the Kiama Downs and Minnamurra suburbs. Beaches and recreation clubs along the coastline.
- The LGA has a total of 545ha of public open space (excluding natural spaces). Out of that, 77% is regional open space, 13% is district open space, 3 % is local level 1 open space, and 7 % is local level 2 open space.
- There is a lack of open spaces in the recent development areas such as Kiama Heights.
- There is a clustering of sports facilities in the Kiama and Gerringong suburbs. A clustering of facilties in Kiama Town Centre and Gerringong.
- There is a lack of public cultural spaces in the Kiama Heights and Kiama West suburbs.

Walking catchment gap nalysis

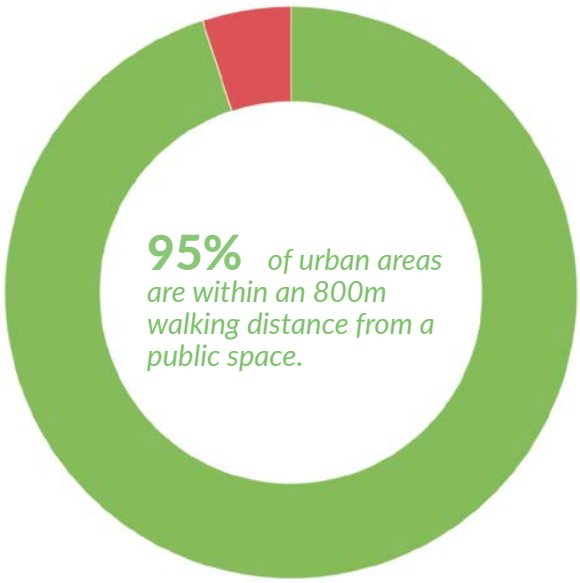
Figure 31 shows an 800m walking catchment around all public spaces in the Kiama LGA . It shows that the following suburbs have limited access to public spaces within the LGA:

- Western and southern regions of Kiama
- Kiama Heights
- Western and southern areas in Jamberoo, and
- Minnamurra.

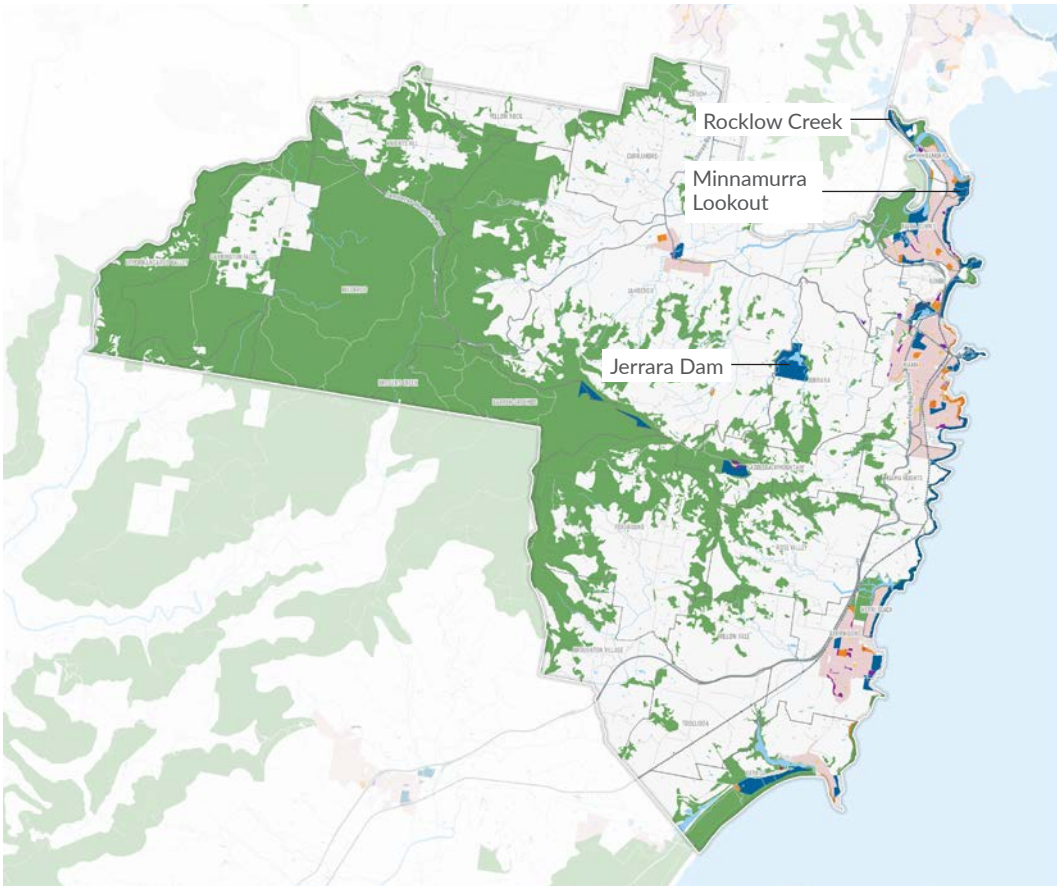
Figure 32 take a closer look at Kiama's urban area of Kiama CBD and shows:

- Minnamurra has access to public open space but limited access to public cultural spaces
- Major infrastructure being barriers of access to public open space, and
- New development areas lack access to all public space.

This calculation excludes Heavy industrial areas (IN3 & IN4) from the urban area



Kiama LGA map: public open space

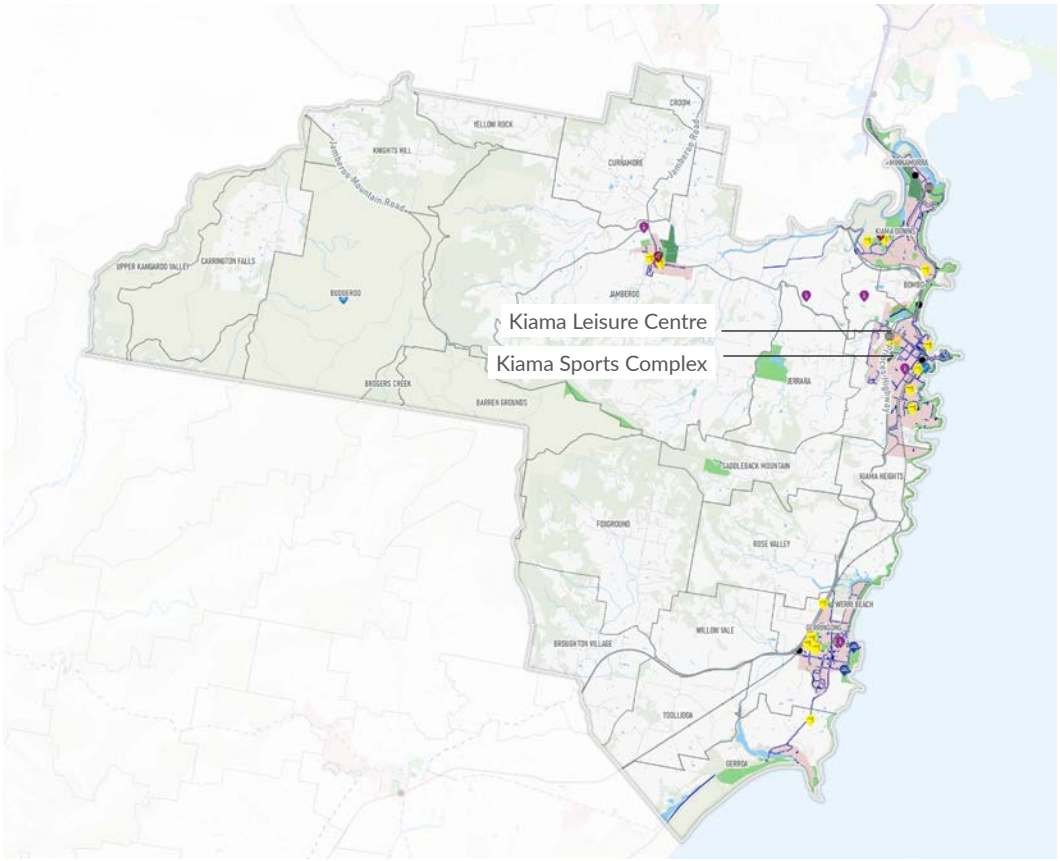


Legend

- Regional open space
- District open space
- Local level 1 open space
- Local level 2 open space
- Natural space including National reserves, State forests and Environment conservation area
- Urban areas

Figure 29 - Audit of public open space in the Kiama Municipal Council LGA by hierarchy

Kiama LGA map: public recreational facilities



Legend

- Swimming pool
- Aquatic centre
- Sea pool
- Sports complex
- Indoor leisure centre
- Sports field/oval
- Skate park
- Recreation club
- Outdoor courts
- Equestrian
- Showground
- Bowling club
- Mountain bike park
- Golf club
- Urban areas

Figure 28 - Audit of public recreational facilities in the Kiama Municipal Council LGA

Kiama LGA map: public cultural spaces

Figure 30 - Audit of public cultural places in the Kiama LGA

Kiama LGA map - all public spaces: 800m walking catchment

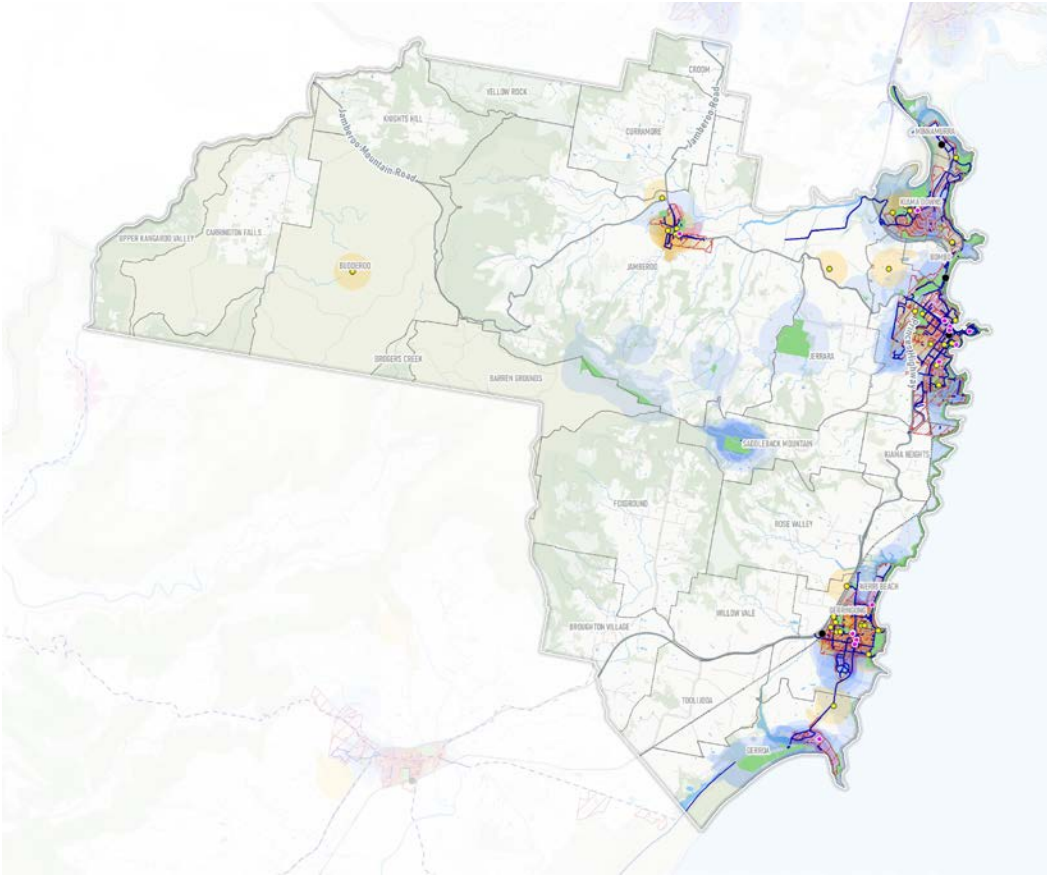


Figure 31 - Kiama Municipal Council LGA - Public space 800m walking catchment

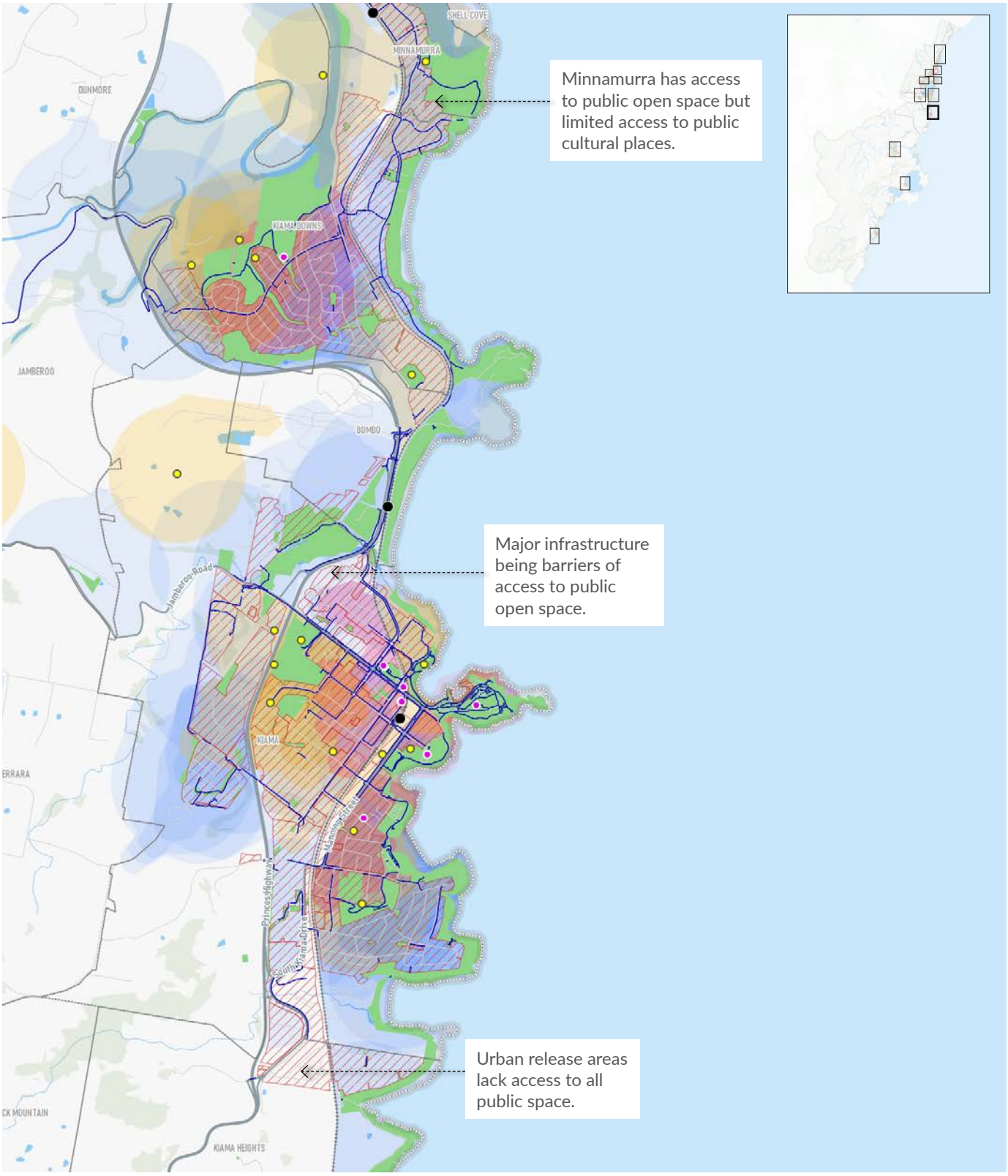


Figure 32 - Public space 800m walking catchment analysis, Kiama urban areas: Kiama CBD

Legend

- 800m walking distance from public open space
- 800m walking distance from public recreational facility
- 800m walking distance from public cultural place
- Public recreational facility
- Public cultural place
- Existing cycle lanes
- Proposed cycle lanes
- Urban areas, minus heavy industrial areas (excl. IN3 & IN4)
- Heavy industrial areas (IN3 & IN4)
- Parks

3.5. Shoalhaven LGA

3.5.1. Key findings

Audit and distribution

Figure 34, Figure 33 and Figure 35 provide maps of all public spaces in the Shoalhaven LGA. The public space audit indicates that:

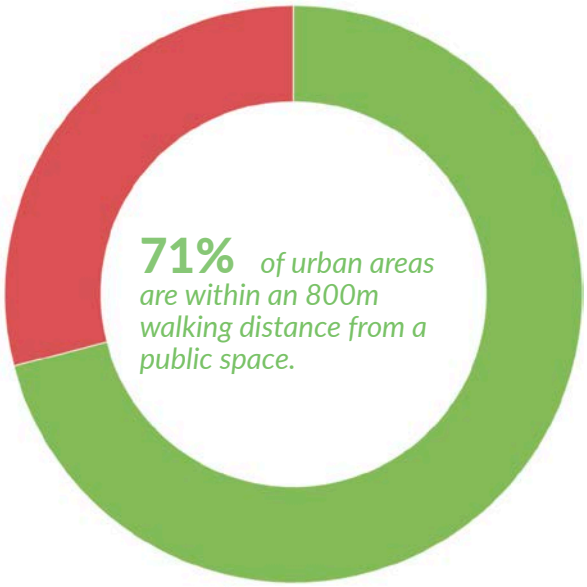
- There are significant natural areas across the LGA. In the Community Infrastructure Strategic Plan, the Shellharbour community has identified the beach, natural areas/ bushland and tracks/trails and boardwalks as the most popular recreation and sports facilities.
- The LGA has a total of 2,629 ha public open space (excluding natural spaces). Out of that, 84 % is regional open space, 9% is district open space, 2% is local level 1 open space, and 5% local level 2 open space.
- There is a higher proportion of regional public open space than local space which can impact on walkable access in urban areas.
- There is a clustering of public recreational facilities in Nowra, Bomaderry and Worrigee. Bomaderry has a number of regional facilities including the new Shoalhaven Indoor Sports Complex and Bomaderry Aquatic Centre. Ulladulla has a number of regional facilities including the Ulladulla Sports Complex and Ulladulla Leisure Centre.
- Berry has a cluster of public cultural spaces including community centres, School of Arts, Community Craft Cottages and the Berry Showground. Nowra CBD has a cluster of facilities including the Shoalhaven Entertainment Centre, Nowra Central Library, Shoalhaven City Arts Centre, Nowra School of Arts, Nowra Senior Citizens, and the Nowra Integrated Youth Facility.
- There are also clusterings of public cultural spaces in Ulladulla town centre and Huskisson.
- Planned cycleways connecting Centres such as Nowra, Vincentia and Ulladulla; and urban such as Berry, Culburra beach, Currarong, Callala Bay, Sanctuary Point, Sussex Inlet, Bawley Point, Kioloa, Conjola and Shoalhaven Heads. Existing and planned cycleways connect the whole coastline of the LGA.

Walking catchment gap analysis

Figure 36 shows an 800m walking catchment around all public spaces in the Shoalhaven LGA .Overall, the following suburbs in Shoalhaven LGA have gaps in access to public space:

- North Nowra
- Nowra Hill
- Mundamia
- Cambewarra
- South Nowra
- Woollamia
- Wandanian
- West Nowra

This calculation excludes Heavy industrial areas (IN3 & IN4) from the urban area



- Worrigee
- Falls Creek
- Sussex Inlet
- Basin View
- Mollymook
- Narrawallee
- Yatte Yatah
- Dolphin Point
- Kings Point, and
- Bawley Point.

Figure 37 and Figure 38 provide a walking catchment analysis for the urban areas of Nowra and Ulladulla and show:

- West Nowra, Worrigee, Narawalle and Mollymook have access to public open space and facilities, but limited access to public cultural spaces.
- New development areas lack access to all public space.
- Strong cluster of public cultural places in centres along coast and river.
- Existing and planned cycleways connect all existing public space.

Shoalhaven LGA map: public open space

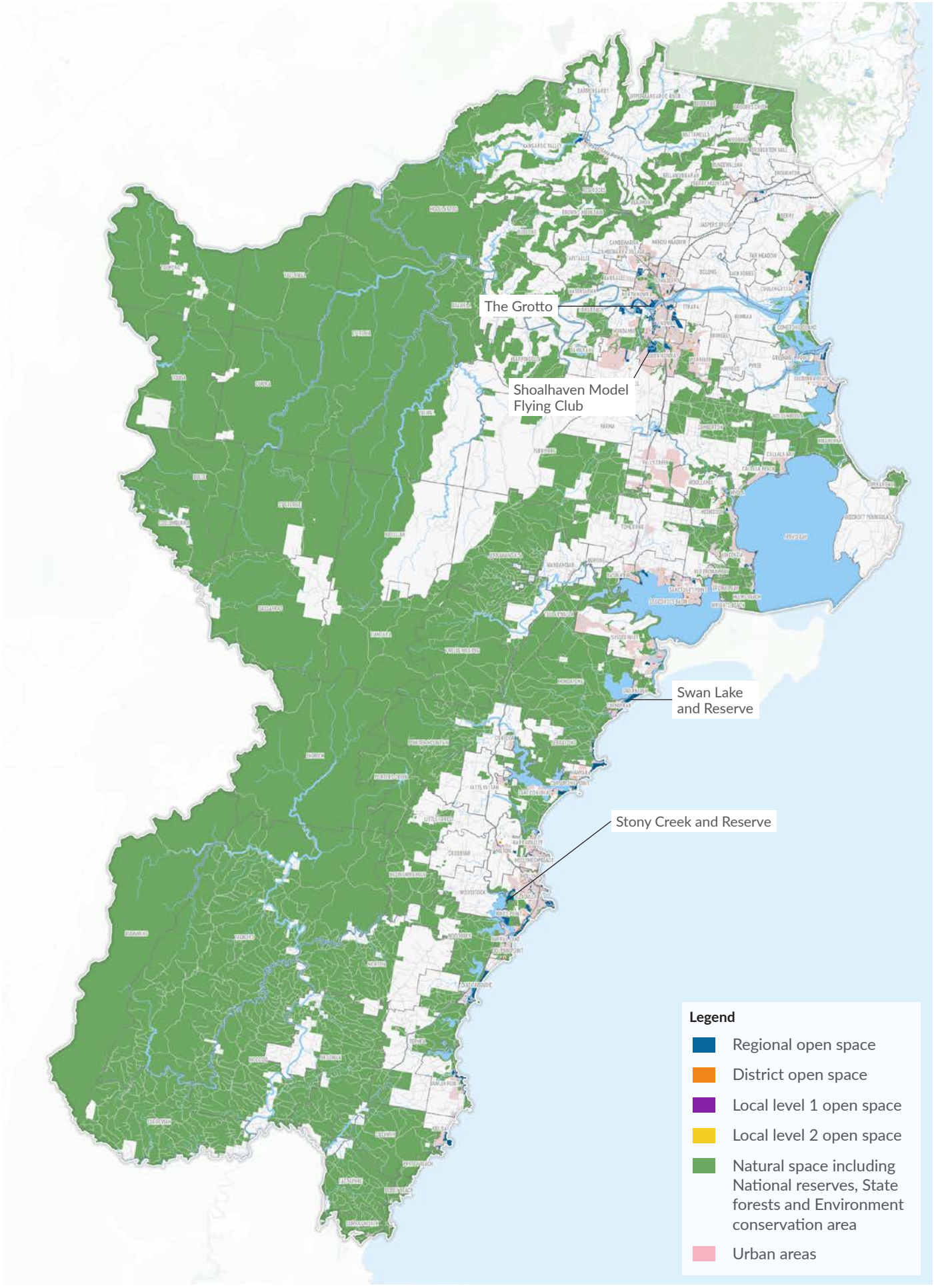


Figure 33 - Audit of public open space in Shoalhaven LGA by hierarchy

Shoalhaven LGA map: public recreational facilities

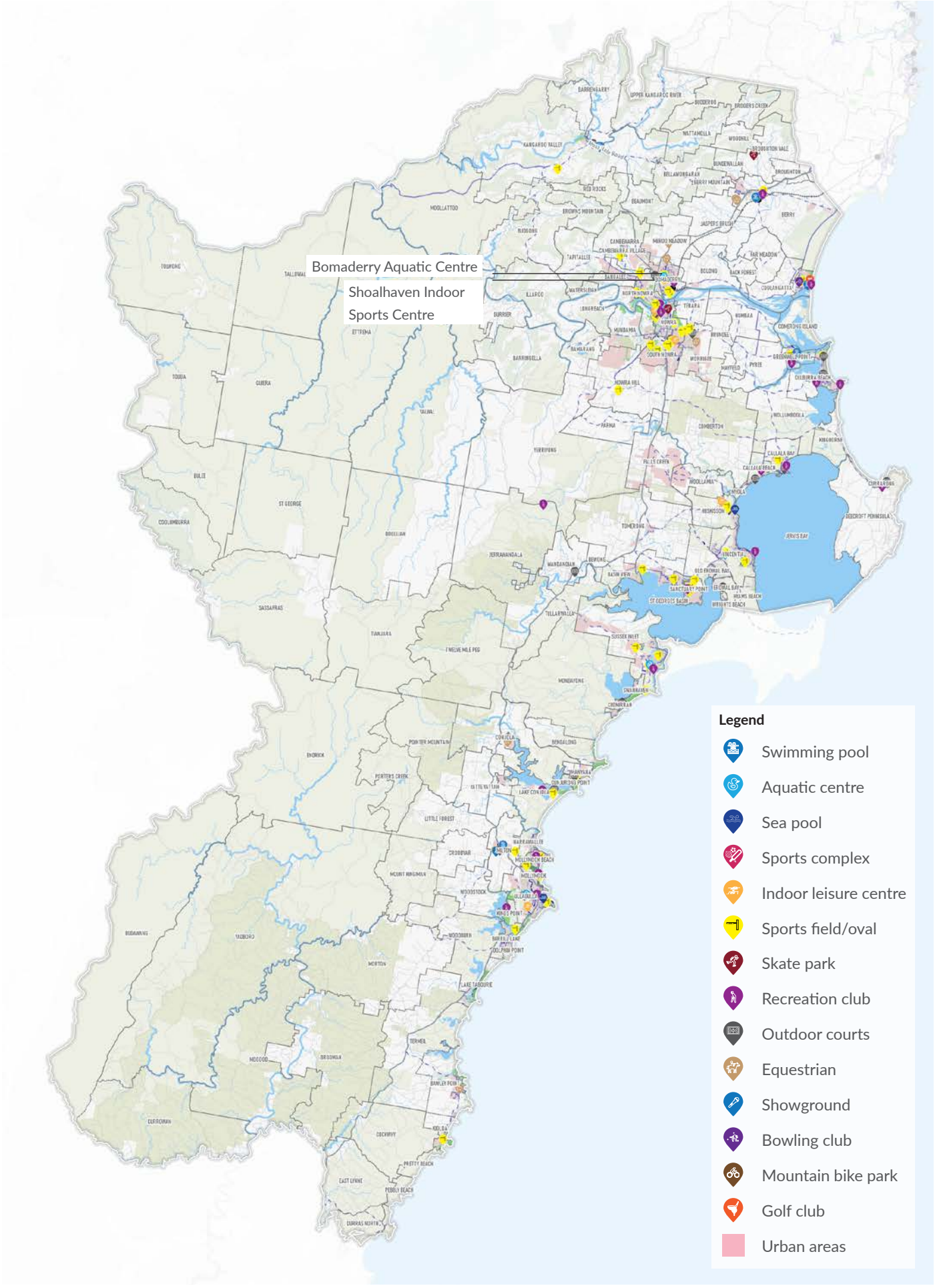


Figure 34 - Audit of public recreational facilities in Shoalhaven LGA

Shoalhaven LGA map: public cultural spaces

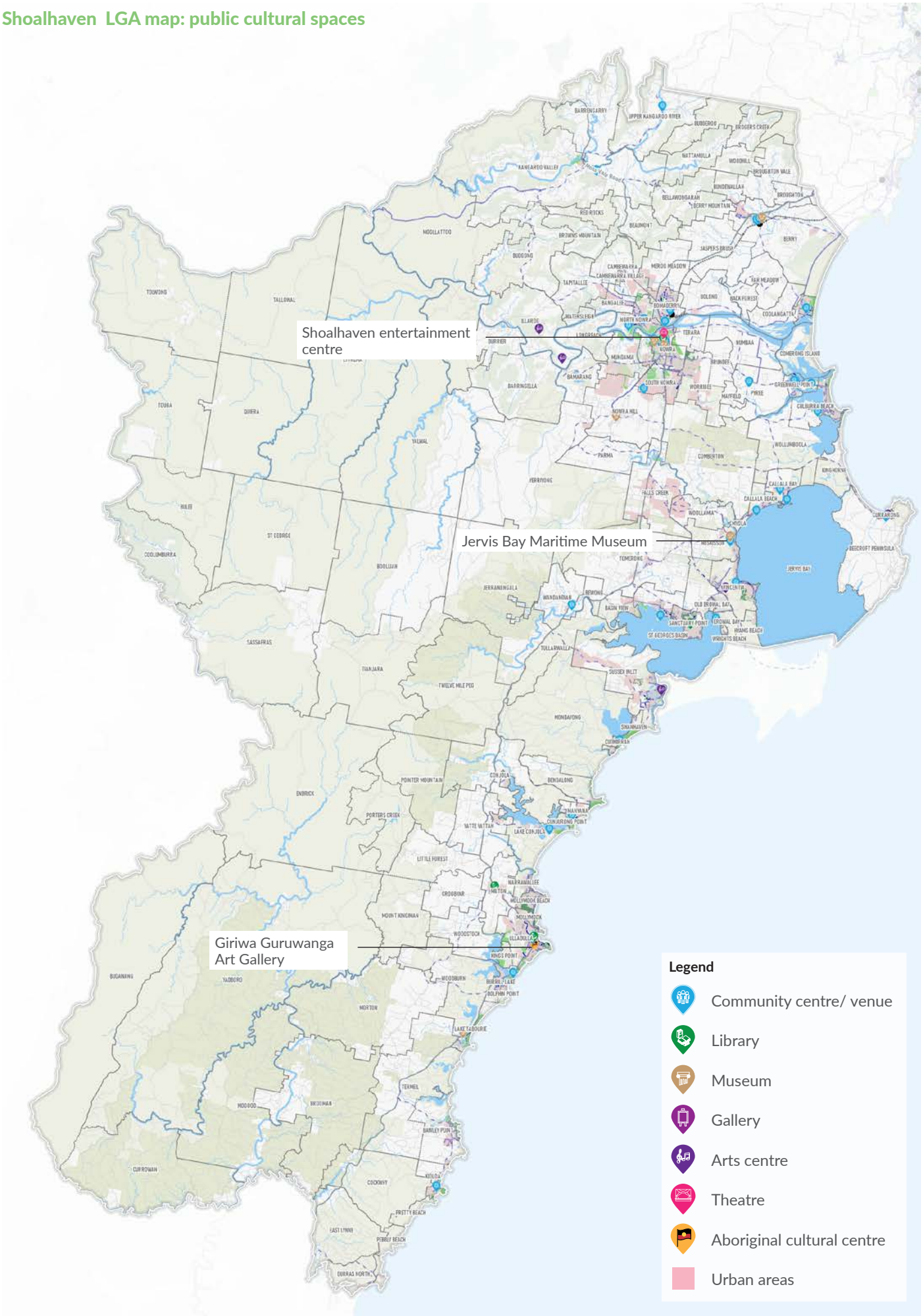


Figure 35 - Audit of public cultural places in the Shoalhaven LGA

Shoalhaven LGA map - all public spaces: 800m walking catchment

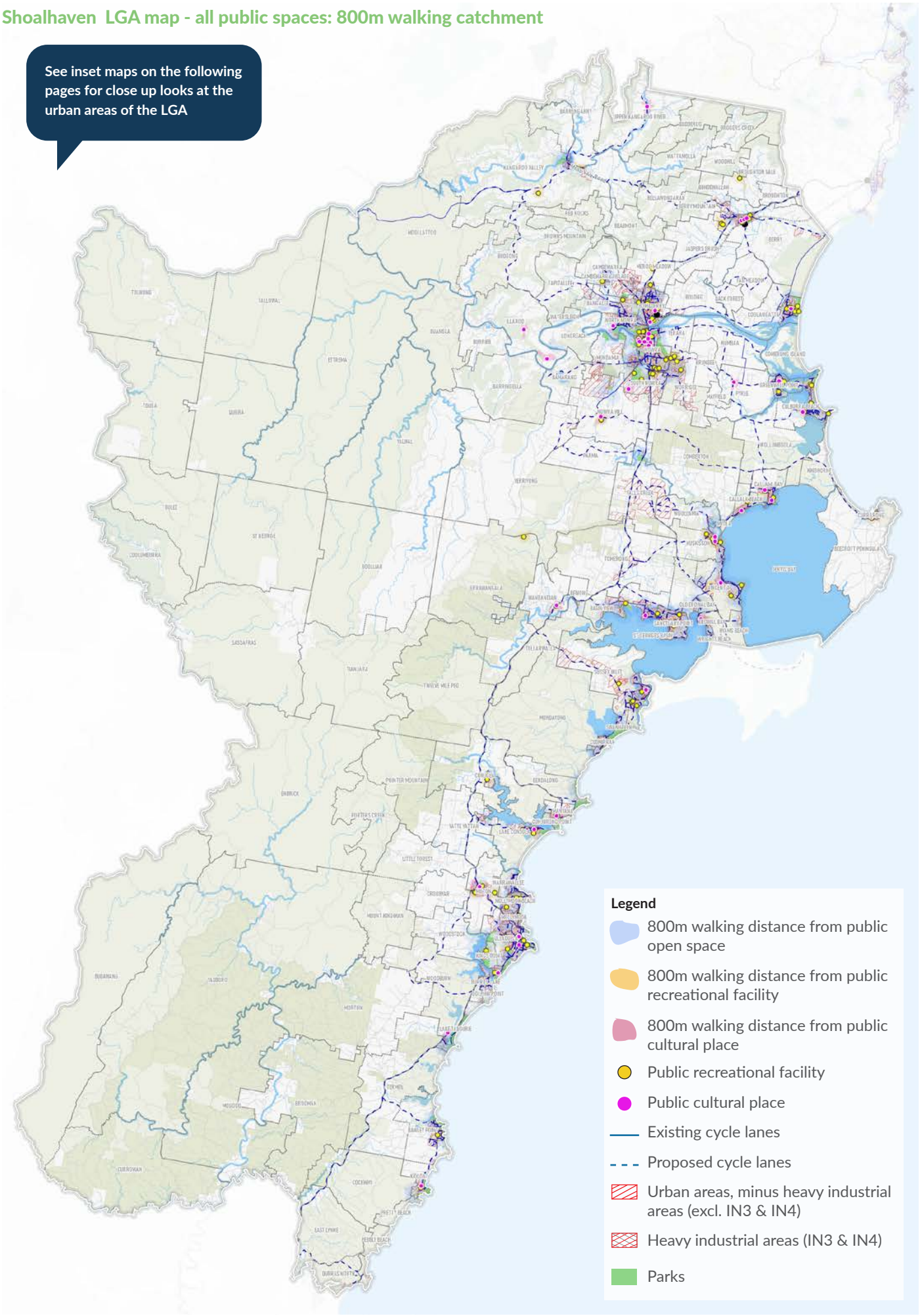


Figure 36 - Shoalhaven City Council LGA - Public space 800m walking catchment

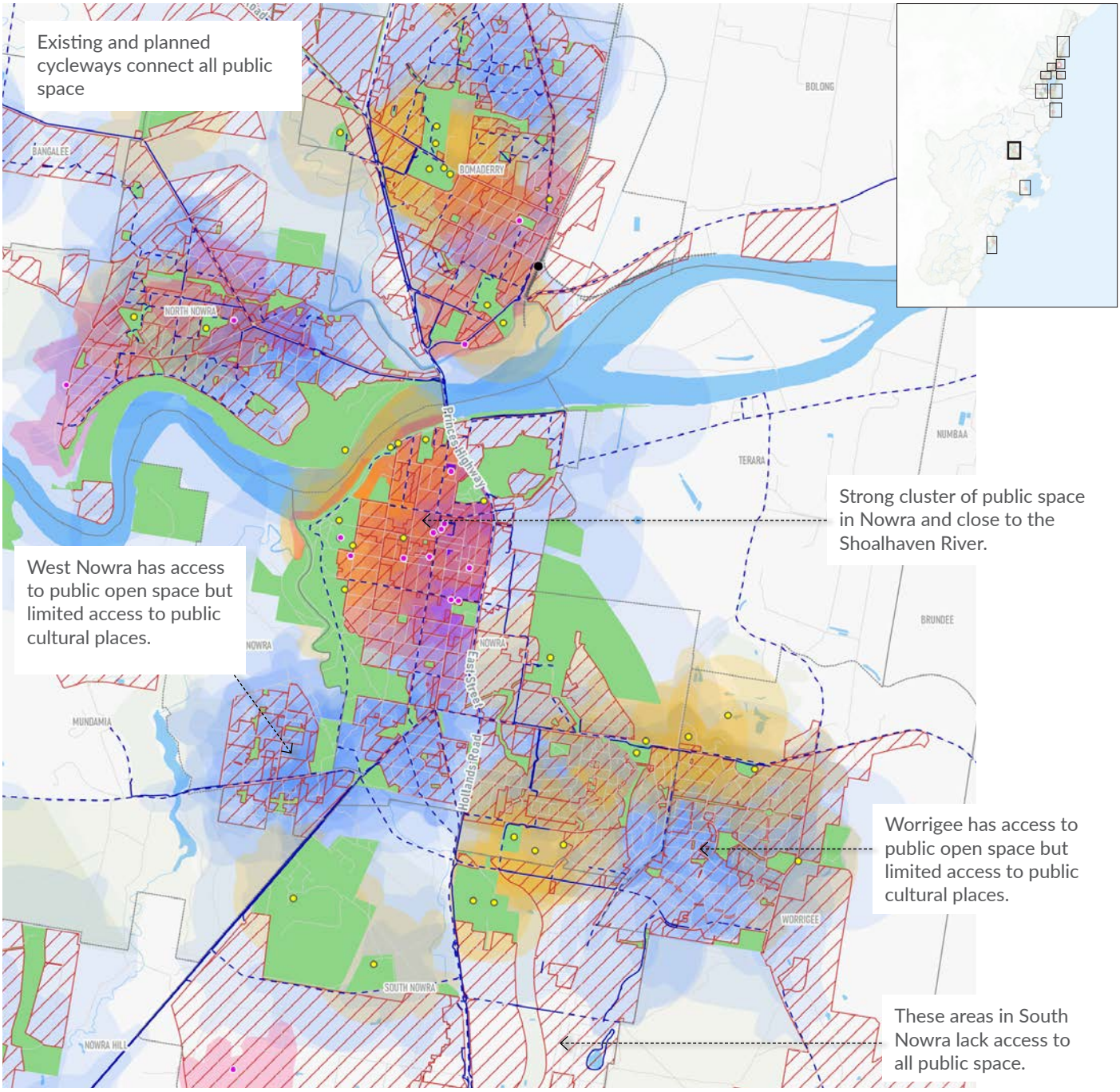


Figure 37 - Public space 800m walking catchment, Shoalhaven urban areas: Nowra

Legend

- 800m walking distance from public open space
- 800m walking distance from public recreational facility
- 800m walking distance from public cultural place
- Public recreational facility
- Public cultural place
- Existing cycle lanes
- Proposed cycle lanes
- Urban areas, minus heavy industrial areas (excl. IN3 & IN4)
- Heavy industrial areas (IN3 & IN4)
- Parks

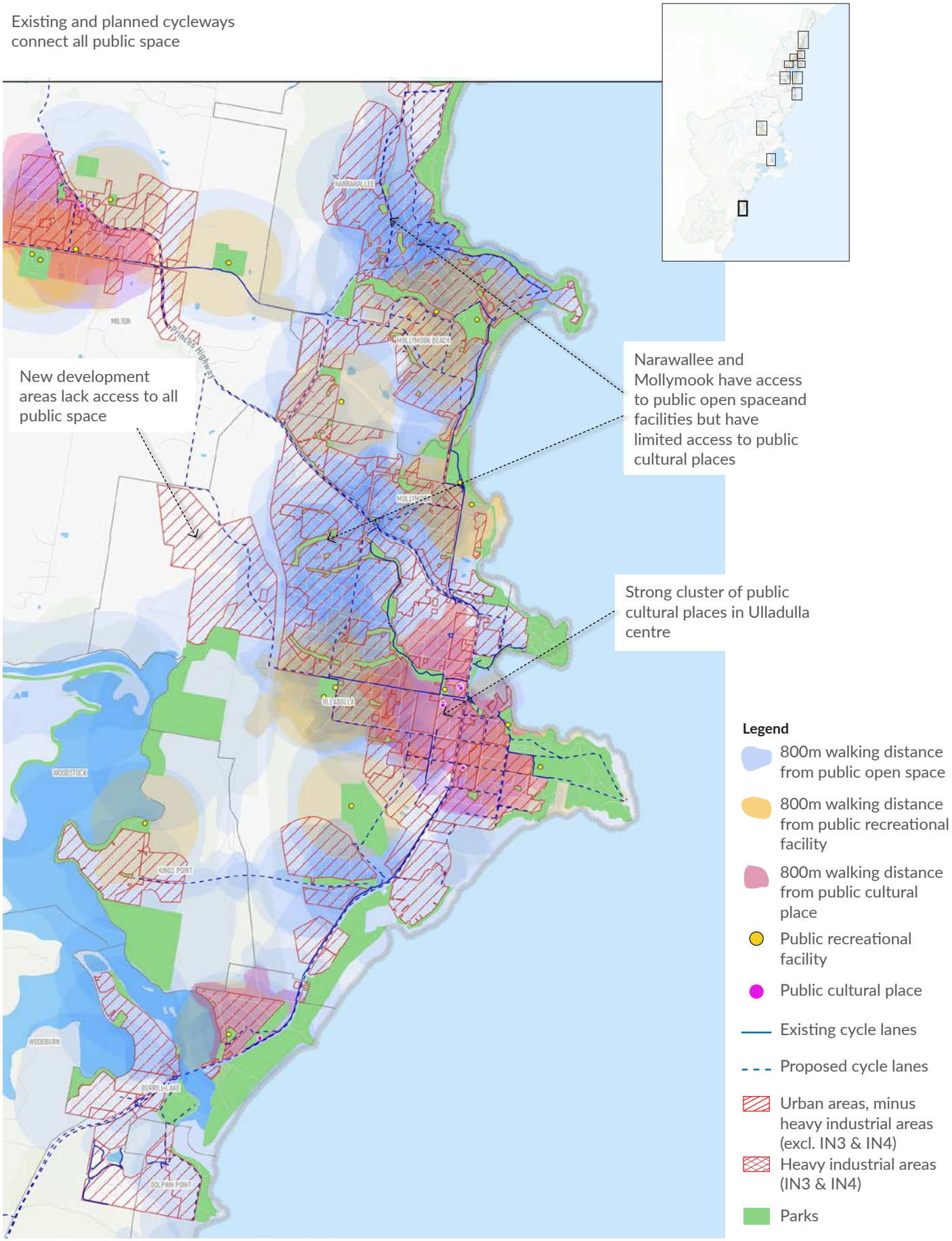


Figure 38 - Public space 800m walking catchment, Shoalhaven urban areas: Ulladulla

04

Urban tree canopy

Street scenes along Terralong Street Kiama NSW *(Image credit: NSW Department of Planning, Industry and Environment / Don Fuchs)*

4. Urban tree canopy

This section provides an audit of the tree canopy across the Region and an analysis of access in urban areas to optimal or below optimal tree canopy coverage. The urban tree canopy data will be used in partnership with the public space audit and walking catchment analysis to identify opportunities to deliver shaded and comfortable recreational links.

Defining urban tree canopy

The Draft Greener Places Discussion Guide by Government Architect NSW defines urban tree canopy as:

Urban tree canopy refers to all trees on public and private land within urban areas. This comprises a variety of tree types such as exotics, natives, deciduous trees, and evergreens occupying a range of environments from busy city centres to regional main streets and suburbs.

Why are trees important in urban areas?

Urban trees have a critical role in creating healthy cities. They are an important urban asset providing many benefits: economic, environmental and social. They provide shade, mitigate urban heat island effects, and improve air quality. On our streets, they improve comfort and amenity as tree canopies can shade pedestrians, diminish traffic noise, screen unwanted views and reduce glare.

Often urban tree canopies are the missing link in making a cycling or walking network a comfortable place for people. Planning for a network of trees in our cities encourage people to walk and cycle more to and between their public spaces and centres. In addition, trees also contribute to attractive urban places, providing seasonal variation and creating memorable landmarks.

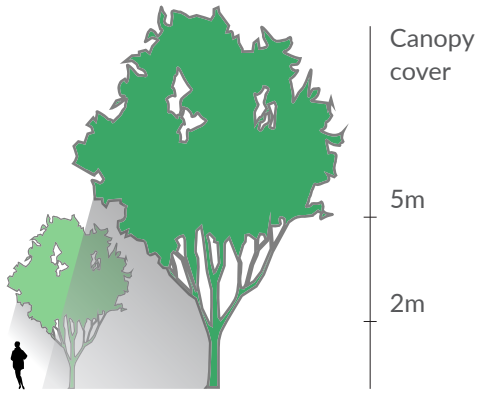


Figure 39 - Section showing 2m and 2-5m canopy cover

Methodology

The urban tree canopy mapping was undertaken by refining LiDAR data from 2010 to 2018 into a cadastral based datasets of previous and current tree canopy cover. This was dataset was assessed in conjunction with high resolution satellite imagery of the Region using a robust image classification process. The detailed methodology is attached in the Appendix 6.1 to allow the process to be replicated in the future when new data becomes available. An example of the mapping output is shown in Figure 40.

This mapping focuses on tree canopy cover in urban areas to understand tree canopy cover in key areas in Centres and address gaps in priority areas.

As shown in Figure 39, the tree canopy mapping uses 2m height as the minimum sized tree mapped.

Limitations

- Satellite imagery is not reflective of the on-ground vegetative scenario post the 2019 bushfires.
- Owing to the large scale of the study area, there are challenges in ensuring 100% accuracy of the data. The mapping and analysis has incorporated mitigation measures such as image classification of high resolution satellite imagery to achieve best possible results and accuracy.

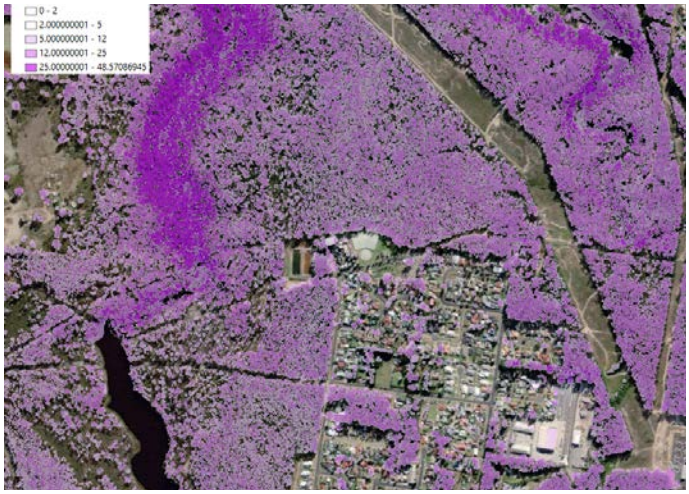


Figure 40 - Sample canopy mapping at West Nowra

(i) Audit

An audit of all tree canopy in urban areas has been completed. For the purposes of this study, urban areas includes land zoned for residential, business, industrial, village or tourist purposes, including:

- Zone R1 General Residential
- Zone R2 Low Density Residential
- Zone R3 Medium Density Residential
- Zone R4 High Density Residential
- Zone R5 Large Lot Residential
- Zone B1 Neighbourhood Centre
- Zone B2 Local Centre
- Zone B3 Commercial Core
- Zone B4 Mixed Use
- Zone B5 Business Development
- Zone B6 Enterprise Corridor
- Zone B7 Business Park
- Zone B8 Metropolitan Centre
- Zone IN1 General Industrial
- Zone IN2 Light Industrial
- Zone IN3 Heavy Industrial
- Zone IN4 Working Waterfront
- Zone SP3 Tourist
- Zone RU5 Village

(ii) Canopy analysis

The percentage of tree canopy available in urban areas has been assessed to:

- Highlight urban areas that are below optimum canopy coverage, that may be priorities for future greening strategies.
- Highlight urban areas that have optimum (35-40%) and high (above 40%) tree canopy coverage, that may be areas for tree retention and conservation.

Figure 41 - Shellharbour - Warilla Beach path - no canopy cover

Figure 42 - Shellharbour - Blackbutt Reserve - 100% canopy cover

4.1. Regional tree canopy cover

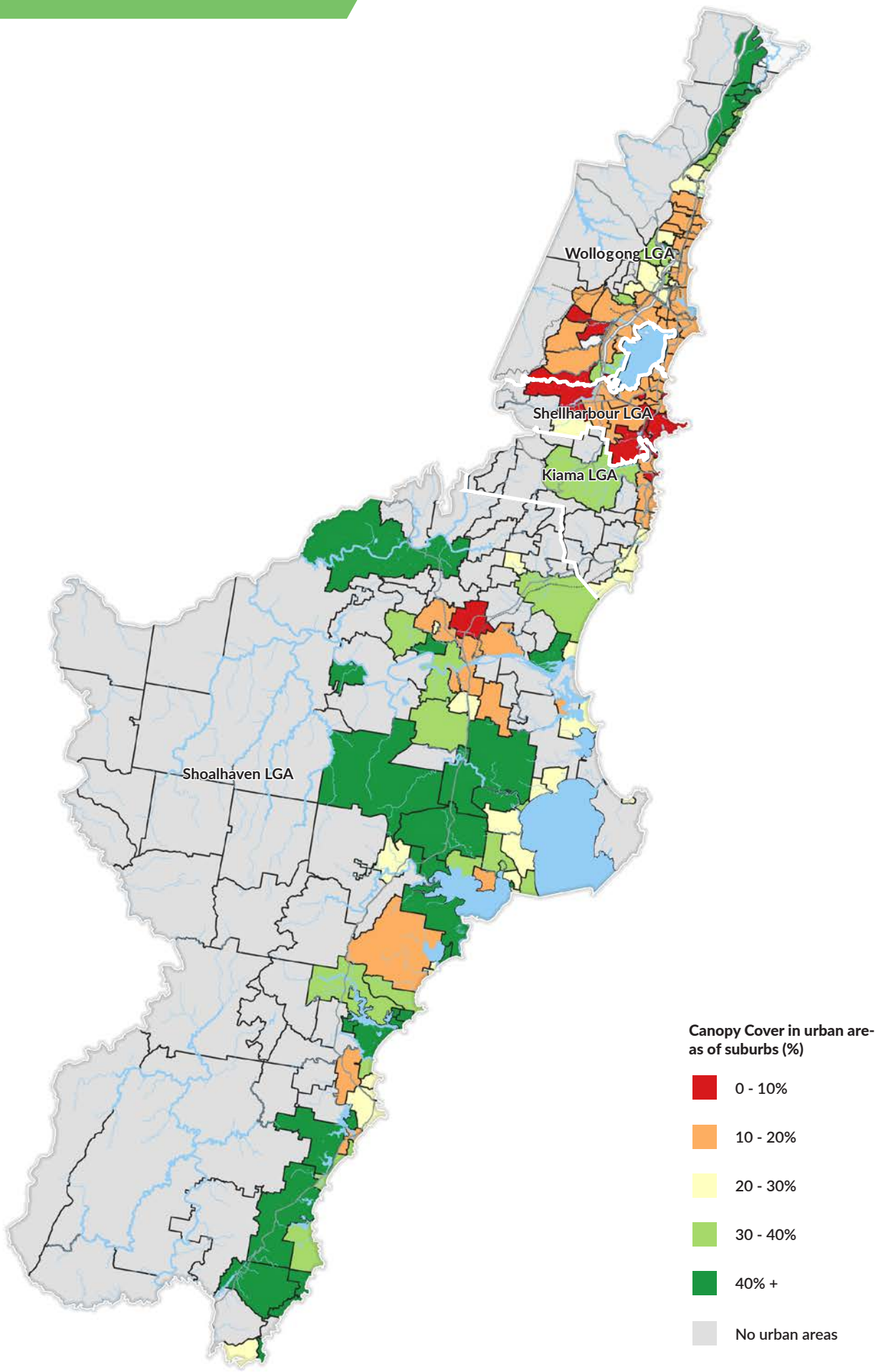


Figure 43 - Tree canopy cover in urban areas in suburbs across Illawarra-Shoalhaven Region

4.1.1. Average tree canopy cover across the Region by suburb

The urban tree canopy cover across the Region varies vastly between the suburbs. 152 suburbs across the Region have urban areas within their boundaries and this study has investigated the tree canopy cover only in these urban areas. 75% (114 of 152) of these suburbs have urban tree canopy cover below the optimum level of 35%. 10% (or 15) of these suburbs have a critically low urban tree canopy cover ranging from 0-10%, and 33% (or 50) of these suburbs have a low urban tree canopy cover ranging from 10-20%.

70%

of total Region area is covered by tree canopy

Tree canopy cover in suburbs with urban areas across the Region

15 suburbs	with tree canopy cover between 0 - 10%
50 suburbs	with tree canopy cover between 10 - 20%
34 suburbs	with tree canopy cover between 20 - 30%
26 suburbs	with tree canopy cover between 30 - 40%
27 suburbs	with tree canopy cover between 40+%

23%

of total urban areas in the Region is covered by tree canopy

Suburb- Urban tree canopy Vs Population density

The case examples matrix below illustrates the different typologies of suburbs across the Region by comparing urban tree canopy cover % and population density in the suburbs. This helps in understanding what suburbs are performing well and then further investigate best practices there to adopt across the Region.

Figure 44 provides a snapshot of population density vs. urban tree canopy analysis. It indicates that there is not a strong correlation between canopy coverage and densities. However, tree canopy analysis by land type indicate a stronger relationship.

** The density has been categorised as a range between low and medium based on existing densities in the region.*	Low tree canopy (0-15%)	Average tree canopy (15-35%)	Ideal tree canopy (35-40%)	High tree canopy (40+ %)
Low density (0-10 people/ ha)	**Haywards Bay** Density - 8.81 Canopy cover - 3%	**Dolphin Point** Density - 1.38 Canopy cover - 30%	**Berry** Density - 0.51 Canopy cover - 36%	**Kioloa** Density - 0.46 Canopy cover - 51%
Average density (10-25 people/ ha)	**Shellharbour** Density - 14.69 Canopy cover - 11%	**Mount Ousley** Density - 20.96 Canopy cover - 27%	**Figtree** Density - 13.58 Canopy cover - 25%	**Mount Pleasant** Density - 14.61 Canopy cover - 51%
Medium density (25+ people/ ha)	**Flinders** Density - 28.94 Canopy cover - 6% **Wollongong** Density - 31.11 Canopy cover - 12%	**Gwyneville** Density - 25.21 Canopy cover - 21% **Mount Saint Thomas** Density - 26.8 Canopy cover - 25%	**Mangerton** Density - 28.2 Canopy cover - 36%	**Nil**

Figure 44 - Case examples of tree cover typologies by density across the Region

Examples of different levels of tree canopy over

Figure 46 - Wallis Cl, Flinders

Figure 47 - Ocean St, Mount St Thomas

Figure 45 - Ramah Ave, Mangerton

4.1.2. Where are the trees in the Region? Tree canopy cover by landuse

A majority of the tree canopy cover in the Region overall is in environmental protection zones which account for 72.32% of all tree canopy. Only 1.37% of the overall tree canopy cover is in urban areas.

Further examining the tree canopy within these urban areas shows that there is low tree canopy coverage in all business zones including key areas such as neighbourhood centres, local centres and commercial cores.

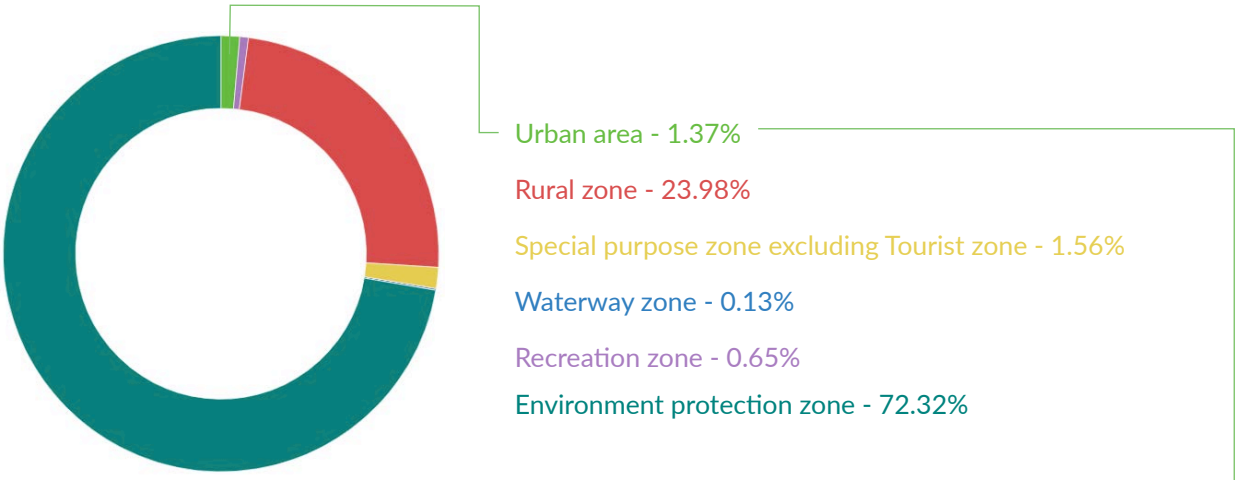
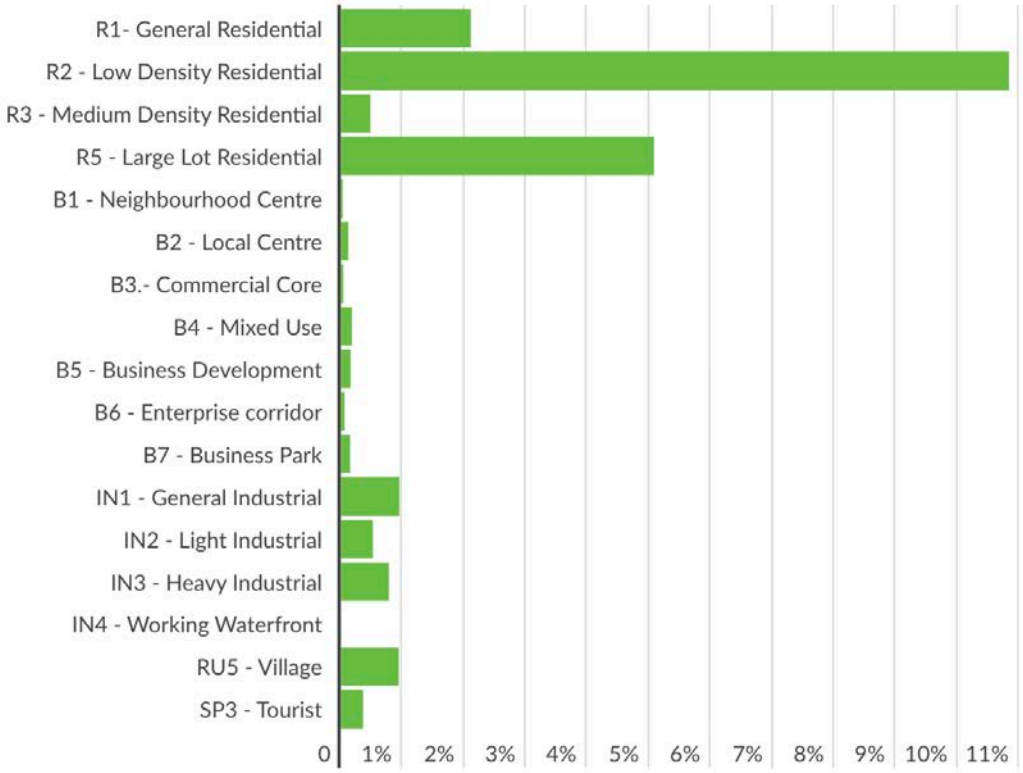


Figure 48 - Tree canopy coverage distribution across the LGA by landuse type



11% of all trees in urban areas are in Low Density Residential(R5) areas followed by 5% in Large Lot Residential (R5) areas.

Only 1.5% of all trees in urban areas are in key areas such as Neighbourhood centre, local centre, commercial core.

Figure 49 - Location of trees in the urban areas across the Region by landuse type

4.1.3. Average tree canopy cover across the Region's centres

The Regions' centres are the main meeting, socialising, shopping, and leisure places for their communities. Creating cool and comfortable centres can activate them, stimulate the economy, and encourage walking and cycling to and between them.

The draft Greener Places Design Guide sets a target of >15% for CBD area. Applying the >15% target for the Region's Centres indicates that 5 centres meet the target. As shown in Figure 50, the centre of Figtree in Wollongong LGA has the highest average tree canopy cover of 25.5%, followed by Ulladulla (25%) and Vincentia (20.%) in Shoalhaven LGA. However, Shellharbour City Centre has an extremely low tree canopy cover of 6.%.

LGA	Centres		Tree canopy cover % within urban areas
Wollongong City Council		Metro Wollongong	12.5 %
		Warrawong	12.5 %
		Dapto	13 %
		Corrimal	17 %
		Fairy Meadow	13 %
		Figtree	25.5 %
		Unanderra	15.5 %
Shellharbour City Council		Shellharbour Centre	6 %
		Warilla	12 %
		Albion Park	12. %
Kiama Municipal Council		Kiama	14 %
		Nowra Centre	14 %
Shoalhaven City Council		Vincentia	20 %
		Ulladulla	25 %

Figure 50 - Tree canopy coverage in the Region's centres

Metropolitan centre
Metropolitan regional centre
Major urban centre
Regional centre
Urban centre

4.1.4. Average tree canopy cover across the Region by LGA

Given the large areas of natural open space in this LGA, as shown in Figure 51, Shoalhaven has the highest amount of tree canopy at 335,172ha, however, only 1% is located in urban areas.

Within the land defined as urban area, Shoalhaven LGA has the highest proportion of tree canopy cover (32%) followed by Wollongong (23%), Kiama (18%) and Shellharbour (10%). All LGAs are below the target of 35-40% tree canopy cover in urban areas, with Shoalhaven the closest to this target.

Figure 51 - Tree canopy cover across all LGAs in the Illawarra-Shoalhaven Region

4.2. Wollongong LGA

The LGA has an overall average canopy cover of 47.6%. Only 3.6% of the overall canopy cover is in urban areas. In those urban areas, the average canopy cover is 22.7% and it varies vastly between different suburbs.

4.2.1. Tree canopy cover in urban areas by suburb

Suburbs with the highest canopy cover in urban areas ranging from 50% to 71% are Stanwell Park, Mount Pleasant and Maddens Plains. However, it should be noted that only a small area of Maddens Plains suburb is zoned as urban, which is partially yet to be developed and partially occupied by large properties with private open space.

Suburbs with the lowest canopy cover ranging from 3.1% to 9.4% are Haywards Bay, Marshall Mount, Wongawilli and Horsley. These suburbs have extremely low tree canopy coverage even though significant portions of it is yet to be developed.

As shown in Figure 53, the tree canopy coverage in urban areas across key centres and high growth areas are:

- Wollongong - 12.4%
- Dapto - 12.8%
- Corrimal - 16.7%
- Thirroul - 24.5%
- Fairy Meadow - 13.2%
- Unanderra - 15.5%
- Figtree - 25.4%
- Warrawong - 12.6%

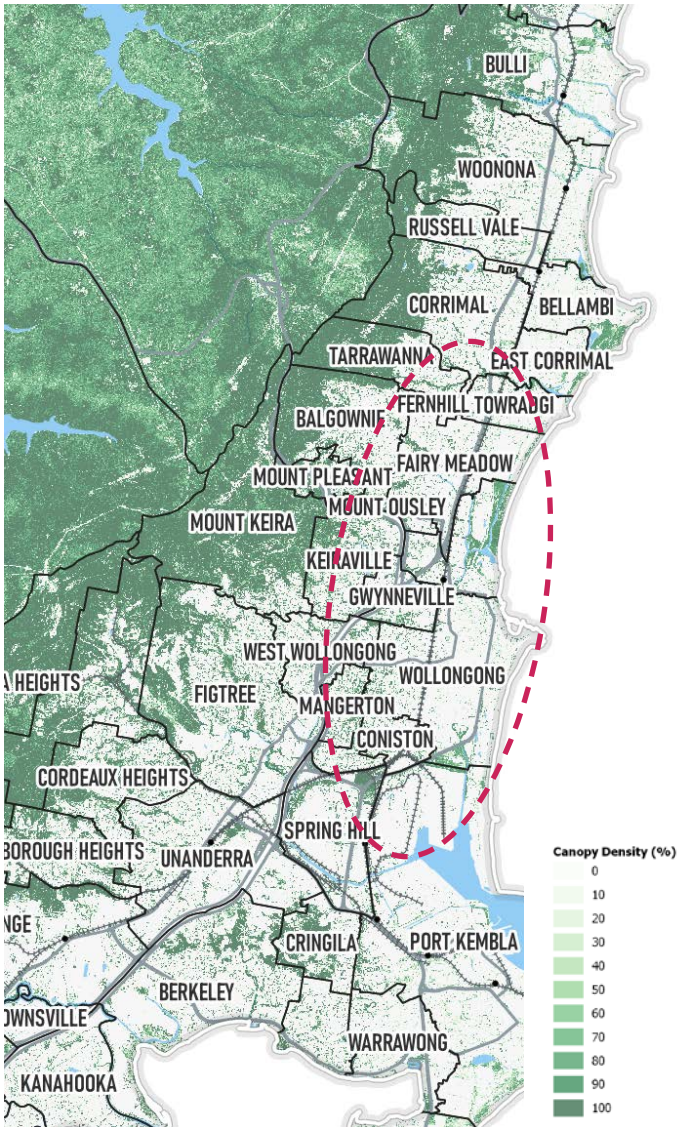


Figure 52 - Canopy density in key Centres in Wollongong LGA

4.7 %
Marshall Mount
The yet to be developed urban area is agricultural land
LOW

12.8 %
Dapto
Town centre and private properties with low tree canopy
AVERAGE

39.1 %
Mount Keira
Good tree cover in open spaces and in private properties
IDEAL

50.8 %
Mount Pleasant
Good tree cover in open spaces
HIGH

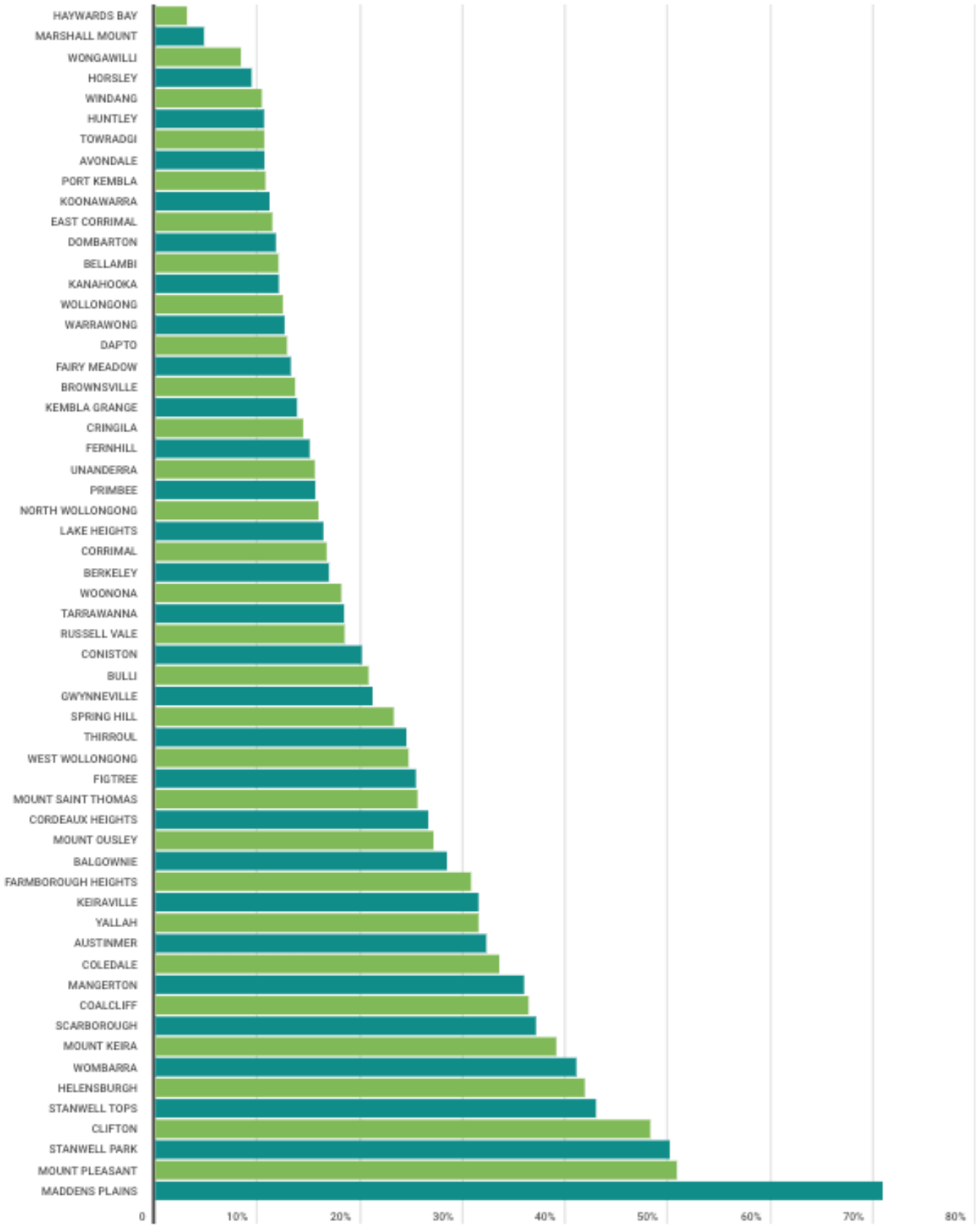


Figure 53 - Canopy coverage in urban areas by suburb (only includes suburbs with urban areas) across Wollongong LGA

4.2.2. Where are the trees in the LGA? Tree canopy cover by landuse

A majority of the tree canopy cover in the LGA is located in environmental protection zones which account for 90.8%. Only 3.6% of the overall tree canopy cover is in urban areas.

Further examining the tree canopy within these urban areas show that there is low tree canopy coverage in key areas such as neighbourhood centres, local centres and commercial cores.

4.2.3. Key findings

- The urban tree canopy mapping and analysis shows that key areas in the Wollongong LGA such as neighbourhood centres, local centres and commercial cores and mixed use areas have extremely low tree canopy which is a priority area for urban greening.
- All urban areas especially key centres such as Wollongong, Unanderra and Dapto, and increased housing activity corridors such as Corrimal, Thirroul and Fairy Meadow have extremely low tree canopy cover.

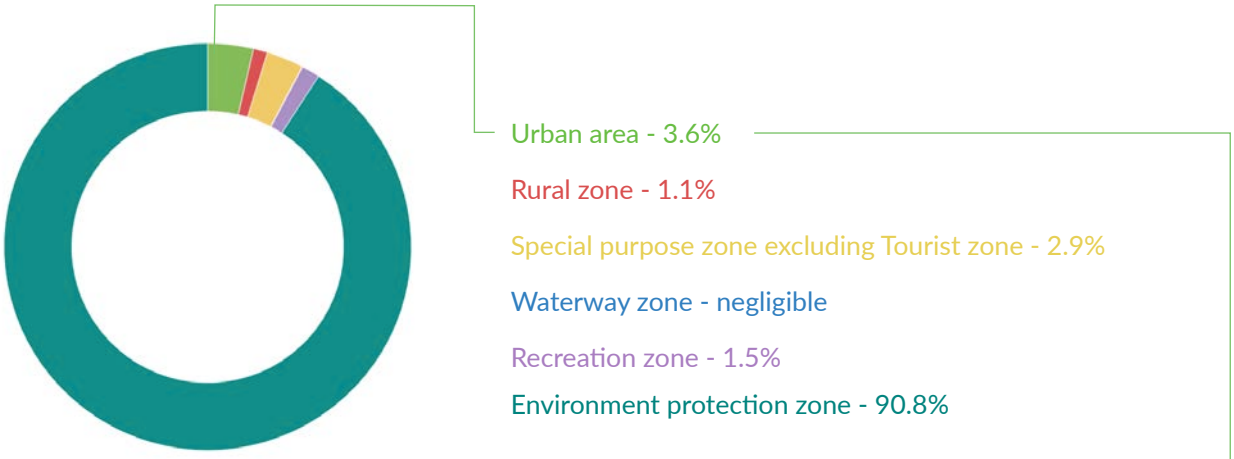
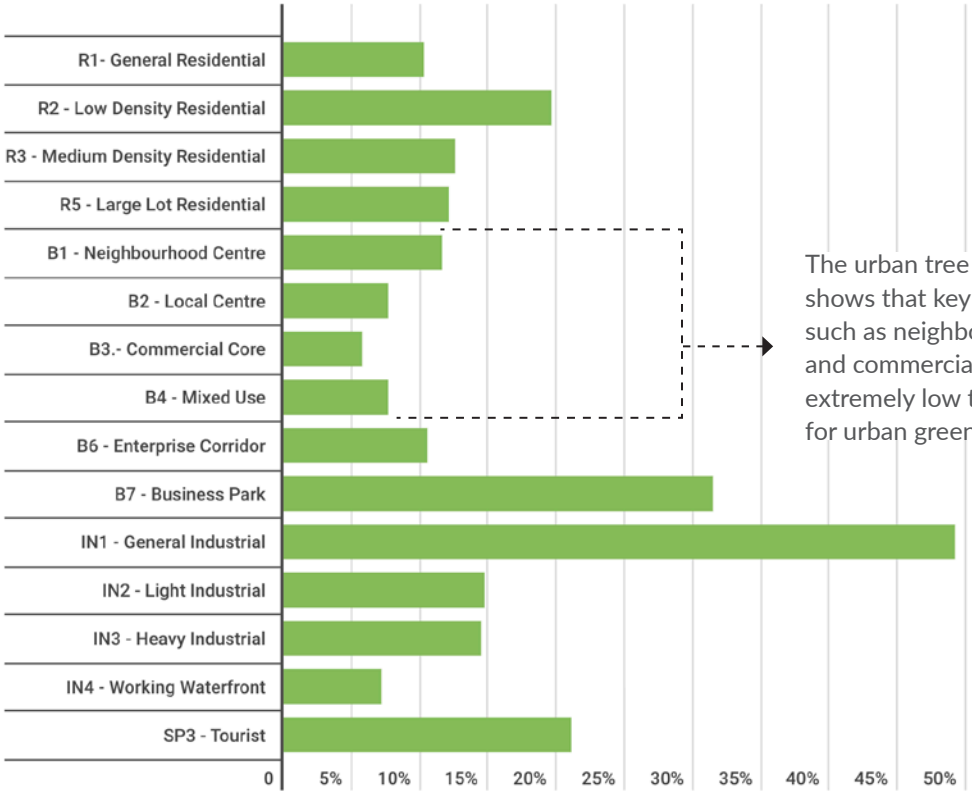


Figure 55 - Tree canopy coverage distribution across the LGA by landuse type



The urban tree canopy mapping and analysis shows that key areas in the Wollongong LGA such as neighbourhood centres, local centres and commercial cores and mixed use areas have extremely low tree canopy which is a priority area for urban greening.

Figure 54 - Canopy coverage in urban areas by landuse type across Wollongong LGA

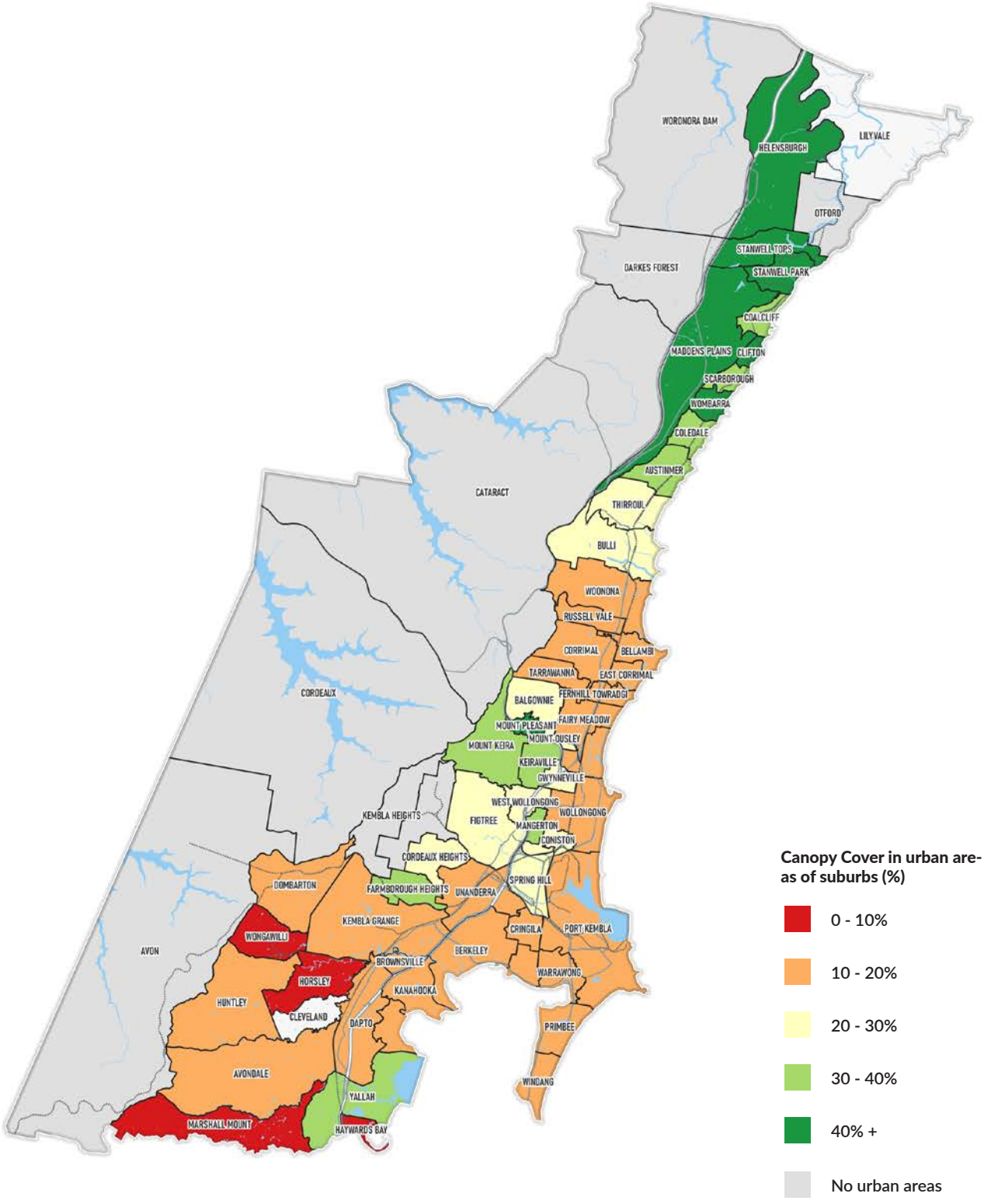


Figure 56 - Canopy coverage in urban areas in Wollongong LGA

4.3. Shellharbour LGA

The LGA has an overall average canopy cover of 29%. Only 5% of the overall canopy cover is in urban areas. In those urban areas, the average canopy cover is 10%, which is extremely low compared to global standards of optimum tree canopy provision (35-40%).

4.3.1. Tree canopy cover in urban areas by suburb

Overall, all suburbs have very low tree canopy cover.

The suburb with the highest canopy cover in urban areas at 27.5% is Yellow Rock. However, it should be noted that an extremely small area of the overall suburb accounts for urban areas which also has large properties with private open space.

As shown in Figure 58, the tree canopy coverage in urban areas across the LGA are:

- Dunmore - 0.88%
- Tullimbar - 3.6%
- Calderwood - 5.7%
- Shell Cove - 65%
- Flinders - 6%
- Shellharbour City Centre - 6.3%
- Barrack Point - 9.2%
- Lake Illawarra - 10.5%
- Croom - 10.6%
- Barrack Heights - 11.3%
- Shellharbour - 11.3%
- Warilla - 11.5%
- Blackbutt - 11.6%
- Albion Park - 12%
- Mount Warrigal - 12.4%
- Albion Park Rail - 12.9%
- Oak Flats - 13.8%
- Yellow Rock - 27.5%

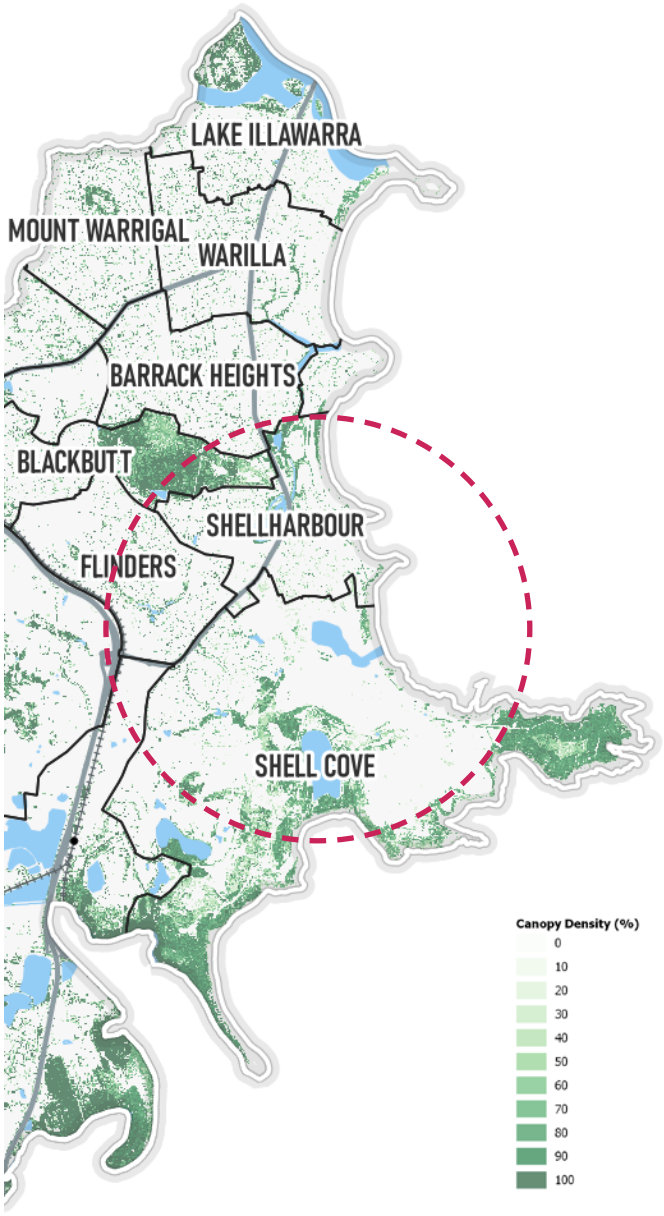


Figure 57 - Canopy density in key Centres in Shellharbour City Council LGA

3.6 %

Tullimbar

Yet to be developed which is currently agricultural land

LOW

6.3 %

Shellharbour City Centre

Town Centre with very low tree canopy cover

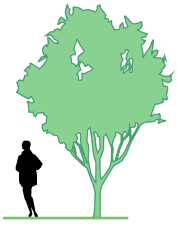
LOW

11.3 %

Shellharbour

A majority of the trees are in private properties

LOW



27.50%

Yellow Rock

Majority of the land is yet to be developed

AVERAGE

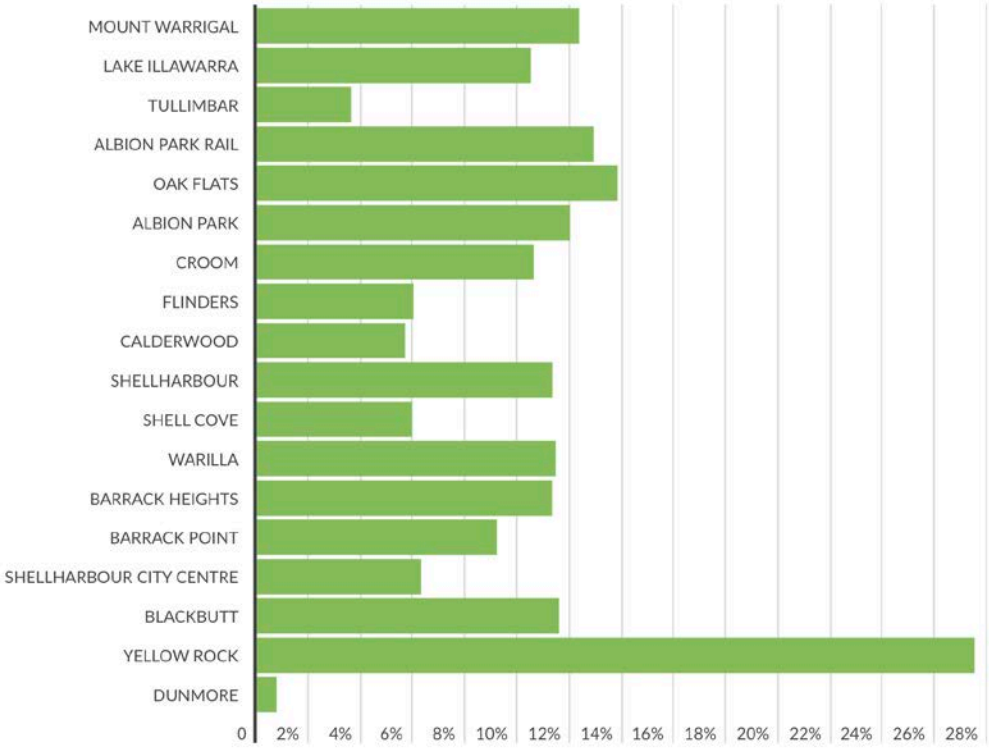


Figure 58 - Canopy coverage in urban areas (does not include other areas) by suburb across Shellharbour LGA

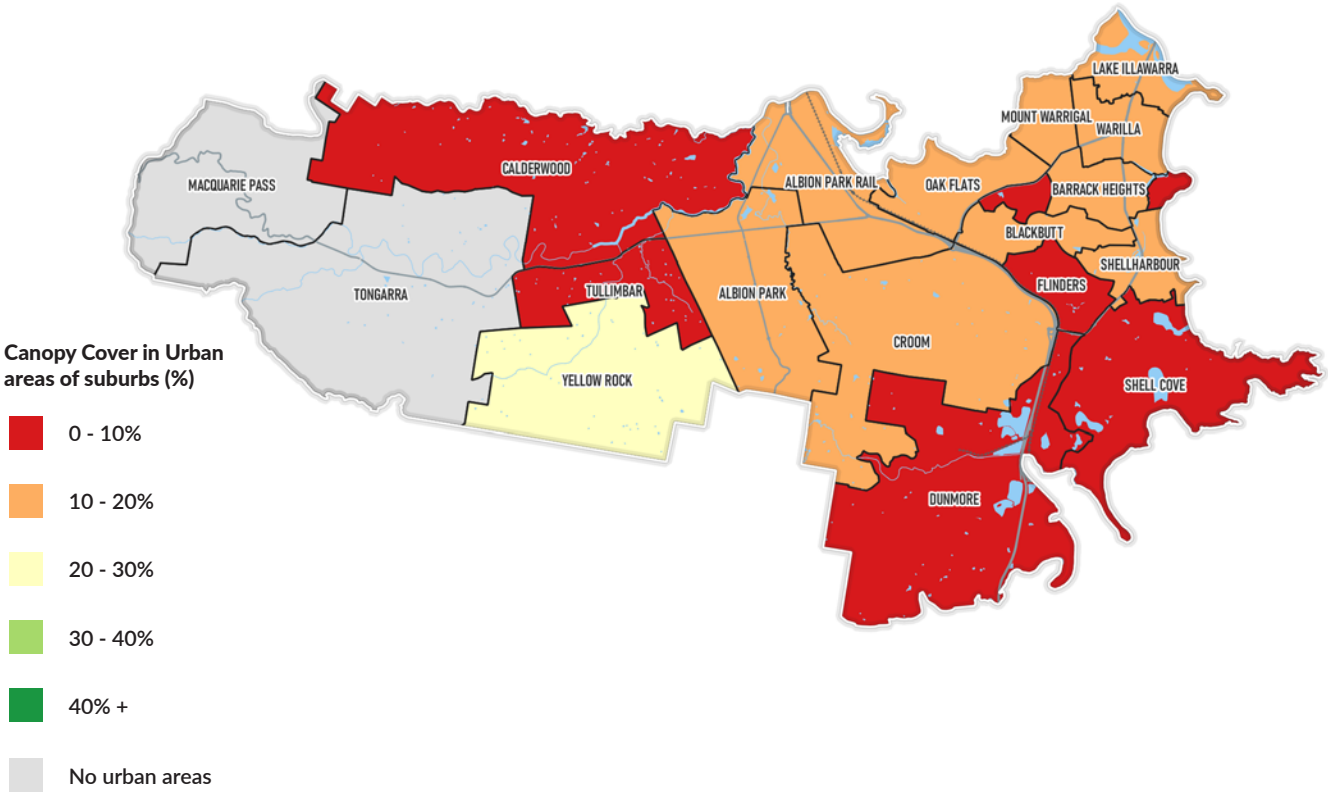


Figure 59 - Canopy coverage in urban areas in Shellharbour LGA

4.3.2. Where are the trees in the LGA? Tree canopy cover by landuse

A majority of the tree canopy cover in the LGA is in environmental protection zones which account for 77.4%. Only 5% of the overall tree canopy cover is in urban areas.

Further examining the tree canopy within these urban areas shows that there is an extremely low tree canopy coverage (below 8%) in key areas such as neighbourhood centres, local centres, mixed use areas and commercial cores.

4.3.3. Key findings

- The urban tree canopy mapping and analysis shows that key areas in the Shellharbour LGA such as neighbourhood centres, local centres and commercial cores have extremely low tree canopy cover which is a priority area for urban greening.
- All urban areas especially key centres such as Shellharbour City Centre, Albion Park and new release areas such as Shell Cove have extremely low tree canopy cover.

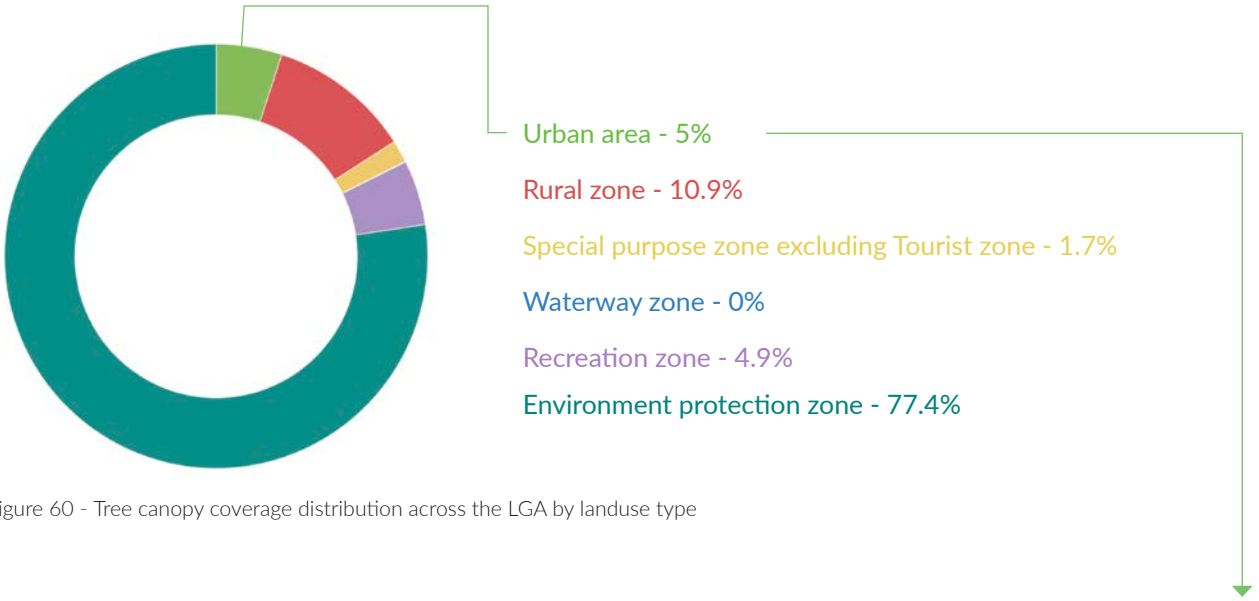


Figure 60 - Tree canopy coverage distribution across the LGA by landuse type

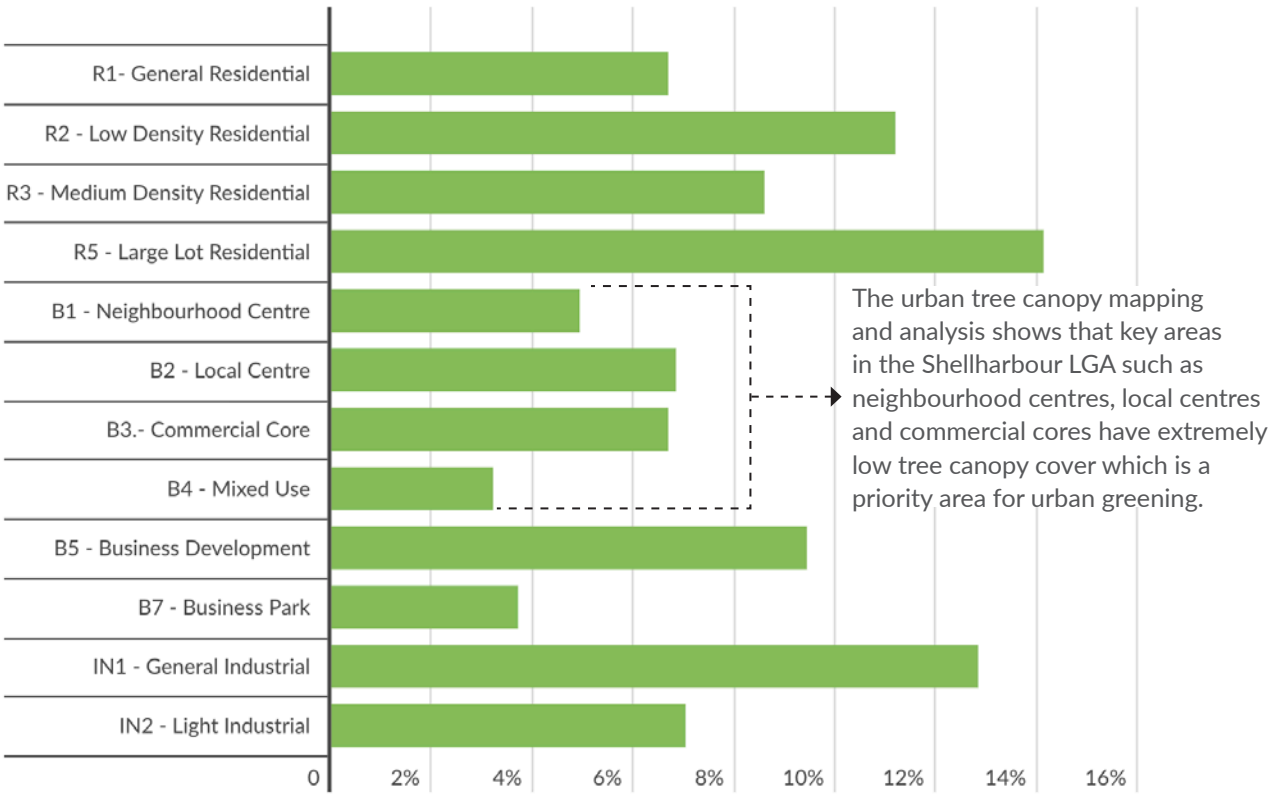


Figure 61 - Canopy coverage in urban areas by landuse type across Shellharbour City Council LGA

4.4. Kiama LGA

The LGA has an overall average canopy cover of 48%. Only 1.2% of the overall canopy cover is in urban areas. In those urban areas, the average canopy cover is 17.7%, which is extremely low compared to global standards of optimum tree canopy provision (35-40%).

4.4.1. Tree canopy cover in urban areas by suburb

Overall, all suburbs have relatively low to average tree canopy cover.

The suburb with the highest canopy cover in urban areas at 32.6% is Jamberoo. However, it should be noted that an extremely small area of the overall suburb accounts for the urban area which also has large properties with private open space and trees.

As shown in Figure 63, the tree canopy coverage in urban areas across the LGA are:

- Bombo - 8.9%
- Minnamurra - 9.2%
- Kiama Heights - 11%
- Kiama Downs - 11.8%
- Kiama - 13.3%
- Gerroa - 23%
- Gerringong - 24.7%
- Werri Beach - 27%
- Jamberoo - 32.6%

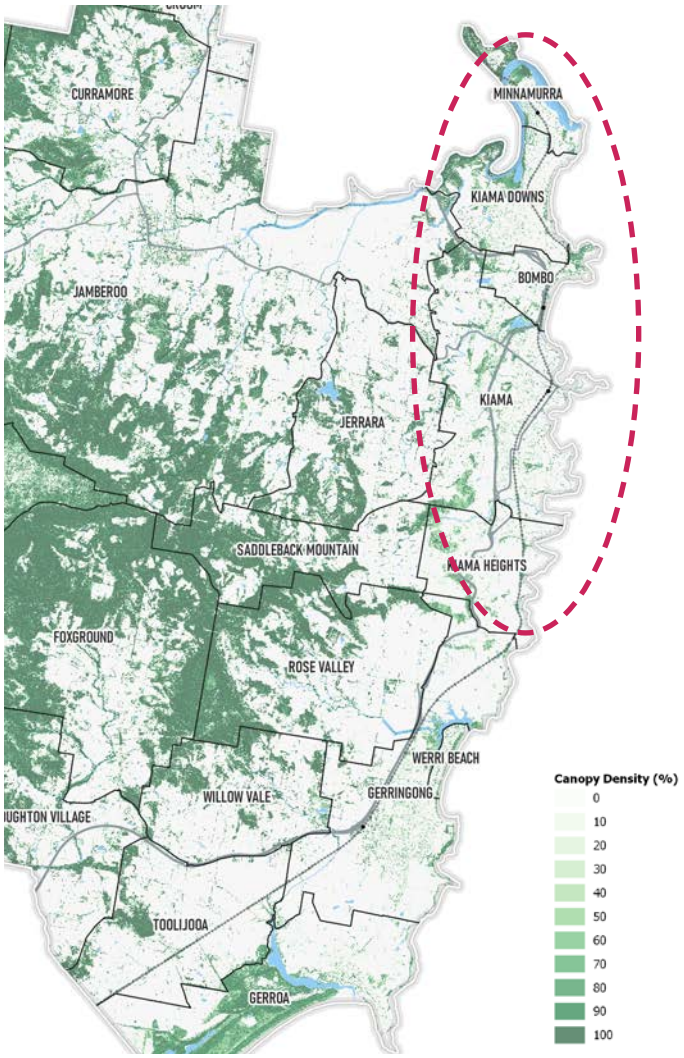


Figure 62 - Canopy density in key Centres in Kiama M LGA

9.15 %
Minnamurra
The urban area has private properties with low tree canopy cover
LOW

13.73 %
Kiama
Town centre and private properties with low tree canopy cover
LOW

24.69%
Gerringong
A majority of the trees are in private properties
AVERAGE

32.60 %
Jamberoo
A majority of the urban area is yet to be developed
IDEAL

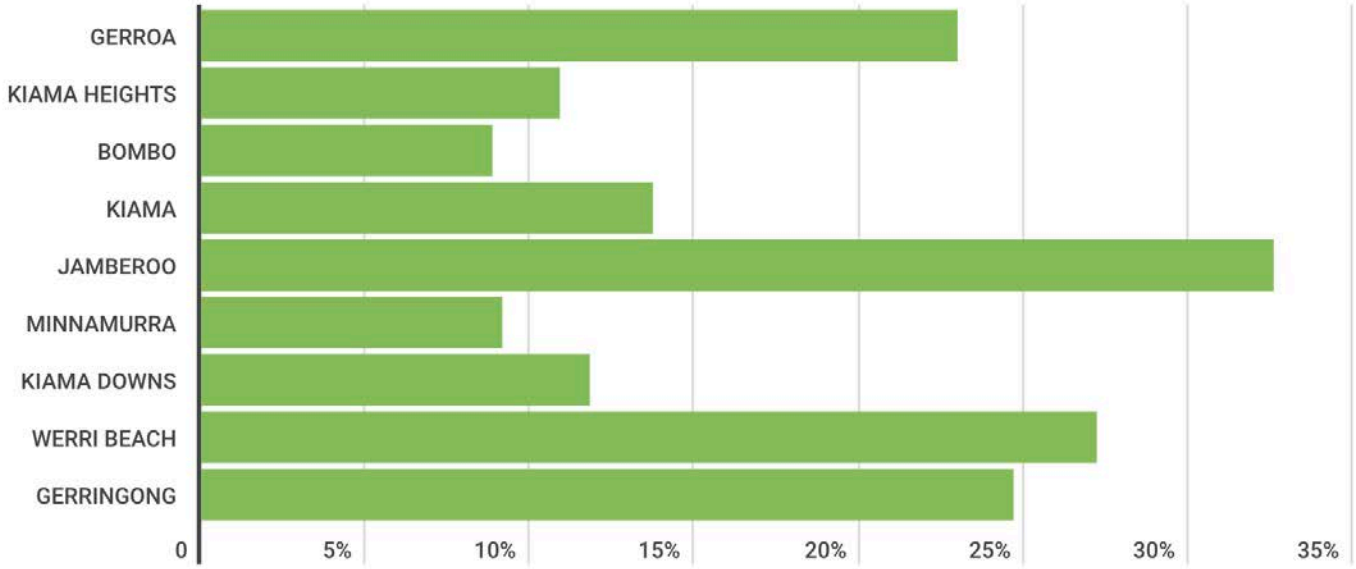


Figure 63 - Canopy coverage in urban areas (does not include other areas) by suburb across Kiama LGA

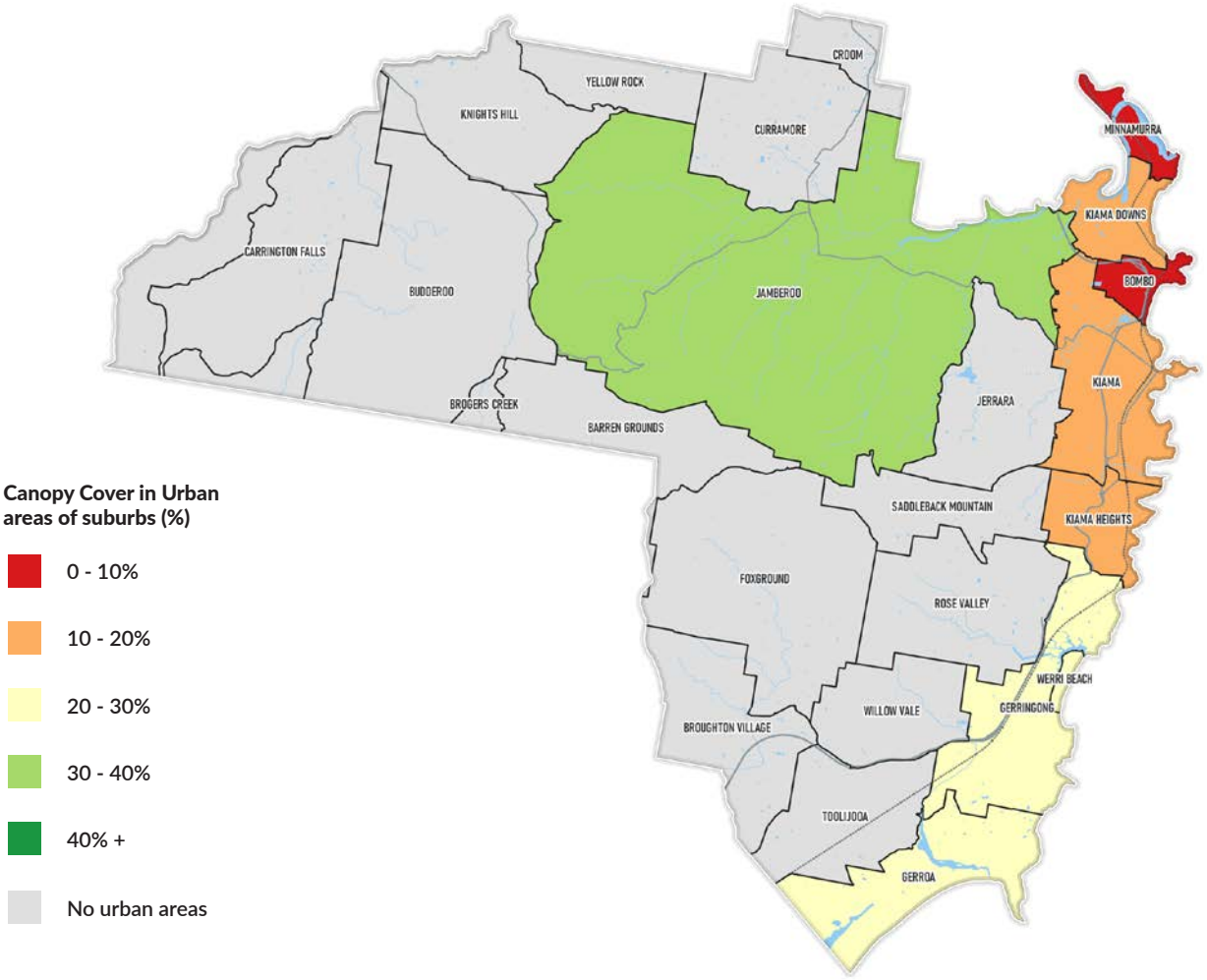


Figure 64 - Canopy coverage in urban areas in Kiama LGA

4.4.2. Where are the trees in the LGA? Tree canopy cover by landuse

A majority of the tree canopy cover in the overall LGA is in environmental protection zones which account for 88.2%. Only 1.2% of the overall tree canopy cover is in urban areas.

Further examining the tree canopy within these urban areas show that there is an extremely low tree canopy coverage (below 8%) in key areas such as neighbourhood centres, local centres, mixed use areas and commercial cores.

4.4.3. Key findings

- The urban tree canopy mapping and analysis shows that key areas in the Kiama LGA such as neighbourhood centres, local centres and commercial cores have relatively low tree canopy cover which is a priority area for urban greening.
- All urban areas especially key centres such as Kiama Downs, Kiama and new release areas such as Kiama Heights have extremely low tree canopy cover.

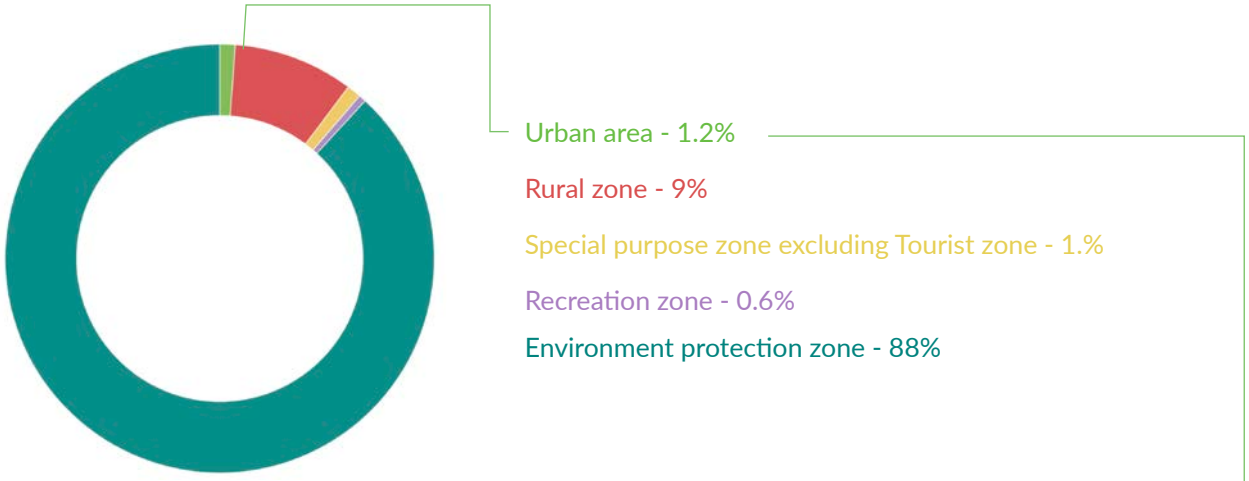
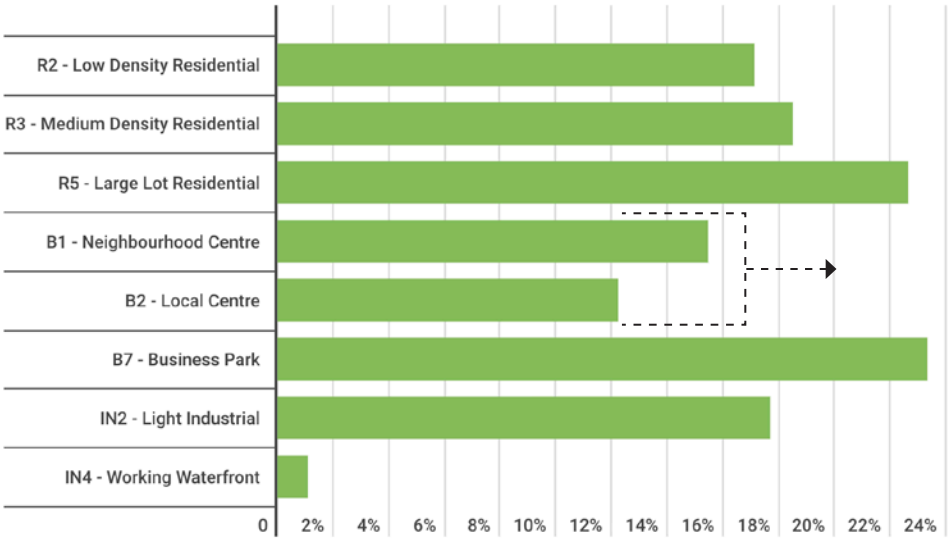


Figure 66 - Tree canopy coverage distribution across the LGA by landuse type



The urban tree canopy mapping and analysis shows that key areas in the Kiama LGA such as neighbourhood centres, local centres and commercial cores have relatively low tree canopy cover which is a priority area for urban greening.

Figure 65 - Canopy coverage in urban areas by landuse type across Kiama Municipal Council LGA

4.5. Shoalhaven LGA

The LGA has an overall average canopy cover of 61%. Only 1% of the overall canopy cover is in urban areas. In those urban areas, the average canopy cover is 32% (close to the target of 35-40%) however, it varies vastly between different suburbs.

4.5.1. Tree canopy cover in urban areas by suburb

Suburbs with the highest canopy cover in urban areas at 68% to 51% are Woollamia, Yerriyong, Falls Creek, Depot Beach, Bangalee, Manyana, Kioloa. However, it should be noted that a majority of areas zoned as urban in these suburbs are yet to be developed and therefore have a high proportion of tree cover. When these areas are developed, there should be emphasis on retaining trees to provide an optimum level of urban tree canopy.

Suburbs with the lowest canopy cover at 0.02% to 16% are Barrengarry, Meroo Meadow, Cambewarra, Greenwell Point, Nowra, Bolong, Worrigee.

As shown in Figure 68, the tree canopy coverage in urban areas across key centres and high growth areas are:

- Nowra - 14%
- Vincentia - 20%
- Ulladulla - 25%
- Bomaderry - 19%
- North Nowra - 30%
- South Nowra - 25%
- Worrigee - 16%
- Sanctuary point - 18%
- Huskisson - 25%

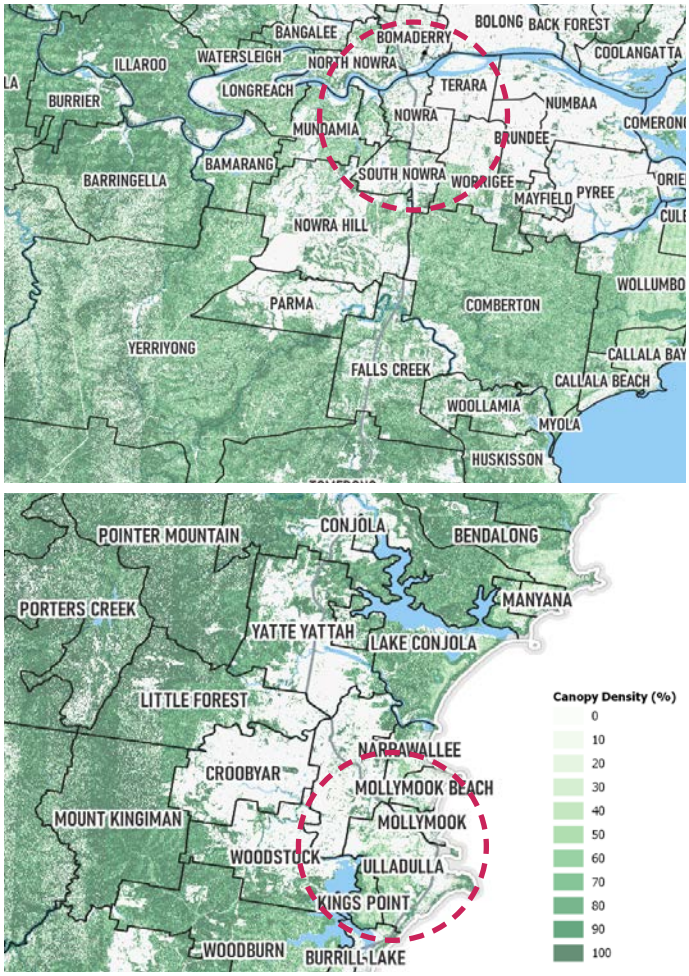


Figure 67 - Canopy density in key Centres in Shoalhaven City Council LGA

Note: In 2018, Shoalhaven City Council commissioned UTS to conduct research into the Assessment of environmental, economic and social benefits of trees in a Shoalhaven City Council. The report had a different focus to this study and looked the benefits of trees for carbon storage and sequestration benefits, air pollution reduction, and used 'i-Tree' software for their analysis. The canopy analysis in this report used NSW Government LiDAR data and GIS mapping to carry out the analysis, in order to have a consistent approach across the Region.

7.43 %
Meroo Meadow
A majority of the urban area is still agricultural land
LOW

18.80 %
Bomaderry
Medium density housing and light industrial area
AVERAGE

36.23 %
Berry
Low density housing with a majority of trees in private properties
IDEAL

68.07 %
Woollamia
A majority of the urban area it is yet to be developed
HIGH

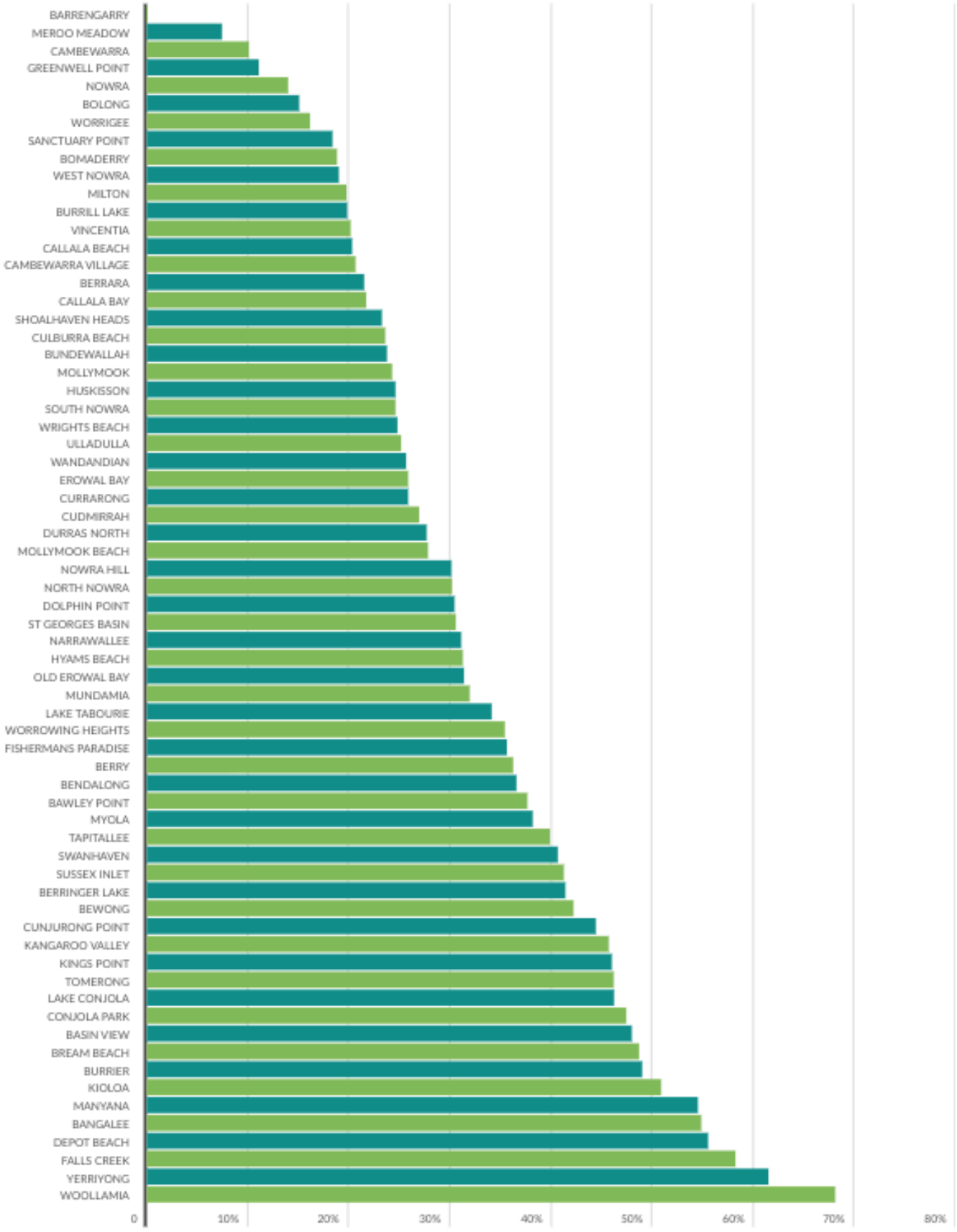


Figure 68 - Canopy coverage in urban areas by suburb (only includes suburbs with urban areas) across Shoalhaven LGA

4.5.2. Where are the trees in the LGA? Tree canopy cover by landuse

A majority of the tree canopy cover in the overall LGA is in environmental protection zones which account for 69%. Only 1% of the overall tree canopy cover is in urban areas.

Further examining the tree canopy within these urban areas show that there is low tree canopy coverage in key areas such as neighbourhood centres, local centres and commercial cores.

4.5.3. Key findings

- The urban tree canopy mapping and analysis shows that key areas in the Shoalhaven LGA such as neighbourhood centres, local centres and commercial cores have low tree canopy which is a priority area for urban greening.
- Centres such as Nowra, Bomaderry, Vincentia and Ulladulla have low canopy tree cover ranging from 10-20%.

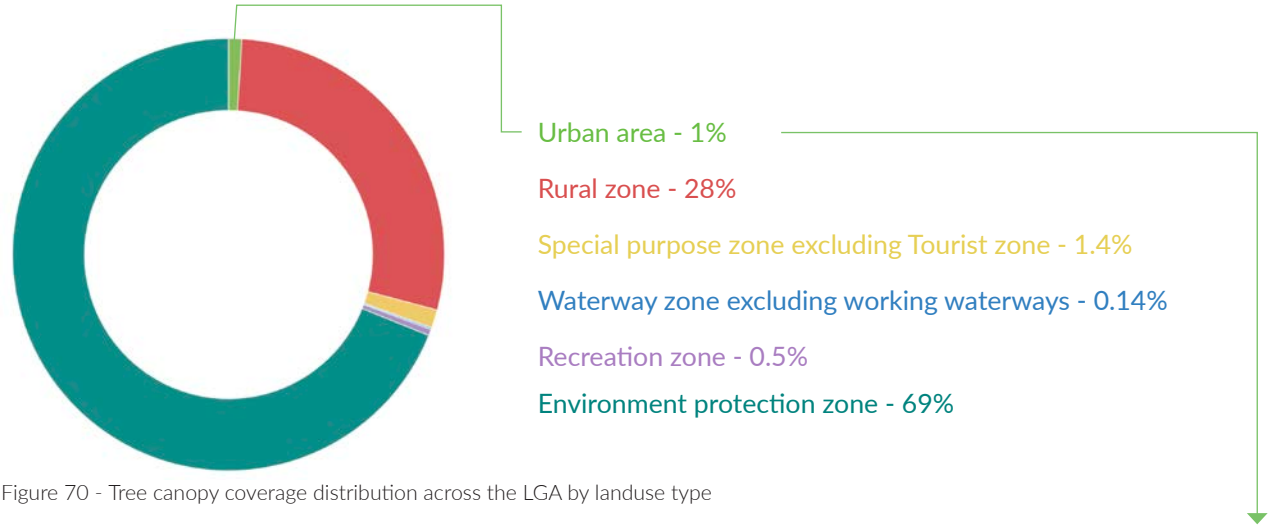


Figure 70 - Tree canopy coverage distribution across the LGA by landuse type

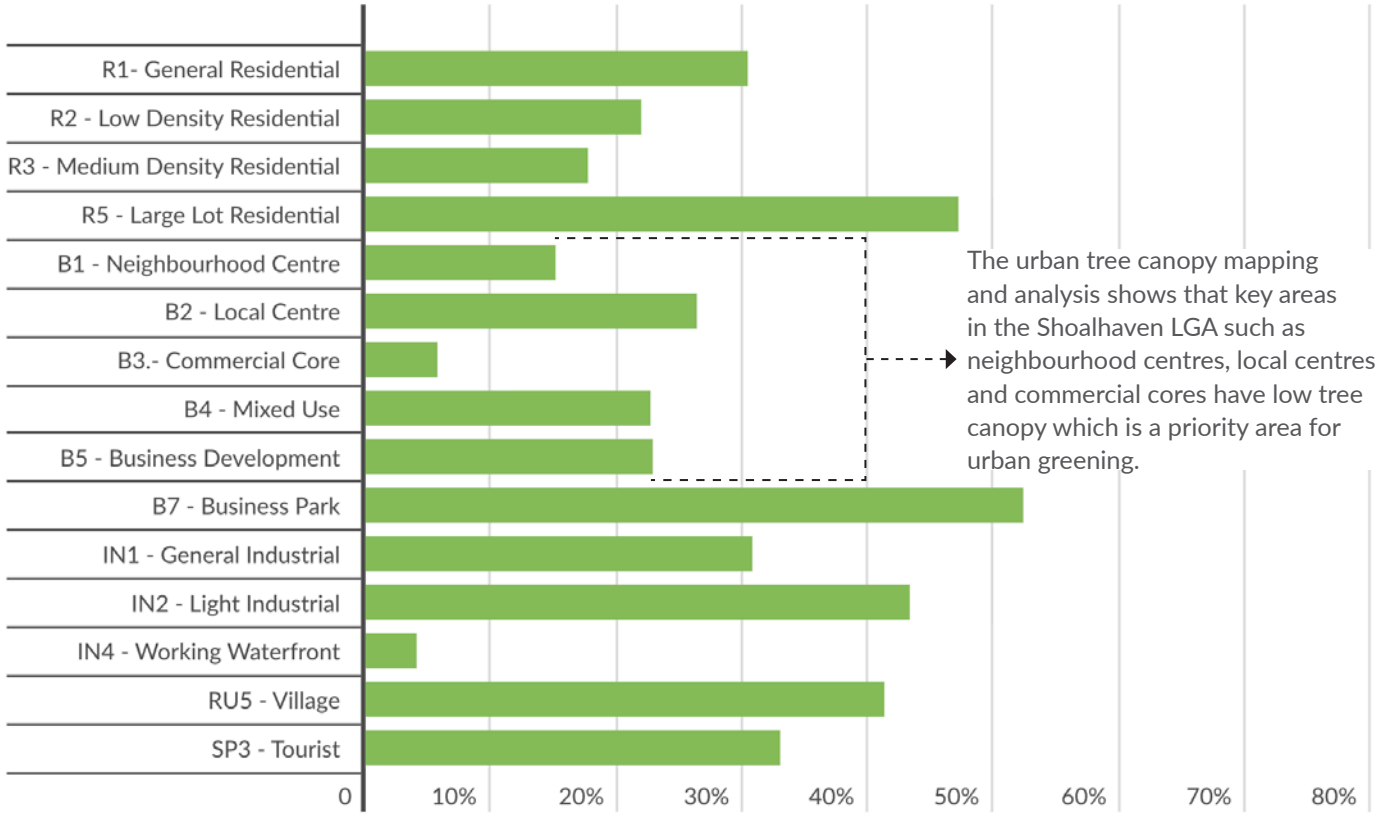


Figure 69 - Canopy coverage in urban areas by landuse type across Shoalhaven City Council LGA

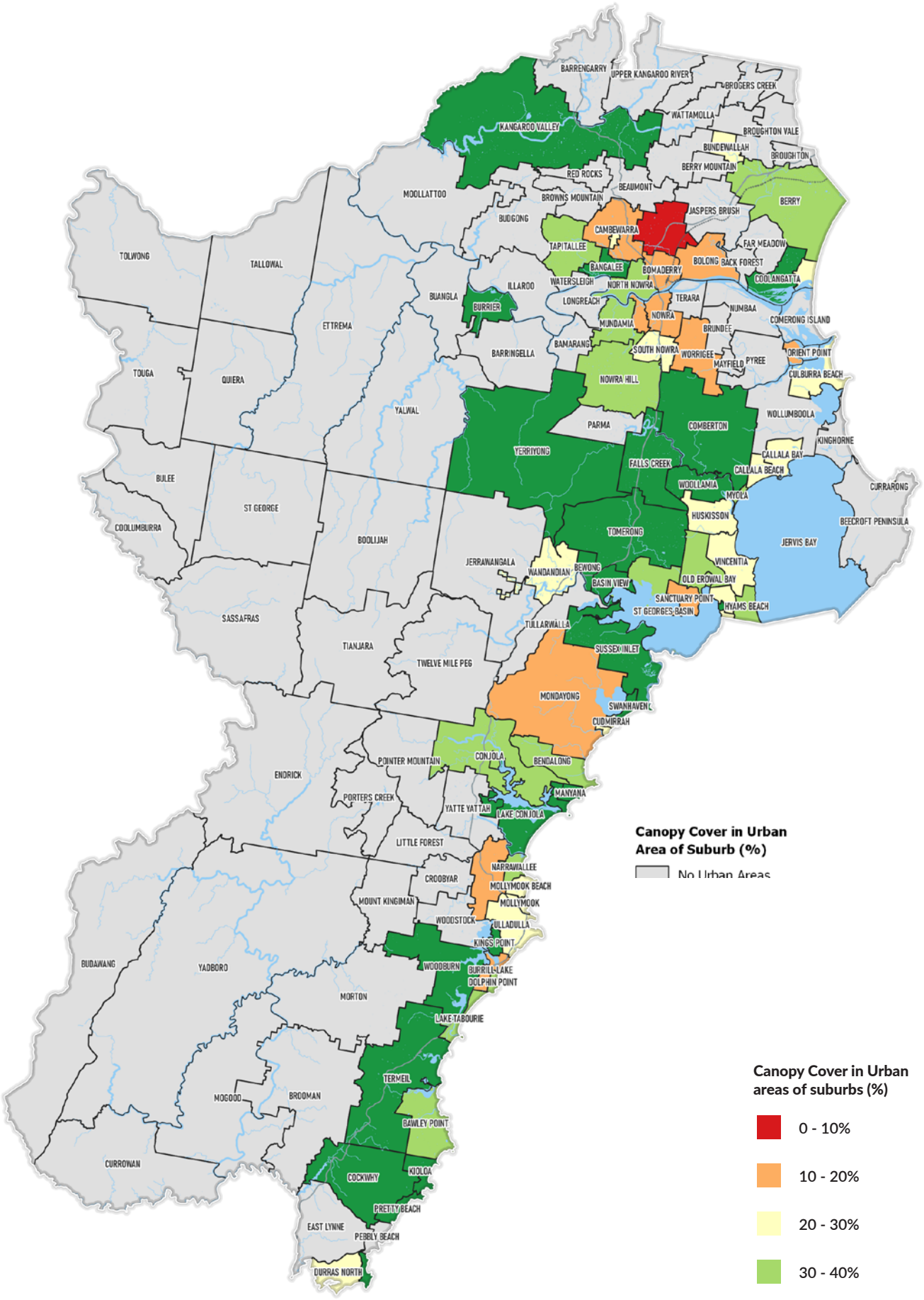


Figure 71 - Canopy coverage in urban areas in Shoalhaven City Council LGA

05

Recreational grid opportunities

Shellharbour City Centre *(Image credit: Shellharbour City Council)*

5. Recreational grid opportunities

This section provides directions and opportunities that can inform the creation of a future recreational grid across the Region connecting people to public spaces and increasing tree canopy to create shadier more comfortable streets. The directions and opportunities aim to improve access to public space in line with the Premier's Priorities and improve health and wellbeing outcomes in line with the Regional Plan.

Five directions have been identified that respond to the public space, tree canopy audit and walking catchment gap analysis completed for the Region and each of the four councils. See Figure 72 opposite for a comparative summary of public space access across the Region.

For each of these 5 directions - the following has been identified:

- Opportunities to improve access to public space for the Region as a whole
- Local opportunities to improves access as identified for the four LGAs, and
- Precedents studies (examples of existing projects elsewhere in Australia or globally that have successfully delivered something similar the identified opportunities).

DIRECTION #1

Create continuous waterfront access

DIRECTION #2

Improve connectivity to Regional destinations

DIRECTION # 3

Integrate and expand the recreational grid in major projects & new release areas

DIRECTION # 4

Increase tree canopy in urban areas

DIRECTION #5

Create equitable and comfortable access to public spaces

Council comparison summary

The diagram below provides a high level comparison of the different public space attributes. It shows:

- Wollongong LGA has an average proportion of areas that can access public space within an 800m walk, and similar levels of tree canopy cover compared to the Region.
- Shellharbour LGA has the lowest levels of tree canopy cover, including in its centres, but a high proportion of urban areas that are within an 800m walk of a public space.
- Kiama LGA has the highest proportion of urban areas than can access a public space within 800m walking distance, but second lowest tree canopy cover in urban areas and centres.
- Shoalhaven LGA has the lowest proportion of urban areas that can access a public space within 800m walking distance, but the highest levels of tree canopy cover in urban areas and centres.

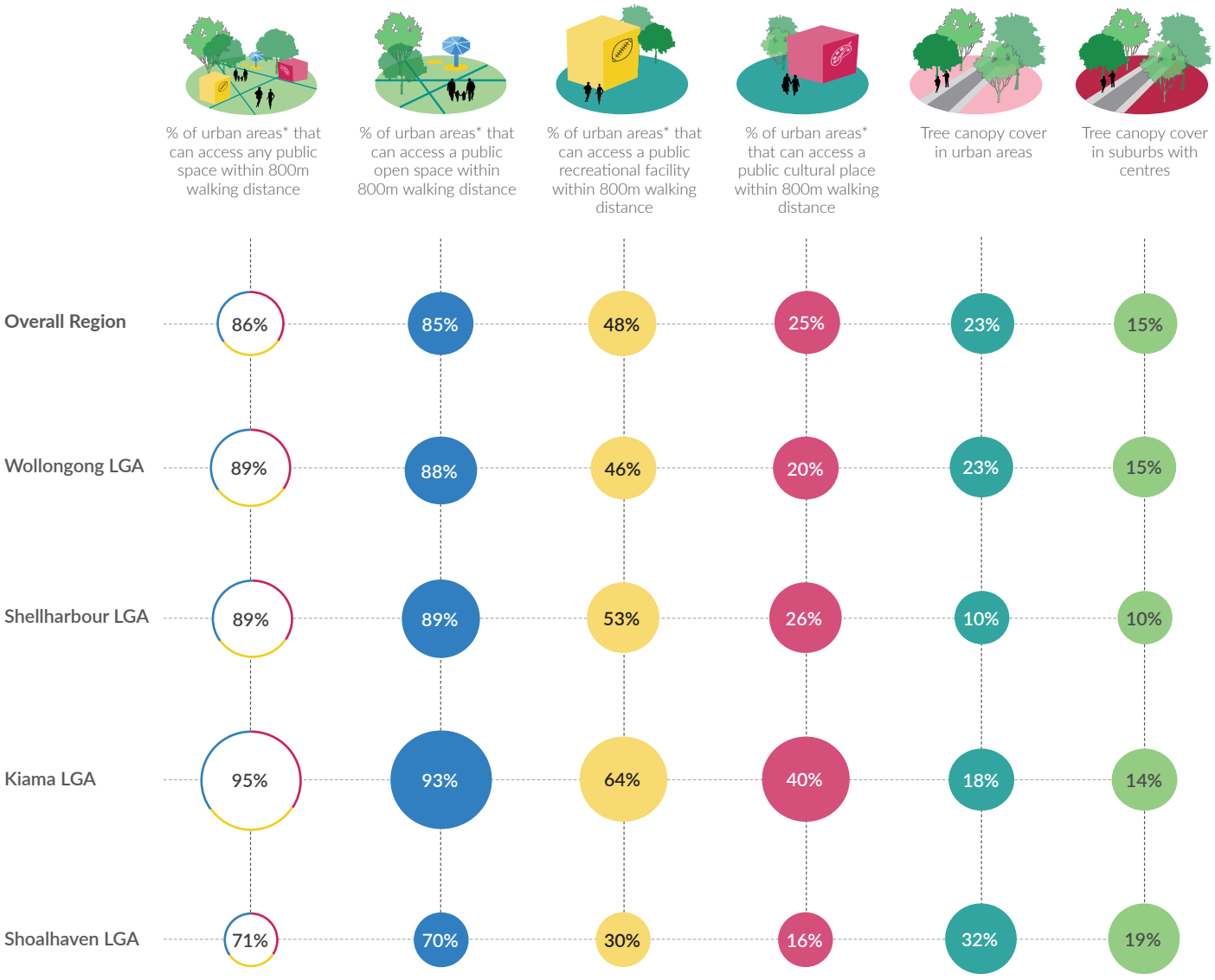


Figure 72 - Council comparison summary
* This excludes heavy industrial areas (IN3 & IN4) from the urban area calculation. The total % in the first colum represents the proportion of urban areas that within an 800m walking catchment of any public open space. It is not an average of the sub categories of public space.

DIRECTION # 1:

Create continuous waterfront access

Waterfront areas and trails - along the coastline, around lakes, and along river edges - are some of the Region's most valued and iconic public spaces. However, the provision and quality of waterfront access varies from place to place. There is an opportunity to 'complete' a number of missing links, improve quality and upgrade 'pinch points' along waterfront areas, as well as create additional opportunities for the types of recreational experiences available to help increase access the waterfront. This is a long term aspirational objective, that can be worked towards through incremental action and will connect the Region's LGAs.

Some of the challenges facing the Region in relation to improved waterfront access and trails include:

- Multiple landholders, including private land ownership along the foreshore edge.
- Waterways and inlets that do not have bridges, with an aim to complete these missing links in the future.
- Large geographical areas and dispersed populations, requiring funding to be spread thin.

Regional opportunities

Continuous coastal foreshore access (linked across all LGAs)

- Long term aspiration and planning to deliver continuous waterfront access along the coast and Lake Illawarra.
- 7 Mile Beach link - shared path along Gerroa Road between Gerroa in Kiama LGA to Shoalhaven Heads in Shoalhaven LGA through the National Park.
- Walk the South Coast - The NSW Department of Environment, Energy and Science is currently planning a 'walk the south coast' project through the Murramarang National Park and Aboriginal Area between Bawley Point in Shoalhaven LGA to Maloneys Beach in Eurobodalla Shire Council.

Continuous links around lakes (linked across all LGAs)

- Lake Illawarra circuit - completion of the cycle / shared path around the entire lake (through Kiama and Shoalhaven LGAs).

Local opportunities

Wollongong LGA

- Respond to demand for foreshore access by expanding the width of existing paths that frequently become congested, such as the shared pathway between Sandon Point to Bulli.
- Improve connections between communities in the west of the LGA (e.g. Dapto, West Dapto) to Lake Illawarra.
- Support the proposed Ngaraba-aan Trail walking track that links Port Kembla Heritage Park to Hill 60 and Coomaditchie Reserve - considered to be one of the region's most important Aboriginal and European heritage sites.

Shellharbour LGA

- Formalise missing foreshore links between Shellharbour North Beach and Shelharbour South Beach, and along Bass Point Tourist Road.

Kiama LGA

- Formalise paths and access along the Kiama Coastal Walk - an existing 20km coastal walk between Minnamurra in the north, to Gerringong in the south. Currently the walk is a mix of sealed paths, grassed tracks and beach walking - opportunity to formalise and improve the quality and accessibility of the trail, especially for cyclists and a wider range of mobilities.
- Link Jamberoo to Kiama Downs and Bombo train station.

Shoalhaven LGA

- Formalise more trails in the National Park areas, especially those that link local communities together along the coastline.
- Aspire to achieving continuous foreshore access, focusing on areas that would have high foot traffic and tourism recreation trail potential, such as:
- Between Jervis Bay Maritime Museum at Dent Street and the Huskisson ferry terminal on Currambene Street in Huskisson.
- Walking routes on Council managed foreshore land around Jervis Bay from Callala Bay to Hyams Beach.
- Between Callala Creek and Marine Parade.

Case Study: Investment in quality of experience drives up utilisation - Bathers Way Walk, Newcastle

Bathers Way Walk is a 5km coastal walk between Nobbys Headland to Glenrock Reserve with swimming, playing and learning opportunities along its length. Completed sections of the Bathers Way coastal walk project have prompted 50 per cent usage increases, demonstrating how investment in high quality recreation infrastructure can drive demand and utilisation. The last stretch of the work, including a coastal skate park at South Newcastle Beach, is now underway, costing a total of $11.7 million. The project is partially funded through a $5 million grant from Infrastructure NSW under the Restart NSW Funding scheme.

“By renewing the site’s infrastructure and building new facilities, we hope to revive South Newcastle Beach as a vibrant and attractive place to visit” - Lord Mayor, Nuatali Nelmes.

Figure 73 - Birdseye view of the final stage of Bathers Way Walk and coastal skate park (source: City of Newcastle)

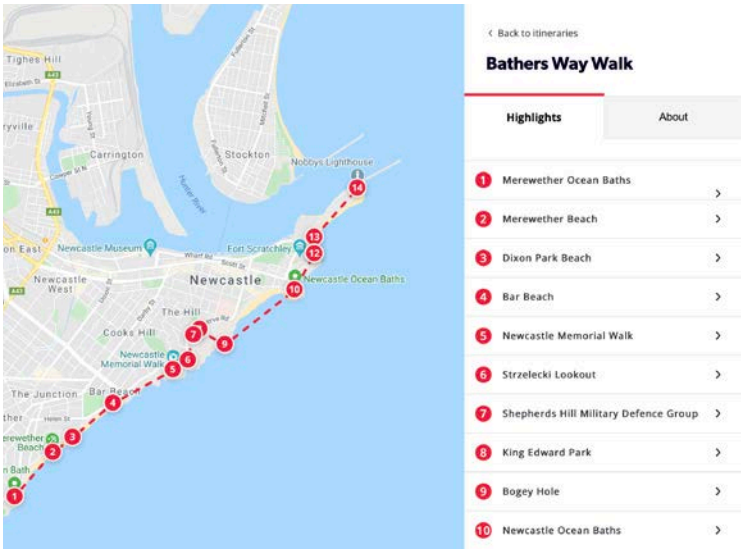


Figure 74 - Bathers Way route and highlights interactive map (source: Visit NSW)

Figure 75 - Concept design of coastal skate park and recreation facilities (source: City of Newcastle)

Precedents

Figure 77 - A continuous connection along the coastline, boardwalks traverse steep-sloped segments- Coolum Foreshore Walk, Coolum.

Figure 76 - Touching lightly on the landscape, boardwalk connections improve access along the coastal walk - Royal National Park, Sydney

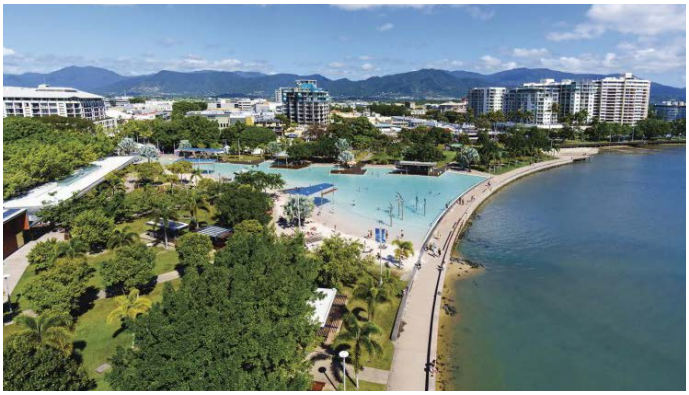


Figure 78 - Linking the people of Cairns back to the waters edge whilst offering a diverse range of experiences; skatepark, public pool and parklands - Cairns Esplanade, Cairns.

Figure 79 - Creek bridges connect the Suffolk community through the Tallow Creek Wetland Area to a number of key amenities such as schools, shops the beach - Tallow Creek Pathway, Suffolk Park.

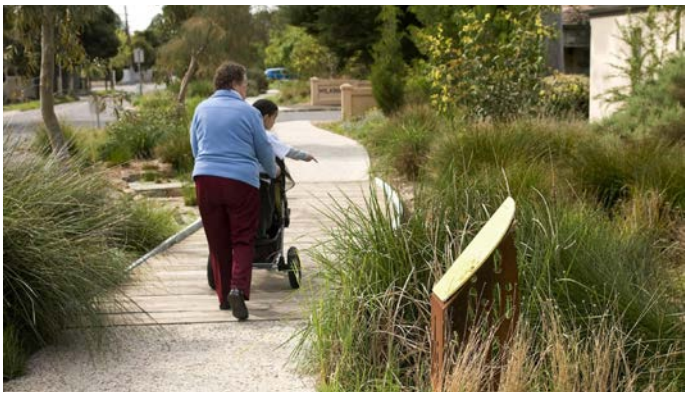


Figure 80 - Conversion of a dilapidated concrete drain into a unique urban Indigenous plant environment; re-introducing a landscape aesthetic into the streetscape and creating a seamless green corridor connection between two local parks - Windsor Street Linear Reserve, Unley (South Australia).

DIRECTION #2:

Improve connectivity between Regional destinations

The Region's centres provide a range of public spaces for their communities shared by all for moving from place to place; enjoying public recreational and cultural opportunities; visiting other parts of the Region; shopping; meeting others or simply going for a walk. Many of the Region's public space destinations such as free galleries and museums, community centres, regional parks, and sporting complexes are clustered within centres. There are also significant Aboriginal cultural heritage places in the Region, some of which are already part of the recreation grid.

Destinational public spaces such as museums, galleries, performance venues, and sporting complexes are important places for communities to view and participate in arts, culture, community and recreational events. Their co-location with parks, civic centres and within centres, delivers multiple economic and social outcomes for communities, including centre activation, economic growth, and creation of social capital and healthier communities.

For some people access to these centres and destinational public spaces is only possible by car, or via long/ uncomfortable walks from train stations along highways, and often unsheltered from the sun. This, along with the physical barriers created by major road and rail corridors, can deter people from walking and cycling more leading to poor health and wellbeing outcomes. While it is not possible to improve access to all public spaces, shaded and walkable/cyclable recreational links should be prioritised to the Region's centres and destinational public spaces which are highly valued by local communities, and are social and economic drivers within regional areas.

In some centres in the Region, the visual and physical connection between the centre and the water (whether it be a coastal, lake or river's edge), can be unclear.

Regional opportunities

Improved connectivity between centres and waterfront

- Visually and physically connect the centres to the water.

Improved connectivity to train stations

- A number of train stations across the Region are disconnected from centres and destinational public spaces. There is an opportunity to improve amenity on key movement routes between these train stations that include safer travel options for all modes of transport, more shade, seating and rest stops, planting/landscape buffers between pathways and busy roads to improve the recreational grid experience.
- There are major and regional public recreational facilities and public cultural places across the Region that require improved active transport links to ensure they can be enjoyed by everyone.
- There are significant areas of Aboriginal cultural heritage where, if culturally appropriate, collaboration with local Aboriginal groups could expand the recreational (or OCHRE) grid network, adding a diversity of experiences.
- Improve recreational links at local and regional levels, between council managed open space or areas of high natural value and National Parks (e.g. between the escarpment and the coast).
- Local government areas throughout the Region are dissected by a number of major road/rail corridors. These barriers contribute to creating an inequity of access to the beach and quality open spaces. In particular, east-west links are a challenging to deliver due to road/rail infrastructure that run in a north-south direction down the coast.
- Expansion and improvement of recreation trails, pedestrian links and cycle paths
- Expansion of the network of trail experiences that provide educational, interpretive & recreational links to the broader Region (ensuring to align with and build on council cycle networks where possible).

Local opportunities

Wollongong LGA

- Embellish parks and foreshore areas that have the potential to provide a greater choice of recreational activities and experiences, prioritising areas with higher levels of social disadvantage (such as Kully Bay in Warrawong) or areas with a lower provision of public open space (such as West Dapto, Lake Heights, Warrawong, Thirroul).
- Improve the experience and amenity of the Grand Pacific Walk in sections such as through Port Kembla - to connect the Wollongong CBD to the proposed Ngaraba-ann Trail.
- Investigate a new east-west connection between the Nan Tien Temple in Berkeley and Jarvie Road in Cringila via the proposed future recreational mountain bike park in Cringila Hills.
- Improve access and safety across highways such as Northcliffe Drive around Lake Illawarra, Primbee Bypass and Memorial Drive, as well as east-west connections across the rail corridor in the northern half of the LGA
- Deliver safe footpaths along key streets in areas that currently don't have any (such as Cordeaux Heights, Farmborough Heights, Dapto, Kanahooka, Lake Heights and Berkeley) to encourage people of all mobilities to get more active.

Shellharbour LGA

- Improve connectivity between the Shellharbour City Centre and Lake Illawarra and the coast generally.
- Improve connections to key public spaces with high natural value including Bass Point Reserve, Blackbutt Reserve, Croom Reserve, Killalea State Park, Lake Illawarra and Shellharbour foreshores, Myimbarr Wetlands and Macquarie Pass National Park.
- Improve links to Reddall Reserve at the entrance to Lake Illawarra - a major destination for kids' and adults' play and where an arts hub is underway, with the ninja warrior course and learn to ride track.
- Improve connection to, and promotion of, Bass Point Indigenous Cultural Walk.
- Deliver a high quality connection between the Shellharbour CBD and surrounding destinations such as Shell Cove Boat Harbour / Marina project, Lake Illawarra, the coast line.
- Improve access between non-coastal suburbs of Tullimbar / Albion Park / Oat Flats to Lake Illawarra, the coast and the Shellharbour CBD, in particular looking at how to improve the quality of experience for active transport travel along New Entrance Road corridor, and access across major infrastructure such as the Princes Highway.
- Improve connections to the new train station at Shellharbour Junction to the coast.
- Delivery of safe footpaths along key streets in areas that currently don't have any, such as Tongarra Road (connects Albion Park to the city centre) to encourage people of all mobilities to get more active.

Kiama LGA

- Improve the quality of existing recreation paths throughout the LGA.
- Extend the off-road cycleway / shared pathway network from Minnamurra to Jamberoo.
- Building on the success of Kiama Coastal Walking Track dreaming poles, continue to work with local Aboriginal groups to identify and delivery future opportunities for cultural enhancement of the recreation grid.
- Improve the connection between Bombo headland to Kiama CBD.

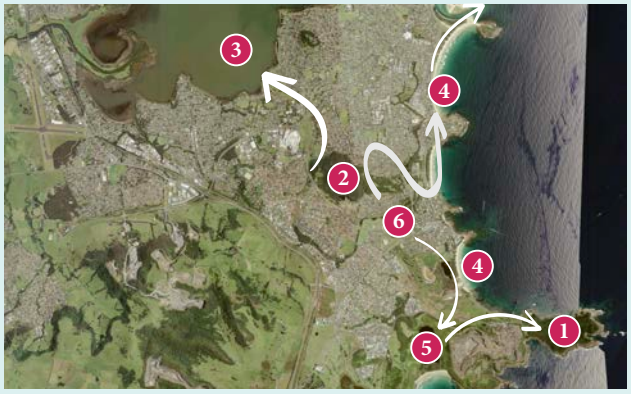
Shoalhaven LGA

- Improve links to destination parks – Voyager Park, Moonee Moonee.
- Work with Jervis Bay Territory Indigenous communities to support their funding efforts for recreation trails through their land.

OPPORTUNITY HIGHLIGHT

Connecting areas of high value, Shellharbour LGA

Council has identified a need to better link to and around their destinational public spaces to improve the community's access to the natural environment, expand the recreation trail network and create opportunities for enhanced recreation tourism. Improving the links could range from a simple upgrade to wayfinding and information signage to promote what is already there, formalising walking and bike trails, or delivering new shared paths that align with and connect to Council's proposed cycle network.

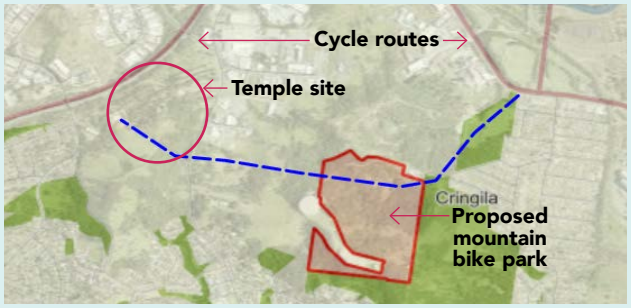


1. Bass Point Reserve
2. Blackbutt Reserve
3. Lake Illawarra
4. Shellharbour foreshores
5. Killalea State Park
6. Myimbarr Wetlands

OPPORTUNITY HIGHLIGHT

Nan Tien Temple, Wollongong LGA

The Nan Tien Temple is a major cultural destination that attracts thousands each year for festivals and general sight seeing. Council has identified an opportunity to better connect the temple with other recreational destinations and the cycle network.



Precedents

Figure 82 - Extending the main street to the river, supporting a revitalisation of the central business precinct - Maitland Riverlink, Maitland.

Figure 83 - Landform manipulation of drainage corridor to create an active open space and recreational link - Shellharbour Civic Centre, Shellharbour.

Figure 84 - Connecting two existing popular cycleways with a biodiverse active transport corridor - Proposed Inner West Greenway, Sydney.

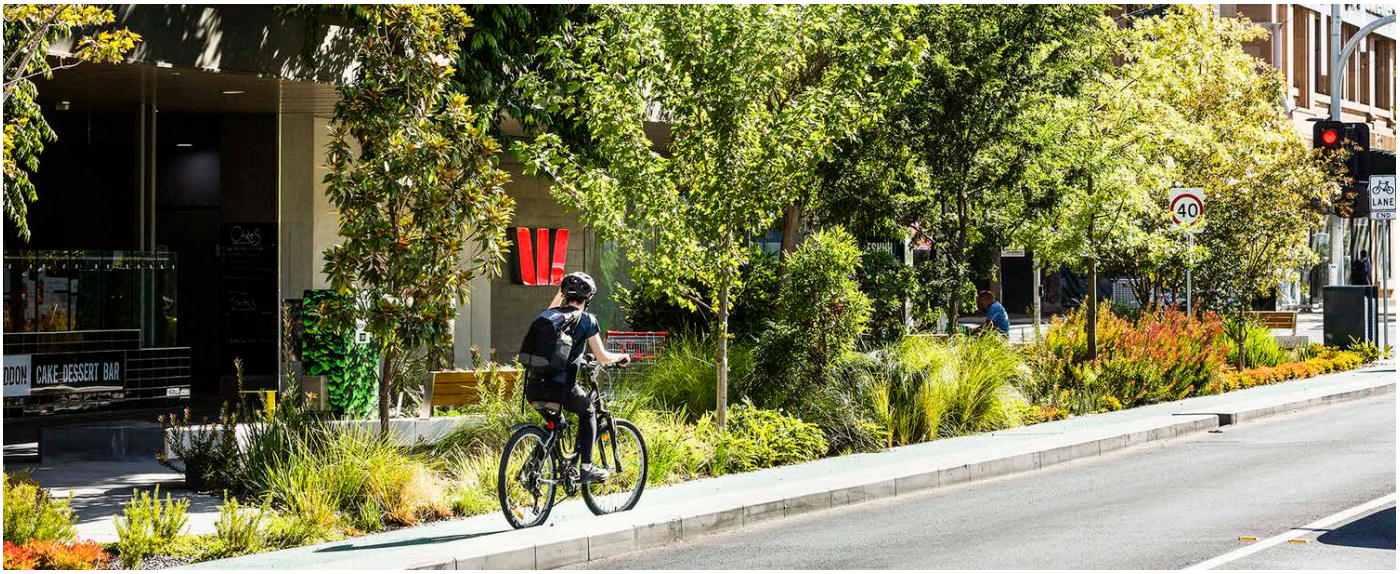


Figure 85 - Green active transport connection through urban centre, connecting two significant open spaces - Mallop Street Green Spine, Geelong.

DIRECTION # 3:

Integrate and expand the recreational grid in major projects & new release areas

As the Region plans for future growth in significant new release areas, infill development and centre revitalisations, access to high-quality public space will become increasingly important.

While some new release areas are being planned and delivered with the recreation grid and green places generally in mind, there are others that have been flagged to potentially deliver poor quality outcomes. There are opportunities for connecting to, and expanding on, the recreation grid when planning and delivering new communities and employment hubs.

In parallel with this future growth, there are a number of current and planned major infrastructure projects such as new bridges, roads and transport corridors that are being planned without the inclusion of active transport links to stations, to Centres and to suburbs. There are opportunities to improve connectivity for all modes of transport in major road and intersection upgrades, not just cars.

Some older suburbs across the Region have been identified by councils as having poorer access to recreation opportunities because newer areas are built to the current planning guidelines - priorities for these suburbs will be high quality connections into existing public open space if no new ones can be provided within land constraints.

Regional opportunities

- Ensure that planning for new communities delivers on strategic directions set by State guidelines (such as Greener Places) and that connect to and expand the recreational grid in a way that responds to the community and place character. Some of the Regionally Significant Growth Areas where this will be a priority include:
  - West Lake Illawarra, Wollongong / Shellharbour LGAs
  - Bombo Quarry (Emerging), Kiama LGA, and
  - Nowra Bomaderry, Shoalhaven LGA.
- Integrate recreational grid outcomes as part of major road and major infrastructure planning and upgrades, ensuring that active transport connections and opportunities to expand the recreational grid are not an afterthought, or excluded all together.
- Be innovative in the types of public spaces that can form part of a meaningful recreation grid such as re-imagining road buffers, balancing recreation use in riparian corridors, utilising and re-engaging with engineered drainage channels and other undeveloped land around public infrastructure.
- Create high quality new public open space as a part of urban renewal, infill and infrastructure schemes in the Region
- Ensure that planned future medium and high density communities meet the GANSW guidelines for park access (every resident in a high density areas to be within 200m walking distance of a quality local park, and in a medium density area within 400m walking distance).

Local opportunities

Wollongong LGA

- Adopt the GANSW guidelines for 200m walking access to public open space for high density communities for the northern growth corridor from Fairy Meadow to Thirroul.
- Investigate feasibility of creating a green active transport corridor between West Lake Illawarra urban release area (including West Dapto) to Kembla Grange.
- Creeks are natural connectors in Wollongong. Similar to the Sydney Green Grid, there are a number of creeks that could form part of a recreation grid - that connect national parks to coastal areas, link a via recreational assets and public open spaces along the and connect residential areas to centres. Some of these creek include: Byarong Creek, Fairy Creek, Cabbage Tree Creek, Towradgi Creek, Collins Creek, Slacky Creek, Hewitts Creek.

Shellharbour LGA

- Work with RMS on the Albion Park Rail bypass project to deliver a high quality recreational link from Albion Park rail station to McDonall Park and other destinations nearby.
- Follow through on the action identified in the LSPS - to update the Shared Use Paths Strategy.

Kiama LGA

- Prioritise recreation links in suburbs that have poor access to public open space (such as Kiama Heights).
- Follow through on the action identified in the LSPS - to deliver a Walking and Cycling Strategy, and pursue a Foreshore Access and Urban Greening Strategy.

Shoalhaven LGA

- Continue negotiations with RMS to improve the quality of public access proposed in the Nowra Bridge Project, aiming to deliver quality recreation outcomes as part of all future 'hard infrastructure' projects.
- Investigate improved connections across the Nowra Bridge between the Nowra Bomaderry urban release area on the north of the river to the Nowra CBD on the south of the river.
- Creeks in Shoalhaven that could form important parts of a recreation grid include Millards Creek and Mollymoke Farm Creek.

Precedents

Figure 89 - Retention and integration of the existing landscape into a new community, and delivery of new recreation opportunities - Fairwater Park, Blacktown.

Figure 90 - Incorporating large volumes of quality open space through a deep understanding of site - Menangle Park Masterplan, Campbelltown.

Figure 92 - A dedicated and safe active transport link, creating a direct connection into the urban centre -Mooloolaba walk and ride bridge, Mooloolaba.

Figure 91 - Incorporating dedicated pedestrian and cycleways with tree cover through streetscape upgrade projects - Bankstown Complete Streets, Canterbury Bankstown.

REGIONAL DIRECTION #4:

Increase tree canopy cover in urban areas

Increased tree canopy in urban areas can provide multiple benefits to the community including shade, improved air and water quality, increased health outcomes, reduced stress, and increased recreational opportunities.

"Urban tree canopy can be found within public parks, squares, and plazas, in street verges, rail corridors, creek embankments, campuses, and private gardens. Urban tree canopy is an important part of green infrastructure, enabling linkages to occur in a small footprint."

- GANSW, Draft Greener Places Design Guide

Tree canopy is particularly important in the Region's centres, which are significant providers of public spaces, and places for communities to meet and connect. The Government Architect NSW's draft Greener Places Design Guide (the Guide) sets a target of greater than 15% canopy cover for CBD areas, but only five centres within the Region meet this target. The centre of Figtree in Wollongong LGA has the highest average tree canopy cover of 25.5%, followed by Ulladulla (25%) and Vincentia (20%) in Shoalhaven LGA. Shellharbour City Centre has an extremely low tree canopy cover of 6.%. Some major centres such as Wollongong have low level of canopy cover, but are also the places with the highest foot traffic and locations of public space destinations.

The Guide also sets a target of greater than 25% in high density areas and greater than 40% in low density areas. The urban tree canopy cover across the Region varies vastly between the suburbs. 75% (114 of 152) of suburbs with urban areas have tree canopy cover below 40%. 10% (or 15) of these suburbs have a critically low urban tree canopy cover ranging from 0-10%, and 33% (or 50) of these suburbs have a low urban tree canopy cover ranging from 10-20%.

Regional opportunities

Greening the centres

- Prioritise increasing tree canopy cover in urban centres as these areas often have low canopy cover but high numbers of people walking and cycling on the street and using public spaces for socialising, recreation and cultural participation.
- Deliver priority green street networks in urban centres, ideally aligning with existing and proposed cycle routes. Where councils have already identified a network of green links or streets, support their delivery (e.g. Nowra Town Center Master Plan)
- Incentivise tree planting and maintenance in private properties along the recreation grid

Adopting canopy targets

- Aim to achieve the Government Architect's Greener Places tree canopy goals, or develop council specific canopy and greening targets (e.g. Wollongong Urban Greening Strategy) that respond to their unique local conditions.
- Consideration of including specifications in DCPs to facilitate increase in tree canopy including tree replacement ratios, sufficient deep soil zones, permeable soil and sustainable water sources.

Local opportunities

Wollongong LGA

Wollongong City Council already has an Urban Greening Strategy that identified the direction and opportunities for the LGA. Our analysis confirms that:

- Wollongong metropolitan centre has an average low canopy cover of 12.5%, although greening opportunities here may be challenging given the nature of a CBD urban form.
- Urban areas with some of the lowest canopy cover that could consider urban greening programs include:
  - Haywards Bay (3% canopy cover) - a recent greenfield development.
  - Horsley (9% canopy cover) and Windang (10% canopy cover) - vacant land parcels along streets and in parks that could be utilised for tree planting.

Shellharbour LGA

- Centres and urban areas with some of the lowest canopy covers that could consider urban greening programs include:
  - Shellharbour City Centre (6% canopy cover)
  - Tullimbar (3.5% canopy cover) - in progress greenfield development with fence-to-fence houses.
  - Shell Cove (6% canopy cover) - vacant land parcels along streets and in parks that could be utilised for tree planting.

Kiama LGA

- Urban areas with some of the lowest canopy covers that could benefit from greening programs include:
  - Minnamurra (9. % canopy cover), Kiama Heights (11% canopy cover) Kiama Downs (12% canopy cover) - vacant land parcels along streets and in parks that could be utilised for tree planting.

Shoalhaven LGA

- Shoalhaven had the highest canopy cover of the 4 LGAs, however there are some areas around Nowra that are increasing in density and urban surfaces that would benefit from increased tree canopy including:
  - Nowra (14% canopy cover).
  - Bomaderry & West Nowra (19% canopy cover).

Precedents

Figure 93 - Retention of significant existing trees within new development, combined with dense understorey planting- Napier Street Open Space, Sydney.

Figure 94 - The ongoing commitment to planting of street trees has enabled suburbs throughout Canberra to achieve high levels of amenity - Canberra, ACT.

Figure 95 - Conversion of a previous landfill site (0% canopy) into a thriving and biodiverse recreational parkland with extensive tree planting - Sydney Park, Sydney.

Figure 96 - Planting draws inspiration from endemic and native vegetation, combining canopy and understorey - Mallop Street Green Spine, Geelong.

Figure 97 - Combining an active transport network with tree planting and green social spaces - Sønder Boulevard, Denmark.

REGIONAL DIRECTION #5:

Create equitable and comfortable access to public spaces

"Public space is everybody's business. Whether it be public facilities such as libraries and museums, open space such as parks and playgrounds, or streets including squares, plazas and boulevards; public space provides positive socio-economic, health, cultural and environmental benefits to the community" (Committee for Sydney, Public Space Ideas Competition)

While the Region has a great range of public spaces, it is not easy for all areas and people to access. Some suburbs have hot, uncomfortable or limited active transport links; low walking catchment proximity to public space; steep topography; or higher socio-economic disadvantage. There are also spatial inequalities across the Region where communities living along the coast line have much higher quality access to public open spaces than those in the west. Improved connections to the west are also increasingly important due to large urban release areas being located there.

Access to public space can differ dependent on your age, your income level, and your ability, and there are unique differences across the Region's LGAs. The Region has a comparatively old and ageing population (particularly in Kiama and Shoalhaven LGAs), but with a high number of young people and families. Public spaces are our truly democratic places, which everyone has a right to enjoy through improved connections to that will enable all residents, including the most vulnerable and disadvantaged groups, to access them. This includes areas with high number of older people that will need to prioritise high quality footpaths, even surfaces and more regular intervals of street furniture for rest stops.

Expanding access to public spaces to a wider variety of the population can also help with the efficient use of public infrastructure - encouraging diversity of use in existing public space, but also taking the burden off road infrastructure & health infrastructure (by improving physical and mental health).

Programs such as the NSW Government's Streets as Shared Spaces Program aim to increase access to public spaces to temporarily and permanently adapt streets to support healthier, safe and resilient communities. This includes through activations, tree planting, seating, public art, play equipment and other interventions to enable diverse user groups to walk, cycle and connect in their communities. The Streets as Shared Program supports the NSW Premier's Priority to increase walkable access to quality open, green and public space in urban areas. It is also aligned with many of the Illawarra-Shoalhaven councils' strategic frameworks.

Regional opportunities

- Prioritise improved access to public space in more disadvantaged communities.
- Improve connections to public space in areas which are not able to walk or cycle to a public space.
- Improve recreational and active transport links so they are safe and accessible for everyone including not just a path, but a place with shade, amenity and beauty, with dedicated places for walking and cycling that are safe from traffic.
- Create a recreational grid that responds to the local population characteristics and needs. For example - areas with large proportions of over 65s are more likely to use high quality, low impact, scenic walking paths than a mountain bike trail.
- Promote/encourage the delivery of Complete Streets through town centres and CBDs - safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation.
- Deliver high quality comfortable and playful pedestrian links in the Regions' significant centres of:
  - Metro Wollongong (Metropolitan City)
  - Shellharbour City Centre (Regional City)
  - Nowra City Centre (Regional City), and
  - Milton-Ulladulla (Strategic centre).

Local opportunities

Wollongong LGA

- Prioritise provision of free recreational opportunities in areas that have low canopy cover, lower access to recreation opportunities and socio-economically disadvantaged areas. Priority suburbs are generally located to the south of Wollongong CBD:
  - Around Lake Illawarra (Windang, Primbee, Lake Heights, Warrawong, Berkeley, Koonawarra)
  - Around the port (Cringila, Port Kembla - Spring Hill), and
  - Areas west of the Princes Highway (Unanderra, Kembla Grange).
- Consider opportunities to better connect West Dapto to major green spaces along riparian corridor to help address their reported undersupply of open space – particularly active open space.

Shellharbour LGA

- Prioritise provision of free recreational opportunities in areas that have low canopy cover, lower access to recreation opportunities and socio-economically disadvantaged areas. Priority suburbs include: Warilla, Lake Illawarra and Barrack Heights, Albion Park and Oak Flats.

- Improve connections between old & new communities (for more equity, connectivity through the LGA, and better access to new open spaces), e.g. Shell Cove and older areas nearby; Albion Park and Tullimbar which is an older area where there is a need to ensure connectivity to newer areas of major development.

Kiama LGA

- Kiama has the highest SEIFA scores of the 4 LGAs within the Region, however, some suburbs that face some challenges to comfortably accessing public spaces are Jamberoo, Kiama Downs and Minnamurra.

Shoalhaven LGA

- Shoalhaven is a relatively disadvantaged compared to the other LGAs in the Region. Prioritise provision of access to free public spaces and recreational opportunities in socio-economically disadvantaged areas including
  - Near Nowra CBD (Nowra, Bomaderry) – which has a low SEIFA score and low canopy
  - Around St Georges Basin (St Georges Basin, Sanctuary Point, Sussex Inlet) - which has a low SEIFA score, and
  - Ulladulla – which has a low SEIFA score, low canopy and transport barriers.

Precedents

Figure 101 - High performing linear parks through urban centres - Living Streets (concept by Turf Design Studio).

Figure 99 - Equal access active transport connection with continuous tree canopy and urban amenities - Constitution Avenue, Canberra.

Figure 100 - A linear park with pedestrian priority. Activation areas include seating, play, outdoor gym, cafe breakout and gardens - Passeig De St Joan Boulevard, Barcelona.

Next steps

Both State and local levels of government play a role in the delivery of the Recreational Grid - but these efforts need to be coordinated.

At the State level, planning to deliver the Recreational Grid can happen through:

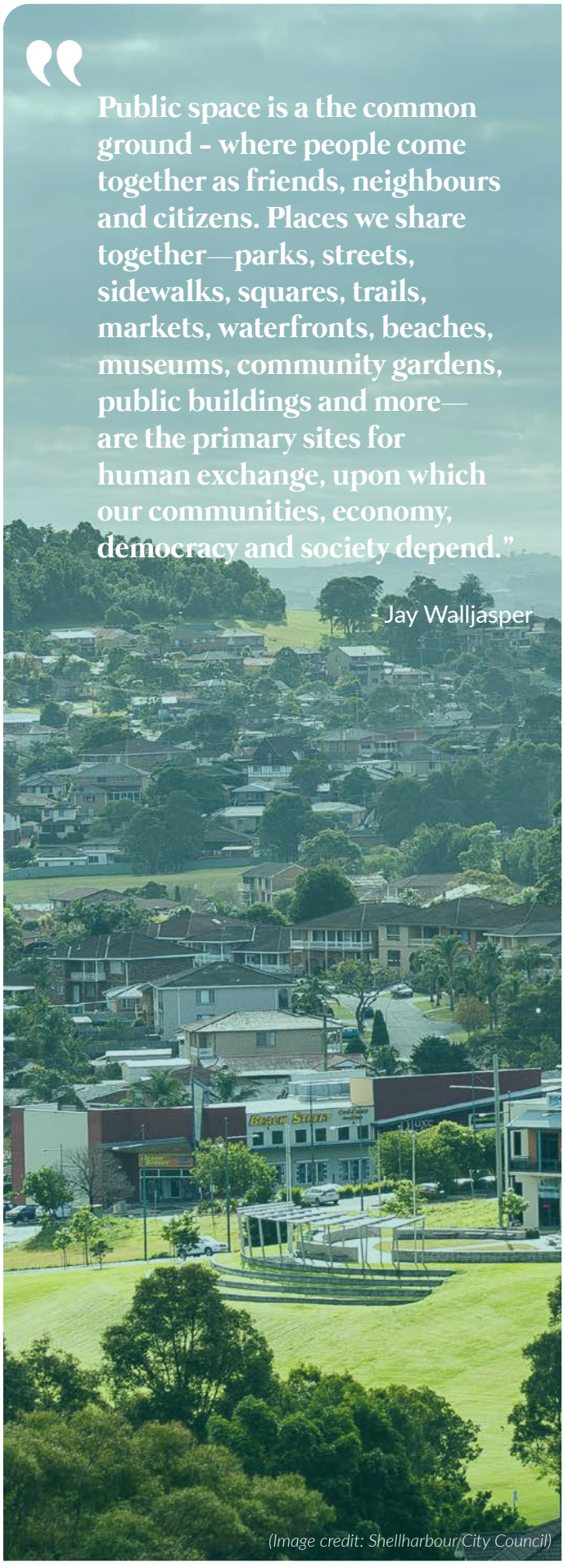
- Undertaking a detailed and collaborative process to research and deliver a Green Grid Strategy for the region (similar to the Sydney Green Grid Strategy).
- Incorporation into the new Regional Plan.
- State significant asset maintenance.
- Investment in Crown Land management and amenity.

At a local government level:

- Provide the GIS mapping layers used in this study to Councils.
- Through the Regional Plan review process, identify priority projects in partnership with councils.
- Consultation with local communities about priority public spaces that they want to access.
- Support councils to deliver or update urban greening, walking and cycling strategies if they haven't already got current plans in place.
- Assist in facilitating conversations between local councils and State government departments about local priorities in ongoing and new major infrastructure upgrades.

Limitations of this study

- Opportunities identified in this report are based on a desktop analysis and high level meetings with councils, but have not been tested for their feasibility
- The audit of public spaces was of quantity and location only - more work will be required to assess the quality of these spaces.
- Due to the vast geography of the Region, some maps are difficult to read at an A4 scale, and will rely on further work using GIS data rather than map exports.



(Image credit: Shellharbour City Council)

06

Appendix

People kayaking at Blue Mile North Beach in Wollongong NSW.(Image credit: NSW Department of Planning, Industry and Environment / Don Fuchs)

6. Appendix

6.1. Methodology – Urban tree canopy mapping

The urban tree canopy mapping was undertaken by refining LiDAR data from 2010 to 2018 into a cadastral based datasets of previous and current tree canopy cover. This dataset was assessed in conjunction with high resolution satellite imagery of the Region using a robust image classification process. It involved four major stages:

- Sourcing and preparation of Data
- Initial Canopy Density production, and
- Manual cleaning and finalising of the Data
- Data analysis

1. Sourcing Data and Preparation

This study uses Lidar data to create the canopy density model. The Australian government has a comprehensive LiDAR program and provides the data free of charge, which can be accessed through the portal - https://elevation.fsdf.org.au/. Below are the steps to download data from the website:

- Use the download tab to define the study area for the project. The portal then lists all available LiDAR point clouds within the specified study area.
- Break down large size LiDAR datasets into smaller regions and downloaded individually.
- Merge the individual .las files into a single LAS dataset using ArcMap.

2. Initial Canopy Density production

The LAS dataset was used to assess Canopy density by:

- Calculate the number of LiDAR returns hitting the ground per output raster cell
- Calculate the number of LiDAR returns hitting vegetation per output raster cell
- Sum the two to get the total number of LiDAR returns per cell
- Divide the vegetation returns per cell by the total returns per cell to get the final density
- This final raster gives the proportion of returns per cell that is reflected off of vegetation before they hit the ground.

Settings used in the analysis are:

- Raster cell size: 2.0m
- Coordinate system: MGA 56
- Tree height cut-off: 2m as the minimum.

3. Cleaning and Finalising

High resolution Google satellite imagery was used in conjunction with the LiDAR canopy density model for image classification.

- Run an image classification for the Region to identify the different land types - trees, buildings, roads, grass, water, etc.
- Isolate tree layer to verify and validate data. Manually clean to remove discrepancies and create the canopy density and height maps.

4. Data analysis

- Use the final canopy density layer to analyse tree canopy coverage by prescribed boundaries. This study focused on urban areas in the Region. Therefore, the analysis was performed only for suburbs with urban areas in them.
- Use the data analysis to generate urban tree canopy coverage maps.

Limitations

- Satellite imagery is not reflective of the on-ground vegetative scenario post the 2019 bushfires.
- Owing to the large scale of the study area, there are challenges in ensuring 100% accuracy of the data. The mapping and analysis has incorporated mitigated measures such as image classification of high resolution satellite imagery to achieve best possible results and accuracy.

An example of the mapping output is shown below in Figure 102.

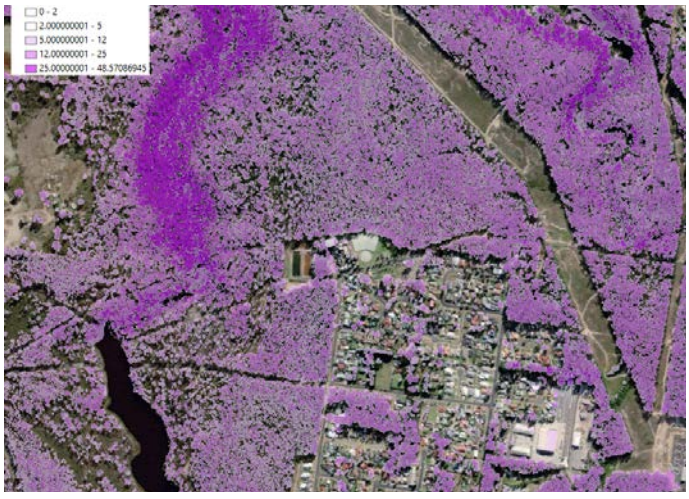


Figure 102 - Sample canopy mapping at West Nowra

6.2. Tree canopy cover in suburbs with urban areas across the Region

This data only accounts for suburbs with urban areas in them. The data shows tree canopy cover in the whole suburb and not just the urban areas within the suburb.

It has been arranged in alphabetical order for each LGA.

S.No	LGA	Suburb	Tree canopy cover %
1	Wollongong	AUSTINMER	32.27%
2	Wollongong	AVONDALE	10.64%
3	Wollongong	BALGOWNIE	28.43%
4	Wollongong	BELLAMBI	12.01%
5	Wollongong	BERKELEY	16.93%
6	Wollongong	BROWNSVILLE	13.63%
7	Wollongong	BULLI	20.79%
8	Wollongong	CLIFTON	48.25%
9	Wollongong	COALCLIFF	36.38%
10	Wollongong	COLEDALE	33.53%
11	Wollongong	CONISTON	20.14%
12	Wollongong	CORDEAUX HEIGHTS	26.61%
13	Wollongong	CORRIMAL	16.71%
14	Wollongong	CRINGILA	14.42%
15	Wollongong	DAPTO	12.84%
16	Wollongong	DOMBARTON	11.76%
17	Wollongong	EAST CORRIMAL	11.42%
18	Wollongong	FAIRY MEADOW	13.22%
19	Wollongong	FARMBOROUGH HEIGHTS	30.78%
20	Wollongong	FERNHILL	15.05%
21	Wollongong	FIGTREE	25.41%
22	Wollongong	GWYNNEVILLE	21.18%
23	Wollongong	HAYWARDS BAY	3.09%
24	Wollongong	HELENSBURGH	41.87%
25	Wollongong	HORSLEY	9.39%
26	Wollongong	HUNTLEY	10.61%
27	Wollongong	KANAHOOKA	12.05%
28	Wollongong	KEIRAVILLE	31.51%
29	Wollongong	KEMBLA GRANGE	13.82%
30	Wollongong	KOONAWARRA	11.14%
31	Wollongong	LAKE HEIGHTS	16.39%
32	Wollongong	MADDENS PLAINS	70.89%
33	Wollongong	MANGERTON	35.95%
34	Wollongong	MARSHALL MOUNT	4.76%
35	Wollongong	MOUNT KEIRA	39.09%
36	Wollongong	MOUNT OUSLEY	27.12%
37	Wollongong	MOUNT PLEASANT	50.84%
38	Wollongong	MOUNT SAINT THOMAS	25.57%
39	Wollongong	NORTH WOLLONGONG	15.91%
40	Wollongong	PORT KEMBLA	10.74%
41	Wollongong	PRIMBEE	15.60%
42	Wollongong	RUSSELL VALE	18.46%
43	Wollongong	SCARBOROUGH	37.11%
44	Wollongong	SPRING HILL	23.25%
45	Wollongong	STANWELL PARK	50.14%
46	Wollongong	STANWELL TOPS	42.96%
47	Wollongong	TARRAWANNA	18.41%
48	Wollongong	THIRROUL	24.48%
49	Wollongong	TOWRADGI	10.63%
50	Wollongong	UNANDERRA	15.55%
51	Wollongong	WARRAWONG	12.61%
52	Wollongong	WEST WOLLONGONG	24.68%
53	Wollongong	WINDANG	10.39%
54	Wollongong	WOLLONGONG	12.44%
55	Wollongong	WOMBARRA	41.05%
56	Wollongong	WONGAWILLI	8.35%
57	Wollongong	WOONONA	18.14%
58	Wollongong	YALLAH	31.51%
59	Shellharbour	ALBION PARK	12.01%
60	Shellharbour	ALBION PARK RAIL	12.92%
61	Shellharbour	BARRACK HEIGHTS	11.33%
62	Shellharbour	BARRACK POINT	9.20%
63	Shellharbour	BLACKBUTT	11.58%
64	Shellharbour	CALDERWOOD	5.70%
65	Shellharbour	CROOM	10.63%
66	Shellharbour	DUNMORE	0.78%
67	Shellharbour	FLINDERS	6.01%
68	Shellharbour	LAKE ILLAWARRA	10.52%
69	Shellharbour	MOUNT WARRIGAL	12.37%
70	Shellharbour	OAK FLATS	13.83%
71	Shellharbour	SHELL COVE	5.95%
72	Shellharbour	SHELLHARBOUR	11.34%
73	Shellharbour	SHELLHARBOUR CITY CENTRE	6.31%
74	Shellharbour	TULLIMBAR	3.62%
75	Shellharbour	WARILLA	11.46%
76	Shellharbour	YELLOW ROCK	27.50%

S.No	LGA	Suburb	Tree canopy cover %
77	Kiama	BOMBO	8.85%
78	Kiama	GERRINGONG	24.69%
79	Kiama	GERROA	22.99%
80	Kiama	JAMBEROO	32.60%
81	Kiama	KIAMA	13.73%
82	Kiama	KIAMA DOWNS	11.81%
83	Kiama	KIAMA HEIGHTS	10.90%
84	Kiama	MINNAMURRA	9.15%
85	Kiama	WERRI BEACH	27.22%
86	Shoalhaven	BANGALEE	54.83%
87	Shoalhaven	BARRENGARRY	0.02%
88	Shoalhaven	BASIN VIEW	47.96%
89	Shoalhaven	BAWLEY POINT	37.63%
90	Shoalhaven	BENDALONG	36.55%
91	Shoalhaven	BERRARA	21.49%
92	Shoalhaven	BERRINGER LAKE	41.39%
93	Shoalhaven	BERRY	36.23%
94	Shoalhaven	BEWONG	42.19%
95	Shoalhaven	BOLONG	15.07%
96	Shoalhaven	BOMADERRY	18.80%
97	Shoalhaven	BREAM BEACH	48.68%
98	Shoalhaven	BUNDEWALLAH	23.75%
99	Shoalhaven	BURRIER	48.98%
100	Shoalhaven	BURRILL LAKE	19.81%
101	Shoalhaven	CALLALA BAY	21.69%
102	Shoalhaven	CALLALA BEACH	20.30%
103	Shoalhaven	CAMBEWARRA	10.09%
104	Shoalhaven	CAMBEWARRA VILLAGE	20.64%
105	Shoalhaven	CONJOLA PARK	47.41%
106	Shoalhaven	CUDMIRRAH	26.93%
107	Shoalhaven	CULBURRA BEACH	23.58%
108	Shoalhaven	CUNJURONG POINT	44.40%
109	Shoalhaven	CURRARONG	25.84%
110	Shoalhaven	DEPOT BEACH	55.50%
111	Shoalhaven	DOLPHIN POINT	30.43%
112	Shoalhaven	DURRAS NORTH	27.67%
113	Shoalhaven	EROWAL BAY	25.84%
114	Shoalhaven	FALLS CREEK	58.20%
115	Shoalhaven	FISHERMANS PARADISE	35.60%
116	Shoalhaven	GREENWELL POINT	11.07%
117	Shoalhaven	HUSKISSON	24.59%
118	Shoalhaven	HYAMS BEACH	31.25%
119	Shoalhaven	KANGAROO VALLEY	45.68%
120	Shoalhaven	KINGS POINT	45.99%
121	Shoalhaven	KIOLOA	50.86%
122	Shoalhaven	LAKE CONJOLA	46.20%
123	Shoalhaven	LAKE TABOURIE	34.10%
124	Shoalhaven	MANYANA	54.49%
125	Shoalhaven	MEROO MEADOW	7.43%
126	Shoalhaven	MILTON	19.73%
127	Shoalhaven	MOLLYMOOK	24.26%
128	Shoalhaven	MOLLYMOOK BEACH	27.80%
129	Shoalhaven	MUNDAMIA	31.93%
130	Shoalhaven	MYOLA	38.16%
131	Shoalhaven	NARRAWALLEE	31.09%
132	Shoalhaven	NORTH NOWRA	30.18%
133	Shoalhaven	NOWRA	13.97%
134	Shoalhaven	NOWRA HILL	30.12%
135	Shoalhaven	OLD EROWAL BAY	31.36%
136	Shoalhaven	SANCTUARY POINT	18.36%
137	Shoalhaven	SHOALHAVEN HEADS	23.25%
138	Shoalhaven	SOUTH NOWRA	24.59%
139	Shoalhaven	ST GEORGES BASIN	30.55%
140	Shoalhaven	SUSSEX INLET	41.24%
141	Shoalhaven	SWANHAVEN	40.64%
142	Shoalhaven	TAPITALLEE	39.86%
143	Shoalhaven	TOMERONG	46.17%
144	Shoalhaven	ULLADULLA	25.14%
145	Shoalhaven	VINCENTIA	20.15%
146	Shoalhaven	WANDANDIAN	25.64%
147	Shoalhaven	WEST NOWRA	18.99%
148	Shoalhaven	WOOLLAMIA	68.07%
149	Shoalhaven	WORRIGEE	16.13%
150	Shoalhaven	WORROWING HEIGHTS	35.40%
151	Shoalhaven	WRIGHTS BEACH	24.78%
152	Shoalhaven	YERRIYONG	61.47%