





Acknowledgement of Country

The location of the Study Area is within country that has been described as belonging to the Bidgigal/Bediagal/Bideegal people.

The Bediagal are described as 'Woods People' who occupied land away from the sea, along rivers and creeks, and ranged between the Georges River in the south and Parramatta in the north. This identification as woods people provides indications as to the likely primary modes of subsistence and possibly their systems of belief.

The Bediagal people were served by the freshwater and riverine resources of the Salt Pan Creek, the local widely-varied woodlands botany and its faunal species.

"We Aboriginal people have walked this land for tens of thousands of years and we continue to do so today. We hold a deep connection to the land, skies and water ways. The study area is highly significant to us Aboriginal people as it is located close by to a water way, this would indicate that Aboriginal people would have utilized this water source."

Kamilaroi-Yankunjatjara Working Group, advice on the Aboriginal cultural heritage values of the study area.

Architectus acknowledges the Australian Aboriginal and Torres Strait Islander peoples of this nation. We acknowledge the traditional custodians of the lands on which our company is located and where we conduct our business. We pay our respects to ancestors and Elders, past and present. Architectus is committed to honouring Australian Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual relationships to the land, waters, and seas, and their rich contribution to society.

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Project and report	Riverwood Estate State Significant Precinct	Public Domain, Place and Urbar Design report		
Date	July 11, 2022			
Client	NSW Land and Housing Corporation			
Document no.	\\architectus.local\DFS\Projects\160344.00\ Docs\C_Client\2020 Revised SSP Master Plan\Urban Design Report\lssue			
Version and date issued	Issue A (Internal draft) - 17/03/21	Approved by: Nick, Cappetta		
	Issue B (Draft to client) - 13/04/21	Approved by: Nick, Cappetta		
	Issue C (TOA Draft to client) - 19/04/21	Approved by: Nick, Cappetta		
	Issue D (TOA Final issue) - 21/04/21	Approved by: Greg, Burgon		
	Issue E (Draft formal submission to client) - 04/04/22	Approved by: Greg, Burgon		
	Issue F (Formal submission to client) - 29/04/22	Approved by: Greg, Burgon		
	Issue G (Updates for exhibition) - 17/06/22	Approved by: Greg, Burgon		
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Executive Summary

The proposal

Riverwood Estate is a 30-hectare site, comprising around 1.100 social and private dwellings as well as land owned by Canterbury Bankstown Council. The site presents two clear opportunities. Firstly, the opportunity to increase housing supply, diversity and affordability in an area already identified by State and local government strategies and plans as a suitable location for growth and additional housing. Secondly, the opportunity to deliver better social and economic outcomes for both current and future residents. The project team have worked with NSW Land and Housing Corporation to prepare a master plan for the redevelopment of the site that will renew the existing dwellings, provide for additional private dwellings, new streets, parks and community uses.

The proposed master plan provides for approximately 3,900 new dwellings, buildings ranging between 3 and 12 storeys and approximately 5ha of open space including new local open space – Roosevelt Park. The Riverwood Renewal project will transform the existing social housing estate into a modern mixed community of social and private homes supported by new infrastructure within close proximity to transport, employment and education.

Purpose of this report

NSW Land and Housing Corporation (LAHC) has engaged Architectus Urban Design and Planning Team to prepare this Public Domain, Place and Urban Design Report to support a State Significant Precinct application for the Riverwood Estate. This report presents our findings about the site and its context, our preferred master plan for the site, and recommendations for new planning controls.

Place narrative

To build the place narrative, the team closely analysed the site, relevant plans and policies, and consulted with government agencies, Canterbury-Bankstown and Georges River Councils, existing residents and the broader community. The analysis and consultation yielded key findings which helped to identify the needs of, and inform the vision for Riverwood. The guiding principles (detailed in section 5.2 of this report) form a design strategy for how to respond to the project objectives to bring the vision to life.

Key findings

Place

- The value of community and gardens: There is an active community in Riverwood, where people generally know their neighbours and look after each other. Many people get to know each other through gardening and spending time in community gardens and front gardens.
- The **site has a rich history**, with evidence of early indigenous activity as well as a US Military Hospital during WWII.
- At its closest, the site is 300m from the town centre and station.

Connectivity

- The existing street network comprises **narrow streets and many cul-de-sacs** that don't lead to important destinations and make it difficult to find your way through the site.
- 8 Active transport links terminate at the site.
- Ganterbury Bankstown Council has recently adopted at the Salt Pan Creek Reserve Master plan in February 2019, which will see it evolve into a fantastic regional open space asset.

Green/Blue Infrastructure

- There is a **lack of local open space** within the Riverwood town centre (800m from the station).
- The site comprises many **beautiful large trees** that provide shade, amenity and habitat.
- The site is relatively flat with a gentle slope that runs from east to west, with a high point along Belmore Road and the low point at Salt Pan Creek Reserve.

Land Use

- There is a need for an appropriate interface to lower scale residential housing.
- The existing social housing buildings have an average age of around 50 years constructed mostly in the 1960's and 1970's and require renewal. The current social housing does not service the demands of the LGA.
- 6 While 16.7 hectares of the Riverwood Estate is used for social housing, there are **many lots in private ownership**.

Vision

Our vision is to deliver a new neighbourhood in Riverwood that contributes to the growth of Greater Sydney as a more liveable, productive and sustainable metropolis and provides a greater supply of diverse and affordable housing in an area identified for renewal.

The Riverwood Estate will be transformed into an attractive and safe neighbourhood with a mixture of private and social housing. People will choose to live here because of the high-quality buildings, facilities and open space, and connections to nearby transport, schools, employment opportunities and services.

New housing, transport and social infrastructure will support a growing and more diverse community with different housing needs. The development will be accessible and welcoming, complementing the site's natural setting with new and upgraded parks positioned amongst mature trees and improved connections to Salt Pan Creek, a central part of Metropolitan Sydney's Blue-Green Grid.

It will be a place that celebrates the site's history and provide opportunities to re-establish Connection to Country. There will be a network of new and reinstated tree-lined pedestrian-friendly streets that connect shared facilities and open spaces to encourage residents to engage with each other and the broader Riverwood community. Buildings and dwellings will be designed to activate streets and provide natural surveillance of the public domain.

The development will be a sustainable built environment. Contemporary sustainability features will be integrated into buildings and the public domain, including commitments to a tree canopy target and management of water in the landscape to mitigate against the effects of climate change and urban heat.

Guiding principles



Create active, living streets – places for all ages to interact



Protect and enhance the memory of the site



Create neighbourhoods with distinct character



Create a legible permeable neighbourhood that is a joy to walk through



Maximises opportunities to access amenity along the Salt Pan Creek Green grid



Provide a hierarchy of gardens, parks and outdoor spaces



Prioritise retention of significant trees across the site



Maximise views and skyview



Implement a height strategy that responds to its context



Optimising the sites potential through the provision of market housing and the renewal of the existing social dwellings



Provide a high level of residential amenity

Master plan at a glance					
	Existing	Proposed			
Open space	2.9 hectares (9.5%)	4.8 hectares (16%)			
Streets	7.5 hectares (25%)	8 hectares (26%)			
Total public domain (open space + streets)	10.4 hectares (34.5%)	12.8 hectares (42%)			
Tree canopy	26%	30%			
Building footprint	50,020 sqm (16%)	85,020 sqm (27%)			





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1 Introduction

1.1 Introduction

Purpose of the report

NSW Land and Housing Corporation (LAHC) has engaged Architectus to prepare this Urban Design Report to support a State Significant Precinct application for the Study Area. This report presents our findings about the site and its context, our preferred master plan, and recommendations for new planning controls.

The proposal

The Study Area is a 30-hectare site, comprising around 1.100 social and private dwellings as well as land owned by Canterbury Bankstown Council. The site presents two clear opportunities. Firstly, the opportunity to increase housing supply, diversity and affordability in an area already identified by State and local government strategies and plans as a suitable location for growth and additional housing. Secondly, the opportunity to deliver better social and economic outcomes for both current and future residents. The project team have worked with LAHC to prepare a master plan for the redevelopment of the site that will renew the existing dwellings, provide for additional private dwellings, new streets, parks and community uses.

The proposed master plan provides for approximately 3,900 new dwellings, buildings ranging between 3 and 12 storeys and approximately 5ha of open space including new local open space – Roosevelt Park.

The Riverwood Renewal project will transform the existing social housing estate into a modern mixed community of social and private homes supported by new infrastructure within close proximity to transport, employment and education.

The team

This master plan has been prepared by the following team:

- Project management Architectus
- Urban design and architecture Architectus
- Planning Architectus
- Landscape architecture JMD Design
- Social impact, consultation and Health impact –
 CRED Consulting
- Water, Environmental sustainability, Infrastructure and climate change – Mott Macdonald
- Demographic and Retail demand SGS Economics and Planning
- European and indigenous heritage Artefact

- Ecological impact Eco Logical
- Contamination, Geotechnical and Air QualityAECOM
- Economic feasibility LAHC
- Transport and traffic TTPP
- Green Infrastructure Clouston Associates
- Stakeholder engagement Urbis
- Noise and vibration Acoustic logic

The proposed planning controls

This master plan, developed through regular Project review Panels (PRP) with stakeholders including but not limited to the Greater Sydney Commission and Council, supports an application to amend the following key controls in the Canterbury LEP 2012, amongst others:

- Retain R4 High Density Zone, rezone R3 Medium Density to R4 High Density, rezone open space to RE1 and rezone part of the site to B2 Mixed Uses.
- New height controls, ranging from 13m to 41m
- New FSR controls, ranging from 0.9:1 to 2.5:1
- Removal of the Min. Lot Size control and default to

new CBLEP controls.

- New Active Frontage control along Belmore Road
- New Additional Permitted Use (APU) to Enable Residential Flat Buildings Within the B2 Zone
- New APU to Enable a Neighbourhood Supermarket Within the R4 Zone
- New APU to Enable a Neighbourhood Shops,
 Cafes and Restaurants up to 250m² GFA

A site specific Development Control Plan (DCP) has also been prepared and provided with this application, which allows for flexible, yet detailed design and development controls relating to built form, land use and public domain outcomes.

It is noted that the Canterbury LEP 2012, in conjunction with the Bankstown LEP 2015, are currently under review as part of Council's Draft Consolidated Canterbury-Bankstown Local Environmental Plan 2020 (Draft CBLEP).



The Study Area is only 300m (at its closest) to the Riverwood Station and the Belmore Road shops



The site represents an opportunity to renew existing social housing with new, modern housing over the next 20 years



The existing community gardens in Washington Park are extremely well-loved and are an important part of the local community networks.



The 30 hectare Study Area adjoins Salt Pan Creek Reserve, which currently benefits from a master planned by Canterbury-Bankstown Council and will be a major recreational asset in the future.

1.2 Study requirements

Study requirements

Study Requirements for the project were issued by DPE on 17 December 2020.

These Study Requirements have been fundamental in developing the master plan, forming both the brief and assessment parameters for the project team.

Item 2 of the Study Requirements relates to public domain, place and urban design. Below provides a summary.

Overview of Study Requirement 2

Item	Study Requirement	Refer Section
2.1	Prepare an Urban Design Framework for the precinct that considers/addresses:	
	Vision and objectives	5.1
	Public open space framework (hierarchy and connectivity, etc)	6.3
	 Movement networks and hierarchy (including internal and external road network) having regard to the movement and place framework 	6.4
	Built form envelopes	6.6
	Relationship of built form to open space	6.3, 6.5 & 6.4
	Land use mix and distribution	6.7
	 Integration with surrounding context including heritage 	6.6
	Public space amenity impact controls	7.1
	Design quality provisions	6.14
	 Findings of a solar access analysis both within the precinct, addressing open space and dwellings, and on adjoining land, including Winter Solstice and Equinox. This analysis should identify minimum solar access controls for open space. 	7.1 & 7.6
	 Given the proximity of the M5 Motorway and nearby industrial land uses, outline the acoustic and air quality impacts of the proposal and the mitigations measures to ensure a high standard of amenity for future residents. The State Environmental Planning Policy (Infrastructure) 2007 and the Development Near Rail Corridors and Busy Roads – Interim Guideline must be addressed. These assessments should also consider other current and future local air and noise issues in the area, including potential cumulative impacts from other activities; 	6.6
	 Findings of a view corridor and visual assessment, including but not limited to an analysis of any visual impacts on surrounding areas and mitigation measures; 	7.7

ltem	Study Requirement	Refer Section
	 Wind comfort, including development of wind comfort criteria for the entire precinct and all adjacent areas affected by the proposed development. At a minimum desktop analysis is required to understand wind characteristics of the precinct and proposed design response and inform criteria to ensure wind comfort. 	7.5
	 Findings of a benchmarking assessment of the proposed development against relevant best practice projects (noting that the benchmarking should be against positive attributes of comparison projects, quantifying positive attributes of comparators that the precinct will meet or exceed); and 	4
	 Outline draft LEP controls with a block by block approach to permissible height and FSR (including residential and non-residential) with all schedules/calculations provided for each individual block. 	6.9 -6.12 & 8.1
2.2	Prepare a Public Domain Strategy that guides future planning and approval processes and seeks to achieve high quality public domain outcomes including:	6.3 & Landscape Report
	A vision statement and a series of goals to achieve the vision.	6.3 & Landscape Report
	 Public open space accessibility analysis and response (particularly for residents East of Belmore Road). 	6.3 & Landscape Report
	Understanding of recreation needs.	6.3, Social infrastructure report & Landscape report
	Public open space provision and identification of type that is needed.	6.3, Social infrastructure report & Landscape report
	Public open space structure	6.3 & Landscape Report
	 Identifying current public space, what will be upgraded and what new public space will be delivered, including links to Salt Pan Reserve (addressing Premier's Priority 11 and Public Space Charter). This should also include identifying opportunities to improve access to Salt Pan Creek from the Riverwood local centre. 	6.3, 6.4, 6.5 and 6.6 & Landscape Report
	Detailed site and context response, noting how the precinct public domain is integrated with its wider context.	6.3 & Landscape Report - Proposed Urban Structure

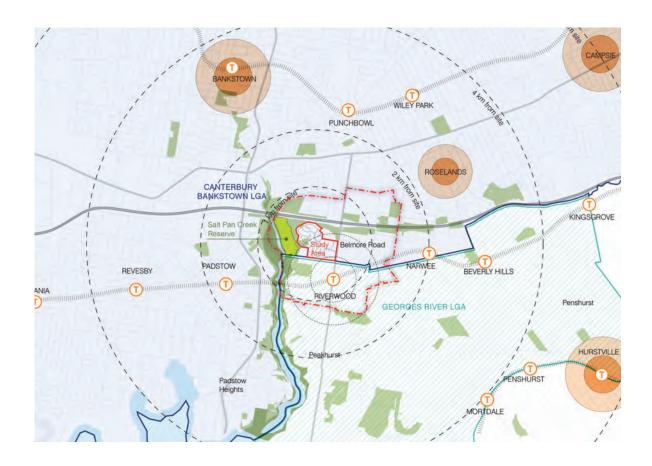
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Item	Study Requirement	Refer Section	Item	Study Requirement	Refer Section			
	 A movement plan setting out the proposed movement corridors and connectivity network throughout the precinct, the types of movements to be captured through the precinct (i.e. walking, cycling, vehicles, employees etc), including Riverwood Station, major bus stops and key destinations such as centres and recreation areas. The plan should emphasise creating strong pedestrian corridors linking outside the precinct. 	6.4 & Landscape Report - Proposed Urban Structure	Consideration	 consideration of: Designing with Country, to guide how the design and operation of the precinct are informed by an understanding and acknowledgement of the Aboriginal cultural connections to the Country within which the precinct lies; Surrounding context of the precinct, particularly the precinct's 		Designing with Country, to guide how the design and operation of the recinct are informed by an understanding and acknowledgement of the boriginal cultural connections to the Country within which the precinct 2 & 3 es; Surrounding context of the precinct, particularly the precinct's	 consideration of: Designing with Country, to guide how the design and operation of the precinct are informed by an understanding and acknowledgement of the Aboriginal cultural connections to the Country within which the precinct lies; Surrounding context of the precinct, particularly the precinct's 	2 & 3
	• A high A landscape master plan for the precinct locating public space (open space, plazas, squares) that have been derived from site analysis, benchmarking assessment, the land uses (residential and non-residential activities) and urban design principles (having regard to Better Placed, Greener Places and Public Space Charter). The master plan is to include (but not limited to) public space connections, deep soils zones, urban canopy targets and outcomes, and, Water Sensitive Urban Design principles. The landscape master plan should identify any improvements to the surrounding area which are critical to realising the public domain vision statement.	6.3 & Landscape Report - Proposed Urban Structure		relationship to its immediate context, setting, streetscape and the social significance of the precinct; • Opportunities for new and upgraded public space and actions that outline the delivery process and funding arrangements to deliver the projects; • Breaking down types of public space into the three types used by the Department's Public Spaces Division which include: • Public open spaces: active and passive (including parks, gardens, playgrounds, public beaches, riverbanks and waterfronts, outdoor playing fields and courts, and publicly accessible bushland).				
	 A tree canopy cover analysis to ensure comfort and usability of public space, having regard to canopy tree cover. 	7.3	_	proposed locations of public spaces in relation to matters including but not limited to, maximising connections to the broader network of new and existing public spaces and topography; • Suitability of the size, location, flexibility and extent of use of public	6.3			
	 A high-level safety and security analysis that outlines how potential future crime and safety risks in relation to the development will be addressed. The proposed development should have regard to CPTED guidelines and integrate closely with other studies. 	7.4			4 & 6.3			
	 Typical sections of street and future pathways in the precinct to demonstrate quality and best practice design principles are being meet. 	6.2, 6.3 & 6.5	-		7.3			
	Design response to interfaces of the precinct including setback, landscape treatments, wide verges, height transitions and servicing requirements. This response should demonstrate consideration for future planning of adjoining sites.	6.6	-	spaces for the number and types of users and relationship to existing public spaces and parks; • Provision of continuous tree canopy over major pedestrian routes/ desire lines with additional areas of canopy cover over the remaining public places to enable shade; and	7.2			
2.3	Prepare an Indicative Staging Strategy that identifies how staging may occur; includes detail of how the delivery of public domain will be considered and coordinated across individual development sites including construction staging. The staging strategy should include measures to the minimisation impacts for existing residents/tenants and how new works will be protected during construction of later stages.	8.3		 Retention of existing trees and provision of new trees, the capacity of the proposal to allow for the growth of new trees; the provision of sufficient soil volumes and quality to provide for long term tree health; Canopy design concepts that improve streetscape amenity; and how the plan can address the key strategies such as GSC Green Canopy targets and the Premier's priority for greening our city. 				
2.4	Provide 3D CAD models and photomontages of the proposal from eye level positions in the public domain.		Consultation	The studies are to demonstrate consultation with: • Canterbury Bankstown City Council and Georges River Council;	3.18			
2.5	State Design Review Panel Undertake an independent design review process led by the GANSW to advise on design work in progress. Design review sessions are to commence as soon as possible after the issue of these Study Requirements.		_	 DPIE's Place Design and Public Spaces Division; The Greater Sydney Commission; and Government Architect NSW, particularly design matters, any regarding any published or upcoming guidance materials and including the forthcoming Connecting with Country (Government Architect NSW). 				
	Prepare a Design Review Report to include all design advice letters and a record outlining how the issues raised by the panel have been addressed.	9						

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Attachment M

1.3 Project scope



Local context

The Riverwood suburb is located within the Canterbury-Bankstown and George's River Local Government Areas (LGAs). Riverwood is strategically located 18km from Sydney, and centrally located between the district centres of Bankstown and Hurstville.

Riverwood is well supported by public transport being located on the T8 Airport, Inner West and South Line, and with access to bus services along Belmore Road, providing connections to key centres, such as Bankstown and Hurstville. The area also has excellent road access provided by the M5 motorway, Belmore Road and King Georges Road.

Salt Pan Creek Reserve, to the west of Riverwood Estate, is a significant green corridor containing important ecological communities, mangroves, wetlands, recreational facilities and walking and cycling trails on both sides of the creek.

The main retail shopping strip runs along Belmore Road, to the north and south of Riverwood Station, providing the primary local retail centre for the area.



The Study Area

The Riverwood Estate State Significant Precinct (the Study Area) is located within the Canterbury-Bankstown LGA. The Study Area contains large areas of government-owned land and is of state importance in achieving key government policy objectives, particularly renewing social housing and increasing housing supply.

The Study Area is a 30ha site, bound by Belmore Road to the east, the M5 Motorway to the north, Salt Pan Creek Reserve to the west, and Killara Avenue to the south. The majority of the Study Area is owned by LAHC, with landholdings comprising 16.7 hectares. Located close to Riverwood train station, with the majority of the Study Area within a 5- 15 minute walking distance of the station.

The Study Area includes 1,019 existing social housing dwellings, including 1,017 owned by LAHC and two assets owned by the Aboriginal Housing Office (AHO). The Study Area also includes approximately 60 privately owned properties.

1.4 Background



Draft Master Plan 2017



The first stage of redevelopment, Washington Park begun in 2013 and was completed in 2017. It delivered social housing mixed with private housing in a model that has created a better place for all residents.

The project demonstrates what can be achieved through redeveloping concentrated social housing estates into a diverse community offering inspiration and opportunity.

The Minister for Planning and Public Spaces has declared the remaining 30 hectares of Riverwood Estate as a State Significant Precinct, paving the way for the state-led master planning of the site and building upon the significant work undertaken to date. Typically, State Significant Precincts are large Government-owned sites of state or regional importance that play a particularly important role in increasing the supply of housing in key locations, and improving housing choice and affordability.



Draft Master Plan 2017

A Draft master plan was initially presented in 2017. This master plan delivered 6.000 dwellings with heights ranging from 6-22 storeys and densities from 2:1 up to 4.5:1.

Stakeholder, including Greater Sydney Commission and Council, as well as community feedback, for the Study Area, was provided on this master plan and included:

- Lower scale options for the Precinct height of proposed towers and built form
- Mix/choice of dwellings to include 1, 2 and 3
- Revise transition between land uses within the Precinct to adjoining properties
- Revise staging plan to ensure retail and commercial is delivered once there is enough population to support it
- Achieve 40% tree canopy and sufficient open space to meet the needs of the community
- Traffic modelling to understand the likely impacts of the proposed development
- Identify all infrastructure required both within and outside of the Precinct and the funding and delivery mechanism proposed



Revised Master Plan 2020

A revision of the 2017 master plan based on community and stakeholder feedback was presented in December 2020 to the State Design Review Panel (SDRP)

What had changed?

- Reduced density:
- Tower heights reduced from 15-22 storeys to 12
- Tower number reduced from 10 to 3
- Southern interface reduced from 6 to a 3 storey terrace typology
- Typical street wall in Roosevelt precinct reduced from 8 to 6 storeys
- Apartments interfacing with Salt Pan Creek Reserve reduced from 6 to 4 storeys to sit below
- Garden apartments reduced from 5-7 storeys to 3-5 storeys



Revised Master Plan 2020

- Increased housing diversity with the introduction of terrace housing along the southern interface and low rise apartment typologies
- Revised zoning plan to respond to the surrounding context
- Tree canopy target increased to 30% which is higher than the existing tree canopy on site and higher than the target 25% canopy for mediumdensity development, as contained within the GANSW Draft Greener Places Design Guide

Urban structure changes:

- Civic plaza open space revised location to increase solar access (north facing) and provide an improved layout
- Washington Avenue revised to create a stronger east west connection to Salt Pan Creek Reserve
- Addition of rear lane access to terraces where possible

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Revised Master Plan following SDRP 2022



Further to presenting to the SDRP in February and May 2021, LAHC received further support and recommendations for the Master Plan. The positive aspects of the proposal that were supported by the SDRP and should be maintained include:

- Revised street layout
- Retention of existing vegetation
- The level of density
- The commitment to upgrading local infrastructure and utilities
- The proposed design targets
- The initiative and commitment of the team to developing a Connecting with Country framework
- The water sensitive urban design approach,
- The approach to basement carpark footprints and location of vehicular and service entries
- The project's support of the implementation of the adopted master plan for the Salt Pan Creek Reserve

The recommendations were in regards to the following areas:

- Connection to Country
- Urban structure
- Interfaces
- Public space and tree canopy
- Built form
- Housing mix
- Social infrastructure
- Tree canopy
- Non-residential uses
- Zoning, and
- Implementation



Revised Master Plan following SDRP 2021



SDRP recommendations plan

Following these recommendations the master plan was revised to include the following changes:

- Revised zoning from B4 Mixed Use to B2 Local
- Revised land use and envelope of block 33 to fit within existing character and desired future character of the centre
- Revised road reserve on local streets within the Roosevelt Precinct from 15.7m to 18m with a carriageway width of 6.5m to accommodate servicing
- Revised road reserve on local streets within the Garden Apartment Precinct from 15.7m to 16.7m with a carriageway width of 6.5m to accommodate servicing
- The inclusion of a north/south through site link connecting Kentucky Road Reserve with Karne Street Reserve
- The inclusion of additional planted mediums/ rain gardens within local streets to aid in water storage and reuse across the site

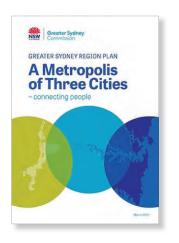
- Increased setback to Belmore Road by 3m to mitigate perception of density and provide spill out space for potential outdoor dining areas and additional tree planting
- Following a High value tree (HRT) report, revised envelopes to mitigate potential impacts to high • value existing trees
- [____Revised basement footprints and entrance locations to ensure urban amenity, mitigate impacts to existing trees and provide opportunities for private deep soil — within the site to connect with the public domain as a continuous soil network which also connects beyond the site.
- Introduced additional opportunities for retail uses across the site, in strategic locations, to further embed walkability, sustainability, flexibility and vibrancy
- Identified opportunities to connect with Country following further consultation, including walking on Country, with First Nation's knowledge holders who reside in or have connections with the lands.

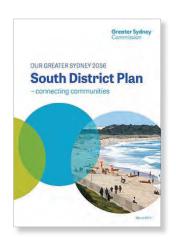


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2 Strategic context

2.1 State planning strategies





Greater Sydney Region Plan

The 2018 Greater Sydney Region Plan, A Metropolis of Three Cities (the Region Plan) sets out the NSW Government's 40 year vision and establishes a 20 year plan to manage growth and change in Greater Sydney. The Region Plan was prepared concurrently with the Government's Future Transport Strategy 2056 and Infrastructure NSW's State Infrastructure Strategy 2018–2038 to integrate land use, transport and infrastructure across Sydney.

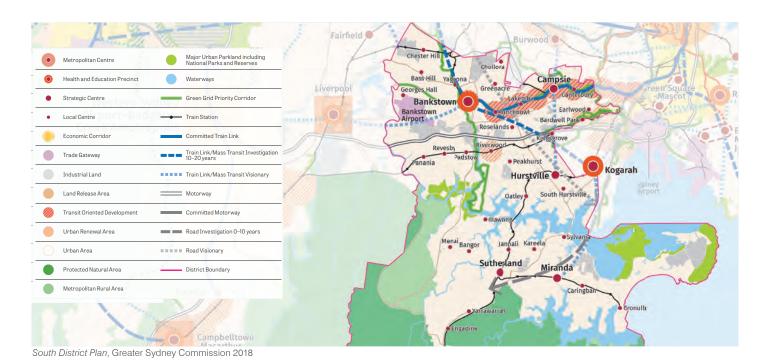
The Region Plan re-imagines Greater Sydney as three cities (the Western Parkland City, the Central River City, and the Eastern Harbour City) rather than a metropolis sprawling from a single CBD. The vision of the Region Plan is that social and economic opportunities will be more fairly distributed across the three cities and that most people will live within 30 minutes of jobs and services. The Region Plan also sets the direction for the strategic planning for the 725,000 additional dwellings that Sydney will need by 2036. The Region Plan identifies the area around Riverwood station as a preferred location for future housing supply.

Our Greater Sydney 2056: South District Plan

The five District Plans are a guide for implementing A Metropolis of Three Cities at a district level. The District Plans inform the preparation of Local Strategic Planning Statements (LSPS) and LEPs and help councils plan for growth and change.

The site is located in the South District of Greater Sydney which includes the LGAs of Canterbury-Bankstown, Georges River and Sutherland. The South District Plan identifies the area around Riverwood station as a planned precinct and local centre and recognises the importance of the site as a renewal major planning proposal in this context.

The South District Plan notes that 83,500 additional dwellings are anticipated to be required in the district (12% of Greater Sydney's total of 725,000 dwellings) to respond to projected population growth between 2016 and 2036. The South District Plan states that the focus of growth to accommodate these dwellings should be in well-connected, walkable places that build on local strengths and deliver quality public places.



The site, being large and predominantly in single

ownership, is uniquely placed to contribute to the South District housing target and be a catalyst for the further renewal of the Riverwood centre. The South District Plan identifies that as the district's overall population grows, it is also expected to age. By 2036, the number of residents over 65 is expected to grow by 61% and the number of single-person households is expected to rise by 46%. In response to these changing demographics, the South District Plan identifies that more apartments in well-serviced locations will be needed to accommodate the needs

Key takeaways relevant to the Site include:

and preferences of the community.

Riverwood, part of a broader planned precinct - not just a local centre

- Riverwood is identified as a Planned Precinct in the South District Plan which provides a focus for future growth and renewal.
- Riverwood will play an increasingly important role, as a distinct centre, with great connections to regionally significant open space and public transport, along the Airport/East Hills rail corridor.
- The renewal of Riverwood Estate presents an opportunity to deliver market and social housing in a high-density, mixed-use community with excellent connections to major employment and retail centres such as Bankstown, Campsie and Hurstville.

Supporting the vision for a 30-minute city

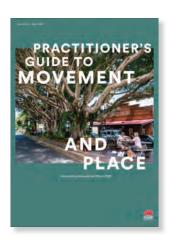
- Enhancing access to a broad range of jobs and services within a 30-minute city is a key part of the Greater Sydney Commission's vision for Sydney.
- Riverwood being strategically located within 30 minutes of existing employment, health, education and recreational facilities, in Bankstown, Campsie and Hurstville, Sydney Airport and the City, can build on this vision, delivering increased housing within easy access of jobs and services.
- Renewal in other centres is demonstrating that there is demand for high density development in middle and outer ring centres, a trend that supports the NSW Government's vision for a 30-minute city.

Promoting the Salt Pan Creek Green Grid Corridor

- The location of Riverwood Estate at the doorstep of the Salt Pan Creek Priority Green Grid Corridor, is a once in a generation opportunity to deliver a new integrated community, adjacent to a regionally significant Green Grid Corridor.
- The renewal of the Study Area presents an exciting opportunity to contribute to new and improved connections between Riverwood and Bankstown, encouraging more walking and cycling trips along the Corridor.
- Salt Pan Creek Reserve has a role in linking broader public open spaces and providing new and improved cycling and walking paths that will not only promote recreational trips, but also has the potential to provide a direct link between Riverwood and major employment, retail and civic services in Bankstown.

State planning strategies







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Premiers Priorities

NSW State Priorities are fourteen priorities unveiled by the NSW Premier, in a commitment to making a significant difference to enhance the quality of life.

- 1. Bumping up education result for children
- 2. Increasing the number of Aboriginal young people reaching their learning potential
- 3. Protecting our most vulnerable children
- 4. Increasing permanency for children in out-of-home care
- 5. Reducing domestic violence reoffending
- 6. Reducing recidivism in the prison population
- 7. Reducing homelessness;
- 8. Improving service levels in hospitals
- 9. Improving outpatient and community care
- 10. Towards zero suicides
- 11. Greener public spaces
- 12. Greening our city
- 13. Government made easy; and
- 14. World class public service.

It will be important to embed the Premiers Priorities, in particularly Priorities 11 and 12 into the design of Riverwood Estate which seek to:

- Increase the proportion of homes in urban areas within 10 minutes' walk of quality green, open and public space by 10 per cent by 2023 (Priority 11 Greener public spaces)
- Increase the tree canopy and green cover across Greater Sydney by planting one million trees by 2022 (Priority 12: Greening our city).

NSW Movement and Place Framework

The Movement and Place Framework is a crossgovernment framework for planning and managing roads and streets across NSW. The framework delivers on NSW policy and strategy directions to create successful streets and roads by balancing the movement of people and goods with the amenity and quality of places.

The renewal of Riverwood Estate presents a significant opportunity to provide an improved street network, that will enhance connectivity to surrounding open space, public transport and nearby centres. The master plan will be supported by a place-based Transport Strategy that applies the Movement and Place Framework to Riverwood Estate.

Future Transport Strategy 2056

The Future Transport Strategy sets out a 40 year vision, direction and outcomes framework for customer mobility in NSW and will guide transport investment over the longer term.

Riverwood Estate is well located to achieve better transport outcomes by focusing on movement of people through and within the site to create a neighbourhood that is connected by public transport, walkable, sustainable and attractive to residents, visitors and businesses.

NSW Public Spaces Charter

The Draft NSW Public Spaces Charter has been developed to support the planning, design, management and activation of public spaces in NSW. It identifies ten principles for quality public space, including:

- 1. Open and welcoming;
- 2. Community focused;
- 3. Culture and creativity;
- 4. Local character and identity:
- 5. Green and Resilient;
- 6. Healthy and active;
- 7. Local business and economies:
- 8. Safe and secure;
- 9. Designed for people; and
- 10. Well managed.

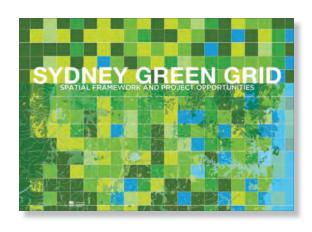
The public domain, landscape and open space strategy for Riverwood Estate will play a fundamental role in the master plan, to deliver on the above principles and create a place of belonging for residents and visitors alike.

State planning strategies









Walking Space Guide - Towards Pedestrian Comfort and Safety, TfNSW July 2020

The Walking Space Guide provides a set of standards and tools to assist those responsible for Walking Spaces on streets, to ensure that sufficient space is provided to achieve comfortable environments which encourage people to walk.

The Riverwood Estate has the opportunity to improve pedestrian connectivity and permeability throughout the site, through a new street network that is sustainable, connected and comfortable.

Green Cover Technical Guidelines (NSW Government)

The Technical Guidelines were endorsed by the NSW Office of Environment and Heritage (OEH) in 2015 and describes how increasing urban green cover can provide effective and low-cost resilience to heat impacts while improving community amenity and providing multiple benefits.

The Guidelines include information for planning and implementing green cover, in consultation with urban design and engineering professionals, utilities and relevant stakeholders.

It will be important to embed the objectives of the Green Cover Technical Guidelines into the design of the Riverwood Estate master plan to reduce overall urban heat impacts, prioritise tree retention and increase tree plantings including overall urban tree canopy coverage.

NSW Government Architect Better Placed Policy

Better Placed is an integrated design policy for the built environment of NSW. It seeks to capture our collective aspiration and expectations for the places where we work, live and play.

The proposal aligns with the objectives for good design, including;

- Better fit: contextual, local and of its place
- Better performance: sustainable, adaptable, durable
- Better for community: inclusive, connected and diverse
- Better for people: safe, comfortable and liveable
- Better working: functional, efficient and fit for purpose
- Better value: creating and adding value
- Better look and feel: engaging, inviting and attractive

It will be important to consider the above 7 principles of Better Placed to achieve design quality in Riverwood Estate. Further consultation with NSW Government Architect Office will also inform the design and development of the master plan.

Sydney Green Grid: Spatial Framework and Project Opportunities

The Sydney Green Grid: Spatial Framework and Project Opportunities provides an extensive network of existing and potential future green spaces and connections between and across town centres, public transport hubs and major residential areas.

The Framework provides a detailed breakdown of each district across greater Sydney (as identified in the Greater Sydney Region Plan), with the Riverwood Estate being located within the South District.

Riverwood is located strategically at the intersection of two corridors identified within the Green Grid, being Salt Pan Creek Reserve, adjoining the site to the west and the M5 motorway corridor, adjoining the site to the north. Together, these intersecting green corridors provide valuable opportunities to provide green infrastructure links between and into the Riverwood Estate, whilst supporting broader public domain works to assist in achieving the objectives of the Green Grid.

Renewal of Riverwood Estate presents significant opportunity to align with the Sydney Green Grid Framework by providing an appropriate interface and improved connectivity to Salt Pan Creek Reserve and beyond.

State planning strategies





NSW Government Architect Greener Places Framework and Draft Greener Place Design Guide

The Greener Places Framework provides information on how to design, plan and implement green infrastructure in urban areas throughout NSW.

The Draft Greener Place Design Guide provides strategies, performance criteria and recommendations to assist planning authorities, and design and development communities to deliver green infrastructure. The Greener Places Design Guide has three main objectives:

- Open space for Recreation: green infrastructure for people,
- Urban tree canopy; green infrastructure for adaptation and resilience and
- Bushland and waterways: green infrastructure for habitat and ecological health.

The Greener Places Framework and Draft Greener Place Design Guide will be an important consideration to guide the design and delivery of green infrastructure throughout Riverwood Estate. Further consultation with NSW Government Architects will continue to ensure that the project will deliver and provide the required green infrastructure for Riverwood Estate and the greater community.

NSW Government Architect Evaluating Good Design and Implementing Good Design

The Evaluating Good Design and Implementing Good Design seeks to promote good design and the amenity of the built environment.

In Evaluating Good Design, seven objectives have been introduced to define the key considerations in the design of the built environment including:

- 1. Better fit:
- 2. Better performance;
- 3. Better for community;
- 4. Better for people;
- 5. Better working;
- 6. Better value; and
- 7. Better look and feel.

It will be important to consider the above 7 principles of Better Placed to achieve design quality in Riverwood Estate. Further consultation with NSW Government Architect Office and ongoing engagement through the State Design Review Panel process will also inform the design and development of the master plan.



NSW Government Architect Connecting with Country Draft Framework and Designing with Country Discussion Paper

The Connecting with Country Draft Framework provides a framework to ensure connections with Country inform the planning, design, and delivery of built environment projects in NSW, through advocating ways that people can respond to, and better support, Aboriginal culture and heritage in the built environment.

NSW LAHC has committed to ensuring that the Connecting with Country Draft Framework is incorporated in future design and development proposals in Riverwood Estate.

It is proposed that the integration of Connecting with Country principles will be incorporated into the next stages of development, planning and design of the project in accordance with the draft framework. This could include a range of measures that will be undertaken, including working groups and ongoing consultation with GANSW to ensure and reinforce connection with Country across all future stages of the development.



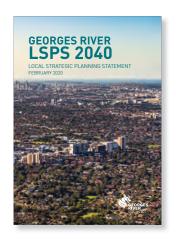
NSW Government Architect Good design and design excellence in the planning system

The Good Design and Design Excellence in the Planning System Advisory Note prepared by the NSW Government Architects seeks to elevate the role of design in the planning system by ensuring that design is considered and balanced with the other objectives of the EP&A Act.

Ensuring good design and design quality will be a key consideration for the renewal of Riverwood Estate.

2.2 Local planning strategies









Canterbury Bankstown Local Strategic Planning Statement (LSPS) – Connective City 2036

A LSPS sets out the 20-year vision for a LGA, demonstrates how change will be managed and identifies local priorities for updating LEPs.

As well as preparing a LSPS, all councils within Greater Sydney are required to prepare a Local Housing Strategy in accordance with the relevant District Plan. Local Housing Strategies are detailed plans that show where and how new homes can be developed in each LGA in Greater Sydney by 2036 to meet the need of the growing and changing population.

Canterbury-Bankstown Council's LSPS, Connective City 2036, is a 20-year plan to guide Canterbury-Bankstown's renewal and growth to accommodate a population of 500,000 residents by 2036. It identifies that there is demand for an additional 50,000 new dwellings between 2016 and 2036 to accommodate population growth.

Riverwood Estate is an important renewal project that has the capacity to deliver increased housing including social and private housing on a key government owned site, contributing to Canterbury Bankstown's housing target and the overall housing target for Greater Sydney.

Georges River Council Local Strategic Planning Statement (LSPS) – 2040

The Georges River LSPS 2040 was prepared by the Georges River Council to guide land use planning over the next 20 years. The LSPS identifies the Riverwood Precinct investigation area as a location for additional housing and as a location for revitalisation and growth, including commercial growth.

In terms of transport and connectivity, the LSPS notes the potential for the T4 and T8 rail lines to be linked by limited-stop buses between Riverwood and Hurstville. It also notes that the revitalisation of the Riverwood Precinct will provide an opportunity to collaborate with state agencies to potentially deliver a new transport interchange at Riverwood, as well as additional express train services from Riverwood station.

The LSPS notes the importance of increasing housing choice and diversity across the LGA in response to population growth and change over the next 20 years. It includes in its vision the need to protect the character of low density residential neighbourhoods by focusing higher density residential development in centres along public transport corridors.

Canterbury Bankstown Council Housing Strategy

The Canterbury Bankstown Housing Strategy provides an overarching, city wide framework for the provision of housing across Canterbury Bankstown. The Housing Strategy provides seven strategic directions for how new housing will be accommodated. These include:

- Deliver 50,000 new dwellings by 2036 subject to the NSW Government providing upfront infrastructure support
- Stage the delivery of new dwellings to address complex renewal issues affecting Canterbury Bankstown.
- Focus at least 80% of new dwellings within walking distance of centres and places of high amenity.
- Ensure new housing in centres and suburban areas are compatible with the local character.Provide a choice of housing types, sizes tenures and
- prices, to suite each stage of life.Design quality housing to maximise liveability and
- provide positive built form outcomes.Align the R2 and R3 zones in the former Canterbury
- LGA.
- Urgently review dual occupancies in the suburban neighbourhoods.

Riverwood Estate has the opportunity to respond to the above strategic directions by delivering new housing including a range of housing types and sizes in a new mixed tenure setting. Renewal of Riverwood Estate has the opportunity to create a great place, with its own character, whilst ensuring housing is still compatible with the surrounding existing local character of Riverwood.

Canterbury Bankstown Council Affordable Housing Strategy

The Canterbury Bankstown Affordable Housing Strategy seeks to reduce the level of housing stress experienced by residents across the City of Canterbury Bankstown so that the community can thrive socially and economically by increasing the provision of affordable rental housing. The Strategy identifies five guiding principles which include:

- Increase the supply of affordable housing in Canterbury Bankstown;
- Locate affordable housing near established centres to allow residents better access to transport, jobs and services;
- Focus on alleviating housing stress for very low and low income households and key workers;
- Establish clear processes for the delivery and dedication of affordable housing dwellings; and
- Establish an internal framework for the management of affordable housing dwellings.

Renewal of Riverwood Estate has the opportunity to improve social housing outcomes by delivering new private and social housing in a diverse mixed tenure setting, with access to public transport, jobs, services, open space and other amenities.

Local planning strategies





Canterbury Bankstown Council Employment Land Strategy

Delivering long term economic and employment growth is a key objective of the Canterbury Bankstown Draft Employment Land Strategy.

Located north of the Study Area, are significant land employment lands including the Riverwood Business Park (within the Bonds Road Employment area and Wiggs Road Industrial precinct), making up a significant proportion of employment lands within the local area.

Renewal of Riverwood Estate has the opportunity to provide improved connections to nearby employment lands.

Canterbury Bankstown's Community Strategic Plan 2028

The City of Canterbury Bankstown's Community Strategic Plan 2028 identifies the long-term aspirations of the community and sets out actions and long-term goals to achieve this vision. The Plan focuses around seven key themes, each with long-term goals and outcomes. These themes and goals include:

- Safe and Strong community: provide high quality community services and buildings. Make the city safer and more accessible;
- Clean and green: protect and promote local biodiversity and reduce our carbon footprint;
- Prosperous and Innovative: a smart evolving city with exciting opportunities for investment and creativity;
- Moving and integrated: facilitate improved movement around the City for all users;
- Healthy and Active: a motivated city that nurtures health minds and bodies:
- Liveable and Distinctive: a well designed, attractive city which preserves the identity and character of local villages; and
- Leading and Engaged: a well governed city with brave, future focused leaders who listen.

It will be important to consider the seven themes of the Community Strategic Plan into the design of the master plan to ensure Riverwood is a safe and strong community, clean and green, prosperous, and innovative, moving and integrated, health and active, liveable and distinctive and leading and engaged.



Canterbury Bankstown Master Plan for Salt Pan Creek, Whitmarsh and McLaughlin Fields

In February 2019, The City of Canterbury Bankstown adopted a master plan for Salt Pan Creek Reserve, Whitmarsh Reserve and McLaughlin Fields, located to the west of Riverwood Estate, which seeks to provide for a destination parkland providing for multiple recreational uses that engage a broad cross section of community, and that celebrates the location and setting of Salt Pan Creek.

Renewal of Riverwood Estate presents significant opportunity to align Salt Pan Creek Reserve, Whitmarsh Reserve and McLaughlin Fields master plan, providing an important link to open space between the Riverwood Estate and Salt Pan Creek Reserve.

Canterbury Strategic Recreation Plan 2010

The Canterbury Strategic Recreation Plan 2010 provides a plan for the future direction for recreation services and facilities within the LGA. One of the key issue's highlighted in the plan is the inequitable distribution of open space across the LGA, as well as the limited availability of open space.

Renewal of the Riverwood Estate has the opportunity to provide new and improved open space to increase local amenity and provide benefits for residents and the broader community.



Canterbury Open Space Strategy 2017

The Canterbury Open Space Strategy will assist the City of Canterbury Bankstown to make informed decisions regarding open space through six key themes, including open space provision, asset management, riverfront and recreation destinations, open space connections and corridors, natural areas and heritage and sport complexes and facilities.

There is significant opportunity for the renewal of Riverwood Estate to provide new and improved open space that reinforces and enhances connectivity to the existing Salt Pan Green Grid Corridor, whilst also providing important new public open space.

Playgrounds and Play Spaces Strategic Plan 2018

The City of Canterbury Bankstown has developed the Playgrounds and Play Spaces Strategic Plan to guide the future provision, development and management of playgrounds and play spaces over the next 10 years.

It will be important to consider the integration of playgrounds and play spaces as part of the broader public domain and open space strategy for Riverwood Estate

2.3 Social housing context



Housing 2041

Housing 2041 is the Government's 20-year vision for better housing outcomes across NSW. It includes objectives to deliver better housing outcomes by increasing supply in the right locations and increasing housing that better meets the diverse and changing needs of the community.

Housing 2041 is centred around four inter-related pillars:

- Supply enough housing delivered in the right location at the right time to meet demand
- Diversity housing is diverse, meeting varied and changing needs and preferences of people across their life
- Affordability housing is affordable and secure
- Resilience housing is enduring and resilient to natural and social change.

The planning proposal responds to these four pillars as follows:

- Supply by delivering 2,800 additional dwellings to assist in meeting State and local government housing targets
- Diversity by delivering apartments in an area where detached housing is the more common housing type and by delivering smaller, more accessible dwellings are required to meet the future needs of the local community
- Affordability by delivering apartments in an area where they are significantly less expensive than detached dwellings (currently the median house price in Riverwood is \$1,260,000 compared to median apartment price of \$580,000)

 Resilience – by delivering dwellings which are built to modern standards and include significantly improved accessibility and sustainability measures than the dwellings currently on site.

Sitting alongside Housing 2041, the Government's Action Plan 2021-2022 identifies five priority areas. Key actions under these priority areas that are particularly relevant to the planning proposal include:

- continuing to modernise and invest in our social housing portfolio, including building mixed tenure communities to support housing affordability and deconcentration and
- testing new housing types, tenures and delivery models to demonstrate best practice on government-owned land.

Future Directions for Social Housing

The Government published its 10 year strategy for social housing, Future Directions for Social Housing in NSW (Future Directions) in 2016. Future Directions is underpinned by three strategic priorities:

- 1. More social housing
- 2. More opportunities, support and incentives to avoid and/or leave social housing
- 3. A better social housing experience.

The planning proposal responds to key actions under these three priorities as follows:

Action 1.1 Increase redevelopment of LAHC properties to renew and grow supply

LAHC is predominantly self-funded and the redevelopment of properties, particularly those containing social housing dwellings that are expensive to maintain and no longer fit-for-purpose, provides LAHC with a critical source of funding.

LAHC renews and grows supply of social housing in two key ways. Firstly, by working with the private sector to redevelop large sites such as Ivanhoe, Telopea and the Riverwood Estate. Secondly, by undertaking smaller-scale residential developments, such as dual occupancies, seniors living developments, boarding houses and residential flat buildings. These are typically located throughout residential areas where:

- These types of dwellings are permitted;
- The site is well-located;

- There is demand for smaller, more accessible dwellings; and
- It is viable for LAHC to redevelop its property. There are currently 1,019 social housing dwellings (including 2 social dwellings owned by the AHO) and 60 privately owned dwellings on the site. About 1,490 social housing tenants live in the social housing dwellings. About one-third of these tenants live alone and about half are over 65 years of age. About 300 of these tenants have lived in their current dwelling for more than 20 years.

The planning proposal will allow LAHC to work in partnership with the private sector to deliver renewed social housing, along with additional private housing dwellings, in an area where demand for smaller, more accessible dwellings, both for private and social housing, is high.

Action 1.4 Better utilisation of social housing properties

The planning proposal will assist in reducing underoccupancy of social housing dwellings in this area by delivering smaller, fit-for-purpose dwellings to match the projected needs of current and future tenants. Although under occupancy of detached dwellings is lower in the Canterbury-Bankstown LGA than in other LGAs, there is still an opportunity to provide more smaller and accessible dwellings to better align the portfolio with demand.

Action 3.4 A "place-making" approach to building communities

Future Directions states that approximately 40% of the dwellings social housing portfolio in NSW are located in concentrated housing estates. It notes that while a range of social housing estates function relatively well, many estates experience high levels of crime, unemployment, domestic violence, tenancy management problems, poor educational outcomes and associated child protection issues.

The planning proposal, which will deconcentrate the Study Area and will include social housing as part a mixed-tenure development, will support the Future Directions action to taking a "place-making" approach to building communities. The social housing dwellings will be indistinguishable from the private dwellings in the new development, with the facilities provided across the site being available to all residents.

Land and Housing Corporation (LAHC) Portfolio Strategy 2020

The LAHC Portfolio Strategy (2020) sets out the vision and priorities to grow and change the LAHC portfolio over the next 20 years.

The Portfolio Strategy notes that most current social housing tenants are older, live alone and rely on the age, disability or some other pension for income. Only 4% of households are couples with children.

The Strategy sets the direction for the dwellings LAHC will own and build into the future, specifically fit-for-purpose and well-maintained dwellings that will be planned and designed to meet needs of current tenants as they age as well as future tenants.

In growing and changing the portfolio, the Portfolio Strategy indicates a need to focus on several areas, including improving the portfolio's flexibility by:

- Having fewer homes on estates
- Building more homes with 1 or 2 bedrooms for seniors, and with better design and accessibility
- Reducing the average age of the portfolio and
- Increasing the number of fit-for-purpose dwellings to better manage under-occupancy and over-crowding.

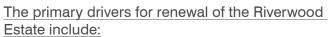
The planning proposal, by deconcentrating an estate, delivering more accessible dwellings and by making a significant contribution to reducing the average age of dwellings in the portfolio aligns with these focus areas and will support the achievement of the 20 year vision.

The planning proposal, which will be delivered in partnership with the private sector, also responds to the focus areas of partnerships and decision making and will support the financial sustainability of the portfolio by make best use of government land.

There is a strong case for the renewal of the Riverwood Estate, with the replacement of existing ageing social housing with new fit-for-purpose social housing dwellings within a vibrant and diverse mixed tenure setting. This will allow LAHC to better match the housing requirements of social housing tenants, whilst also delivering new and improved public spaces, community facilities and educational uses that will provide benefits for residents and the broader community.

2.4 Primary drivers for renewal

The renewal of the Study Area will transform the existing dwellings into in a vibrant, mixed tenure setting, delivering new and improved public spaces, community facilities and retail uses that will provide benefits for residents and the broader community.



- Social housing dwellings are at the end of their economic lifecycle. The social housing dwellings at the Riverwood Estate, built in the 1950's and 1970's, are at the end of their useful life and require a high level of maintenance at a significant cost to government. Further, substantial parts of Riverwood Estate require major refurbishment to bring them up to standard. Construction of new social housing at Riverwood Estate will lower the maintenance requirements and costs by replacing the ageing housing and infrastructure with modern, new, fit for purpose homes into the future.
- Social housing dwellings are no longer fit-forpurpose and suitable for the needs of residents. The existing social housing dwellings at Riverwood Estate are aging, being at the end of their useful life and are no longer suitable for the needs of residents. One of the major reasons for renewal is the existing housing stock do not have lifts, and the aging demographic require these. Further, there is growing demand is for smaller dwellings, such as one and two bedroom homes with better design and accessibility to suit a range of needs and lifestyles. The proposal seeks enable a range of dwelling types and sizes to be provided to meet this demand to better respond to the existing and future needs of residents.









- To reduce concentration of social housing in Riverwood Estate. At present, Riverwood Estate is a concentration of social housing and is somewhat set apart from the wider community of Riverwood. Historically, the Riverwood Estate has suffered from a range of physical and social disadvantages attributed to poorly designed public spaces, an uninviting pedestrian and street network, and buildings that are easily identifiable as social housing. The proposal seeks to respond to these known constraints to deliver a diverse, mixed tenure development which is better integrated within the broader suburb of Riverwood.
- To improve safety and create a welcoming neighbourhood. At present, the Riverwood Estate has a number of environmental and built form constraints, including a fragmented street network and poor building layouts which reduce lines of sight and poor lighting across the estate, limiting active and passive surveillance and presenting significant challenges in preventing crime.

The proposed master plan seeks to respond to these known constraints, including rationalising the existing street network, delivering revised building layouts with a positive street address and maximising visibility and lighting across the estate, to ensure a safe welcoming and inviting places for







- Increased enrolments at Riverwood Primary School. Enrolment demand at Riverwood Primary School is currently below capacity. The renewal of the Riverwood Estate will increase and diversify the population within the catchment of the Riverwood Primary School which will help the school grow and improve.
- Revitalise the Riverwood Local Centre. A larger population will further support local businesses and retailers, strengthening the high street and creating opportunities for new retail. The renewal of the Riverwood Estate will contribute to the economic livelihood of the Riverwood Local Centre overall.
- Integration of Salt Pan Creek Reserve. The Salt Pan Creek Reserve is a significant regional space adjacent to the Riverwood Estate. This parcel of land is owned by Canterbury-Bankstown Council and is subject to a separate Council-led master plan which seeks to improve the interface and connections to Salt Pan Creek Reserve, which will be further supported by upgrades to Whitmarsh and McLaughlin Fields, to transform this area into a regional parkland destination with various sports fields and recreational facilities.





 The renewal of the Riverwood Estate will complement the master plan for the Salt Pan Creek Reserve and provide an opportunity for the reserve to integrate and connect with the wider community. The dwellings adjacent to the park will be redeveloped to activate the park edge. The renewal will also provide key pedestrian and vehicular access to the Salt Pan Creek Reserve.

The planning proposal is consistent with the strategic planning framework for where and how housing should be delivered in Riverwood. It responds to the Government's position to use Government-owned land to deliver better social and economic outcomes. including by increasing housing supply and affordability, and will assist Government to meet high and growing demand for social housing.



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3 Analysis of existing conditions

3.1 The site

The Study Area, located in the north of Riverwood, is within 300m to 1km of Riverwood station. The site is also serviced by local bus routes, including the 944, 940 and 945 providing connections to key centres including Bankstown, Hurstville, and Roselands.

The Study Area contains around 1,100 social and privately owned properties. The social housing buildings, mostly constructed in the 1960's and 1970's, average 46 years. The Study Area is predominately three storey walk-up flats, and high rise apartments however also includes detached housing and townhouses. Surrounding the Study Area to the east and south, is low density residential housing.

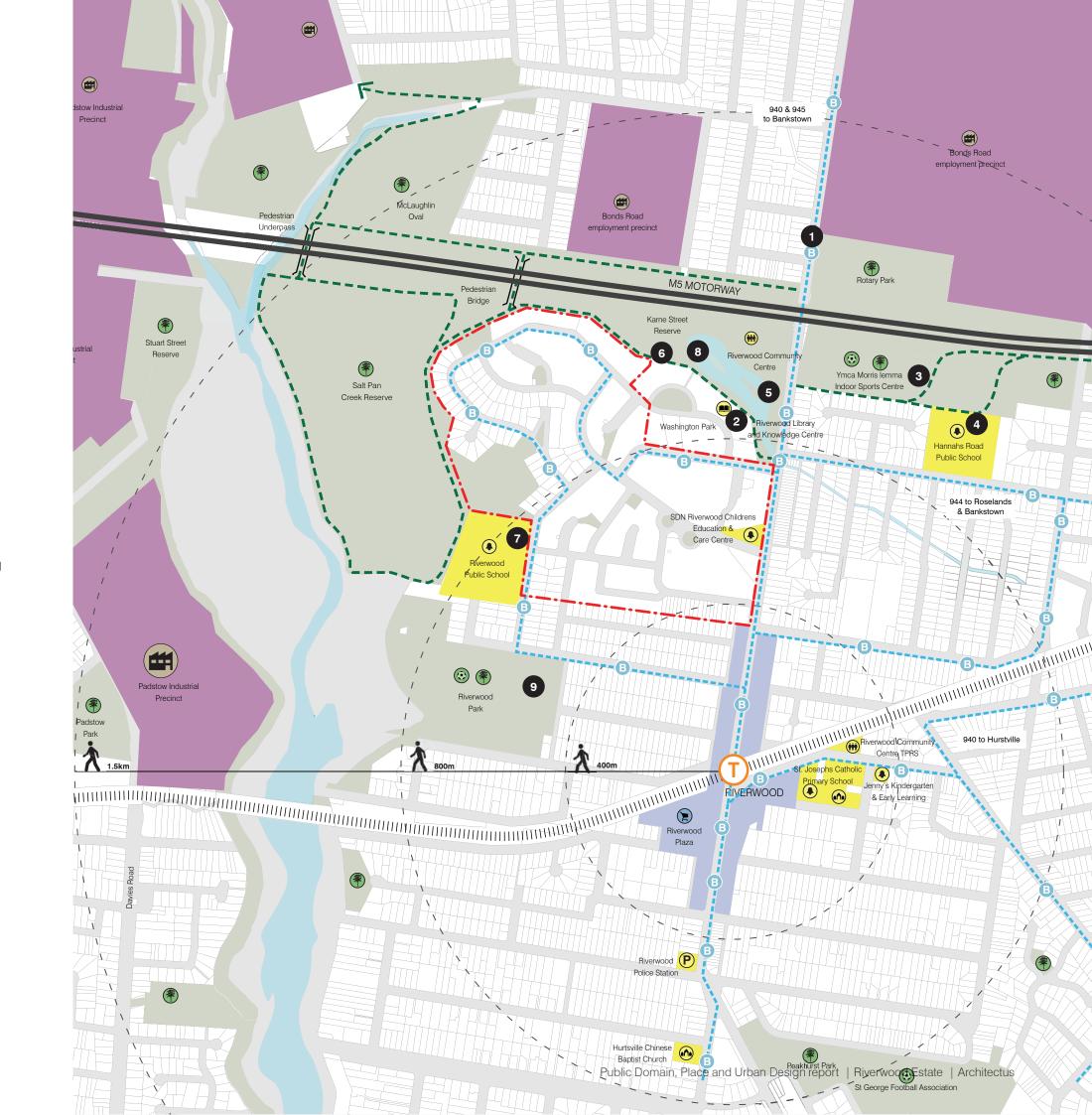
The Riverwood local centre, located to the south of the Study Area along Belmore Road, is an important local centre. Providing over 21,000m² of retail floorspace, it is the second largest retail centre in the Georges River local government area and is the main shopping centre for the suburb.

The site is well-serviced by existing social infrastructure, including Riverwood Public School located immediately adjacent to the Study Area, existing parks and community facilities, including Riverwood Community Centre and Riverwood Library and Knowledge Centre.

A number of large open spaces surround the site, including Salt Pan Creek Reserve, Karne Street Reserve, Riverwood Park and McLaughlin Oval to the north of the M5 Motorway. A number of smaller parks, including Salt Pan Gardens and Kentucky Reserve are located within the Study Area. The Riverwood Skate Park and Morris lemma Indoor Sports Centre are also within close proximity of the site.

Washington Park, a 3.5ha urban renewal site to the north of the site provides 757 dwellings, including 150 social housing dwellings. This mixed tenure development includes a new public plaza, public library, cafe community hub and senior citizens centre framed by high rise apartments with building heights ranging between 6 and 10 storeys.

Further north, there are significant employment lands, including Riverwood Business Park within the Bonds Road Employment area, making up a significant proportion of employment lands within the local area.



The site

- 1. Bonds Road employment precinct
- 2. Riverwood library and knowledge centre at Washington Park
- 3. YMCA Morris lemma Indoor Sports Centre
- 4. Hannan's Road Public School
- 5. Riverwood Community Centre
- 6. Riverwood Community Garden
- 7. Riverwood Public School adjacent to the site
- 8. Karne Street Reserve cycleway adjacent to the site
- 9. Riverwood Park



















3.2 Site history

Salt Pan Creek has been a focus of Aboriginal residence dating back prior to European colonisation. Throughout the 19th and 20th centuries, the area around Salt Pan Creek was a site of refuge and activism for Aboriginal Australians displaced from their own land.

No Aboriginal Heritage Information Management Systems (AHIMS) sites are located within the Study Area.

An area of Potential Archaeological Deposits (PAD) has been identified within the Study Area known as PAD01. Where impacts are proposed to PAD01 further investigation and comprehensive Aboriginal stakeholder consultation is required to establish the nature and extent of any sub-surface archaeological deposit.

The previous course of the Salt Pan Creek was considerably closer to the Study Area than at present and the Study Area is partially within 200m of the Salt Pan Creek's natural course. Areas within 200m of the original alignment of Salt Pan Creek should be considered archaeologically sensitive.

During World War II, the area of the current Study Area was occupied as the Herne Bay US military hospital. This was largest military hospital in Australia, comprising 490 timber barracks-type huts accommodating 1,250 patients and 3,500 staff. The 1943 aerial photo shows the original road alignment of the site, including Roosevelt Avenue and Minnesota Avenue.

After the war, the hospital site was temporarily used as one of the largest public housing projects undertaken in Australian history. During the 1950's the Housing Commission began to demolish the estate's timber huts, replacing them with high and medium density housing.

Permanent streets were laid out, named after persons and places in the USA as a commemoration of the site's history. In 1954, after a process of community consultation, the suburb and its railway station was renamed from Herne Bay to Riverwood.











- 01 The Study Area outline over 1943 aerial images of US Army 118th General Hospital. Source: SixMaps/JMD Design
- O2 Parish of St George (1800-1899). The Study Area approximately marked in red. Source: National Library of Australia.
- 03 Map indicating PAD01 as well as area within the Study Area that sits within 200m of the original Salt Pan Creeks watercourse
- 04 Retail store on the US Army 118th General Hospital site. Source: National Library of Australia.
- 05 Typical barrack building on the US Army 118th General Hospital site. Source: National Library of

3.3 Retail centres hierarchy

Riverwood

Riverwood is the second largest retail centre in Georges River LGA providing up to 21,000 square metres of retail floor space.

The Study Area is strategically located between the strategic centres of Bankstown and Hurstville, and is supported by Revesby and Padstow, key local centres along the East Hills rail corridor. To the north-east of the Study Area is Roselands, which is an important retail centre for the local area.

Hurstville

An important strategic centre with a strong retail role with its high street and Westfield Shopping Centre. Hurstville also has a strong commercial presence, with a growing health services sector.

Bankstown

An important strategic centre, with a range of retail, healthcare, community and civic services. The proposed future Metro Station provides significant opportunity for the centre, to grow as a local employment centre supported by enhanced public amenity and higher density living.

Revesby and Padstow

Key local centres functioning as the 'twin hearts' of the local area, providing a large retail and civic role. Significant opportunity for high density and mixed uses in both centres.

Roselands

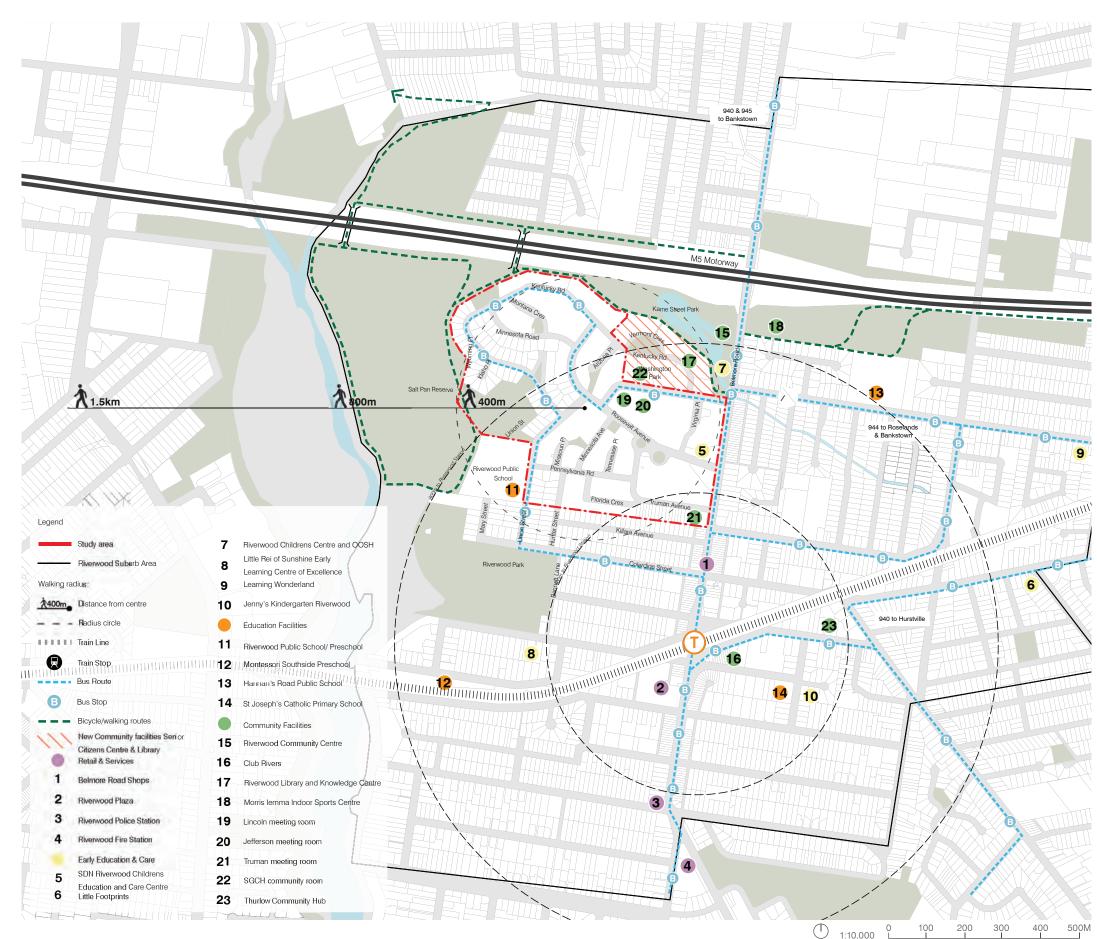
A major retail destination supported by a large retail anchor - Roselands Shopping Centre, and is well serviced by buses.



3.4 Social infrastructure

The Study Area is well serviced by existing social infrastructure, including:

- Three community rooms, a childcare centre and a men's shed which are highly valued spaces by local residents and the broader community. The Study Area also contained the Riverwood Library, which has been relocated to Washington Park.
- The Riverwood Community Centre is located just outside the Study Area and provides a range of community programs and activities including after school care and child care services.
- Washington Park, adjacent to the Study Area incorporates a number of facilities, including a new library, seniors citizens centre, community garden and a social enterprise café (Kick Start) for local youth in the area.
- Riverwood Public School is located immediately adjacent to the Study Area, and Hannan's Road Public School is located within close proximity to the site. Narwee Public School, Peakhurst Public School, and Sir Joseph Banks High School, are also located within the local area.
- Within broader Riverwood, there are a number of early educational facilities including seven early education centres, in addition to the 60-place child care centre within the Study Area.
- The Study Area is also close to the YMCA Morris lemma Centre (indoor sports centre), and a skate park to the north of the community centre on Belmore Road.
- A police station and a fire brigade station is located along Belmore Road, south of the Study Area.
- Riverwood is also well serviced by a number of district level services including Padstow TAFE, Bankstown-Lidcombe Hospital and Western Sydney University (Bankstown) campus.



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3.5 Public transport

The Study Area is well serviced by existing bus and train services. The Study Area is located within 300 metres and 1.1km from the Riverwood station, with the majority of the Study Area within a 5-15-minute walk of the train station.

Trains

Riverwood Train Station is located to the south along Belmore Road, approximately a 5-15 minute walk from the Study Area.

Riverwood Train Station is serviced by the T8 East Hills and Airport Line, which provides a link to the Sydney CBD via International and Domestic Airport.

The station provides regular train services on and off-peak, and is served by 5-12 trains per hour over a 24-hour period. Travel times to Central station range from 22 minutes (express) to 31 minutes.

Riverwood station currently has around 2,500 passengers during the AM peak. Increased capacity is planned for the T8 Airport/East Hills Line, adding an additional 200 services per week. This will double the service frequency during peak and off-peak periods.

Buses

There are several local bus routes that service the site, including the 944 than runs every 30mins through the site, as well as services from Belmore Road that provide connections to Bankstown, Hurstville, Mortdale, Roselands and Campsie. All bus services provide links to the Riverwood local centre and train station to the south.

Travel times to Bankstown and Hurstville are approximately 20 minutes, providing excellent connections to key employment centres.

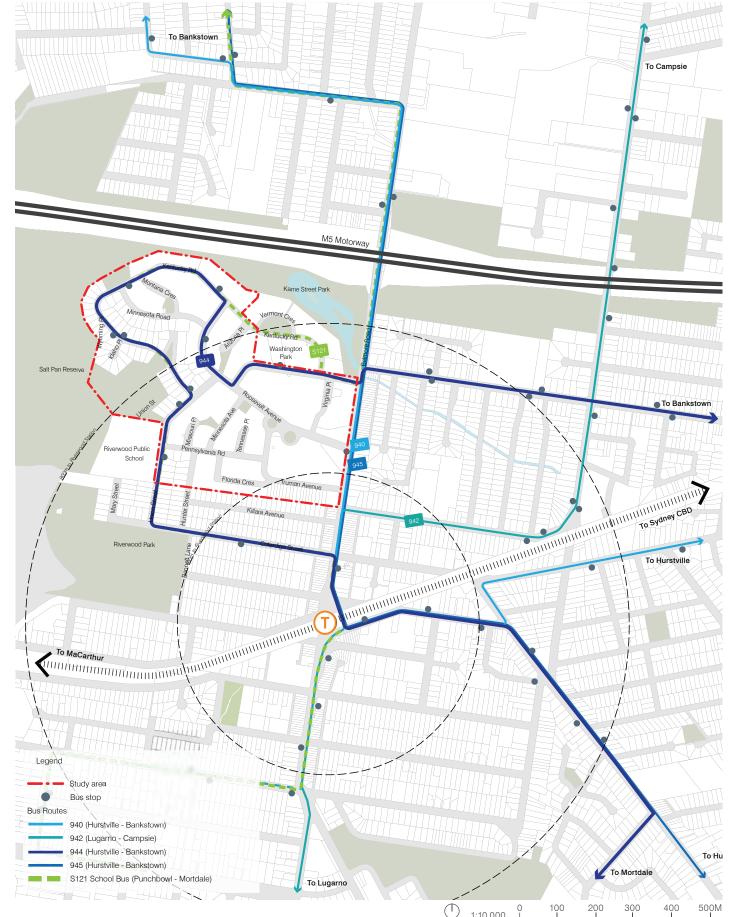
The map to the right shows the existing public transport network in Riverwood. All areas within the site are within a 300m of an existing bus stop.







- 01 Riverwood railway station is a short walk from the site via Belmore Road
- 02 The site is well served by buses with well placed bus stops
- 03 Belmore Road is a major shopping which is served by several bus routes to local centres



3.6 Walking and cycling

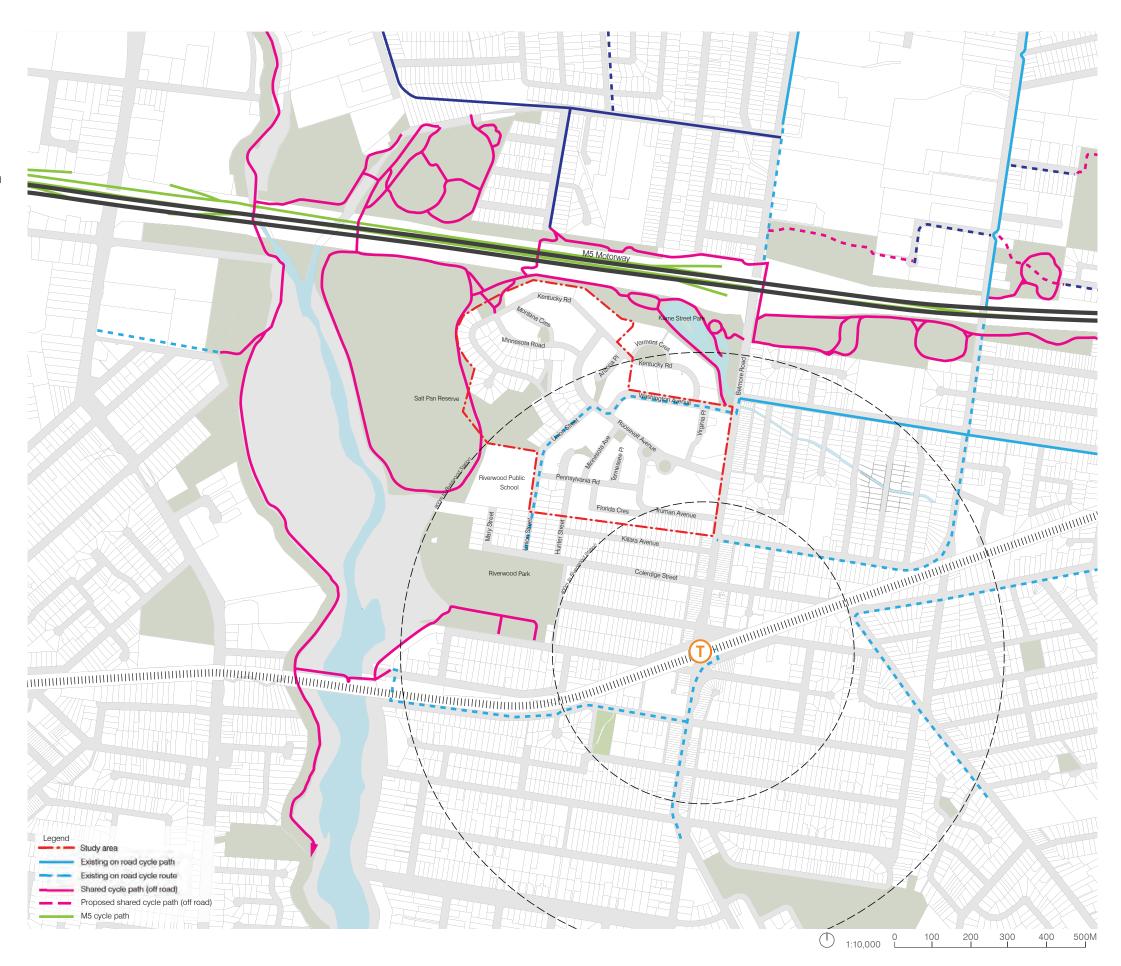
Cycling

Currently, on-road cycle routes along Washington Avenue and Union Street connect with the regional M5 bicycle path to the north and the off road Salt Pan Creek regional shared path to the north east. The on road cycle path at the southern end of Union Street does not connect with the off road Salt Pan Creek regional shared path in the west.

The off road Salt Pan Creek regional shared path, in the north west, directly connects with and terminates at the site. There are no dedicated off-road cycling paths within the site.

All land in the Study Area is less than a 5-minute cycle to Riverwood station. Improving the local cycle network will increase accessibility to the station, town centre, and local services in Riverwood.

There is also an opportunity to expand the existing cycle network within the site, to provide better connections to the regional cycleway network and Salt Pan Creek corridor, improving connections to Bankstown in the north, and Padstow to the south-west.



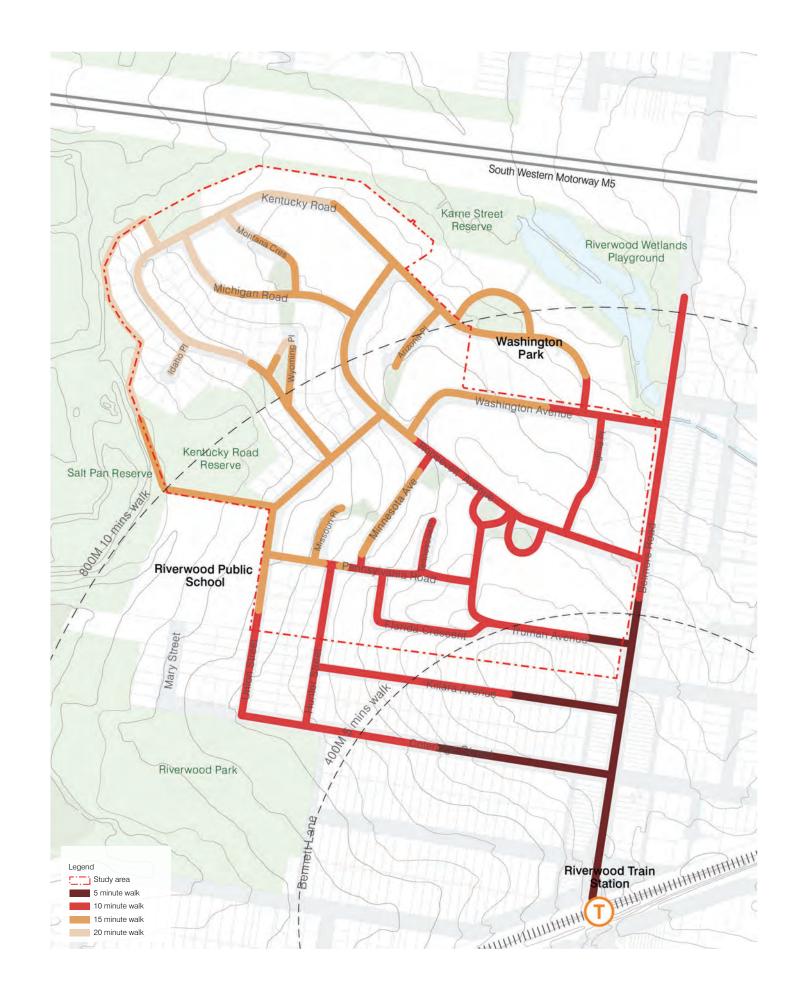
Walking and cycling

Walking

The plan to the right shows the 5, 10, 15 and 20-minute walking distance from Riverwood train station to the Study Area.

The majority of the site is within a 5-15 minute walk of the station and town centre. There is a small portion of land in the north-west, adjacent to Salt Pan Creek Reserve, which is a 20-minute walk from the station.

The existing street pattern is irregular with cul-de-sacs and is constrained by a lack of legibility. This presents an opportunity to create permeable street network, with new street connections, and a high amenity pedestrian environment with increased surveillance and points of interest, that will reduce walking times and improve the pedestrian experience, walking to and from the Riverwood Station and town centre.



3.7 Riverwood local centre

The Riverwood local town centre, located along Belmore Road, provides an existing retail strip. The strip includes a range of local restaurants and specialty stores that have been there for a long period of time including restaurants, cafés, shops and number of specialty stores.

The Riverwood Plaza also forms part of the local town centre, providing residents with over 30 specialty stores including Woolworths and Aldi.

The scale of the Riverwood local town centre is fine grain, with traditional two storey shop top houses. Large trees and planting continue the green landscaped character throughout the suburb and provide relief and shade walking to and from the local centre, along Belmore Road.

There is a continuation of retail and mixed use development, which runs north along Belmore Road, toward the M5 Motorway. These uses include the Department of Family and Community Services office, along with the former local Riverwood library branch (which has been relocated to Washington Park).

On the corner of Belmore and Hannans Road, is a small strip of neighbourhood shops containing a local convenience store and real estate agency.

The Riverwood Community Centre and Morris lemma Indoor Sports Centre are also located along Belmore Road.

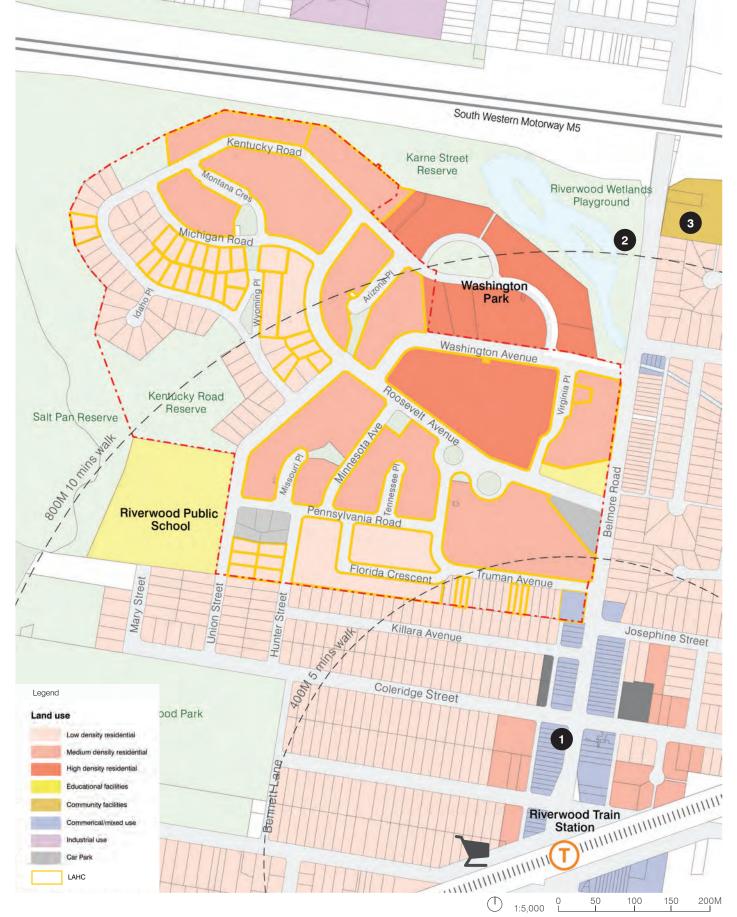
The future use of the Study Area should build upon the strength of Belmore Road, as an extension of the existing local town centre.







- 01 A bustling local retail centre along Belmore Road
- O2 Riverwood Community Centre located along Belmore Road is highly valued by local residents
- 03 Morris lemma Centre provides a local indoor sports centre along Belmore Road



3.8 Street network

The Study Area has excellent road access provided by the M5 motorway, Belmore Road and King Georges Road. The M5 Motorway is directly to the north of the site and is the main arterial road for the area.

Belmore Road is the main road servicing the site, carrying over 20,000 vehicles per day. All traffic access to the site is provided from Belmore Road.

The local street network is constrained due to its irregular and disconnected street pattern, limiting movement around the site.

The existing local streets are narrow and do not provide sufficient travel lane width to accommodate two-way traffic, bus movements and on-street car parking.

There are also several cul-de-sacs and narrow circular streets that restrict connectivity and permeability, creating poor pedestrian amenity throughout the site.

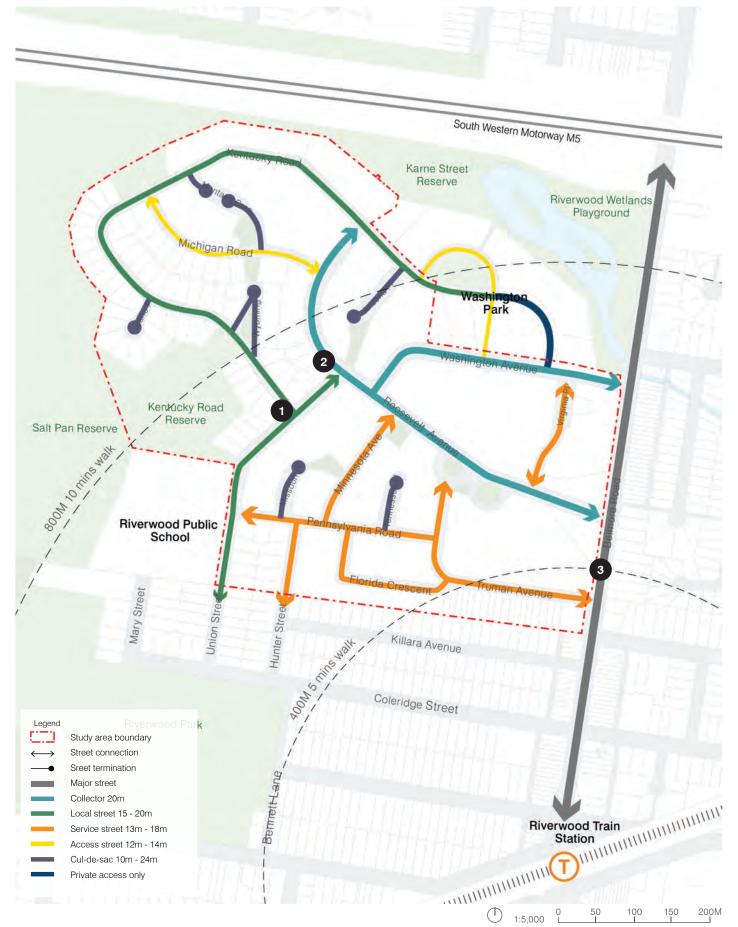
A clear, legible street hierarchy that connects the site back into the Riverwood suburb, with improved connections to Salt Pan Creek Reserve, Riverwood town centre and Riverwood station is a priority for the renewal of the Study Area.







- 01 Kentucky Road is a narrow road which struggles to cater for buses
- 02 Roosevelt Avenue has a generous road reserve with good street trees
- 03 Belmore Road is the main street through Riverwood with a connection to the M5



3.9 Open space

The Study Area is well-serviced by existing regional and district level open space, with over 60ha of open space within the Riverwood suburb.

Salt Pan Creek Reserve, located adjacent to the Study Area is a regionally significant open space, which forms part of the Salt Pan Creek Green Grid Corridor. The corridor provides a green connection to Bankstown in the north and Padstow and Georges River to the south.

Kentucky Road Reserve, adjacent to Riverwood Public School, includes a soccer field with lighting and a children's playground.

Surrounding the site are various passive and active open spaces. In particular, north of Washington Park is Karne Street Reserve and Playground which incorporates a park with wetlands, bike paths, barbeques, children's playgrounds, and community garden.

Riverwood Park, south of the Study Area also provides an off leash dog area, sporting facilities (cricket, soccer, and rugby fields) and play equipment.

However, there is currently a lack of local open space within the Study Area, and the broader Riverwood suburb, particularly within 400m of the town centre.

The Study Area contains a number of small open space areas including a local community play space, as well as small isolated local pocket parks scattered through the site. The renewal of the site presents an opportunity to provide a new local park within walking distance of the town centre.







- 01 Image above showing Local Community play space in the Study Area
- 02 Image above showing Kentucky Reserve and Riverwood Public School
- 03 Image above showing Karne Street Reserve



3.10 Ecology, trees and vegetation

A High Retention Value Tree (HRT) report has been prepared by EcoLogical and has identified 299 trees of significance within the Study Area, and where possible, existing trees are to be retained.

A Biodiversity Development Assessment Report (BDAR) has been prepared by EcoLogical. Although a BDAR is not required at the master plan stage, LAHC sought to prepare a BDAR to better understand, avoid, mitigate and offset impacts of the proposal on the biodiversity values of the site.

The BDAR identified the prevalence of three threatened fauna species within the Study Area and potentially affected by the proposed works, including the Grey-headed Flying-fox (*Pteropus poliocephalus*), Large-eared Pied Bat (*Chalinolobus dwyeri*) and the Swift Parrot (*Lathamus discolour*).

Remnant native Plant Community Type (PCT) has been identified in both the north west periphery of the Study Area and the south west of Kentucky Road Reserve (PCT 849: Grey Box - Forest Red Gum grassy woodland). This PCT is located either outside of the Study Area or in the existing open space and will not be impacted by the proposed renewal and will be retained.

The Study Area features many planted native and exotic trees along the streetscape. Passive open spaces and landscaped property boundaries, provide suitable habitat for native species such as birds, whilst also acting as an urban green corridor for the site. Seven hollow-bearing trees, three nests and one stag, were identified within the area of planted native vegetation on site providing evidence of fauna.

With regard to the presence of threatened fauna, it has been determined that vegetation within the site provides marginal potential foraging habitat in the form exotic and native planted vegetation and is considered likely these species would use the site and adjacent areas on occasion for foraging purposes.

The remaining land within the Study Area contains limited ecological values comprising low biodiversity constraints.







- O1 Small pockets of open space between buildings contain mature trees
- O2 The site includes a mix of mature and exotic species of trees
- O3 The park edge adjacent Salt Pan Creek Reserve featuring the endangered Cumberland Plain Woodland



3.11 Topography and views

The site is relatively flat with a gentle slope that runs from east to west, with a high point along Belmore Road and the low point at Salt Pan Creek Reserve.

The gentle slope facilitates an easily, walkable neighbourhood for most residents and visitors.

Existing views from the site include Salt Pan Creek Reserve to the west and Riverwood Park to the south.

Roosevelt Avenue, should be retained as the main entrance to the site, to enhance and promote views to open space and Salt Pan Creek Reserve.

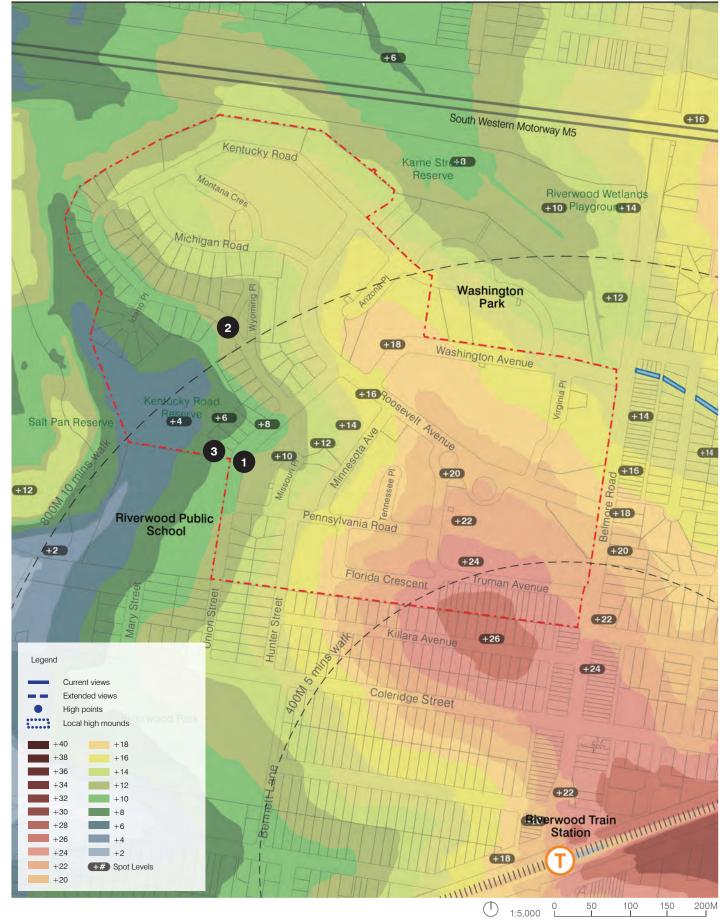






- Union Street view to Riverwood ParkKentucky Road view to Salt Pan Creek
- 03 Union Street view to Salt Pan Creek Reserve

Above images: JMD Design 2017



3.12 Crime mapping

Bureau of Crime Statistics and Research (BOSCAR) mapping

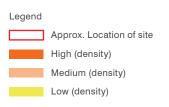
The Study Area has historically suffered from a wide range of physical and social disadvantages including poorly designed public spaces, uninviting pedestrian and street network, and buildings that are easily identifiable as social housing. The estate is a concentration of social housing and somewhat set apart from the wider community.

The Study Area is located in a crime hotspot, as shown in the BOCSAR crime maps for the year to December 2020. The poor urban design, and environmental characteristics of the estate such as poor lighting and lack of natural vigilance, present a significant challenge in passive surveillance.

Consultation with the Riverwood community in 2017 indicated that some residents, particularly women, report feeling unsafe walking through the area, and in their homes. One service provider noted that this is partly because of the distribution of dwelling types, with clusters of studios leading to concentrations of single men in some areas. People also said they felt unsafe because of areas of poor lighting and poor casual surveillance.

The renewal of the Study Area will deliver an attractive, safe, inviting and connected area. The public spaces will be well designed providing improved connectivity, surveillance, lighting and safety ensuring people feel safer getting around and participate in their local community

The social housing will be transformed into a new mixed tenure community where social housing blends in with private housing, in typical suburb integrated with the wider Riverwood community.





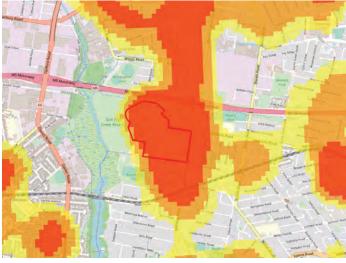
Assault (non-domestic)

- Canterbury Bankstown LGA sits below the state average for non-domestic assault incidents, however,
- The estate sits within an assault (non-domestic) hotspot with over 50% within the high density occurrence



Theft (break and enter dwelling)

- Canterbury Bankstown LGA sits below the state average for theft (break and enters) however,
- The estate sits within a break and enter hotspot with over 50% within the high density occurrence



Assault (domestic)

- Canterbury Bankstown LGA sits below the state average for non-domestic assault incidents, however,
- The estate sits within a domestic assault hotspot with almost 100% within the high density occurrence



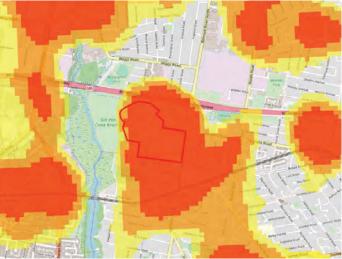
Theft (steal from dwelling)

- Canterbury Bankstown LGA sits well below the state average for theft (steal from dwellings), however,
- The estate sits within a domestic theft (steal from dwellings) hotspot with over 80% within the high density occurrence



Malicious damage to property

- Canterbury Bankstown LGA sits well below the state average for non-domestic assault incidents, however,
- The estate sits within a malicious damage to property hotspot with almost 100% within the high density occurrence



Theft (steal from motor vehicle)

- Canterbury Bankstown LGA sits at the state average for theft (steal from motor vehicles)
- The estate sits within a theft (steal from dwellings) hotspot with almost 100% within the high density occurrence



Crime Prevention Through Environmental Design (CPTED)

Crime Prevention through Environmental Design (CPTED) is a crime prevention strategy that focuses on the planning, design and structure of cities and neighbourhoods. It reduces opportunities for crime by using design and place management principles that reduce the likelihood of essential crime ingredients (law, offender, victim or target, opportunity) from intersecting in time and space.

Predatory offenders often make cost-benefit assessment of potential victims and locations before committing crime. CPTED aims to create the reality (or perception) that the costs of committing crime are greater than the likely benefits. This is achieved by creating environmental and social conditions that:

- Maximise risk to offenders (increasing the likelihood of detection, challenge and apprehension);
- Maximise the effort required to commit crime (increasing the time, energy and resources required to commit crime);
- Minimise the actual and perceived benefits of crime (removing, minimising or concealing crime attractors and rewards); and
- Minimise excuse making opportunities (removing conditions that encourage/facilitate rationalisation of inappropriate behaviour).

CPTED employs four key strategies. These are territorial re-enforcement, surveillance, access control and space/activity management. All CPTED strategies aim to create the perception or reality of capable guardianship.

Analysis of existing conditions against CPTED Strategies:

Existing Territorial Re-enforcement issues:

- Large building setbacks and poorly programmed open space fail to delineate between public and private open space and connections.
- Streets and open spaces have inactive edges/ blank facades

Existing surveillance issues:

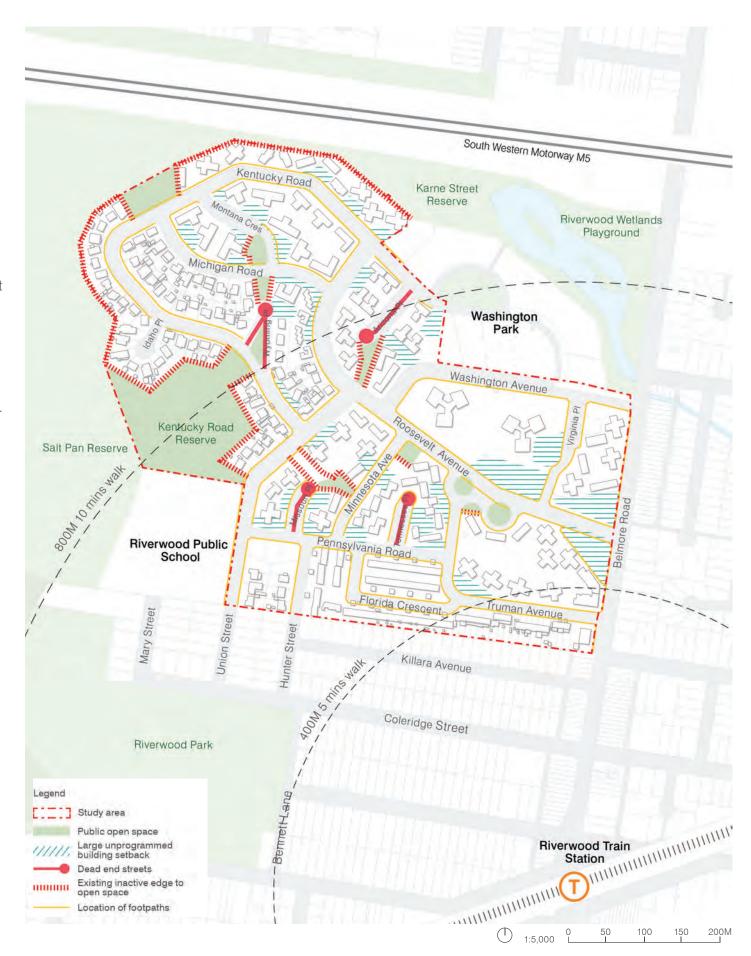
- Cul-de-sacs and narrow circular streets restrict sight lines and visibility from public and open spaces
- Large building setbacks reduce levels of natural surveillance to all streets, public domain and open space.
- Small isolated local pocket parks with little to no passive surveillance
- Poorly lit streets, open spaces and building entries.

Existing access control issues:

- Buildings do not reinforce street network
- Poor definition of public and private space
- Inconsistent narrow footpaths

Existing Space/Activity Management issues:

Poor maintenance of existing open space

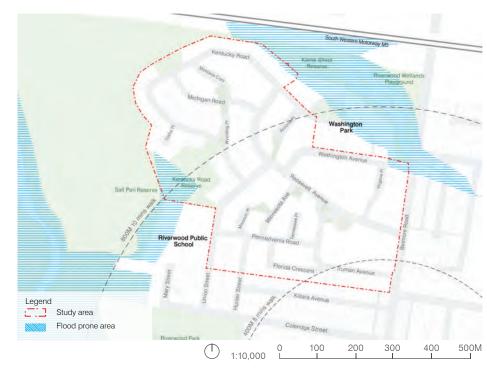


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3.13 Servicing, flooding and contamination







Contamination

Asbestos is a matter to be considered as a constraint to residential redevelopment. There is potential for the proposed development to require remediation and/or management of asbestos impacted soils to make the land suitable for continued residential and recreational land uses.

Salt Pan Creek Tip, a former waste management facility, is located adjacent to the site. The landfill has been associated with landfill gases, groundwater impacts and leachate seepage. Groundwater impacts are likely to migrate westwards towards the adjacent Salt Pan Creek, and are therefore considered unlikely to impact the site.

Sewer

A 1350mm trunk sewer main (Bankstown submain) traverses the site which is a major constraint to development. In its current alignment the sewer easement impacts on a significant portion of the site, as no structures can be constructed within the 3m easement.

To facilitate redevelopment of the site, the sewer may need to be realigned.

Flooding

Part of the subject site is identified within the flood planning area in Canterbury LEP 2012, including Kentucky Park.

Land immediately adjacent to the site, including Salt Pan Creek, Salt Pan Creek Reserve and Karne Street Reserve is also identified in the flood planning area.

Canterbury-Bankstown Council's flood modelling indicates that several properties in the north of the site, adjacent to Karne Street Reserve, are also subject to flooding.

3.14 Land ownership and built form



Land ownership

The majority of the Study Area is owned by NSW LAHC. NSW LAHC's landholdings comprise around 16.7ha of the 30ha Study Area, and contain 1,019 social housing dwellings. Of the total social housing dwellings, two dwellings are owned by the Aboriginal Housing Office (AHO).

The Study Area contains approximately 60 privately owned properties. The Study Area also includes Council-owned land, including the former Riverwood Library, Kentucky Reserve and Peace Park, and small pockets parks scattered through the site.

Surrounding the site ownership is more fragmented, with smaller lots located to the south and east of the site. Smaller, privately owned lots may be a constraint for future renewal in these areas, despite proximity to shops and services along Belmore Road and Riverwood Train Station.

Land use

The site is predominately zoned medium to high density residential uses, with a range of residential building types. Washington Park, to the north of the Study Area includes high density residential development, delivered as part of the renewal of Riverwood North.

The site is surrounded by large green spaces, including Salt Pan Creek Reserve to the west and Karne Street Reserve to the north. The site also includes a number of small pocket parks throughout the Study Area.

The Study Area is surrounded by low density residential housing and is adjacent to the Riverwood Public School. To the south of the Study Area on Belmore Road, is Riverwood local centre, catering for local residents every day shopping needs. Closer to the local centre there is more recent residential apartment development, ranging up to 4 storeys.

Lot size

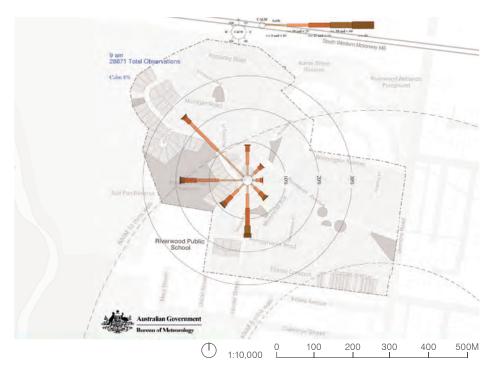
The Study Area contains large consolidated blocks in single ownership which is a rare opportunity in a town centre. Within the Study Area, there are no lots less than 500m² in size. The majority of the sites are greater than 2,000m². This presents a significant opportunity for renewal within the Study Area.

To the south and east of the site, lot sizes are much smaller and ownership is more fragmented. Some lots are less than 500m² in size, which may be a constraint to increased densities, despite proximity to shops and services along Belmore Road and Riverwood Train Station.

Land ownership and built form







Building Height

The subject site has a variety of building heights ranging from 1-2 storey dwelling houses, 3-storey low rise walk up flat buildings and a 9-storey residential tower block (which currently exceeds the existing planning controls). The majority of detached dwellings are situated on the west and south side of the site, with density sited more toward the east of the site.

Washington Park, to the north, includes buildings ranging from 6-10 storeys. Land surrounding the site consists predominately of 1-2 storey detached housing, with some low-medium density housing (townhouses, villas and 3-storey flat buildings) to the south-east of the Study Area along Belmore Road.

A consideration in the redevelopment of the Study Area is managing the interface with the low density residential housing located immediately south of the site in Georges River LGA.

Built form, typologies and character

Existing social dwellings are ageing, with majority of housing stock constructed between 1965-1974, and averaging 46 years of age. The Study Area consists of a range of building typologies, including detached houses, townhouses and villas, three storey walk-up flats and high rise, tower block apartments.

Residential apartments are the predominant housing type, representing 92% of social housing dwellings, and 85% of all dwellings within the Study Area. LAHC and the AHO's 1,019 dwellings include 28 cottages, 10 townhouses, 39 villas and 942 units

Development surrounding the site to the south and east is made up of predominately single storey detached dwellings. Some low-medium density housing is located close to Riverwood town centre, mostly developed for townhouses and villas, consistent with current planning controls.

Existing wind conditions

The site is approximately 4km to the east of Bankstown Airport which is the location of the closest Meteorology anemometer. The prevailing strong winds at Bankstown Airport come from the south-east and west quadrants.

From a wind perspective Bankstown Airport is relatively mild, with an average wind speed in the order of 10-11kph.

3.15 Local character

- Retail uses in the area are changing over time. The Belmore Road retail strip is now an exciting mix of restaurants and shops that have been there for a long time, and new cafés.
- 2. An example of street tree planting along Roosevelt Avenue, contributing to the public domain and streetscape character of Riverwood.
- 3. High density living is not new to Riverwood. The Study Area currently contains residential towers (equivalent of 12-storeys), constructed in the 1970s, also known as the Lincoln and Jefferson buildings.
- The fine grain on Belmore Street is really important

 it makes the street active and interesting for pedestrians.
- 5. Within the Estate, and in the neighbouring streets front gardens and landscape define the local character.
- 6. Washington Park has changed the character of the area. In this context, 6-10 storey buildings are a comfortable scale, primarily because of the large trees and quality open space.
- 7. The Riverwood Town Centre is a successful centre with a new supermarket opening in the coming months. The scale of the centre is traditional 2-storey shops. Trees and planting add character and shade.
- 8. Nearby streets comprise mainly single dwellings. The predominant height is 1 2 storeys. Streets are typical generously proportioned with good street planting.
- 9. Karne Street Reserve, within Salt Pan Creek Wetlands is a well-loved and well-used park that provides a landscaped setting for the Study Area.



















Built form - Single detached homes

Single detached homes constructed in the Study Area are one storey in height, situated on large lots and feature double brick and fibre cement construction. The houses have contained front, rear and side yards with garages or carports located at the front or side of the house.

The houses in the Study Area are generally located at the edges of the Study Area next to the neighbouring parklands to Salt Pan Creek to the west and at the edge of the Riverwood town centre to the south. The majority of houses in the area were built in the 1960's and are generally well maintained and in good order attributable to the fact that some houses in the Study Area are privately owned.

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Flores Cres Frame Are
Key plan

Performance Criteria	Comments
Access to light and air	Fair Dwellings with limited/small openings limiting access to light, air and cross ventilation
Security and Surveillance	Good Verandas and small patio areas to the front of the house provide surveillance to the street.
Private Open Spaces	Good Front, side and rear yards as private open space are provided within lots.
Communal Open Spaces	Not applicable
Building Accessibility	Poor * Two storey layouts makes access difficult for the elderly or disabled within dwellings.
Parking	Good Each dwelling receives a dedicated parking space
Visual Impact	Good Low - little visual impact on the surrounding environment and are consistent with the building fabric of the suburb at large.







Examples of single storey houses within the Study Area. All images above: Architectus 2017

Built form - semi-detached dwellings and terraces Semi-detached dwellings and terraces in the Study Area are one to two storeys in height, situated on small lots and constructed in double brick. The houses are repetitive in nature and appear consistent to the street. Typically they have a small front and rear yards with garages or carports located at the front or side of the house.

The semi-detached dwellings in the Study Area are generally located on the southern edge of the Study Area adjacent to the residential area to the south. The majority of houses in the area were built between 1965 and 1976 and their condition varies greatly. Some dwellings appear well looked after and in good working order while others appear in poor condition requiring maintenance.

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Performance Criteria	Comments
Access to light and air	Fair Dwellings with limited/small openings limiting access to light, air and cross ventilation.
Security and Surveillance	Fair Small front yards, with no patio or verandas areas to occupy and provide surveillance to the street.
Private Open Spaces	Fair Small front and rear yards as private open space are provided within lots.
Communal Open Spaces	Not applicable
Building Accessibility	Poor * Two storey layouts makes access difficult for the elderly or disabled within dwellings.
Parking	Poor * Each dwelling receives a dedicated parking space at the front of each dwelling in the form of an uncovered hard-stand or carport.
Visual Impact	Fair Low - little visual impact on the surrounding environment but the repetitive nature of the building type is a strong point of difference.



Example of a dual occupancy unit in Wyoming Place.



Example of two storey row housing on Truman Avenue.



Example of single storey semi-detached housing on Florida Crescent. All images above: Architectus 2017

Built form - Walk-up units

Walk-up units in the Study Area are situated on large lots, two to three storeys in height arranged in clusters of three to four buildings around open space. The buildings vary in size with their orientation dictated by the shape of the lots in which they sit.

Typically the open space around the units are poorly planned and underutilised. Residents in some unit blocks utilise these areas to propagate plants and adapt it for recreational uses in the absence of yard spaces found in houses.

The walk-up unit type makes up the majority of the housing stock in the Study Area and were built in the 1960's with some more contemporary variants constructed in the early 2000's on Roosevelt Avenue. The overall condition of the dwellings vary greatly, with some dwellings appearing well looked after and in good working order while others appear in poor condition requiring maintenance.

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Performance Comments Criteria Access to Fair Dwellings vary depending on the design light and air characterised by breezeway or gallery access. Small openings to some dwellings limit light, air and cross ventilation. Security and Fair -Poor Surveillance Many older buildings have concealed entries located away from the street with little surveillance which is a safety issue. Private Open Poor Some areas in close proximity to resident Spaces balconies with good access to sunlight are used as spaces for socialising or are propagated for vegetable and flower gardens. Balconies to apartments are generally small and of little use to residents with many used as storage or drying areas. Communal Open Spaces Outdoor areas at the ground floor are generously provisioned but are poorly defined for communal and private uses. They are rarely used for recreation purposes. Building Poor Accessibility The buildings do not have lifts making access for the elderly and disabled difficult. Parking On grade off-street parking is provided near the entry of dwellings, often at the expense of outdoor spaces at ground floor. The parking that is provided is generally inadequate with residents also parking on the street. Visual Impact Moderate visual impact on the surrounding environment but their placement around the site makes them difficult to relate to streets and open spaces.



Walk up units with external stairways and small openings.



A small private open space carved out by a resident on the ground floor of a unit block.



and defensible space.



The small balconies provide little amenity to residents and often is the location for rubbish.

All images above: Architectus 2017



Most walk up units sacrifice resident open space amenity for the convenience of parking

Built form - Tower unit blocks

The tower unit blocks are located in a large lot at the centre of the Study Area. Two ten storey structures are arranged in a public park setting and is accessible from all sides. The under croft of the buildings at ground floor house a Men's shed for the community and some resident car parking.

As with many of the open spaces in the Study Area, the park in which the towers are located is poorly planned and underutilised. Poor sight lines from the street and blind corners at the base of the towers, make the park feel unsafe.

The towers were constructed in the late 1970's, of which there are only two.

The overall condition of the buildings appear in working condition but appears neglected in places some dwellings appearing well looked after and in good working order while others appear in poor condition requiring maintenance.

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Performance Criteria	Comments
Access to light and air	Good Tower apartment buildings comprise a combination of single and dual aspect apartments and are afforded reasonable solar access and views.
Security and Surveillance	Poor The under croft and lobby of the towers are especially dangerous with poor lines of sight from the street and a number of blind spots which are currently not under surveillance.
Private Open Spaces	Poor Balconies to apartments are generally small and are of little use to residents with many used as storage or drying areas.
Communal Open Spaces	Poor Outdoor areas at the ground floor are generously provisioned with gardens and a children's playground but are in poor working condition.
Building Accessibility	Good The tower has lifts allowing for elderly and disabled access.
Parking	Poor On grade off-street parking is provided in the under croft of the tower. The parking that is provided is generally inadequate with residents also parking on the street.
Visual Impact	Fair The towers provide a strong contrast to the existing low-rise context but its visual impact is softened by the quantity of open space and mature trees in which it is situated.



The towers are currently the tallest buildings in the Study Area, located at the centre of the Study Area and sit above the canopy of the existing trees.



View of the concrete pathways at ground level which criss cross the park.
All images above: Architectus 2017



Residents attempt at propagating plants on a small opening in front a fire stair landing.



View of the tower interface at ground level and the under croft area adjacent the park.

Built form - Apartment buildings at Washington Park The apartment buildings at Washington Park are

located on the northern fringes of the Study Area. The development consists of a number perimeter street edge buildings ranging from 6-10 storeys in height arranged around communal courtyards. In contrast to the existing development around the Study Area, open spaces are well structured and are clearly defined. Communal open spaces range from small pocket greens for passive recreation to large parks and gardens for active recreation. Completed in 2017, the apartments feature a number of measures to ensure it met the requirements of the residential flat design code. These included restricting building depths to 20metres and providing large floor to ceiling windows to maximise ventilation and solar access. Given their relatively recent completion, the apartment buildings are in good condition but have had minor repairs made to the facade.



Performance Criteria	Comments
Access to light and air	Good Apartment buildings comprise a combination of single and dual aspect apartments and are afforded good solar access and views with floor to ceiling windows.
Security and Surveillance	Good Lobbies are highly visible from the street, well-lit and are secure locations with swipe card access.
Private Open Spaces	Good Balconies are well provisioned with residents being able to utilise them for a range of activities including socialising, cooking, storage and drying clothes.
Communal Open Spaces	Good Communal open space at the ground floor is provisioned with a clearly defined strategy for its use as community gardens.
Building Accessibility	Good The buildings have lifts and accessible ramps allowing for elderly and disabled access.
Parking	Good Off street parking is provided to all residents via several levels of basement reducing the impact of cars on the street.
Visual Impact	Poor-Fair Perimeter edge apartment blocks up to 10 storeys provide a strong legible street wall to Washington Avenue. Basements to the rear of apartment blocks face existing community gardens and parkland providing a poor interface to open public spaces.



View of the signage at the entry to one of the recently completed buildings.



View of the open public space fronting residential buildings.



Elevation showing the use of floor to ceiling windows and deep balconies to apartments. Fronting residential buildings.



View of the basement levels which form the podium for the residential buildings above. All images above: Architectus 2017



Air and Light Ensure that design of built form considers both active and passive measures for cross ventilation and ensure buildings are orientated to maximise solar access.



Security and Surveillance Provide secure entries to buildings which are clearly marked and highly visible from the street. Avoid where possible blind corners to spaces.



Private Open Spaces Provide good quality private open spaces with good solar access, which are clearly defined for residents. Ensure spaces are considerate of residents needs such as cooking, gardening and socialising..



Communal Open Spaces Ensure a diverse range of communal open spaces are provided at a range of scales which reflect the patterns of use in the community.



Accessibility Consider accessible single storey dwellings which can be modified to accommodate disabled or elderly residents and lobbies



Car Parking Ensure a provision of basement car parking to new development to reduce the visual and traffic impact on new and existing roads.



Walk-up apartments on Truman Avenue maximise its solar access through its north

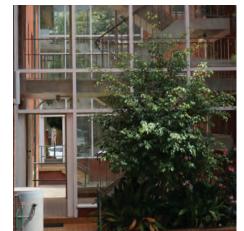
View into lobby from Washington Avenue of one of the recently completed apartment



Ground floor of walk-up apartments on Minnesota Avenue used for gardening.



Aerial view of the community garden located between buildings in Washington



Ground floor of walk-up apartments on Minnesota Avenue used for gardening.



View of the existing on-grade car park provision located adjacent the towers on Washington Avenue which is visually unappealing.

All images above: Architectus 2017

3.18 Consultation outcomes

Engagement with residents has been an important part of the study, providing insights into what people currently value about the area and key factors to be considered in the renewal of the site.

There is a lot that people currently like about Riverwood, including the existing community networks, Salt Pan Creek, the Riverwood Community Centre, local schools, and the convenient location.

Key findings from consultation included:

Open space and public domain

People would like to see include playgrounds with connection to nature, local parks for active and passive sports and games, and community gardens. People would also like improved walking and cycling connections and better surveillance.

Community facilities and services

People would like to see more spaces for older and young people, additional community meeting rooms, a library or spaces for education and training and improvements to Riverwood Community Centre. People would also like health services such as a medical centre incorporated into the Study Area along with a grocery store, chemist, post office and opportunities for multi-cultural groceries/restaurants.

Traffic and transport

People have concerns regarding the safety at the intersection of Washington Avenue and Belmore Road. People also identified the need for wider streets, more parking and retaining the names of existing streets.

Housing and built form

People would like to see a mix of housing types including density, bedrooms and tenure (particularly more aged care/seniors housing). More open space between buildings was also a key issue raised.

People

Residents in the Study Area would like to retain social networks with neighbours. People are also concerned with relocation issues including how relocations would be managed and the cost of potential relocations.







- 01 Community consultation
- 02 The Kick Start Cafe
- 03 Community consultation







- 04 Community consultation
- 05 Community consultation
- 06 Community consultation



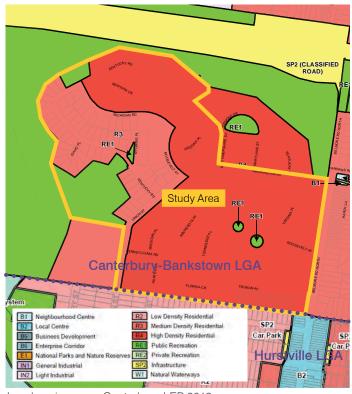




- 07 Washington Park community gardens
- 08 Salt Pan Creek Reserve
- 09 Riverwood community centre

3.19 Existing planning controls

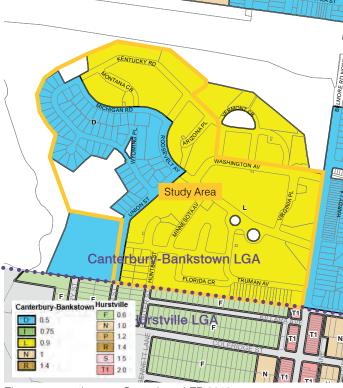
The subject site lies within the Canterbury-Bankstown LGA (formally Canterbury Council). The Canterbury Local Environmental Plan (LEP) 2012 remains the primary planning instrument for the site. The subject site also borders Georges River LGA (formerly Hurstville Council). The Hurstville LEP 2012 provides relevant planning controls for land immediately south of the Study Area.



Land zoning map, Canterbury LEP 2012 and Hurstville LEP 2012

Study Area Study Area Canterbury-Bankstown LGA FLORIDAGE FLORI

Maximum building height map, Canterbury LEP 2012 and Hurstville LEP 2012



Floor space ratio map, Canterbury LEP 2012 and Hurstville LEP 2012

Land zoning

The subject site is predominately zoned R4 High Density Residential, with the remaining area zoned R3 Medium Density Residential.

The site is surrounded by RE1 Public Recreation zoned land along the western and northern boundaries, with small pockets of RE1 zoned areas within the Study Area.

A small neighbourhood shopping centre, close to the site on the corner of Belmore Road and Hannan's Road is zoned B1 Neighbourhood Centre.

The area immediately south of the subject site is zoned R2 Low Density Residential and B2 Local Centre under Hurstville LEP 2012.

Maximum building height

The maximum building height for land zoned R4 High Density Residential is 11.5 metres. Land zoned R3 Medium Density Residential has a maximum building height of 8.5 metres.

The R2 Low Density Residential land immediately south of the subject site has a maximum building height limit of 9 metres under Hurstville LEP 2012.

The maximum building height in the Riverwood local centre is 18m, transitioning to 12m for Medium Density zoned land immediately adjacent to the centre.

Floor space ratio

Land zoned R4 High Density Residential has a floor space ratio (FSR) of 0.9:1, while land zoned R3 Medium Density Residential has an FSR of 0.5:1.

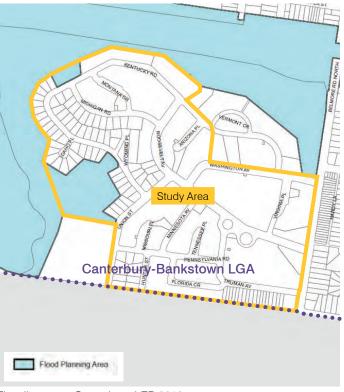
Clause 4.4A of the Canterbury LEP 2012 provides that non-residential development must not exceed 0.5:1 in zone R3 Medium Density Residential and 0.75:1 in zone R4 High Density Residential.

Land to the south of the site, zoned R2 Low Density Residential under Hurstville LEP 2012, has an FSR of 0.6:1. The B2 Local Centre, has a maximum FSR of 2:1. The surrounding R3 zoned land has a maximum FSR of 1:1.

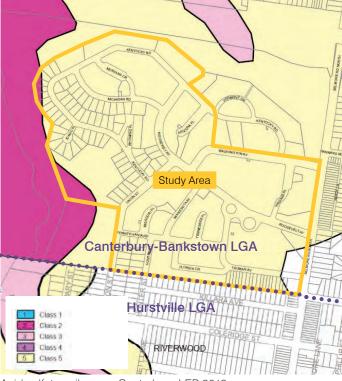
Existing planning controls



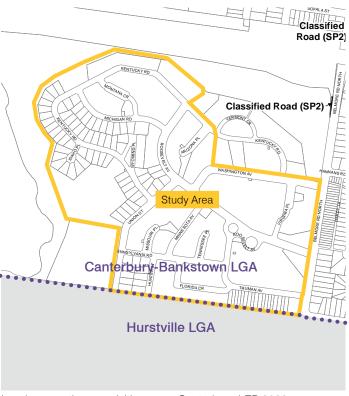
Minimum lot size map, Canterbury LEP 2012 and Hurstville LEP 2012



Flooding map, Canterbury LEP 2012



Acid sulfate soils map, Canterbury LEP 2012 and Hurstville LEP 2012



Land reservation acquisition map, Canterbury LEP 2020

Minimum lot size

A minimum lot size of 460 square metres applies to land zoned R4 High Density Residential and R3 Medium Density Residential within the site.

The area immediately south of the subject site, zoned under Hurstville LEP 2012, has a minimum lot size of 450 square metres, with a small section of 550 square metres adjacent to Riverwood Park.

There is no minimum lot size for land zoned B2 Local Centre under the Hurstville LEP 2012.

Flooding

Part of the subject site is identified within the flood planning area in Canterbury LEP 2012, including Kentucky Park.

Land immediately adjacent to the site, including Salt Pan Creek, Salt Pan Creek Reserve and Karne Street Reserve is also identified in the flood planning area.

Canterbury-Bankstown Council's flood modelling indicates that several properties in the north of the site, adjacent to Karne Street Reserve, are also subject to flooding.

Acid sulfate soils

The majority of the site contains Class 5 acid sulfate soils. A small number of properties in the western portion of the Study Area, along Kentucky Road, have a mix of Class 2 and Class 5 acid sulfate soils.

Development consent is required for these lands unless:

- (a) a preliminary assessment of the proposed works prepared in accordance with the Acid Sulfate Soils Manual indicates that an acid sulfate soils management plan is not required for the works, and
- (b) the preliminary assessment has been provided to the consent authority and the consent authority has confirmed the assessment by notice in writing to the person proposing to carry out the works.

Land reservation acquisition

There is no land identified for acquisition within the site, or in the immediate surrounds of the site.

Heritage

There are no heritage items located within or surrounding the subject site.

There are no listed heritage items under the Hurstville LEP 2012, located in the area immediately south of the subject site.

3.20 Summary of key findings

Constraints

The Study Area is relatively unconstrained for residential development; however, the key constraints affecting the Study Area:

- Existing street pattern is irregular and disconnected, with several cul-de-sac streets and narrow streets making it difficult to navigate around the Study Area
- Pedestrian amenity is poor and several streets lack pedestrian footpaths
- There are limited cycleways, with no dedicated cycle paths within the Study Area
- Traffic congestion at the intersection of Washington Avenue and Belmore Road is an issue at peak times
- The Study Area contains small isolated and underutilised pocket parks and green space within the site and lack of open space in the south-east of the Study Area
- Inactive park edges creates impermeable edge conditions, with limited potential for views and surveillance
- Low density residential housing immediately to the south of the site in Georges River LGA will need an appropriate transition.
- There is potential for Aboriginal cultural sensitivity within 200m of the original course of Salt Pan Creek
- **=** A sewer trunk main traverses the site, limiting development within the easement
- A portion of the Study Area in the north is flood
- Areas of biodiversity constraints through the Study Area
- High value existing mature trees
- Private lots within Study Area

The majority of the site has Class 5 acid sulphate soils



Summary of key findings

Opportunities

The Study Area presents significant opportunities for renewal and redevelopment, including:

The majority of the Study Area is large, unfragmented land holdings, in single ownership which is a rare opportunity to upgrade the current social housing which is not fit for purpose, ageing and has both accessibility and safety issues, within a town centre and in close proximity to the Salt Pan Creek Corridor.

Build on the success of Washington Park

 Priority Green Grid Project, Salt Pan Creek Reserve, is directly adjacent to the site. This presents a significant opportunity to provide better connections, complimentary open spaces, infrastructure and activate the park edge, to enhance the relationship between Salt Pan and the site.

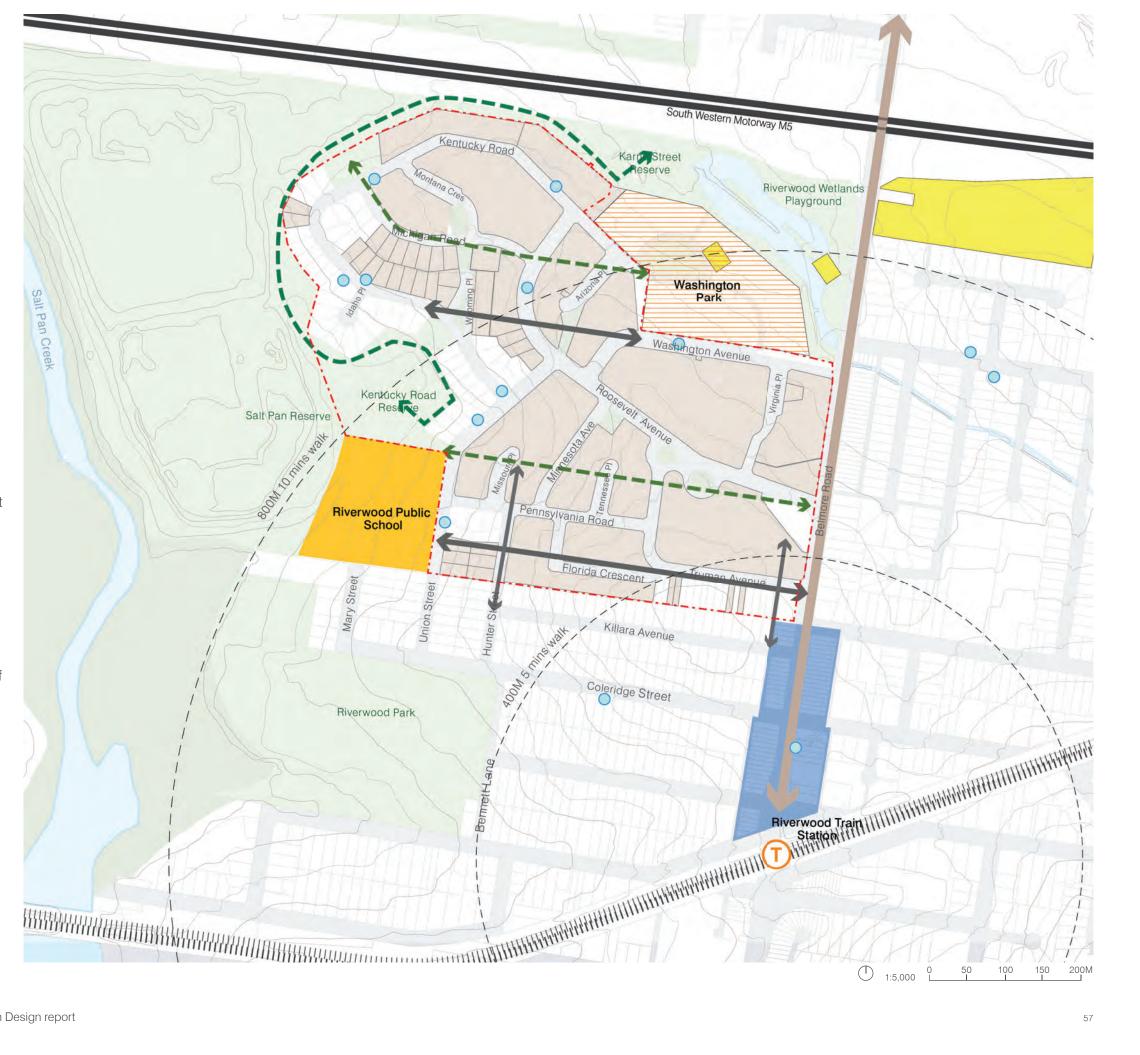
Contours - The site is relatively flat and within easy walking distance to the Riverwood town centre, existing community facilities and train station.

Public transport - The Study Area is well serviced by bus and train. The majority of the site is within 5-15-minute walking distance of the Riverwood train station, with a travel time of 22 minutes to the Sydney CBD.

The Riverwood local centre is located immediately to the south of site. There is an opportunity to extend the retail centre further north along Belmore Road to create an enhanced retail high street experience.

The Riverwood Public School is located adjacent to Study Area. Providing improved connections, and integrating the school in to the stud area, is a key opportunity to connect the school back to the broader community.

Opportunities to connect the Study Area and Salt Pan Creek Reserve back into Riverwood town centre.





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4 Case studies and benchmarks

4.1 Comparable renewal precincts

Residential built form has evolved across Sydney, with the transition to higher densities in suburban areas that benefit from good access to public transport, employment, educational opportunities, and cultural and recreational facilities.

Some comparable growth areas to the Riverwood State Significant Precinct are shown below. It is anticipated that future growth and residential densities within the Study Area will be comparable with these centres.



Source: LFA 2017



- 5,500 dwellings
- 52 hectares
- 18km from the Sydney CBD
- A mix of housing, employment and retail, new parks, a primary school and community centre
- 5.4ha of open space 9% of site area
- Proposed building heights up to 20 storeys
- FSR controls ranging between 1.5:1 to 2.0:1
- Average site FSR 1.5:1
- 176 dwellings per hectare



Source: Payce 2017

Victoria Park, Green Square

- 4,500 dwellings
- 22.4 hectares
- 4km from the Sydney CBD
- Mixed use precinct including residential and retail
- 2.8ha of open space 13% of the site area
- Heights up to 22 storeys
- FSR controls ranging from 1.81:1 to 11.54:1
- Average site FSR 2.5:1
- 294 dwellings per hectare



Source: Bates Smart 2014

North Ryde

- 3,300 dwellings
- 12.5 hectares
- 14km from the Sydney CBD
- A mix of residential and retail with new open space and community facilities
- 2.4ha of open space 19% of the site area
- Heights up to 30 storeys
- FSR ranging from 1.15:1 to 4.3:1
- Average site FSR 2:1
- 235 dwellings per hectare



Source: SJB 2017

Rhodes

- 6,000 dwellings
- 44.5 hectares
- 17km from Sydney CBD
- Mixed use precinct including residential, retail, new foreshore areas and community facilities
- 5.2ha of open space 12% of the site area
- Heights up to 35 storeys
- Average FSR 1.6:1
- 188 dwellings per hectare

4.2 Lessons learned - Washington Park

Washington Park is a testament to 'density done well', building an integrated and resilient community that gives all residents a strong sense of place and belonging



Source: Payce 2017

Washington Park, an urban renewal project in Riverwood North, is a structured relationship via a Project Delivery Agreement between property developer, PAYCE, and NSW Land and Housing Corporation (LAHC).

The 3.5-hectare staged development includes 757 dwellings, comprising 150 social housing dwellings and 607 privately owned dwellings, with a mixture of one, two and three bedroom apartments. Building heights range between 4 and 10 storeys, with a total GFA of 69,470m².

The project has won numerous development and design awards over recent years, and is widely recognised as a model for future development in Sydney. The project has been praised for being more than just a residential development, but rather an inclusive and integrated community development that includes facilities such as a new public plaza, public library, café and retail uses, community hub and senior citizens centre.

Focus on social outcomes and social sustainability

A key factor in the success of Washington Park was early and ongoing community engagement with residents and the local community. There continues to be proactive and ongoing community engagement in Washington Park which is well supported by improved social infrastructure and community programs, including:

- A local youth jobs program through the Kick Start Café
- Riverwood Community Choir
- Riverwood community garden, and
- Regular community events, such as weekly BBQ's, fairs, and multicultural celebrations.

A key part of the redevelopment is improvements at Riverwood Public School, including programs and initiatives such as the school garden and 'open air cinema' fundraising event. These programs have helped to build capacity, increase enrolments, and support the local school community as part of the redevelopment of Washington Park.

Creating places for people

The design of the public domain was critical to the success of Washington Park. The creation of the garden square which includes a library, senior citizens centre and cafe in centre of Washington Park creates a high quality space to be shared by all residents. The redevelopment of Washington Park has focussed on high quality and carefully designed landscaping, streetscapes and public open spaces that connects with the surrounding public parklands and key community infrastructure, such as the Community Centre on Belmore Road.

Lessons learned - Washington Park

Focus on high quality open space and public domain

The built form in Washington Park responded to the design of the open space and public domain. The open space and public domain elements were designed first which subsequently informed the location of buildings. The local street network was also designed to lead to open space. This has improved permeability and legibility, and ensures open space and public domain areas are the focal point of Washington Park.

Integrated and high quality building design

A key component of Washington Park is the high quality and integrated building design, providing a consistent quality between social and private buildings. All residential apartments have been designed and built to a high quality and were designed to complement and integrate with the design of the social housing apartments. This ensures the social housing dwellings, which were the first to be designed and constructed, are indistinguishable from privately owned dwellings. This has created a cohesive and integrated built form approach between social and private buildings in Washington Park.

Retaining significant street trees

The retention of significant trees was an important design consideration in Washington Park. In Riverwood the existing eucalypti trees provide a sense of place and are an important element of the local character. Retaining the significant trees ensured this unique environmental character was incorporated into the new development, It has minimised visual impacts, created improved streetscape and public domain outcomes and ensures Washington Park integrates with the broader landscape character of Riverwood.



Garden Square will become the focal point for the community. Source: Payce 2017

4.3 Best practice case studies

A case study analysis of international best practice mixed tenure housing projects, has identified a number of lessons learned relevant to Riverwood. This section presents the findings of Architectus' case study analysis and a set of benchmarks which have informed the urban design framework and design principles for Riverwood.



Source: Dertien 2012



Location: Freiburg, Germany Size: 41 ha

Vauban is one of the most successful integrated social and co-housing models, which delivered 2,000 low-energy homes in the foothills of the Black Forest in Frieburg, south-west Germany. Key principles of the Vauban master plan include:

- Accessible by private car from the east, but parking is not permitted on U shaped streets, known as 'play streets'. In absence of parked cars these roads are used as social space, especially by children, many of whom can be seen playing unattended.
- Several large green spaces separate the residential apartment blocks which provide recreation areas for residents and also contribute to urban cooling.
- Green walking trails are found along the southern boundary of the site, providing yet another draw for families and minimise the need to travel out of the district in search for pleasant recreation areas.
- The neighbourhood consists of green, landscaped pedestrian streets which connect to surrounding open space
- Retail and non-residential uses are all located on the main spine of the development.
- A public square is provided in the centre of the neighbourhood, which is used for a weekly farmers market and community events.



Source: Divisare 2017

Kidbrooke, Berkley

Location: London, United Kingdom Size: 30 ha

Kidbrooke is a regeneration project that will renew the former Ferrier Estate and deliver up to 4,800 new mixed tenure homes, supported by quality open space, community facilities and social infrastructure. Key design principles of the Kidbrooke master plan include:

- Highest density area of the master plan is the "hub" which provides a focal point for the community and complimentary commercial spaces with access to the train station.
- Medium density areas are positioned adjacent to the railway, fronting the existing park and in transition zones between the low density perimeters and the high density areas towards the heart of the site.
- Areas of lower density are positioned directly adjacent to existing neighbourhoods as a response to the scale of these communities.
- The green river provides the community with an amenity focus.
- Green fingers' extend the park into the residential areas, providing landscaped pedestrian access through the site.
- Clear permeability that integrates the renewal area and strengthens connections to the wider community.



Source: Hawkins Brown Architects 2017

Agar Grove, Camden

Location: London, United Kingdom Size: 25,600 square metres

Agar Grove is the largest of Camden Council's community investment projects in London, which will deliver up to 500 affordable homes for new and existing social housing residents. Key principles of the scheme include:

- A coherent network of streets and squares that stitch the neighbourhood back into the local context.
- Focus on opening up buildings onto the street and providing liveable spaces between streets that allow people to move across, through and within the site
- Generous sized apartments that provide balconies or external rooms, recessed into the buildings to provide shelter and privacy.
- Maisonettes are provided at ground level, which lift bedrooms above the street, activating the public realm with front doors and passive surveillance from kitchen windows.



Source: Lendlease 2016

Trafalgar Place, London

Location: London, United Kingdom Size: 11.3 hectares

Trafalgar Place is a development of 235 homes that forms the first part of the Heygate Estate at Elephant and Castle by developer Lend Lease in partnership with Southwark Council in London. Key principles of the scheme include:

- The massing and height of the buildings provides the required density with a variety of scale and form - a mixture of mini-tower, apartment buildings and terraced houses.
- Each apartment has been designed from the 'inside out', maximising light and space, and all have either a garden, balcony or roof terrace.
- The forms are simple, prioritising interior space and spaces between buildings. Apartments are mainly dual aspect and designed to maximise natural daylight, ventilation and views.
- Public spaces are improved with new thoroughfares and an attractive new central square, which serves as a central community space and covers a subterranean car park beneath.
- A new public thoroughfare extends through the centre of the scheme while a private internal courtyard contains seating and steel planters in which residents can grow food.

4.4 Lessons learned for Riverwood



Provide housing that is equitable, inclusive and diverse, that facilitates improved social outcomes in a mixed community with new affordable and private housing.



The Riverwood master plan should provide a mix of housing types for families including maisonette/terrace apartments with front gardens to accommodate for family households with children, as well as older people with a love for gardening.



Provide better walking and cycling connections throughout the Study Area that connect to key attractions including Salt Pan Creek Reserve, existing and new local parks, Riverwood Public school, Riverwood Community Centre and the Riverwood Town Centre



Deliver a clear street hierarchy that allows for wide streets and landscaping. A street planting strategy should be incorporated to support movement hierarchy and legibility.



Retail and non-residential uses should be considered within the Study Area, as an augmentation of the existing retail and commercial uses provided along Belmore Road and in the Riverwood Town Centre.



Prioritise connections, views over rooftop terraces and communal gardens and views to open space.

4.5 Benchmarks for Riverwood



Front doors 50% of ground floor frontage must be residential entries with a front garden

Ground floor maisonette apartments at the ground level of all buildings, wherever possible will create vibrant, safe and attractive residential streets, with a diversity of housing and family-friendly housing options. To achieve this, at least 50% of all ground floor frontages must be ground floor maisonette apartments with direct residential access to the street.



Tree canopy

Existing and new trees to create tree canopy cover for 30% of the site

The Study Area has an existing tree canopy cover of 26% which is significantly higher than the Sydney average at 15%.

The renewal of the Riverwood Estate will set a new benchmark for suburban renewal projects, providing a tree canopy of 30% across the Study Area.



Park access

Dwellings linked to parks by crossing no more than one road

Tree canopy cover of 26% which is significantly higher than the Sydney average at 15%.

The renewal of the Riverwood Estate will set a new benchmark for suburban renewal projects, providing a tree canopy of 30% across the Study Area.

The renewal of the Study Area will deliver a neighbourhood where children can play.

To achieve this the master plan will maximise the number of dwellings that front parks, and the structure of the site must allow access to parks without the need to cross more than one street.



Walk score

Improve the walkability of Riverwood to achieve a walk score of 85/100

Riverwood currently has a walk score of 73/100 meaning it is already very walkable.

The renewal of the Study Area will deliver a high quality mixed use development, with all services and facilities within a 20-minute walkable neighbourhood.

Through the renewal of the Study Area, Riverwood will increase its walkability, becoming more walkable than Bondi, with a walk score of 85/100.



Public transport

40% of all journeys to work by public transport or active transport modes

Over 35% of residents in the Riverwood suburb use public transport or walk to work. The renewal of the Study Area will promote public transport use, with a high quality public domain, direct and legible streets and new local shops and points of interest, to create an attractive and safe walking environment.

The renewal of the Study Area will build on the existing high public transport use in Riverwood, and will target a benchmark of 40% of work trips to be by public or active transport modes.



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5 Urban design framework



5.2 Project objectives

Objective 1: To deliver the sustainable renewal of the Riverwood Estate, transforming it into a more safe, attractive, and connected neighbourhood with a strong connection to its past.

A place that builds on its history, where residents can enjoy the memories of the past – while creating a high-quality neighbourhood that will facilitate new shared experiences and memories.

We want to create neighbourhoods with distinct character and a feeling that the site has evolved over time. The structure of the site should allow the site to adapt and evolve well into the future.

We will preserve a memory of the site's past through retaining key streets, protecting as many significant trees as we can, and opening views and connections to Salt Pan Creek Reserve at every opportunity.



Source: Taylor Cullity Lethlean



Source: Payce

Objective 2: To increase housing supply, diversity, and affordability in a mixed tenure development that meets the needs of current and future residents.

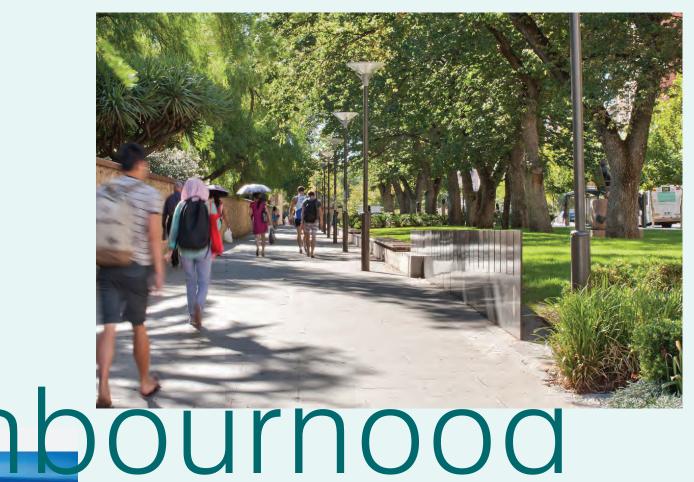
Develop new homes that will better meet the needs of existing social housing residents. We will maximise the site's development potential, ensuring that new housing meets the needs of the tenants with a focus on increased amenity in both the public realm and internally.

The planning proposal will include social housing as part a mixed-tenure development where the social housing dwellings will be indistinguishable from the private dwellings in the new development, with the facilities provided across the site being available to all residents Creating a walkable neighbourhood.

Objective 3: To integrate development with the natural environment, surrounding neighbourhood and Riverwood centre.

A catalyst for the Salt Pan Creek 'Green Grid Corridor' project – Riverwood as a place of regional recreational opportunity. We want to create a place that responds to its location adjacent to Salt Pan Creek, where residents can connect with, and enjoy regional green space on their doorstep. The renewal of the Riverwood Estate will complement the master plan for the Salt Pan Creek Reserve and provide an opportunity for the reserve to integrate and connect with the wider community. The dwellings adjacent to the park will be redeveloped to activate the park edge. The renewal will also provide key pedestrian and vehicular access to the Salt Pan Creek Reserve.

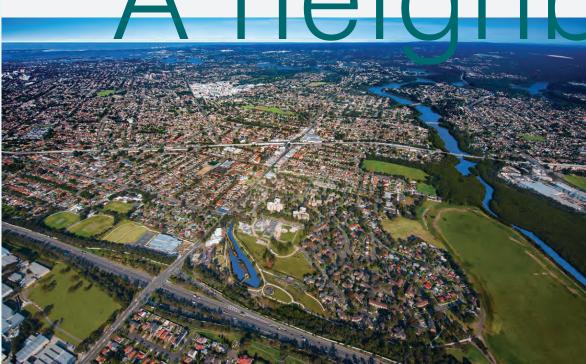
Residents will benefit from improved access to a thriving local town centre within walking distance of their homes.



Objective 4: To provide a high-quality public domain where it is enjoyable to move around the precinct, play and relax.

We want to deliver a master plan that maximises the number of daily trips made by foot and by bike, through the design of walkable streets. A safe, active, and vibrant community where residents have access to parks, laneways, and green streets that foster neighbourhood interaction and create spaces for play.

We will use the structure of the street network and careful traffic planning to maximise the number of dwellings that front on to parks, or that can be accessed without crossing a busy road. The walk to school should be an important and fun part of the day.



Objective 5: To provide welcoming community spaces and facilities that support people to connect with others.

Our vision is that new residents living in the Riverwood Estate will support local retail on Belmore Road because the pedestrian connections make it easy and pleasant to get to. Retail uses, restaurants and facilities within the existing centre and the site will complement each other and thrive. Great new streets through the site will reconnect the centre to the school and Salt Pan Creek Reserve.

Source: Architectus 2017



Source: Taylor Cullity Lethlean

Objective 6: To achieve high environmental performance that addresses the effects of climate change and urban heat through management of water in the landscape, tree retention and planting, and sustainable buildings.

We envisage a neighbourhood that includes sustainability features in both buildings and the public domain. Open spaces and streets will benefit from generous tree canopy, with water managed in the landscape to mitigate against the effects of climate change and urban heat.

5.3 Guiding principles

The following guiding principles have been established to set clear direction regarding a future urban renewal outcome for the Riverwood Estate.

The guiding principles have been informed by the key findings and are the actions required to meet the objectives of the master plan. The guiding principles have informed the draft development control plan (DCP).



Design active, living streets – places for all ages to interact

- Maisonette apartments, front doors and front gardens fronting streets, where ever possible.
- 6-8 storey street wall heights that create a pedestrian scale and allow sunlight to streets.
- Towers located so as not to overshadow open spaces.
- Community and retail uses to activate streets and parks



Create neighbourhoods with distinct character

Roosevelt Precinct.

- A high-density neighbourhood with wide streets, a large new park and taller buildings
- Apartments that directly interface streets with multiple front doors to create a fine grain density approach to each street block
- Taller buildings maximise views, allowing for lower street wall heights and providing landmarks for the park and entry to the site closest to the station.

Garden Apartment precinct

- A lower scale precinct with a focus on communal gardening spaces and interaction with the street.
- Orientation, location and design of buildings maximises views to Salt Pan Creek.
- Each building has a raised communal open space that fronts the street.
- Lower heights allow for narrower lane instead of wide streets, providing more opportunities for gardening and interaction.



Create a legible permeable neighbourhood that is a joy to walk through

- Roosevelt Avenue re-designed as a grand 30m boulevard.
- Wide streets connecting Belmore Road directly to the school and park.
- Direct sight lines to the new local park from Belmore Road encourage its use to the wider community while helping to orientate pedestrians.
- New, highly permeable street block pattern – typical blocks are 80m x 100m.
- 30% tree canopy target to provide shade



Maximise views and skyview

- Taller building footprints to not exceed 750 square metre gross floor area.
- The slender side of towers should be in the direction of the park.
- The edges of the site have been designed to sit below the tree line.
- From key regional views, towers are slim and well-spaced.



Provide a hierarchy of gardens, parks and outdoor spaces

- Roosevelt Park a new local park for all of Riverwood.
- Community Greenway an active linear open space that connects the school to Belmore Road.
- Maximise the number of dwellings with uninterrupted pedestrian access to a park.
- Multiple pocket parks adjoining Salt Pan Creek Reserve allow for views to the park and community gardening activities.
- Activate Salt Pan Creek
 Reserve and provide car,
 cycle and pedestrian access
 to the park.



Provide a high level of residential amenity

- All buildings comply with SEPP 65 solar access and communal open space standards.
- All buildings to comply with the Apartment Design Guide building separation standards.



Implement a height strategy that responds to its context

- To locate density within walking distance of Riverwood train station
- Towers located and orientated so not overshadow the park
- Minimise any impacts on adjoining neighbourhoods with a sensitive height transition of 3 storeys, to existing single dwellings to the south.
- Provide master plan provisions that optimises potential uplift for privately owned lots.



Optimising the sites potential through the provision of market housing and the renewal of the existing social dwellings

- To renew the existing aged social housing dwellings.
- Optimising the site's potential to a point where:
 - The heights in the master plan are supportable from a strategic planning perspective, when looking at the centre in its context.
 - The development will result in great internal amenity.
 - The public domain provided is of the highest quality and suitable for a large increase in population.
- A master plan that represents an equitable outcome for all landowners and agencies.



Maximises opportunities to access amenity along the Salt Pan Creek Green grid

- To provide and improve pedestrian, cycle and vehicular access to the Salt Pan Creek Reserve.
- Increase opportunity to access amenity along the Salt Pan Creek blue grid.
- Maximise views from public domain, rooftop gardens and apartments across the green grid corridor



Protect and enhance the memory of the site and uses

- Learn the meaning of first placenames in the area to better understand the historical character and purpose of the site.
- Allow Country to tell us who she is through placenaming and naming of the parks or streets within the master plan.
- Retention of key streets.
- Retention of as many significant trees as possible.
- Retain provision for community uses across the Estate.



Prioritise retention of high value trees across the site

- Retention of existing road patterns, deep soil locations and the sitting and design of buildings to maximise significant tree retention and achieve the 30% canopy target
- Minimum 50% retention of high value trees.



The location of the Study Area is on country described as belonging to the Bidgigal / Bediagal / Bideegal people of the Dharug nation.

Bediagal country possibly ranged as far as Castle Hill.

In contrast to the fishing and canoe-centred based culture common among First Nation's people located around the bays and ocean at Sydney, Bediagal people were described to Governor Phillip by other First Nation's people as 'climbers of trees' and 'men who lived by hunting'. This does not imply that the Bediagal did not utilise riverine resources such as at Salt Pan Creek. Rather, that their dry land activities differentiated them from the groups who lived in the sandy country around the bays and ocean shore. This differentiation of the Bediagal based on the landform of their country was also reflected in their material culture, their traditions and language, their dances, their songs and their dialects.

The Bediagal occupied land away from the sea, along rivers and creeks, which ranged between the Georges River in the south and Parramatta in the north. The Georges River is located 4km to the south of the Study Area and formed a boundary between First Nation's language groups to the south and north. The lands around the river likely comprised an area of heightened First Nation's inter-group contact

Geology

The predominant geology of the Study Area is Wianamatta Group Shales with the eastern extremity of Riverwood Estate situated on silty to peaty quartz sand, silt and clay with frequent layers of shell, deposited by the Salt Pan Creek. The wider surrounds of the Riverwood Estate contain isolated areas of carbonaceous claystone, and fine to medium grained sandstone which forms the outcroppings locally utilised as shelters, grinding stones and as surfaces for art.

Vegetation

The vegetation form that is native to this area is Turpentine-Ironbark Forest. The open ground was often covered in herbs, wildflowers and flowering shrubs, and a variety of creepers grew over trees and branches. This rich vegetative form in the area of Riverwood Estate was complimented by the estuarine and mangrove vegetative species associated with the Salt Pan Creek that flowed nearby. This abundant and varied environment provided materials and vegetative food sources for First Nation's people, and also provided a habitat for a wide variety of animals of prey.

Salt Pan Creek

Salt Pan Creek was associated with the Bediagal group of the Dharug First Nation's People on Sydney's Georges River. River side areas in the Sydney region, such as Salt Pan Creek, have been noted as preferentially occupied by First Nation's people and have been historically recorded as used for purposes including yam cultivation.

The Bediagal people were served by the freshwater and estuarine resources of the Salt Pan Creek, the local widely-varied woodlands botany and its faunal species. Ethnohistorical accounts indicate that the Study Area would have constituted an attractive area for camping by First Nation's people in the past.

The current course of the Salt Pan Creek appears to have been considerably modified through the substantial filling along its eastern banks, and Salt Pan Creek once flowed far closer to the location of Riverwood Estate than it currently does. In this part of

Salt Pan Creek is seen within Salt Pan Creek Reserve.

The Salt Pan Creek Green Grid Corridor links
Bankstown to the Georges River and has been
identified as a priority project as part of the
Government Architect NSW Green Grid Strategy. Salt
Pan Creek Reserve, to the west of Riverwood, is a
significant portion of this green corridor containing
important ecological communities, mangroves,
wetlands, recreational facilities and walking and
cycling trails on both sides of the creek.

In February 2019, The City of Canterbury Bankstown adopted a master plan for Salt Pan Creek Reserve, Whitmarsh Reserve and Mclaughlin Fields. The master plan will provide for a destination parkland providing for multiple recreational uses that engage a broad cross section of community, and that celebrates the location, history and setting of Salt Pan Creek.

Connecting town centres such as Riverwood is a key part of delivering Sydney's overall green grid and the Study Area is located adjacent to Salt Pan Creek and provides a significant opportunity to contribute to the development and use of the future master plan.

The master plan will:

- Further activate and facilitate access;
- Promote passive and active recreation opportunities within Salt Pan Creek Reserve; and
- Improve connections and access across the Study Area to the wider Riverwood community to areas of open space that will provide recreational, social and cultural spaces for the community.

Engagement with local First Nations community

An Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Estate has been produced by Artefact and First Nations community consultation has been conducted in accordance with the Consultation Requirements. The consultation undertaken for this study is statutory in nature. It is understood that additional engagement and consultation would be undertaken during design and implementation phases with a focus on an oral history approach resulting in a far richer understanding of local Aboriginal history.

A total of 12 stakeholder groups had registered their interest in the consultation process, including one group which requested that its details not be disclosed publicly (not listed below). These groups were:

- A1 Indigenous Services
- Butucarbin Aboriginal Corporation
- Clive Freeman
- Didge Ngunawal Clan
- Gulaga
- Kamilaroi Yankuntjatjara Working Group
- Metropolitan Local Aboriginal Land Council
- Murra Bidgee Mullangari Aboriginal Corporation
- Ngambaa Cultural Connections
- Wori Wooilywa
- Wurrumay Pty Ltd

First Nations stakeholders were consulted on two occasions:

- A copy of the proposed ACHAR methodology was distributed to Aboriginal stakeholders on 26 April 2021:
- The Draft ACHAR was distributed to Registered Aboriginal Parties on 25 May 2021.

Further detail including responses, key findings and recommendations as well as a consultation log which details all correspondence with the registered Aboriginal parties for the project can be found within Attachment L Aboriginal Heritage Assessment of the planning proposal.

Potential pathways for connecting

The NSW Government Architect's *Connecting with Country draft framework* (December 2020) offers 4 potential pathways to connect with country and help develop cultural awareness. These pathways help projects to align with First Nation's values.

Pathway 1: Learning from first languages and placenames

This pathway acts as a form of cultural expression through language. It is important to recognise cultural expression can take many forms including performance, ceremony, collection and preparation of food, song, dance, art, clothing, and tools" (2020b: p21.).

Opportunities:

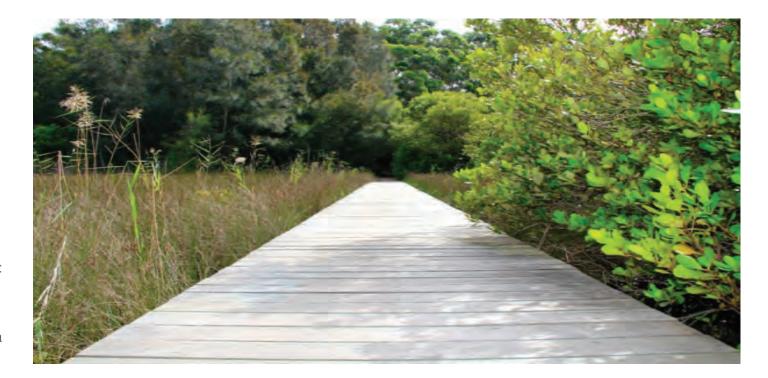
- Learn the meaning of first placenames in the area to better understand the historical character and purpose of the site.
- Share, communicate and celebrate language through including first placenames throughout the master plan
- Allow Country to tell us who she is through placenaming and naming of the parks or streets within the master plan.

Pathway 2: Develop mutually beneficial relationships with Country

A relationship with country is developed through making decisions that address the needs of Country as well as benefiting the people upon it. This relationship will be developed through walking country and gaining insights from local knowledge holders and may include:

Opportunities:

- Expressions of water in the way it moves through the site and is cleaned before returning to Salt Pan Creek
- Use of endemic plant material of significance to local Dharug First Nation People
- A natural soil profile, derived from local parent geology, unobstructed by structures and services and connected to the local groundwater to optimise growth and aid the ongoing flourishing of the tree.



- Protecting/providing healthy habitat for native fauna
- Contributing to the development of Salt Pan Creek
- To retain significant tree canopy where possible and where replacement is required to consider intergenerational equity where the number of trees planted replace removed canopy in a generation.

Pathway 3: Reawakening memories of cultural landscapes

To learn from country through walking country with First Nation's knowledge holders and being guided as to appropriate:

Opportunities:

- Application of cultural practices to assist deep understanding of country
- Memories to be shared in both tangible and intangible means

Pathway 4: Finding common ground

Knowledge sharing and providing opportunities to combine First Nation's ways of knowing and eco systemic thinking with western scientific knowledge.

Opportunities:

- Knowledge sharing through inviting First Nation's people to co-design and co-manage projects like community gardens and community spaces
- Recognising the importance of First Nation's peoples retained authorship and control of their shared knowledge

LAHC acknowledges we all stand on Aboriginal land and is committed to implementing the principles outlined in the draft framework, to demonstrate an ongoing commitment to planning and creating places that respect Aboriginal cultural heritage and respond to the contemporary social, cultural and economic needs of Aboriginal people.

As the development of the master plan predates the release of the guidelines, Connecting with Country requirements will be met in future stages of the project.

The draft DCP details objectives and provisions to ensure development acknowledges and embeds Country.

Options and ideas tested

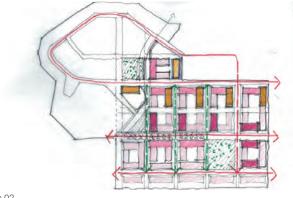
The site constraints and staging issues were too complex to develop wholesale options for the site, as might be the approach for some projects. Instead, individual options were worked through and tested over many months, in consultation with the community and the team's specialist consultants. The outcome is a robust and tested master plan that is a solid foundation for new controls for the site.

Ideas tested through the design and consultation process are listed below:

- 1. Street layout options
- 2. Strategy for new open space
- 3. Location of a new Local Park
- 4. Retail strategy
- 5. Retention of Kentucky Road
- 6. Building heights on The Community Greenway
- 7. Interface with low density areas to the south (Killara Avenue)
- 8. Private lots facing Salt Pan Creek Reserve
- Built form strategy for the Garden Apartment precinct
- 10. Retention of the sewer
- 11. Buildings height options







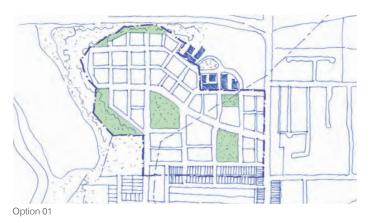
Option 02

1. Street layout options

- Two fundamental street networks were tested for the site, as shown below.
- Option 01 retains Roosevelt Avenue as an organising spine for the site, and allows for the retention of large trees in this street. Other benefits of this option include staging, improved connections between the station and the Garden Apartment Precinct and the protection of this historical alignment which dates back to the use of the site as a Naval Hospital.
- The weaknesses of Option 1 are the efficiency of street blocks and the impact on development yield.
 It also results in a complicated intersection where Roosevelt Avenue intersects with the new grid network at Washington Avenue.

- Option 1 also presents the best option from a traffic perspective, reducing pressure on the intersection of Belmore Road and Washington Avenue.
- Option 2 presents a comprehensive new street network that priorities legibility and connectivity over staging benefits and preserving the memory of the site's use and the significant trees. The resulting lot pattern is efficient and has the potential to result in greater yield.
- There was a strong preference for the retention of Roosevelt Avenue and Option 1 from the community, landscape architects, designers, planners, traffic engineers, Council and the Department of Planning and Environment.

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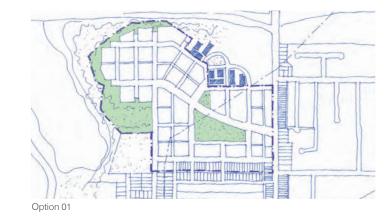


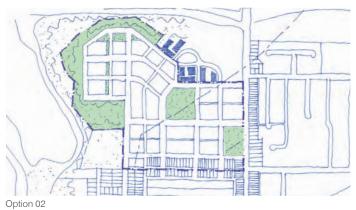




- The master plan sought to provide above 15% of the site as public open space (this figure, derived through the benchmarking of comparable renewal precincts, includes the existing parks in the Study Area).
- Different open space configurations were tested and discussed with the community.
- The existing small and unused pocket parks within the Study Area were not valued by the community.
- Feedback from local residents was to amalgamate and embellish existing open spaces to provide a variety of different experiences and uses such as BBQ facilities, playground equipment, and seating.
- The large park allows for possible active recreation uses, such as basketball courts, which are required to support the future population.

- Option 1 (preferred) sought to provide a large, 1
 hectare open space in the south-east corner of the
 site. This park provides valuable open space in the
 town centre, in a location where it would be enjoyed
 by a large catchment of residents, visitors and
 businesses.
- Option 2 provides more parks, and increases the number of dwellings looking over open space. The key benefit to this approach was the opportunity to build distinct neighbourhoods within the precinct, with local amenity and character.
- Option 1 was seen as the best outcome, primarily because it served a wider open space need for the Riverwood community. The new park (Roosevelt Park) will be a great focus for the community, and accommodate active and passive recreation, festival's and events.





3. Location of a new Local Park

- Following the decision to provide a large local park in the south-west corner of the Riverwood Estate, Architectus considered the opportunity to locate the open space on Belmore Road (Option 02) where it could be easily accessed by more people from outside of the master plan area, and potentially have a stronger relationship with the town centre.
- Issues with this option included exposure to the traffic noise from Belmore Road, and lost opportunity to provide activation of that side of the park – where the edge was effectively single dwellings on the eastern side of Belmore Road. It also meant that there were no retail and commercial uses on Belmore Road, to effectively extend the existing shopping strip.

 Option 1, which prioritises the amenity of the park, is the preferred option for Roosevelt Park.

4. Retail Strategy

- SGS Economics and Planning studied the existing retail market and provided projected retail demand generated by the proposed new population. The initial retail report suggested that the planned population would generate demand for retail services equal to existing retail floor space in Narwee and Riverwood.
- In summary, their findings were that some additional retail space would be required to support the future population, and that the renewal of the Riverwood Estate would also see the reinvigoration of the Riverwood Town Centre shops. This is a great outcome for the existing town centre.
- The team tested two options for the provisions of retail uses on the site – the creation of a new town centre within the Riverwood Estate, or designing the site as an extension of the existing town centre.
- It was decided that one of the best opportunities arising from this renewal project would be the revitalisation of the town centre, and that any retail on site should complement the primary function of the existing retail area adjoining the station.

- Sites fronting Belmore Road should be designed as a continuation of the existing retail and commercial local centre along Belmore Road, with retail and commercial uses at ground floor. These uses will allow for small-scale retail opportunities to meet the day to day needs of local residents, including grocery store/supermarket, post office, chemist, cafés and restaurants, which would help minimise trips to other retail centres, and encourage walking and cycling within the area.
- Retail and commercial uses are also situated opposite the new Roosevelt Park including cafés and restaurants that will activate the park and provide opportunities for outdoor dining overlooking
- It may be that a supermarket is required in the future, and providing one within the site may be appropriate. The proposed master plan provides the opportunity to accommodate a supermarket in the basement of the street block north of Roosevelt Avenue and adjoining Belmore Road. This is a great location from a loading and servicing perspective, would not impact the quality of the public domain and creates a 'bookend' for the Belmore Road high street.





Option 01

5. Maximise tree retention

- Option 1 presented a street network that prioritised legibility and a efficient lot pattern which had the potential to achieve a greater yield but left little room for tree retention.
- Option 2 while a less efficient lot pattern retained the majority of the existing street network allowing for the potential retention of high value street trees and canopy.
- The widening of existing roads to increase amenity and traffic movement also presented an opportunity for trees that were once in the private realm to be brought into the public domain.
- The potential to retain a higher % of the existing mature tree canopy was favoured over the potential higher for higher development yield for a number of reasons.
 - The already green nature of the site and the importance of retaining that character
 - Maximising shade for reduction in urban heat island effect
 - Create a street environment which prioritised pedestrian comfort and movement across the Study Area

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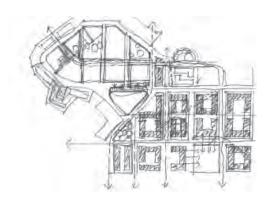




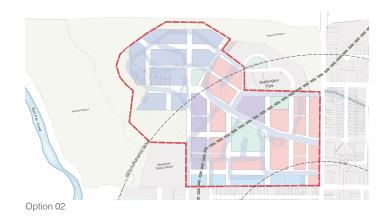
- Earlier options explored the provision of a terrace typology on The Community Greenway. The idea was to create a low scale, sunny, activated linear open space.
- As the concept for The Community Greenway evolved, it became evident that it was going to be a great place, and that maybe more units should have the opportunity to have an interface with The Community Greenway. This is consistent with the principle to maximise private outlook to parks and trees
- In response, the master plan is now showing predominately 4 storey buildings adjoining The Community Greenway. This has been carefully tested to allow solar access to parts of the street

right throughout winter.

- The master plan also provides for maisonette style apartments at the ground levels of the apartment buildings, which will have the same effect on the quality and activation of The Community Greenway as the earlier terraces.
- On reflection, the taller buildings here may also have the effect of ensuring that The Community Greenway has a truly public character, and does not feel semi-privatised by terraces opening on to the street.



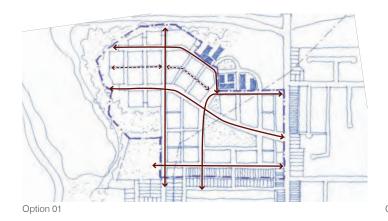


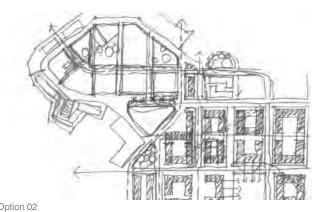


7. Retention of Kentucky Road

- Several street and layout options have been tested for the Garden Apartment precinct. The key, and sometimes competing objectives include the need to activate the park, staging, and maximising efficiency and densities.
- Option 02 tested an alternative street pattern that provided deeper development parcels adjoining the park, resulting in higher yields and improved efficiency.
- The weaknesses of this option were:
- The deep blocks resulted in raised basement / ground levels adjoining the park (such as those in Washington Park) which affects the quality and activation of the park edge.

- The deep blocks also affected the sense of connection to the park, and views into the park.
 This is inconsistent with the idea of 'bringing the green' into the site.
- Staging and ensuring equitable development for privately owned lots.
- The need to remove additional street trees.
- It was considered that the retention of Kentucky Road in Option 01 presented the best planning and design outcomes.



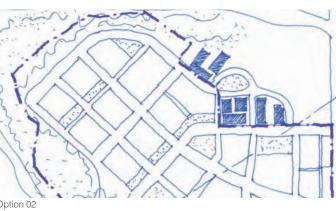


8. Private Lots on Salt Pan Creek Reserve

- One of the key opportunities presented by the renewal of the Riverwood Estate is the activation of Salt Pan Creek Reserve and the provision of new, quality development fronting the park. Currently, the predominant edge condition is the back fences of single dwellings, which does not active the park edge, or provide surveillance over the park.
- In Option 01, the fragmented land ownership pattern on the western edge of the site was ignored. The scheme maximised activation of the park, provided new sight lines, and reconfigured the existing open space to make the shape of the park more regular.
- While this option presented a good design outcome, consultation with Council confirmed that reconfiguring or reducing the area of the existing open space was not preferred and would not be consistent with Council's master planning work for Salt Pan Creek Reserve.

- Additionally, testing with the team's economic and feasibility consultants revealed that the yield proposed (only 4 storeys because of the proximity to the park) would not support a viable development outcome if all lots were to be acquired to deliver the proposed built form and open space configuration.
- Option 2, the preferred option, shows a 2-3 lot amalgamation for the park edge properties.
 This is considered achievable and feasible, and allows future redevelopment of private lots that can be delivered independently, consistent with the master plan.
- The preferred approach also has the benefits of resulting in a finer grain built form and provides opportunity for multiple developers and development diversity. Apartments will be required to activate the park with multiple entries, front gardens and balconies overlooking the park, while breaks between buildings and pocket parks ensure the park edge is permeable and clearly visible from within the site.

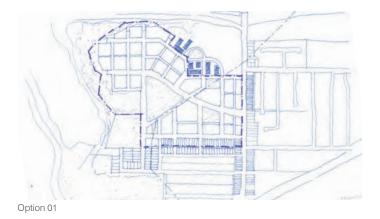




9. Built form strategy for the Garden Apartment Precinct

- The master plan tested several built form options for the north-west 'Garden Apartment precinct', with the aim to create a distinct neighbourhood that responded to Salt Pan Creek Reserve and promoted a parkland character.
- Initially, Option 02 tested a new street network in which the block layout was orientated on an off-north axis. This resulted in a block layout that created poor solar access and the regular grid-like street structure that did not support a built form strategy that responded to local context and street. This option did not create a unique precinct that focused on the surrounding parkland, and was considered likely to create a consistent built form across the whole Study Area.
- The existing ownership and lot configuration at the edge of the Study Area also required a response that would allow for future amalgamation and redevelopment of private lots, while creating an active park edge and built form that responds to, and provides surveillance over Salt Pan Creek Reserve.
- Option 01, The Garden Apartments tested a more efficient, lower scale built form focussed around communal open space and views over parkland. This option created a unique building typology that responded to its setting, creating a distinct neighbourhood and diversity across the site.

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10. Retention of Sewer

One of the key constraints is the existing sewer line that runs diagonally through the site. The sewer cannot be built over, and in its current location, presents a challenge for the redevelopment of the site.

- Mott MacDonald have prepared a servicing strategy for the site which includes a proposal to partially relocate the sewer line. The proposal is to relocate the sewer out of development blocks and into the road reserve.
- To consider the full implications of the sewer line,
 Option 01 tested a layout that could be built around the existing sewer line. These options resulted in very inefficient and irregular building blocks, and created large areas of essentially undevelopable land, in locations that were not best suited for public open space.

The preferred Option 02, developed in collaboration with the Mott MacDonald and the project team, provides a design-led approach that will require partial relocation of the sewer line, but delivers a master plan that can be appropriately staged to deliver a high quality public domain, new parks and increased densities in the most suitable locations.

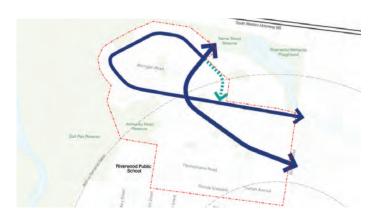




11. Interface with low density areas to the south (Killara Avenue)

- Previously, the master plan showed 4-6 storey residential apartment buildings, on the southern boundary, where the site has an interface with existing single storey dwellings (Option 01)
- This was informed by the potential for the lots to the south being likely to be redeveloped.
- Following feedback from community, government bodies and stakeholders the interface has been reduced to a 3 storey terrace typology (Option 02)
- The 3 storeys is an appropriate transition to existing 1 & 2 storey dwellings to the south for the following reasons:
- 1. Minimises visual impact
- 2. Minimises overlooking
- 3. Minimises overshadowing
- Rear laneway access where possible provides opportunity for increased on street parking and tree planting

5.6 Key design moves



Retain Roosevelt Avenue and complete the Kentucky Road loop

Roosevelt Avenue is historically significant as it was established as part of the initial settlement of the site and will be retained to keep existing trees and memory of the place.

Upgrade Roosevelt Avenue to make it the primary entry point into the precinct to minimise the traffic impacts currently experienced at the intersection of Belmore and Washington Avenue.



Re-connect Riverwood Public School back to the broader community

A new east-west road across the southern end of the precinct will connect the Riverwood Public School back to Belmore Road and the local neighbourhood. The new street will provide a direct connection to the school in anticipation of its future growth.



Create a legible street grid

Retain as much of the existing street network as possible while creating a new street hierarchy that improves walkability and a variety of streets that enhance local character, pedestrian interest and amenity.

Servicing and loading to be carefully considered to ensure streets are places for people –basement car entrances to be excluded from primary streets.



Create a permeable edge to Salt Pan Creek Reserve

Maximise permeability of the park edge to provide better connections, and clear views to open space.



Create a hierarchy of new open local parks and playgrounds within neighbourhoods to complement existing green open spaces

Develop a clear and legible hierarchy of open spaces that define neighbourhood character.

Each local neighbourhood to be focused around open space and spaces for community interaction.

Focus non residential uses around open space.

Maximise views to open space from both, the public and private domain, to encourage active use,

community interaction and a sense of ownership.



Create a pedestrianised Linear Park

A pedestrian promenade that will create a direct visual and accessible corridor from Belmore Road. This green link will connect local residents with the existing Primary School, The Salt Pan Creek Reserve Green Grid corridor and new local open spaces. Provide a common space for children to meet and play with other children in the neighbourhood. The linear park will also provide small lawn areas, planted pods and seated gathering pods for people of all ages to meet and chat.



Create active transport links to open space and green streets between green space

Connect into the existing cycle network through east-west off road cycle links connecting Salt Pan Creek Reserve to the broader community Create green streets that are a place for people, promoting activity, interaction and community Maximise frontages and pedestrian entrances on green streets to promote activity.

Provide views to parks along Roosevelt Avenue



Create distinct neighbourhoods that respond to their local context

A garden parkland precinct that responds to Salt Pan Creek Reserve

A higher density urban precinct that sits within 800m of the station and responds to Riverwood Town Centre but provides a transition to its southern neighbours Precincts will be supported by local neighbourhoods focused around local parks and opportunities for community interaction.

5.7 Structure plan

Preferred Structure Plan

The iterative options and ideas testing for the Study Area combined with a set of key moves, developed through analysis, consultation and stakeholder feedback have informed the structure plan for the precinct.

Key features of the structure plan are as follows:

30ha total site area, 16.7ha owned by LAHC

Roosevelt Avenue transformed into a 30m wide boulevard



Primary routes

Indicative local roads

Truman Avenue extended to connect to Riverwood Public School



Approximately 5ha of open space including new local park (1ha) and Community Greenway (0.5ha)



View corridor connecting Belmore Road, the existing Primary School and Salt Pan Creek Reserve



Potential community facilities including new child care centres



New active transport, pedestrian, visual and vehicular connections to Salt Pan Creek Reserve



Retail opportunities



Higher density Roosevelt Park neighbourhood



Lower Density Garden Apartment neighbourhood



Transition zone to existing low density housing



Active street frontage



Indicative taller building (12 storey) location



Intersection upgrade



Indicative location of stormwater wetlands



Through site links



Indicative through site links





architectus

6 Master plan

The preferred Master Plan provides a conceptual layout to guide future growth and development. The Master Plan is indicative and builds upon the information presented in the previous chapters to inform the future planning controls for the site.





6.2 Desired future character

Roosevelt park urban neighbourhood

The Roosevelt Park Urban Neighbourhood comprises an urban character and should be considered as an extension of the Riverwood Local Centre. New parks and streets will be of the highest quality, and combined with diverse housing types, it will be an active and exciting place to live.

Building heights are to respond to their street type and character, to create local neighbourhoods and the feeling of a place that has evolved over time.

New parks including the linear park 'Community Greenway' will create a sequence of places that draw people to Riverwood Public School and the Roosevelt Park, where the school, supported by community uses and new open space, will become a hub for the wider community.

Block edge apartment buildings will activate streets with multiple front doors, front gardens and grand lobby entries promoting passive surveillance and encourage walking and cycling while large internal sunny communal spaces are protected from the streets.

The retention of Roosevelt Avenue continues the memory of the site and provides a strong connection to open space.



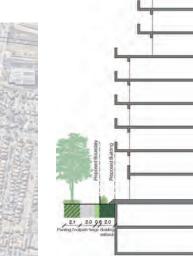
Key Plan



Precedent: Mills District, Portland. Source: Newberg 2015



Precedent: Trafalgar Place, London. Source: Lendlease 2016



Indicative section through block edge apartment



Precedent: Burridge Gardens, Wandsworth, London. Source: Peabody 2017



Precedent: Zona de Juego, Houston TX



Precedent: Ryde Garden. Source: Bates Smart 2017



Precedent: Tote Park, Sydney. Source: Kid Size Living 2017

Desired future character

Garden apartment neighbourhood

The Garden Apartments Neighbourhood comprises a lower scale, green precinct that re-imagines old fashioned residential neighbourhoods, with children playing in the street, front gardens and stoops that help neighbours get to know each other.

Carefully designed, elevated communal open spaces that open to the streets re-visit the existing character of the neighbourhood to promote interaction, and continue the Riverwood resident's love of gardening.

Much of the neighbourhood's character is established through view lines along key streets to open space.

The Garden Apartments Neighbourhood is also the link between the Study Area and the Salt Pan Creek Green Grid Corridor. It should be welcoming to visitors, and provide places for people to relax and enjoy the park.

Providing new links north to the Washington Park Community Gardens and Karne Street Reserve, in the form of new open space, it reconnects those existing community facilities back into the broader community.



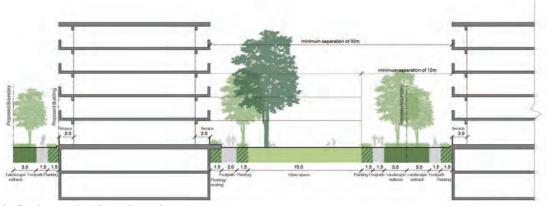
Key Plan



Precedent: Trafalgar Park, London. Source: dRMM Architects



Precedent: West River Commons, Minneapolis. Source: Newberg 2014



Indicative section through garden apartment



Precedent: Kidbrooke, London. Source: Divisare 2017



Precedent: Freiburg, Germany. Source: Dertien 2012



Precedent: Mary O'brien Reserve, Sydney. Source: Gabriel Saunders



Precedent: Gibbons Rent, London. Source: Londonist 2017

Desired future character





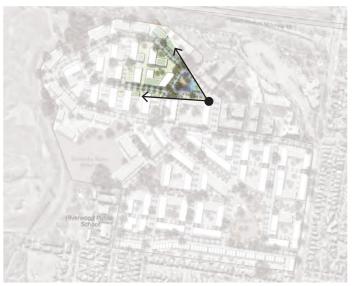
Images above: Scharp 2017

Belmore Road and Roosevelt Avenue



Key Plan

Civic Plaza and Kentucky Road



Key Plan

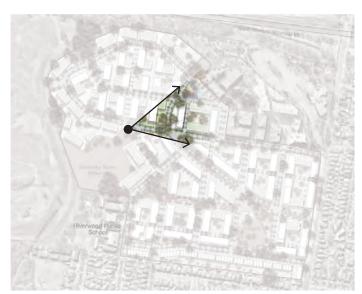
Desired future character





Images above: Scharp 2017

Garden Apartment Precinct



Key Plan

Community Park and The Community Greenway



Key Plan

Public domain vision

The character of a place is converted in the minds of the community by the way they move through their neighbourhood, what they see and how they remember it (their 'mind maps')

By creating a sequence of open spaces, sense of an entry and making the experience easy, attractive and green the perception of the neighbourhood is established as a positive experience and the character of the place is established.

Public domain key moves/principles

Public Domain principles were developed by Landscape architects JMD for the site. (See Attachment I Landscape Design Report for full report)

The following principles define means of achieving this positive character for a place.

(Source Appendix I Landscape Design Report)

Green Infrastructure



Connect both public domain and private deep (continuous) soil within the site as a network.
Continuous soil network to extend and connect beyond the site.



Reveal the movement of water through the site. Maximise water infiltration, reuse and the improvement of quality water leaving the site.

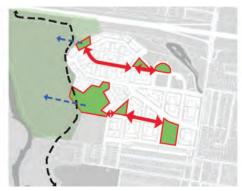


Link existing urban tree canopy and habitat with green grid connectors, providing a continuous canopy over major pedestrian routes and desire lines. Maximise urban tree canopy, locally native species and habitat on site.





East-west civic street & The Community
Greenway connecting Riverwood Public School
with open space and Belmore Road



East-west park to park streets provide pedestrian and cycle connections to Salt Pan Creek Reserve.



North South green to green links provide a focus for pedestrian and cycle links

Open Space



Streets terminating on views of parks, significant deep soil or feature tree planting aids legibility, connection to amenity and reinforces access to open space. Provide connections to the broader landscape network and vistas through and beyond the site to orienting features reinforcing place context.



New open space to south east at site high point revealing place and to address gap in local open space distribution



Evenly distribute open space throughout neighbourhoods to provide access within a short walk for all dwellings

Public domain master plan

The public domain and landscape interface will play a crucial role in how future development will look and feel. Hard and soft treatments to the key public spaces will ensure the new development will feel part of the local suburban neighbourhood whilst also creating a sense of belonging and pride for residents. The master plan provides a variety of high quality public open spaces, providing a diverse range of local and neighbourhood parks that will meet the needs of the future population, and complement the extensive district and regional open space surrounding the site. A number of key new public open spaces have been considered as part of the study. These include: Roosevelt Park Community Park Civic Plaza Community Greenway Community Garden Park Salt Pan View Park

The proposed public domain will comprise 43% of the site area, including 16% public open space and 27% as streets.



Public open space

The level of provision of public open space proposed in the master plan exceeds comparable renewal precincts in Sydney, which generally deliver between 5-15% of site area as public open space.

The master plan will retain 2.4ha of existing open space and provide an additional 2.4ha of new open space on the site:

Kentucky Road Reserve 2.10 ha* Roosevelt Park 1.01 ha Community Greenway 0.52 ha Civic Plaza 0.35 ha Salt Pan Gardens 0.28 ha Community Park 0.28 ha Community Garden Park 0.16 ha Salt Pan View 0.10 ha

Total: 4.8 ha

Existing open space

*excludes area (1,300sqm) required for stormwater management



Public open space accessibility

The previous analysis indicated that there was a lack of local open space within the Riverwood town centre as well as residents east of Belmore Road and south of Truman Avenue.

The location of Riverwood Park, a new 1ha local open space addresses this gap and supports the desired future character of the town centre.

Views to new open space from outside the precinct exist along Belmore Road.

Additional connections to Salt Pan Creek Reserve are provided to increase access and visibility.

The social infrastructure study identifies the public open space and recreation facilities needs which are listed below and highlighted in the public domain concept plans.

Overall public open space provision needs

- There is a need to deliver between 3.3ha to 4.5ha
 of public open space across the Study Area
 including local parks of between 0.5ha and 2ha. All
 residents can access a local public open space of
 a minimum of 0.5ha within 200m of their homes.
- Public open space needs to function as backyards for residents living in higher density dwellings. An iconic central space, with connections to the history of the area, could support community identity and connections to place among new and existing residents.
- No new sports fields are required onsite based on benchmarks.
- Parks should be embellished with infrastructure including shading, seating, tables and play elements to support social connectivity and health and wellbeing outcomes. They should be universally designed to be accessible for people who are older or with disability.

Outdoor exercise equipment needs

 1 x outdoor exercise station should be provided to meet benchmarked demand and feedback through previous community engagement.

Sports fields and hard-surface active courts needs

- While no new sports fields need to be provided within the Study Area, an additional 5,800 residents may impact on the capacity of sports fields nearby. Future embellishment of local sports fields may be required to improve their capacity. Nearby sports fields include Kentucky Road Reserve, Riverwood Park and McLaughlin Park.
- 1 multipurpose outdoor court is needed, which could be shared use for outdoor markets, tai chi and dance and other cultural and community programs and events.

Public domain and street needs

Streets provide an important recreational link between public open space, public facilities, homes and services. Given the mix of social housing and private residents, older people, children and culturally diverse residents, providing public space that provides opportunities to socially connect and create resilient communities will be important for the Study Area. This could be achieved through:

- Provision of sheltered hard-surface areas for civic activities, tai chi, events to respond to the culturally diverse community and recreational interests, and provide a place for social cohesion and creation of strong community bonds.
- Safety and crime prevention should be a key consideration in the design of the public domain and open space. Universal design to support the inclusion of older people and people with disability will be important. Inclusion of seating and shade, including large street trees for street cooling, will support the usability of the public domain.
- Cool, comfortable and fun active walkable linear parks/links connecting to the town centre and nearby districts and regional open spaces including Salt Pan Creek Reserve, Morris lemma Indoor Sports Centre and local Riverwood shops.

The recommendations of the report have been accommodated within the allocation, amount and design of public open space as can be seen in the following open space concept plans.

(Source Appendix D Social Infrastructure Study)



Roosevelt Park

This 1ha park is at the heart of the community and is located within 400m of Riverwood station off Roosevelt Avenue. The location of the new Local park services the master plan as well as the wider open space need for the Riverwood community.

Within a view corridor that runs from Belmore Road, along The Community Greenway to Salt Pan Creek Reserve, the local parks physically and visually connects through and beyond the master plan.

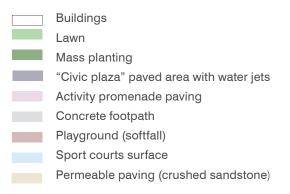
The large central lawn offers a welcoming relaxing green space as well as flexible space for community activities.

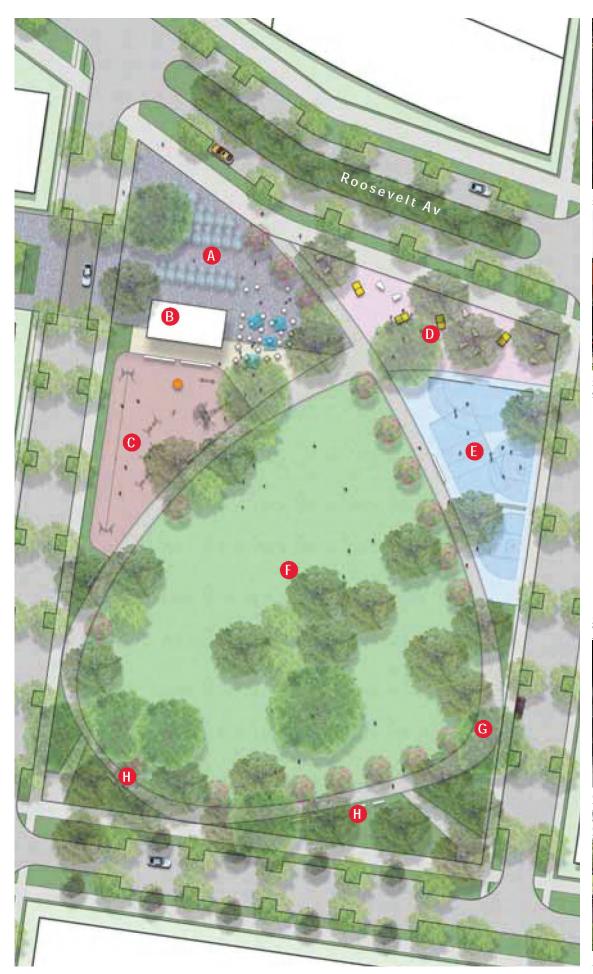
The park also features a paved plaza area capable of supporting a small cafe.

Programme

- "Civic Plaza" with water jets
- B Kiosk | Amenities building
- Neighbourhood playground
- Activity promenade with table tennis and informal
- Informal sport fields (street ball, volleyball court, soccer goal)
- Kick around lawn
- **6** Loop path with orchard trees
- Quiet seating nodes along perimeter loop path

Legend







Sydney Park Playground | Sydney | JMD design





21 Balancoires | Montreal | Daily



The Lawn on D | Boston | Sasaki





Centenary Square | Parramatta | JMD design



Redfern Park | Sydney |





Community Park

Community Park is a local park, co-located with the proposed community uses, within close proximity to the Riverwood Public School.

The space will provide an important area for activities within the community facility to spill outdoors.

The park will also include an additional community garden area for individual plots.

Programme

- Shaded area for social community activities (Community festivals, gatherings, line dancing, BBQs)
 Garden beds
- © Community orchard
- Picnic lawn
- Building with assumed community facilities

Legend





James St Reserve Community Garden | Sydney



Victoria Park gathering area | Sydney | HASSEL



Docklands Community Garden | Melbourne | Urban Reforestation





Clempton Park





Civic Plaza

The intersection of Roosevelt Avenue and Kentucky Road provides an accessible, bike friendly and pedestrian focussed area for informal gathering and small weekend markets.

Informal seating and board game tables under a tree canopy provides a relaxed and casual atmosphere in this area with a number of play areas for organised sports such as soccer, badminton and basketball located in the northern end of the park space.

Programme

- Plaza for gathering and weekend marketsInformal seating and board game tables under
- canopy of trees
- Activity pods (play area, badminton court, soccer goal)

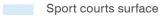
 Private gardens of adjoining building residents

Legend



Mass planting

"Civic plaza" paved area









Tai Chi in the Park

Group Dancing

Community lunch event

Private gardens and maisonette apartments





The Community Greenway

A pedestrian promenade designed with children and play in mind - this generous space will act as a Green Grid connector, connecting local residents with the Salt Pan Creek Green Grid priority corridor as well as the existing Primary School, providing a common space for children to meet and play with other children in the neighbourhood.

The linear park space also provides small lawn areas, planted pods and seated gathering pods for supervising parents to meet and chat.

Programme

- A Pedestrian promenade
- B Shared path
- Play pods
- Seating and gathering pods (pop up library, board game tables)
- Planted area
- Lawn
- **G** Orchard

Legend



Mass planting

"Civic plaza" paved area with water jets

Activity promenade paving

Concrete footpath

Playground (softfall)

Sport courts surface

Permeable paving (crushed sandstone)



Potgieterstraat | Amsterdam | Carve Landscape Architecture



Passeig De St Joan Boulevard | Barcelona | Lola Domenech



Passeig De St Joan Boulevard | Barcelona | Lola Domenech



Pop-up Library | New York





Superkilen Park | Berlin | BIG and Topptek 1 and



East Village | London | Vogt Landscape Architects



JUMP Potgieterstraat | Amsterdam | Carve Landscape Architecture



University of Adelaide Adelaide | T.C.L



Potgieterstraat | Amsterdam | Carve







Community Garden Park

The Community Garden Park will incorporate a new community lawn adjacent to the existing community garden allotments.

The park will include places to sit and view the existing community garden in addition to providing an improved connection to Karne Street Reserve beyond.

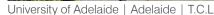
Programme

- Existing Community gardensNew pedestrian path through garden allotments
- Community lawn
- Timber seating and viewing points towards the garden allotments and Karne St reserve

Legend









Passeig De St Joan Boulevard | Barcelona | Lola Domenech



Washington Park community garden





Park vistas

A number of key vistas to open space have been identified along the primary roads within the Study Area.

Views to parks and open space aids legibility, amenity and reinforces access to open space and the broader landscape network.

These vistas strengthen the site's link to Salt Pan Creek Reserve and create a sequence of important visual links between open space.

Key view corridors are impacted by the existing irregular street network, lot pattern and the topography of the site. The major view corridor, linking Belmore Road to Salt Pan Creek Reserve will be identified within the LEP with additional through site links to be provided as an easement on title for public right of way in the design guide, see attachment B_Design Guide.

The most significant of these vistas include:

- View corridors from Belmore road through the site to new and existing open space
- Green to green vistas at key locations across the master plan
- Vistas to parks along Roosevelt Avenue
- Vistas to Salt Pan Creek Reserve at several key points along Kentucky Road.
- Views of open space from outside the Study Area
- These view corridors should retain the visual connection to Salt Pan Creek Reserve from within the site.



Park Interfaces

A park interface is any area where a transition is between built form, its private or communal open space at ground and a public park.

This occurs at two locations in the master plan, at the Community Park and the Civic Plaza.

Community Park

This 4 storey interface is residential in character. Key interface objectives:

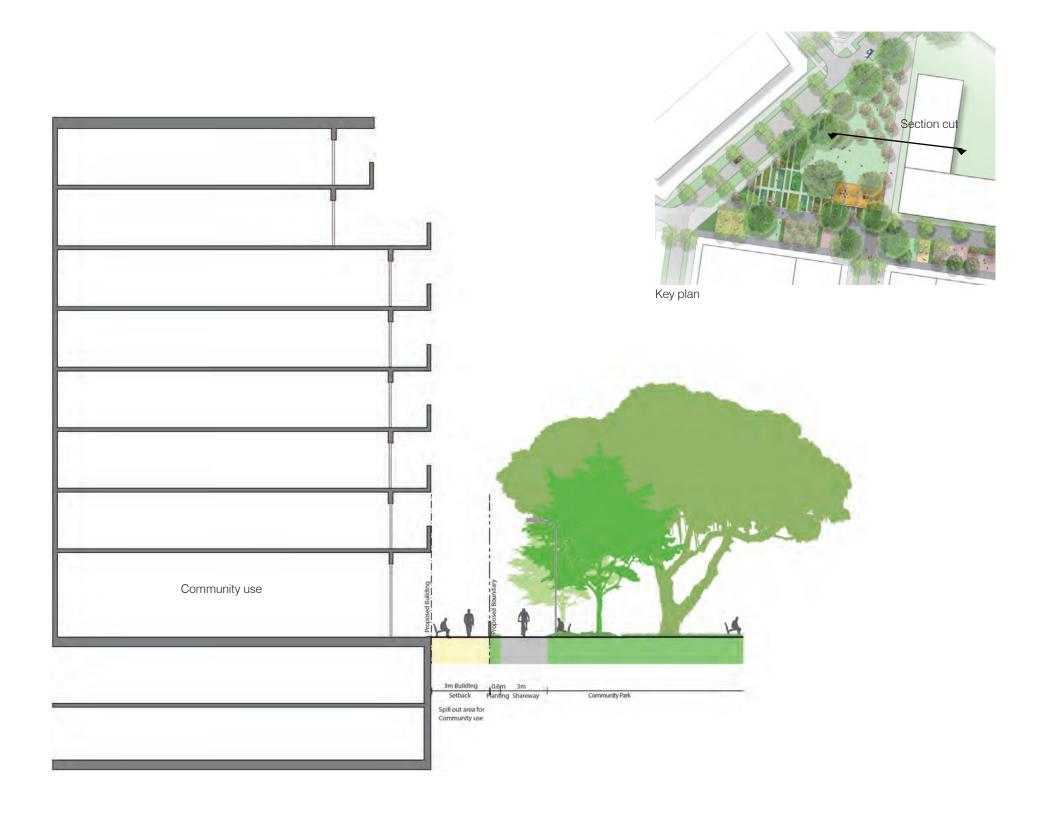
- To allow for an active interface between ground floor community uses and public open space
- Maintain adequate levels of natural surveillance over the adjacent public open space
- Allow for some defensible space at the boundary to maintain a level of security to community uses

Key design components:

- A 3m building setback to allow for spill out community space
- 0.6m verge to property boundary
- 3m shareway to encourage social interaction
- Upper level windows and balconies to overlook public open space



Key plan - park location



Park Interfaces

Civic Park

This 4 storey interface is residential in character. Key interface objectives:

- A clear delineation between public and private open space
- Maintain adequate privacy for ground floor residential dwellings
- Maintain adequate levels of natural surveillance of the adjacent public open space
- Allow for casual social interaction at the interface of public and private open space

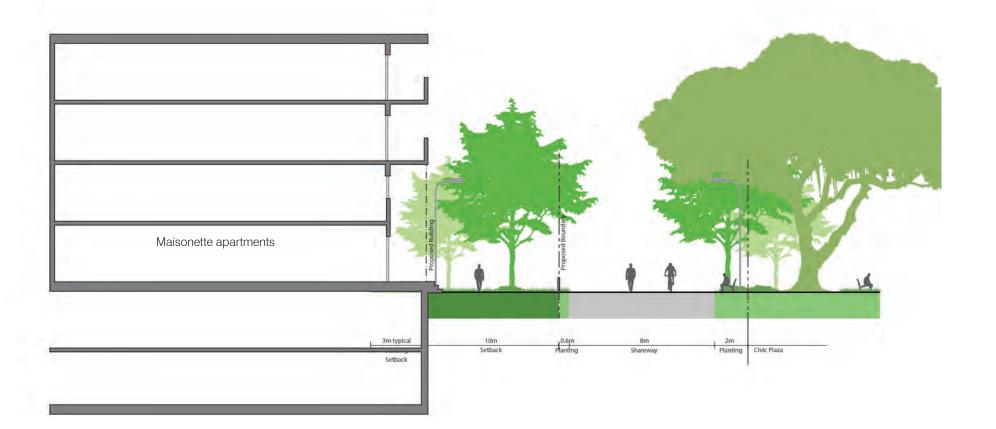
Key design components:

- A generous 10m setback allowing for private gardens to maisonette apartments
- 0.6m verge to property boundary
- 8m shared space to encourage social interaction
- Direct access from the shared space with multiple maisonette entries
- Upper level windows and balconies to overlook public open space
- A subtle change in level reinforces a sense of privacy for ground floor residents



Key plan - park location







6.4 Movement networks

Walking

The master plan proposes an improved walking network, that aims to connect the Study Area with key local services, open space, and public transport.

Most of the Study Area is within a 5-15 minute walk of the Riverwood train station and through the introduction of new and improved walking paths, active forms of transport have been prioritised.

The future street network introduces new tree lined streets and generous road corridors that unlock permeability and improve legibility throughout the site. Through the addition of new, direct, tree lined street connections, with footpaths both sides of the street, the master plan promotes walking in a safe, shaded and attractive environment.

Maisonettes at ground, private gardens and street tree planting activate the street network ensuring the walking environment is a shaded, interesting and vibrant environment to walk through.

The proposed walking network aims to:

- Improve walking to the Riverwood town centre and train station by improved legibility, direct connections and the extension of a new lane south from Truman Avenue.
- Encourage walking by providing ample tree canopy cover on all streets mitigating urban heat
- Provide new and improved connections to key attractors such as local parks, Riverwood Public School, community facilities and the Riverwood retail centre to reduce reliance on private vehicles for local trips.
- Provide new connections that will enhance and support walkability along the M5 Motorway and Salt Pan Creek Reserve.
- Additionally, all development is within 400m of a bus stop, with excellent bus services, including the 944, 940 and 942, providing access to the Riverwood local centre and other key local centres, including Hurstville and Bankstown. More housing in a highly accessibly location, will encourage more people to use public transport, ultimately reducing reliance on private vehicles.



Public Domain, Place and Urban Design report | Riverwood Estate | Architectus

Cycling

The master plan proposes an improved cycling network, that aims to connect the Study Area into the existing cycle network improving access to key local services, open space, and public transport.

Most of the Study Area is within a 5-minute cycle of the Riverwood train station and active transport has been prioritised through the introduction of a number of new cycling connections through the Study Area supported by the improved future street network.

By providing generous road corridors the master plan unlocks the potential for new on road cycle routes, and shared paths to promote active transport to work and for recreation.

The proposed cycling network aims to:

- Provide dedicated off-road shared cycleways along key roads, including Roosevelt Avenue, Washington Avenue and Kentucky Road, to deliver a direct link for commuters to the station and the regional cycleway network.
- Extend shared paths along existing and new streets to improve the connectivity and promote walking and cycling throughout the Study Area.
- Provide on road cycle connections to the Riverwood town centre and train station off Belmore Road
- Provide new and improved connections to key attractors such as local parks, Riverwood Public School, community facilities and the Riverwood retail centre to reduce reliance on private vehicles for local trips.
- Provide new connections that will connect into the regional cycleway network along the M5 Motorway and Salt Pan Creek Reserve.
- Encourage cycling by providing ample tree canopy cover on all streets mitigating urban heat



Proposed public transport network

A key objective of the master plan is to promote public transport use by concentrating the largest increase in density within walking distance of the Riverwood train station.

Over 70 per cent of apartments are located within 800m Riverwood train station, providing the largest increase in density within walking distance of the station, increasing access to public transport for more people.

Given that over 30 per cent of residents in the Riverwood suburb already travel to work by public transport, increasing housing supply within the walking catchment of the train will encourage more people to use public transport to travel to work.

Future improvements to the public transport network will increase the level of service on the T8 Airport/East Hills Line, adding an additional 200 services per week. This will double the service frequency during peak and off-peak periods and will promote increased public transport use,

The Study Area is well serviced by existing bus services and with full development of the Study Area the demand for bus services will increase and bus services will need to operate at a higher frequency. The bus rapid transit route, currently under investigation by Transport for NSW, also has the potential to significantly improve bus services from the Study Area to key centres.

Minor modifications are proposed to the existing 944 service which runs through the Study Area. The proposed route will be redirected along Roosevelt Avenue to provide improved coverage and service for residents, supported by new and more efficient bus stops, that will provide a high-quality user experience.

Additionally, all development is within 400m of a bus stop, with excellent bus services, including the 944, 940 and 942, providing access to the Riverwood local centre and other key local centres, including Hurstville and Bankstown. Providing more housing in a highly accessibly location, will encourage more people to use public transport, ultimately reducing reliance on private vehicles.



New streets and roads

A number of roads have been added to the network assist in providing a better flow for pedestrians, vehicles and bicycles across the site. These include:

- A new connection from Washington Avenue to Roosevelt Avenue.
- An extension of Truman Avenue, west through to Union Street.
- Several new north-south streets which connect the extended Truman Avenue to Roosevelt Avenue.
- A new east-west connection which bi-sects
 Kentucky Road providing improved permeability for the garden precinct.
- An extension of the laneway running south, through to Killara Avenue towards the Riverwood town centre and train station

Many of the existing streets in the Study Area are too narrow to provide sufficient carriageway width for buses and on-street car parking. Existing roads will be subject to widening to ensure local streets can accommodate buses, increased traffic movements and on-street car parking.

An indicative park edge road along Salt Pan Creek Reserve is also identified. A future road connection will be investigated as part of the Salt Pan Creek Reserve master plan currently being prepared by Council.



Proposed street network

The existing street hierarchy has been re-shaped and supplemented by a number of new streets to create a robust road network capable of supporting increased densities, a diverse range of dwelling types, and prioritising pedestrian movement and active transport.

The key aspects of the proposed street hierarchy include:

- Major widening of Roosevelt Avenue to a become a 30m boulevard and the major entry into the precinct.
- The intersection of Washington Avenue and Belmore Road will become a left-in, left-out arrangement, to reduce congestion and improve traffic flow.
- Minor widening of existing local roads including Kentucky, Union and Hunter Streets to facilitate improved traffic flow.
- Establishing new north-south local roads to improve pedestrian and vehicular connectivity across the site.
- Extending Truman Avenue west to facilitate a direct connection of Riverwood Public School back to the local community.
- Removal of dead-end streets which inhibited connectivity and permeability through the site.
- The addition of two new signalised intersections at the following intersections:
- Belmore Street and Roosevelt Avenue
- Belmore Road and Washington Avenue



Public Domain, Place and Urban Design report | Riverwood Estate | Architectus

6.5 Streets

Roosevelt Avenue

This 30m road reserve will be lined with significant trees on both sides and feature generous footpaths and cycleways. It will re-vitalise the area and form a gateway entry into the site.

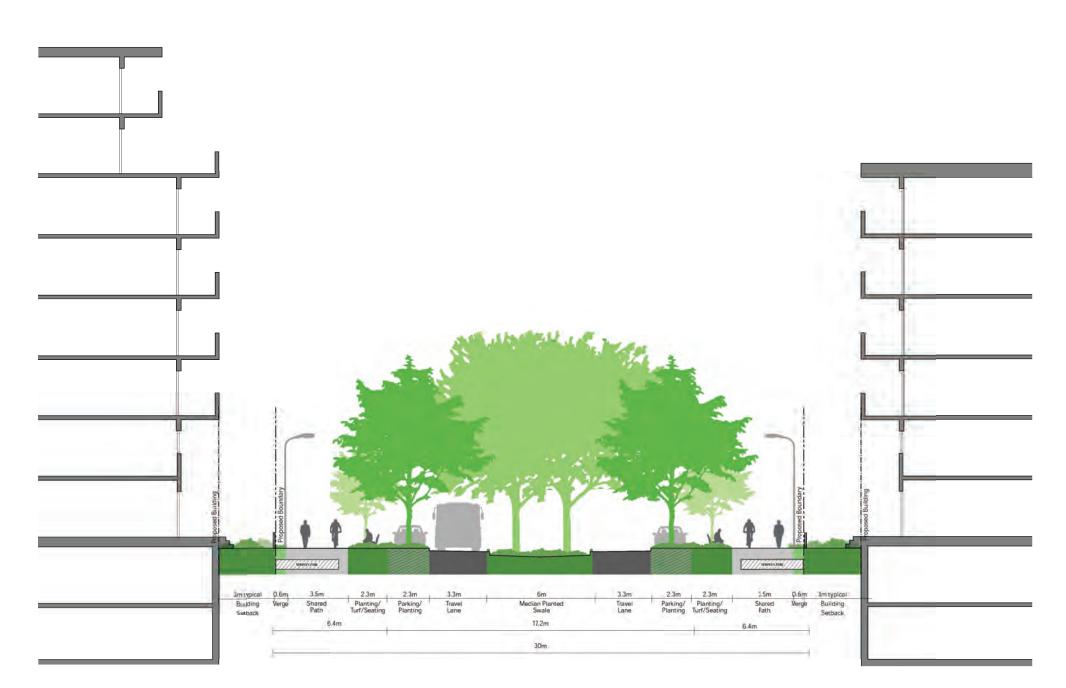
This proposed street type will replace the existing 20m road reserve on Roosevelt Avenue.

Provides a sense of arrival for residents and is designed to be welcoming to visitors with indented on-street parking on both sides.

Key features include:

- 2.1m foot paths and dedicated 1.4m cycleways on both sides of the street.
- 6m median planted swale.
- 4.6m indented parking and planting areas.
- Travel lanes will have sufficient width to accommodate local buses and bus stops.





Roosevelt Avenue 30m wide boulevard



Local Street - with bus route (20m)

These streets will be local streets and have a public character, flanked by maisonette apartments on both sides.

This proposed street will replace the existing 15m road reserve along Kentucky Road and Union Street.

On-street parking will be provided to help street activation.

These streets will provide access to off-street basement car parking and ground floor garbage facilities.

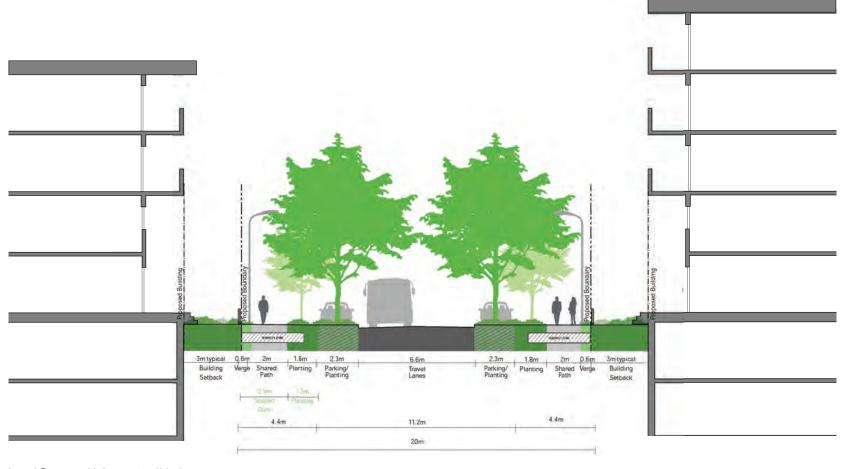
The travel lane will have sufficient width to accommodate local buses, with a number of stops along this street.

Streets with these characteristics include Kentucky Road and Union Street.

Key features include:

- 2.3m street planting on both sides of the street.
- On-street parking provision on both sides to assist with street activation.
- 2m footpaths on both sides of the street.
- A 2.5m shared path option to accommodate active transport connections
- A travel lane with sufficient width to accommodate local buses and bus stops.





Local Street - with bus route (20m)



Local Street - without bus route (20m)

These proposed local streets have a similar dimension to type 2 local streets, but will not be required to carry buses, reducing the required travel lane width.

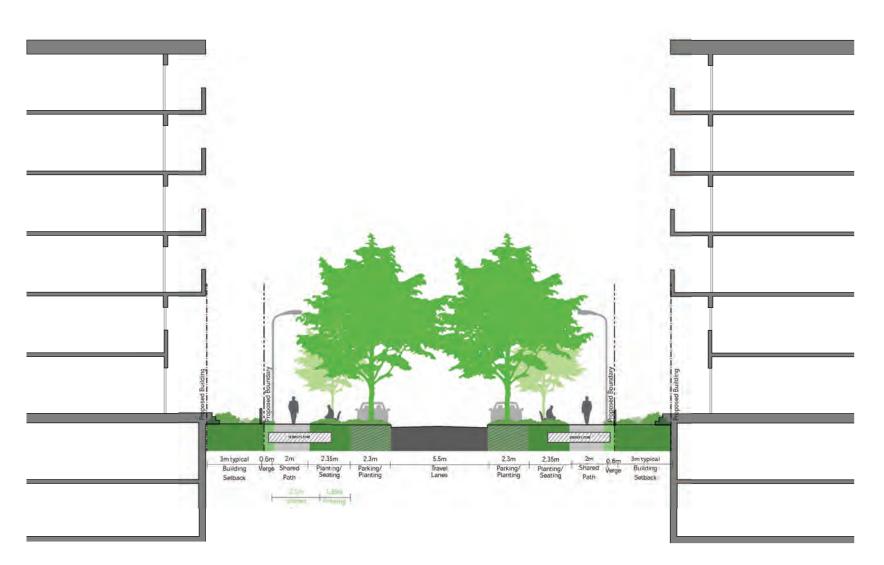
These streets will quieter and more generous allowing for additional planting and seating area adjacent the proposed footpath.

This street type will replace portions of the existing 15m road reserve on Truman Avenue and Kentucky Road. This street type will also apply to Washington Avenue (currently 20m).

Key features include:

- 4.1m wide street planting on both sides of the street.On-street parking provision on both sides to assist with street activation.
- 2m footpaths on both sides of the street.
- A 2.5m shared path option to accommodate active transport connections





Local Street - without bus route (20m)



Service Street and Local Street (18m)

These streets will have a predominately public character, but are designed to accommodate a number of service and basement entries for buildings.

This proposed street will replace the existing 14m road reserve on Hunter

The street will be defined by double storey maisonette apartments at ground level to encourage street activation and improve surveillance. Local streets will have a maximum 6 storey street wall height.

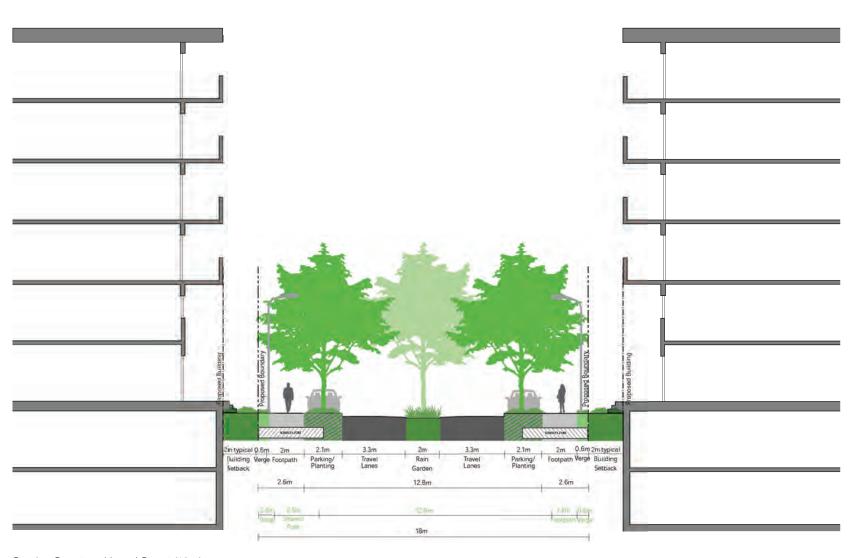
On-street parking will be provided to help street activation.

These streets are crucial for accommodating higher density, providing alternative routes through the precincts. Service streets will appear similar in character, but be dedicated to building servicing and be dominated by basement car parking entries and ground floor garbage facilities.

Key features include:

- 2m footpaths.
- 2.3m indented parking and planting areas.
- 2m central medium rain garden
- A 2.5m shared path option to accommodate active transport connections
- 3.3m travel lanes to accommodate service vehicles





Service Street and Local Street (18m)



Service Street and Local Street (16.7m)

These streets will have a predominately public character, but are designed to accommodate a number of service and basement entries for buildings.

This proposed street will replace the existing 14m road reserve on Michigan Road and a portion of the 15m road reserve on Kentucky Road.

The street will be defined by double storey maisonette apartments at ground level to encourage street activation and improve surveillance. Local streets will have a maximum 6 storey street wall height.

On-street parking will be provided to help street activation.

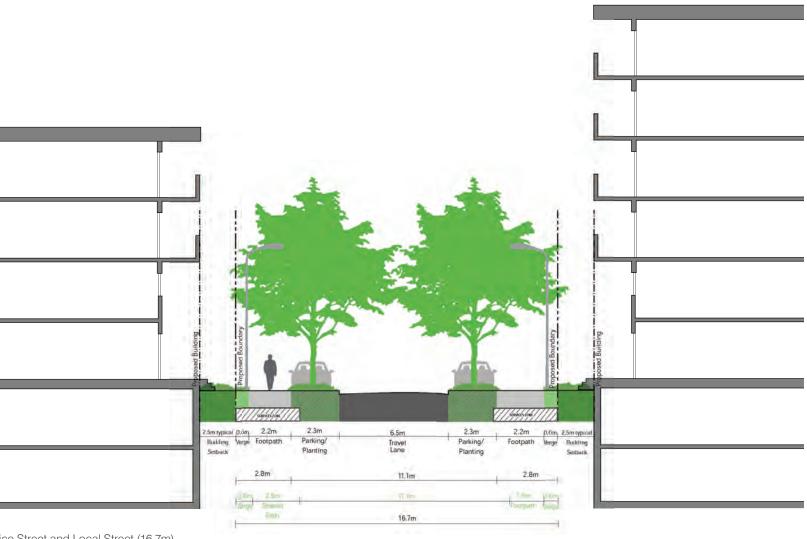
These streets are crucial for accommodating higher density, providing alternative routes through the precincts.

Service streets will appear similar in character, but be dedicated to building servicing and be dominated by basement car parking entries and ground floor garbage facilities.

Key features include:

- 2.2m footpaths.
- 2.3m indented parking and planting areas.
- A 2.5m shared path option to accommodate active transport connections





Service Street and Local Street (16.7m)

*Shared path scenario

Park Edge Street (20m)

These streets will have one side of residential frontage, and open space adjoining the other side of the street.

This street responds to the park edge by providing heavily planted edges to both sides of the street and indented parking to promote street activation.

This street type will replace a portion of the existing street network on Truman Road which has a 15m road reserve.

Key features of these streets include:

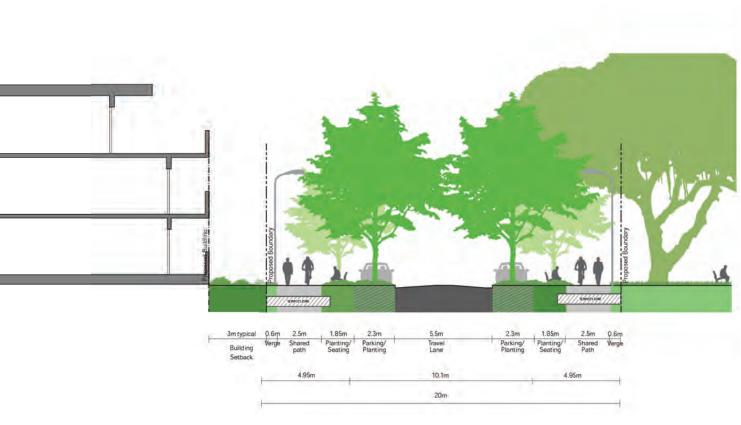
- A minimum 4m wide street planting on both sides of the street.
- On-street parking provision on both sides to assist with street activation.
- 2.5m footpaths on both sides of the street.

The 2.5m footpaths will be shareways for pedestrian and cyclist with a 1.85m planting/ seating reserve.

On-street parking has been designated to both sides of the street, with intermittently spaced landscape bays.

Streets with this characteristics include parts of Truman Avenue (Roosevelt Park) running alongside the designated green open space within the precinct.





Park Edge Street (20m)

Park Edge Street (16.7m)

These proposed local and service streets are located adjacent to open space that will provide off-road shared footpaths and cycle paths.

This is a new street type for the Study Area, proposed as part of the new street hierarchy.

The street will be defined by double storey maisonette apartments at ground level to encourage street activation and improve surveillance. Local streets will have a maximum 6 storey street wall height.

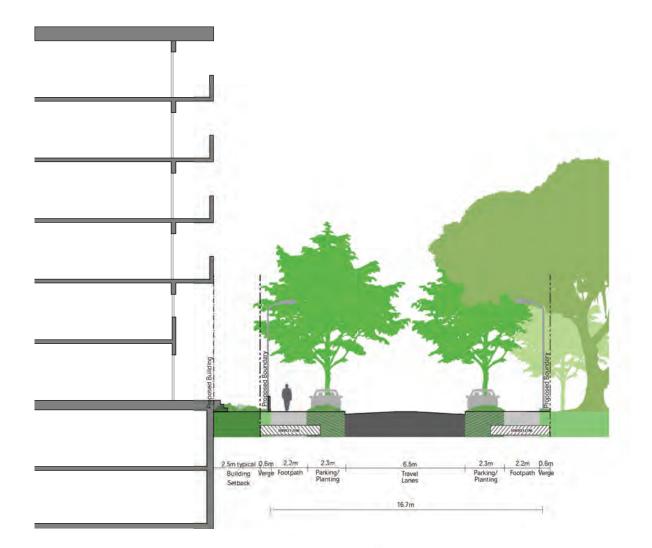
Typically characterised by:

- A minimum 2.3m wide street planting on both sides of the street.
- On-street parking provision on both sides to assist with street activation.
- 2.2m footpaths on both sides of the street.

A landscape setback along the property boundary and the road will maintaining a visual connection between the park and the built form.

Streets with this characteristic includes to two new north south roads running alongside Roosevelt Park





Park Edge Street (15.7m)



Laneway (12m)

The laneway linkages are intimate one-way vehicular and pedestrian access through the garden apartment neighbourhood. The laneways will facilitate a fine grain, permeable network between the long north-south blocks which characterise this precinct.

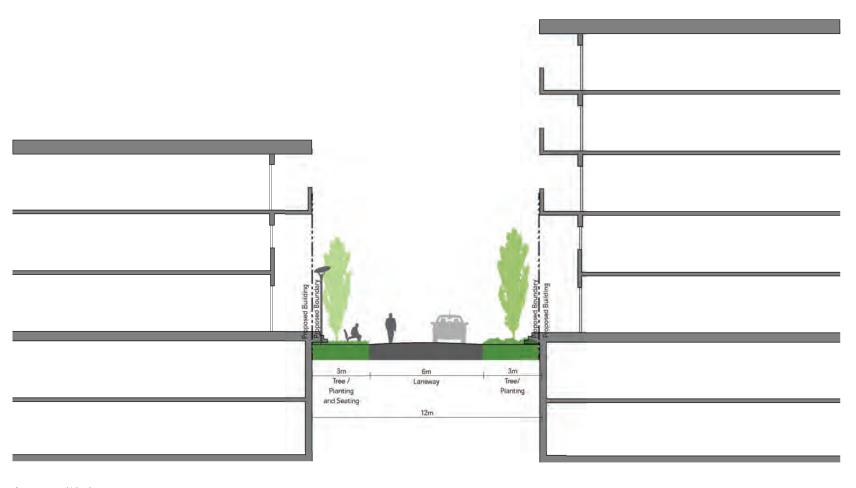
This is a new street type for the Study Area proposed, as part of the new street hierarchy.

They provide a secure pedestrian connection between Kentucky Street and can be landscaped to suit the garden character of the precinct.

Key features include:

- 3m wide street planting and seating verge on both sides of the street.
- 6m shared laneway for vehicles and pedestrians.





Laneway (12m)

Through site link (8m)

These links support the street network by providing pedestrian and cycle only access between local north-south streets, and between Kentucky Road in the Garden Apartment Precinct.

This is a new street type for the Study Area proposed, as part of the new street hierarchy.

Through site links will provide a secure pedestrian connection between Kentucky Street and can be landscaped to suit the character of the precinct.

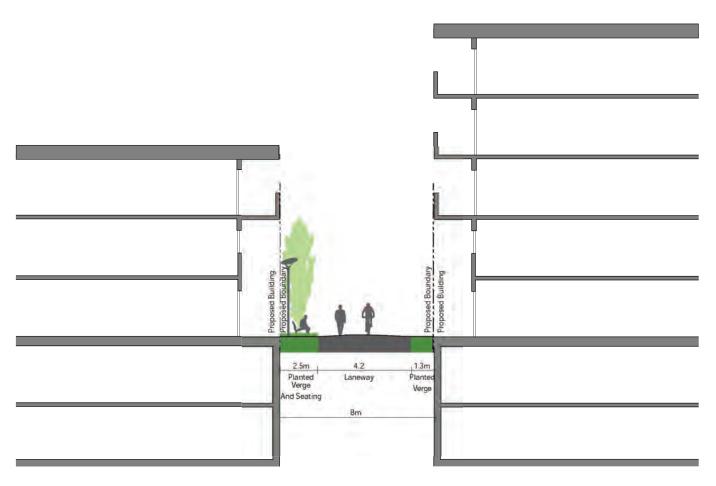
Through site links will be publicly accessible during daylight hours, but may be gated at night for security purposes.

The through site link in the north of the site connects with the laneway on the previous page creating a continuous pedestrian and cycle connection from Kentucky Road Reserve through to Salt Pan Creek and Karne Street Reserves.

Key features include:

- 2.5m and 1.3m wide planted verges on either side of the link.
- 4.2m laneway for cyclists and pedestrians.





Through site link (minimum 8m)



Northern Interface - Washington Park



Washington Park, a 3.5ha urban renewal site to the north of the site provides 757 dwellings, including 150 social housing dwellings. Sitting predominately within 800m from Riverwood station Washington Park is characterised by high rise apartments with building heights ranging between 6 and 10 storeys. Buildings elements step down to 4 storeys along Karne Street reserve however no street wall has been established.

Key Master Plan interface objectives:

- Build on the success of Washington Park
- Take cues from existing local character of Washington Park
- Learn from Washington park
- Establish a pedestrian scale street wall

Key Master Plan design components:

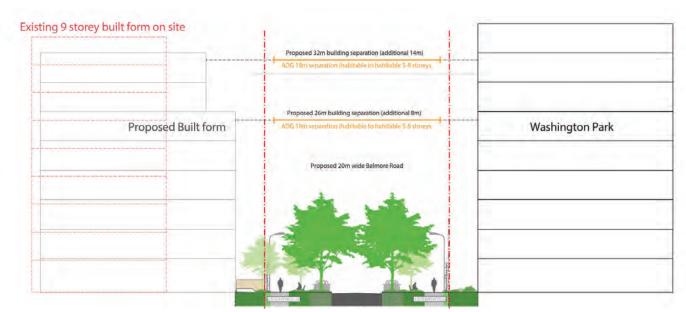
- 20m road reserve
- 6 storey street wall height
- No inactive edges/blank walls at ground. Multiple residential/lobby entries



/iew looking west down Washington Avenue



View looking east down Washington Avenue



Indicative Washington Avenue interface section

Eastern Interface -Belmore Road



Belmore Road is the main road servicing the site and runs along the eastern boundary of the site. The eastern edge of Belmore road is currently 1-2 storey development with building heights of 8.5-10m.

See Meters Street, to the right, a successful precedent of an 8 storey build form with a 6 storey street wall interfacing 2 storey terrace development. Note road reserve for Metters Street is 13m while Belmore Road is 20m.

Key Master Plan interface objectives:

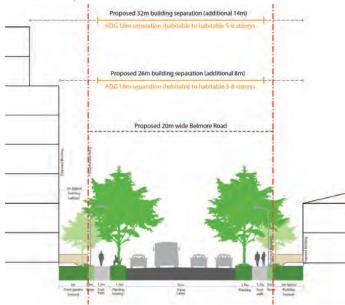
- Create a vibrant urban experience
- Create an active ground floor
- Minimise visual and overshadowing impacts to eastern neighbours
- Establish a desired future character for Belmore Road
- Establish a pedestrian scale street wall

Key Master Plan design components:

- Currently a 20m road reserve with road widening like to occur at the intersection of Belmore Road and Roosevelt Avenue.
- 6 storey street wall height in response to lowest
- Retail ground floor within 400m of town centre
- Perimeter building that reads as separate parcels, defined through varying architecture and articulation
- Maisonette apartments with multiple entries and front gardens to activate residential length outside 400m of the station
- Maisonettes provide opportunities for material variation to mitigate visual impact
- DCP compliant with overshadowing requirements to neighbours
- 5-6 apartments/core facilitate the development of small communities while providing a larger number of lobby entries
- Minimise the number of residents with a single aspect over Belmore Road.



Meters Street. Erskineville NSW



Indicative Belmore Road interface section



Precedent - Perimeter building that reads as separate parcels through architectural expression and materiality

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Southern Interface -Killara Avenue



The southern interface abuts neighbours that are predominately 1 - 2 storey detached housing along the length of Killara Avenue.

Key Master Plan interface objectives:

- Minimise overshadowing impacts to the south
- Provide an appropriate transition to southern neighbours
- Provide an adequate rear setback to minimise overlooking, and maximise private open space and area for tree planting

Key Master Plan design components:

- Lot depth ranging from 30-40m
- 3 storey typology to:
 - Minimise overshadowing
 - Provide appropriate transition
- 6m rear setback to:
 - Allow retention of existing vegetation
 - Minimise overshadowing
 - Significant back yard



Existing 1-2 storey development along Killara Avenue



Precedent - 3 storey terrace typology, Warriewood

Western Interface - Salt Pan Creek Reserve (SPCR)



The southern interface abuts neighbours that are predominately 1 - 2 storey detached housing along the length of Killara Avenue.

Key Master Plan interface objectives:

- Improve ground plane permeability
- Provide strong connections to SPCR
- Ensure height of building sits below existing mature tree canopy
- Activate park edge with apartment entries at ground
- Maximise views from both the public and private domain to SPCR

Key Master Plan design components:

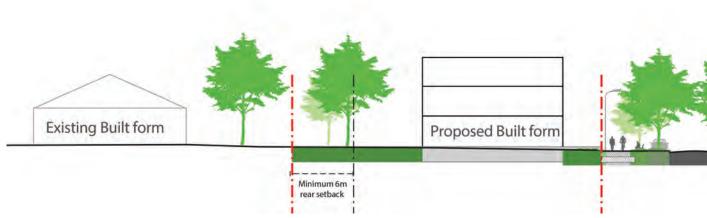
- Building heights of 4 storeys maximise views from apartments while remaining below the existing tree canopy which sits from 18-25m (ecological High Value Tree report)
- Additional 3 connections through to Salt Pan Creek and Karne Street Reserves
- Dual frontage built form with maisonettes at ground to activate both park edge and Kentucky Road
- Minimise lot amalgamations required for apartment typology reducing building footprint, increasing visual permeability and improving the likelihood of re-development.



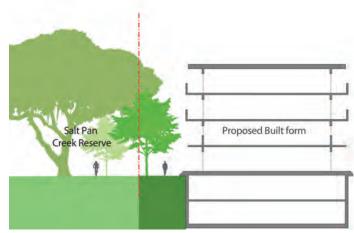
Salt Pan Creek Reserve



High Value Tree (HRT) survey, Ecological



Indicative southern interface section



Indicative park edge interface section

Indicative building typologies

Six key housing typologies have been developed specifically to reinforce the desired future character of each residential precinct on the site and respond to the surrounding context

The building types proposed have been developed to cater for a culturally diverse population with differing lifestyles and include generous provisions for a range of communal open spaces.





Block Edge Apartment Buildings

A fine grain density approach to each street block that will create a comfortable, pedestrian scale 6 storey street wall height.

Lower scale buildings ranging from 6-8 storeys, will provide excellent solar access to streets and open space, creating streets as places for people, with high residential amenity

Roosevelt Avenue, a 30-metre-wide, tree-lined boulevard, will support buildings up to 8 storeys, with a consistent 6 storey street wall height.

Apartment buildings will transition to 4-6 storeys along the Community Greenway to maximise solar access and amenity, and along Truman Street in the south, to transition to a 3 storey typology.



Block edge taller buildings

Located in the centre of the site, the location of the tallest buildings will create an urban village focused around a new central open space. This will minimise visual impacts from beyond the site, and create a transition from surrounding lower scale residential areas.

Taller buildings, ranging up to 12 storeys, are identified in key locations, providing a consistent 6 storey street wall and generous podium setbacks.

Providing taller buildings will create diversity in form and scale, while delivering a finer grain, lower scale built form across most the site.

Towers will be slender to reduce visual impacts (maximum building footprint 750m² GFA), and are aligned east-west to maximise solar access and minimise overshadowing of public spaces.



Garden apartments

Located within the Kentucky loop, the garden apartment precinct will be characterised by lower scale apartments, focused around communal gardens, in a parkland setting

The garden apartments prioritise views over roof top terraces, communal gardens and to Salt Pan Creek Reserve

Predominately 3-5 storeys, with 1-2 storey height difference, providing opportunities for rooftop gardens on lower levels, and views over communal gardens from higher levels.

Communal gardens and ground floor apartments will directly adjoin the street. This will create opportunities for residents to interact with their neighbours, while increasing visual interest, surveillance and street activation.



Park edge apartments

Located along the edge of Salt Pan Creek Reserve, the park edge apartments will improve ground plane permeability and provide strong connections to open space across the site

Narrow blocks and slender apartment buildings will create a permeable park edge, providing views from Kentucky and helping to bring the park character into the site

Buildings will be 4 storeys – an appropriate scale that will also ensure views and increased surveillance over Salt Pan Creek Reserve.

Ground floor apartments will have front gardens spilling out, activating the park edge. Balconies at higher levels will overlook Salt Pan Creek Reserve, with excellent views and surveillance from the top two-floors.

Buildings will be dual frontage to ensure activation of the park edge, as well as providing a high quality streetscape along the street frontage.



Acoustically treated park edge apartments

Responding to their location, these apartments will be designed to maximise views to open space and mitigate against the noise from the M5 Motorway and Belmore Road

Buildings should generally minimise apartments with a single aspect towards noise source to ensure residential amenity and comfort.

Buildings along the M5 will be narrow, with regular breaks and through site links, to open up views and access to Karne Reserve and the regional cycleway network

Providing high quality buildings that mitigate noise, while balancing the need for residential amenity and improved surveillance and activation of Karne Reserve and Belmore Road will be a priority

Acoustic attenuation measures will need to be considered in detail through the building design process.



Terrace dwellings

Responding to the one and two storey dwellings to the south of the Study Area, these 3 storey terraces will be designed to provide an appropriate transition, minimise overshadowing and overlooking issues and provide a greater diversity in housing to appeal to a broader population.

Front gardens will directly adjoin the street. This will create opportunities for residents to interact with their neighbours, while increasing visual interest, surveillance and street activation.

Terraces shall provide parking to the rear or have a minimum dimension of 7.5m to allow for a front garage which is under 50% of the front facade.

Local context

In terms of how heights might contribute to the legibility of the town centre, the Study Area is close enough to the station and high street to be part of the centre. Indeed, the 10 storey development at Washington Park to the north of the site is also considered part of the broader town centre. It is an appropriate response for the site to identify through taller buildings, where new shops and a new open space will provide an anchor to the retail strip.

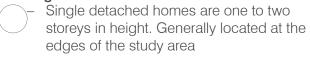
To support this strategy, it is critical that the Study Area feels like an extension of the town centre, by extending the retail uses on Belmore Road to the north, and by providing excellent connections from within the site back into Belmore Road.

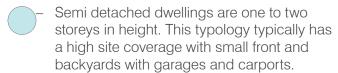
Character area approach to building design Within the Roosevelt Park and Garden precincts, subprecincts, or character areas have been identified through the site/context analysis and consultation process.

The following 8 steps provide an understanding of the built form strategy within these character areas and how it responds to its context.



Existing built form





Walk-up units are situated on large lots, two to three storeys in height arranged in clusters of three to four buildings around poorly planned and underutilised open space. The walk-up makes up the majority of the housing stock in the Study Area

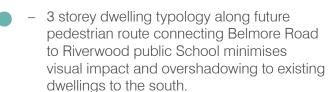
The 9 storey tower unit blocks are located in a large lot at the centre of the Study Area arranged in a public park setting and are accessible from all sides. They do not activate the streets.

> The apartment buildings at Washington Park are located on the northern fringes of the Study Area. Consisting of perimeter street edge buildings ranging from 6-10 storeys in height arranged around well structured, planned and clearly defined communal



Southern Interface

The southern edge of the site should remain at a lower scale not exceeding 3 storeys to provide an appropriate transition to neighbouring low density dwellings



 Proposed Minimum 2 lot amalgamation of private lots.

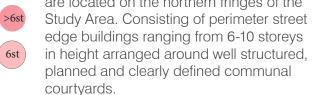
 Appropriate transition to existing 1 & 2 storey dwellings to the south

 Rear lane where possible to allow rear access and increased tree canopy

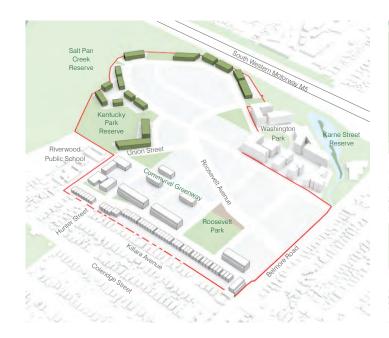


Truman Avenue and Community Greenway

- 4 storey street wall along Truman Avenue and Union Street provide an appropriate interface to Riverwood Public School and the 3 storey terraces to the south. The 4 storey street wall along Community Greenway mitigates overshadowing impacts while maximising activation and passive surveillance making the linear park a safe, sunny and active environment
- Connecting Riverwood Public School and town centre
- An additional 2 storeys setback along Truman Avenue provides an appropriate interface to 3 storey terraces













Park edge interface

At the edges of the site, building heights should sit at, or below the height of the tall trees (20m) where possible.

- 4 storey park edge apartments
- Interface with Salt Pan Creek Reserve
- 4 storeys remains below existing tree canopy while maximising views across Salt Pan Creek
- Apartment depth responds to the existing small/awkward lot pattern
- Typology allows for minimum lot amalgamation of private lots

Garden apartments

Low rise typology with a variation of heights ranging from 3-5 storeys

- Takes cues from existing 3 storey walkups currently existing on site
- 3 & 5 storey garden apartments
 - 5 storey orientated north south to maximise views to Salt Pan Creek Reserve while minimising overshadowing of communal space (gardens)

Roosevelt Avenue & Eastern Gateway

An appropriate 6 storey street wall height in the Roosevelt Urban neighbourhood takes cues from the development at Washington Park (6-10 storeys), the built form currently existing on site (3-8 storeys) and sets up a desired future character for the local centre. With a width to height ratio of 1:1 the street wall balances urbanity with a human scale where connections to the ground plane exist at all levels.

- 6 storey buildings



- 8 storey element set back and with a predominate north/south orientation to mitigate overshadowing impacts
- 6 storey street wall across entire precinct
- Maintains a connection to the ground maximising separation without maximising height
- Responds to existing building heights in Washington park (8-10 storeys)

Roosevelt Avenue & Eastern Gateway

Tall buildings of up to 12 storeys are supportable where the majority of the site can be lower in scale, and the development can deliver excellent public domain outcomes.



- Taller buildings of 12 storeys
- Located within close proximity to Riverwood station (500m).
- Taller buildings mark gateway to the site
- Taller buildings mark the location of Roosevelt
- Slender towers (750m² GFA) will perform better internally.
- North south orientation to mitigate overshadowing impacts and prioritise solar access to the new parks and streets.



- Taller buildings, responding to existing 9 storey buildings on site and Washington Park built form (up to 10 storeys), free up the ground plane and provide additional housing
 - Tall buildings should be located to respond to how the site is viewed from key regional views.
 - Taller buildings should be located away from the site interfaces to minimise impacts to neighbours

Building heights

The master plan proposes heights ranging from 3-12 storeys. A consistent street wall height of 6 storeys, will ensure a lower scale built form across the majority of the site.

- Building heights, up to 12 storeys, are identified in key locations. The tallest buildings are located within 800m of the station.
- The master plan includes 12 storey towers focused around the new local park and within 500m of the station.
- Building heights of 3 storeys on the southern boundary of the site to provide an appropriate interface with adjoining low scale development.
- Maximum height of 4 storeys for buildings on the park edge adjacent to Salt Pan Creek Reserve.
 Heights increase to 8 storeys with a 6 storey street wall closer to Karne Street Reserve, to respond to Washington Park.
- Garden apartments are 3-5 storeys in height with rooftop gardens and communal spaces on lower levels.
- Buildings along Belmore Road have a 6 storey street wall. With a varying road reserve of approximately 20m and proposed building setbacks of 3m this 6 storey street wall creates an urban 1:1 ratio of public domain to building heights at ground producing a comfortable environment for pedestrians.
- Above 6 storeys, envelopes are setback 3m and orientated in a north south direction to mitigate overshadowing impacts.
- Courtyard blocks along Roosevelt and Washington Avenue are generally 6-storeys podium buildings punctuated by north-south orientated 12-storey tower blocks.
- Buildings fronting the Community Greenway are generally 4storeys, to maximise solar access.



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Building setbacks

- On most street frontages, a building setback of 3m applies.
- Building setback of 3m applies from the lot boundary where the building faces a park.
- For mixed use development along Belmore Road, south of Truman Avenue a zero setback will apply for non-residential ground floor uses.
- For mixed use development along Belmore Road, north of Truman Avenue a 3m setback will apply for non-residential ground floor uses to mitigate perceived density by increase separation allowing for additional are for tree planting/retention and outdoor dining opportunities.
- Garden apartments along Kentucky Road have a minimum 2.5m setback; however, typology encourages large breaks between buildings for communal open space
- A minimum 4.5m building setback applies for development directly adjoining Kentucky Road Reserve.
- A minimum 5m front landscaping setback applies at the corner of Roosevelt Avenue and Kentucky Road, to mark the entry to the Garden Apartment Precinct, provide landscaped area for feature tree planting and enhance views from Roosevelt Avenue.
- The setback at the site entry at Roosevelt Avenue is 45m between buildings to maintain a view corridor to Salt Pan Creek Reserve down The Community Greenway to Union Street.
- A front setback of 4m applies to development along the south of Truman Avenue to provide for private gardens
- Terraces which share a common boundary to existing residential development along Killara Avenue shall have a minimum rear setback of 6m.
- A building setback of 2m applies to development along the through site link between Kentucky Road Reserve and Karne Street Reserve



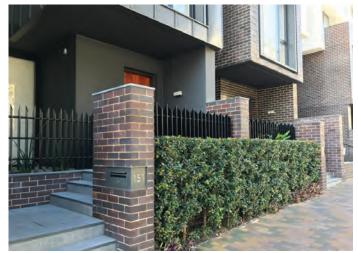
Indicative residential entries

The master plan aims to provide a clear street address on all residential streets, to:

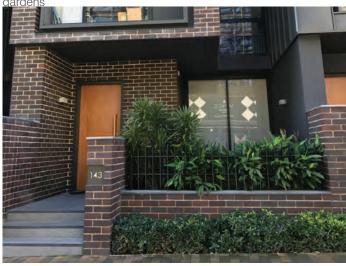
- Ensure accessibility to the residential development is clearly articulated.
- Create a 'sense of arrival ' for residents and visitors.
- Provide legible points of access.

Building on our vision, the majority of street frontages will comprise maisonette garden apartments.

- A maisonette apartment is a two-storey terrace style apartment, setback from the street that allows for secure front gardens, bike storage and direct pedestrian access to the street.
- Aiming for ground floor maisonette apartments on most streets, and a residential entrance every 10m, the master plan will create vibrant and attractive residential streets, with a diversity of housing and family-friendly housing options.
- This responds to the communities' love of gardening, the strong sense of community, spending time in the front garden and knowing your neighbours.
- This will encourage resident interaction, street activation and surveillance of streets.



Maisonette terrace style apartments allows for secure front



Front doors to streets allows residents direct access to their homes Images above: Harold Park, (Source: Architectus, 2017)



Indicative basement locations

- The ADG requires a minimum of 7% deep soil. The ADG does provide that on sites over 1,500m² it may be possible to provide 15% deep soil.
- All lots achieves the higher standard of 15% deep soil.
- A minimum of 15% of each development block within the Roosevelt Precinct, is to be provided as a deep soil zone.
- A target of 25% of each development block within the Garden Apartments Precinct, should be provided as a deep soil zone to reinforce garden character.
- The deep soil excludes the setback zones for residential development.
- Deep soil has a minimum width of 6m
- Consideration will need to be given to development lots along the northern boundary in terms of flooding risks to basement levels.
- Basement footprints should not extend beyond the building perimeters, where possible.



Service streets and indicative vehicular entries

 To minimise vehicle-pedestrian conflict, basement entries or service entries to waste collection areas will not be located on Roosevelt Avenue, Belmore Road or Roosevelt Park.



Communal open space

- A range of communal open space, including ground floor courtyards, front gardens and rooftop terraces, is proposed.
- Rooftop gardens are identified on lower levels in the Garden Apartment Precinct to provide surveillance of laneways and ground level gardens, with views over Salt Pan Creek Reserve.
- Residential units above ground floor will have access to rooftop gardens and communal open space.
- In the Garden Apartment Precinct, ground floor communal space will comprise raised front gardens that generally face the street. This will allow for social interaction, and a high level of surveillance of local streets.
- In the Roosevelt Park Urban Precinct, communal open space will predominately be communal courtyards. Rooftop gardens are also identified on key streets, including along the Community Greenway and Truman Street, to increase amenity and surveillance.
- Communal open space will provide residential apartments with safe, accessibility, and high quality landscaped open space within the development lot. Facilities within the communal spaces can range from communal gardens, informal seating areas to shared barbecue and dining facilities.



6.7 Land use

- The Study Area will retain a predominately residential land use, providing a range of residential housing types to support a variety of households.
- Mixed use and retail ground floor uses are identified along Belmore Road. This will allow ground floor retail uses, including a small supermarket, child care centres, cafés, community spaces, and local services, such as a post office or medical centre, and provide an extension to the Riverwood town centre.
- Small scale retail uses should be delivered in the early stages of the development to support future residents and promote walking and cycling for day-to-day shopping needs.
- The northern block fronting Belmore Road has the potential to extend retail and mixed use ground floor uses to maximise retail and commercial uses. In the future this could include a local supermarket to meet the needs of residents, and would deliver an integrated mixed use development that encourages walking and cycling within the site.
- Key corner sites with potential for non-residential uses, such as cafés and convenience stores, have also been identified throughout the site. This will also ensure local amenities and cafés are within walking distance of all apartments.
- Community uses are envisaged along the Community Greenway and fronting the proposed open space area along Union Street to support the community development. These uses could include:
 - Child care facilities
 - After school care
 - Men's shed/maker space
 - Community space
- The Riverwood Library and Knowledge Centre is within the adjoining Washington Park development.
 The library provides over 700sqm of floorspace.



The plan above shows the typical residential floor plan for above ground uses across the site.

The plan to the right shows the proposed ground floor land use plan with proposed non-residential uses along Belmore Road and adjacent to Roosevelt Park. Community uses are also proposed along opposite Union Street, adjacent to the new Community Park.



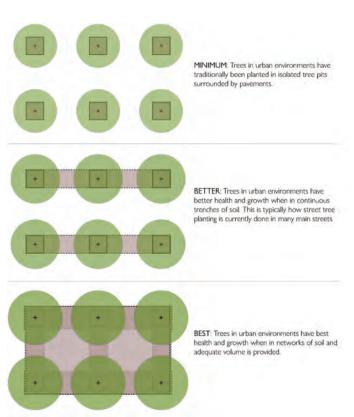
6.8 Green infrastructure

A well-considered and coordinated precinct-wide approach to green infrastructure will ensure that the ideal foundations are established at an early stage to encourage biodiversity, increase amenity, promote walking and cycling, and connect into existing and new open space.

Key opportunities include:

Retain existing mature tree canopy where possible and increase tree canopy - 30% target in 30 years. A tree canopy strategy is further described in Section 7.2 Tree canopy.

- Link soil networks with ample soil volumes in both the public domain and private deep soil zones for trees to thrive. Potential to connect soil networks with surrounding open space such as Salt Pan Creek Reserve and Karne Street Reserve.
- Link existing and new tree canopy to protect and encourage biodiversity.
- Connect into the existing Salt Pan Creek Reserve and proposed Green Grid priority projects.
- Implement green infrastructure on roofs and podiums.
- View the precinct; streets and parks, as a water supply catchment. Implement Water Sensitive Urban Design (WSUD) strategies, including raingardens, passive street tree irrigation and porous paving to collect and reuse stormwater and rainwater.
- Provide access and opportunities to connect to local green space to improve mental and physical wellbeing.



Continuous soil systems



Link existing tree canopy and habitat



Raingardens that capture runoff and provide passive irrigation



6.9 Building height

- The proposed Maximum height of building (HOB) controls range from 13m to 41m across the site.
- The proposed HOB controls are based on a design-led approach, that ensures a suitable transition from the lowest buildings in the south of the site, to the tallest buildings in the centre of the site.
- The proposed maximum height controls have been determined based on the desired future character of each street, and to manage impacts such as overshadowing and solar access.
- The highest HOB is located close to the proposed Roosevelt Park and off Belmore Road, in the Roosevelt Park Urban Village.
- Proposed HOB controls are lower in the Garden Apartment Precinct, adjacent to Salt Pan Creek Reserve and along the south of Truman Avenue.
- The HOB controls will be considered in conjunction with floor space ratio, setbacks, communal open space and landscaping requirements to determine the final built form outcome on each site.

HOB methodology is provided in the table below and includes a number of assumptions:

- Floor to ceiling height Non-residential ground floor = 3.6m
- Floor to ceiling height residential ground floor = 3.1m
- Ceiling height above ground = 2.7m
- Structure allowance = 0.4m
- Rooftop articulation = 1m
- Topographic changes = 1m
- Flooding allowance where applicable = 1m
- Heights have been rounded to correspond to those within Canterbury Bankstown consolidated LEP

Height associated DCP controls include:

- No more than 1 building over 8 storeys for each block
- Maximum footprint area for buildings over 8 storeys (750m² GFA)
- Upper level setbacks
- Ground floor setbacks

Building height methodology

Ground floor use	Ground floor height (m)	Height of storeys above ground (m)	Total structure allowance (m)	Rooftop articulation (m)	Topographic changes	Flooding	Height in storeys	Total HOB (m)
Residential	3.1	5.4	1.2	1	2	-	3	12.7
Residential	3.1	8.1	1.6	1	2	1*	4	16.8
Residential	3.1	10.8	2.0	1	2	-	5	18.9
Residential	3.1	13.5	2.4	1	2	-	6	22
Non-resi	3.6	13.5	2.4	1	2	-	6	22.5
Residential	3.1	18.9	3.2	1	2	-	8	28.2
Non-resi	3.6	18.9	3.2	1	2	-	8	28.7
Residential	3.1	29.7	4.8	1	2	-	12	40.6
Non-resi	3.6	29.7	4.8	1	2	-	12	41

^{*4} storey development to the north of the site adjacent to Karne Street Reserve sit within the flood plane



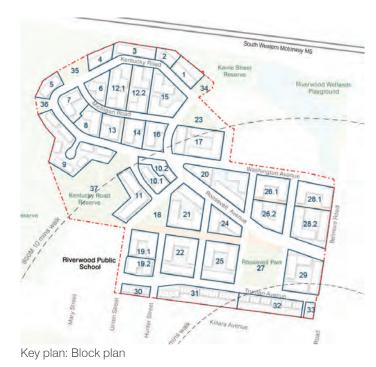
6.10 Indicative development yield

Yield summary	
Site Area	305,186sqm
Indicative GFA	345,124sqm
Site FSR	1.13

Assumptions

- Residential GFA = 75% of building envelope area
- Non-residential GFA = 85% of building envelope area
- NSA = 85% of GFA
- Average apartment size of 86sqm

Note: Dwelling numbers are notional and may be subject to change



Development lots	
Site Area	305,186

175,541 58%

Public domain	
Total public domain area	129,645
Public domain coverage	42%

Open Space	
New open space	23,991
Existing open space	24,827
Total open space	48,818
Open space coverage	16%

Streets	
Total street area	80,827
Street coverage	26%

Indicative master plan areas

Lot Area

Lot coverage

Yield Analysis							
Block	Lot Area	Open Space	Indicative Non- Resi GFA	Indicative Residential GFA	Indicative TOTAL GFA	TOTAL NSA	Indicative Dwellings
	m2	m2	85%	75%			86m2
Block 1	3,309		-	3,930	3,930	3,341	46
Block 2	1,915		-	2,175	2,175	1,849	25
Block 3	3,269		-	5,025	5,025	4,271	58
Block 4	2,335		-	3,585	3,585	3,047	42
Block 5	2,364		-	3,255	3,255	2,767	38
Block 6	3,098		-	3,915	3,915	3,328	46
Block 7	3,850		-	4,864	4,864	4,134	57
Block 8	3,488		-	4,980	4,980	4,233	58
Block 9	11,067			11,085	11,085	9,422	129
Block 10.1	2,868		-	5,670	5,670	4,820	66
Block 10.2	2,419		-	3,555	3,555	3,022	41
Block 11	5,786		-	8,265	8,265	7,025	96
Block 12.1	5,635		-	7,519	7,519	6,391	87
Block 12.2	5,897		-	8,768	8,768	7,453	102
Block 13	3,400		-	5,269	5,269	4,479	61
Block 14	3,491		-	5,119	5,119	4,351	60
Block 15	7,304		-	10,703	10,703	9,098	124
Block 16	3,551		-	5,119	5,119	4,351	60
Block 17	8,608		-	23,595	23,595	20,056	274
Block 18 (Park)	-	2,779	-	-	-	-	-
Block 19.1	4,352			9,285	9,285	7,892	108
Block 19.2	3,016		-	4,144	4,144	3,522	48
Block 20	8,678		-	23,325	23,325	19,826	271
Block 21	7,863		1,143	19,061	20,204	16,202	222
Block 22	8,098			19,553	19,553	16,620	227
Block 23 (Park)		3,534		-	-	-	-
Block 24	3,860			12,495	12,495	10,621	145
Block 25	7,861			21,585	21,585	18,347	251
Block 26.1	5,084			14,153	14,153	12,030	165
Block 26.2	5,108			16,650	16,650	14,153	194
Block 27 (Park)	-	10,059		-	-	-	-
Block 28.1	5,326			14,093	14,093	11,979	164
Block 28.2	7,642			22,110	22,110	18,794	257
Block 29	8,330		2,410	24,574	26,984	20,888	286
Block 30	1,775			2,171	2,171	1,845	9
Block 31	7,747			6,199	6,199	5,269	25
Block 32.1	1,699			945	945	803	4
Block 32.2	4,534			3,701	3,701	3,146	15
Block 33	914		451	1,823	2,274	1,550	21
Block 34 (Park)	-	1,634		-	-	-	-
Block 35 (Park)	-	2,811		-		-	-
Block 36 (Park)	-	768		-		-	-
Block 37 (Park)	-	22,016		-		-	-
Play Street	-	5,217				-	-
TOTALS	175,541	48,818	4,004	342,263	346,267	290,925	3,881

Indicative development yield

6.11 FSR methodology

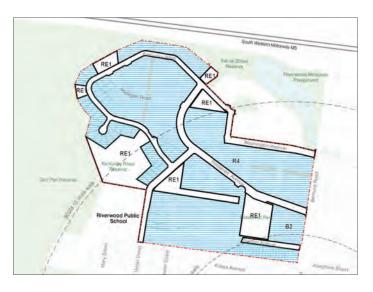
- A range of maximum FSR controls are proposed across the Study Area between 0.9:1 and 2.5:1.
- The proposed controls reflect the detailed urban design analysis undertaken in this report and aim to provide a high quality and appropriate built form outcome, consistent with the master plan.
- The intention of the proposed FSR control and associated mapping is to establish a maximum permitted GFA, which is then apportioned against the intended density outcomes across the site.
- The proposed FSR has been derived through the following key principles:



 FSR has not been applied to existing key roads and streets, which are proposed to be retained under the master plan, including Roosevelt Avenue, Washington Avenue, Kentucky Road and Union Street.



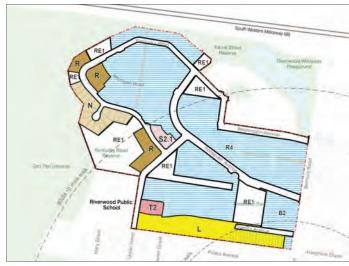
2. FSR has not been applied to existing nor proposed areas of open space (including, however not limited to, Roosevelt Park, Kentucky Park and the Community Greenway).



3. For all other areas of the site, including proposed internal roads, FSR has been applied.



4. Further, separate FSRs have been calculated when considered against areas of privately owned allotments, to enable equitable development outcomes.

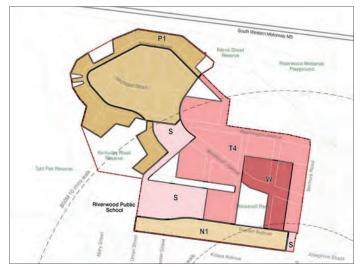


5. Given the larger area of LAHC owned and Canterbury Bankstown Council land, this has resulted in a proportionally lower FSR to some areas of the site, which are anticipated to comprise future development (or 'super') lots.

FSR methodology

Super lot FSR calculations

 The proposed FSR for the remaining super lots FSR has been calculated with consideration to associated zoning and height controls, to enable a clear visual correlation of proposed densities across the site.



Building height map (reference for FSR area boundaries)

Super lot	НОВ	Block	Block GFA	Total GFA	Super lot area	FSR
А	P1	Block 1 Block 2 Block 3	3,930 2,175 5,025	14,715	10,828	1.4
		Block 4	3,585			
		Block 6	3,915	51,392		
		Block 8	4,980			
		Block 12.1	7,519		44,651	1.2
	Q1	Block 12.2	8,768			
В	Qı	Block 13	5,269			
		Block 14	5,119			
		Block 15	10,703			
		Block 16	5,119			
	S	Block 10.2	3,555	3,555	2,414	1.5
	S	Block 19.1	9,285	28,838	16,122	1.8
		Block 22	19,553	20,030	10,122	1.0
С	T4	Block 21	20,204	54,284	23,911	2.3
		Block 24	12,495			
		Block 25	21,585			
		Block 17	23,595		37,281	2.2
D	T4	Block 20	23,325			
		Block 26.1	14,153	83,281		
		Block 28.1	14,093			
		Block 28.2	8,115			
	W	Block 26.2	16,650	30,645	12,721	2.4
	VV	Block 28.2	13,995	30,043		۷.4
Е	W	Block 29	26,984	26,984	11,021	2.4

FSR calculations for super lots



6.12 Floor space ratio

- The proposed FSR controls range from 0.9:1 to 2.5:1 providing an average FSR of 1.1:1 across the site.
- The proposed FSR controls are based on a design-led approach, that balances the need to deliver a high quality built form and commercially viable development.
- The highest FSR is located close to the proposed Roosevelt Park and Belmore Road, in the Roosevelt Park Urban Village.
- Proposed FSR controls are lower in the Garden Apartment Precinct, adjacent to Salt Pan Creek Reserve and along Truman Avenue.
- The proposed FSR controls are maximum controls that apply across the areas indicated in the HOB map. This will provide flexibility for a variety of design outcomes; however, when considered in conjunction with the buildings heights and Design Guide controls, the controls will ensure a variety of built form outcomes.
- The FSR controls will be considered in conjunction with building heights, setbacks, communal open space and landscaping requirements to determine the final built form outcome on each site.



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6.13 Sustainability

Sustainability principles should be integrated across all stages of the renewal of the Study Area. A number of regulations and policies at a state, national and international level provide guidance on developing a sustainability approach for the precinct. Rating tools are useful in assessing how the master plan can respond to and comply with sustainability principles and initiatives.

A Green Star - Communities rating is considered by industry as one of the best practice frameworks for integration of sustainability in large scale urban developments. It outlines a holistic approach to address key issues such as energy use, greenhouse gas emissions, water use, wastewater, solid waste and climate change resilience.

Achieving a 5-star Green Star - Communities v1.1 tool rating is recommended to ensure that the precinct complies with all sustainability related regulations, and contributes to achieving a well-designed and integrated sustainable community. The Green Star - Communities core principles are described adjacent.

In combination with achieving a 5-star Green Star - Communities rating for the precinct, consideration of the following rating tools is recommended:

- Aiming to achieve 5 stars for Green Star Buildings
 v1 for towers and townhouses
- Aiming to achieve NABERS for apartment buildings
- BASIX energy and water scores that exceed minimum targets



Enhance liveability

- Providing diverse and affordable living
- Creating health, safe and secure communities
- Fostering inclusiveness and cohesiveness
- Building community adaptability



Create opportunities for economic prosperity

- Promoting education and learning
- Enhancing employment opportunities
- Attracting investment
- Encouraging innovation
- Promoting efficiency and effectiveness



Foster environmental responsibility

- Enhancing our natural environment
- Reducing ecological footprint



Embrace design excellence

- Adopting effective planning practices
- Encouraging integrated design
- Maintaining flexible and adaptable approaches
- Creating desirable places
- Promoting accessibility



Demonstrate visionary leadership and strong governance

- Establish coordinated and transparent approaches
- Build a commitment to implementation
- Engaging with stakeholders
- Fostering sustainable cultures and behaviours
- Encouraging and rewarding innovation

Green Star - Communities core principles

6.14 Design excellence

Design quality
For Part 4 DAs through Council, this will require any buildings higher than three storeys to be reviewed by Council's Design Review Panel (DRP).

For projects lodged with DPE as State Significant Development (SSD), it is expected the SDRP will continue to provide design oversight and this process will be confirmed as DPE issues the Secretary's Environmental Assessment Requirements (SEARs) for the project/s. This process is outlined in the Government Architect's State Design Review Panel Terms of References Terms of Reference.



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7 Assessment

7.1 Public domain amenity assessment

Overshadowing - Winter solstice

This analysis looks at the impact of shadows cast from 9am to 3pm during the winter solstice.

- The study reveals minimal overshadowing impacts on open space within and surrounding the site from 10am to 2pm. Minor impacts are limited to 9am-10am in the morning and 2pm -3pm in the afternoon and only during the winter months.
- All major roads and public domain show minor impacts however again are limited to short periods of the day during the winter months only.
- Overshadowing of surrounding residential properties is restricted to the late afternoon from 2:30pm onwards to the properties east of Belmore Road. The additional overshadowing to these properties is negligible.







June 21, 10am



June 21, 11am



June 21, 12pm



June 21, 1pm



June 21, 2pm



June 21, 3pm

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Overshadowing - Spring equinox Spring equinox

This analysis looks at the impact of shadows cast from 9am to 3pm during the spring equinox.

- The study reveals negligible overshadowing impacts on open space within and surrounding the site from 9am to 3pm.
- All major roads and public domain show negligible impacts
- Overshadowing of surrounding residential properties does not occur
- Negligible additional overshadowing following design excellence height bonus







September 23, 10am



September 23, 11am



September 23, 12pm



September 23, 1pm



September 23, 2pm



September 23, 3pm

Open space winter solstice - solar analysis
The analysis indicates that each of the public open
spaces within the master plan, excluding The
Community Greenway, receive more than:

- 5-6 hours of sunlight to 50% of the area from 9am to 3pm in the winter months
- 4-5 hours of sunlight to 60% of the area from 9am to 3pm in the winter months (proposed DCP control)
- 3-4 hours of sunlight to 70% of the area from 9am to 3pm in the winter months
- >2 hours of sunlight to 80% of the area from 9am to 3pm in the winter months

The analysis shows that, on the winter solstice, The Community Greenway receives 2 hours of sunlight to 50% of the area from 9am to 3pm.



Open space spring equinox - solar analysis

The analysis indicates that all of the public open space within the master plan, excluding The Community Greenway, receive more than:

- >6 hours of sunlight to 50% of the area from 9am to 3pm on the solstice
- 5-6 hours of sunlight to 75% of the area from 9am to 3pm on the solstice
- 4-5 hours of sunlight to 90% of the area from 9am to 3pm on the solstice
- 3-4 hours of sunlight to 98% of the area from 9am to 3pm on the solstice
- >2 hours of sunlight to 100% of the area from 9am to 3pm ion the solstice

The analysis shows that, on the spring equinox, The Community Greenway receives 2 hours of sunlight to 90% of the area from 9am to 3pm.



Public domain winter solstice - solar analysis

The analysis indicates that 50% of all of the public domain (streets) within the master plan, receive more then 2 hours of sunlight from 9am - 3pm in the winter months.

Careful consideration should be taken in determining location of specific tree species in relation to solar requirements with:

- Deciduous trees focused on east-west streets; and
- Evergreen trees focused on north-south streets



Public domain spring equinox - solar analysis
The analysis indicates that 80% of all of the public domain (streets) within the master plan, receive more then 2 hours of sunlight from 9am - 3pm in the spring months



7.2 Tree retention

Potential tree canopy retention

This analysis considers impacts to high retention value trees (HRT) in relation to the proposed building envelopes within the master plan.

It should be noted that the impacts arise from envelopes, not built form and do not take into account breaks and/or articulation in buildings which will be designed during the development application (DA) stages.

An example of this potential future retention at the DA stage is highlighted on the following page 'Indicative schematics - High value tree (HRT) retention plan'.

The analysis indicates that at least 50% of high retention value trees should be retained.

The HRT's are split into 3 categories:

- 1. HRT with the a high potential for retention Open space
- These are HRT's that fall within the proposed open space and have a very high likelihood for retention
- 2. Tree canopy with the potential for retention Deep soil and streets
- These are the HRT's that fall within:
 - Potential deep soil zones
 - Verges of existing streets to be retained
 - Potential locations of verges in new streets
- These HRT's potential for retention while not as high as category 1, is still likely however, will require further detailed design work at the DA stage
- 3. HRT's with the potential for removal
- These are the HRT's that have major encroachment (greater than 10% of the TPZ or inside the SRZ) by:
 - Basement footprints
 - Vehicular travel lanes
- The potential for retention of these HRT's is low, however, through detailed design including building breaks and articulation could be retained.

The table to the right indicates defines high value trees in comparison to medium value trees.

Tree significance assessment criteria - STARS

Medium

High

- The tree is in good condition and good vigour
- The tree has a form typical for the species
- The tree is a remnant or is a planted locally indigenous specimen and/ or is rare or uncommon in the local area or of botanical interest or of substantial age.
- The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on Council's significant tree register
- The tree is visually
 prominent and visible from
 a considerable distance
 when viewed from most
 directions within the
 landscape due to its size
 and scale and makes a
 positive contribution to the
 local amenity.
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ tree is appropriate to the site conditions.

- The tree is in fair to good condition and good or low
- The tree has form typical or atypical of the species
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street
- The tree provides a fair contribution to the visual character and amenity of the local area
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ



Tree retention

Indicative schematics - High value tree retention plan

Tree retention must be carefully considered in the design phases of the development.

The following testing demonstrates how built form envelopes can be revised following a detailed arborist report during the future design phases to prioritise retention of significant trees while still achieving the GFA targets.

Retention of trees follow the following principles:

- 1. Retain trees using a natural systems based approach
- 2. Maintain natural soil profiles of adequate volumes to ensure the health of trees to be retained and to ensure deep soil parcels are interconnected with the groundwater network
- 3. Consolidate on a site by site basis. Adjust locations of deep soil areas to maximise tree, soil & hydrological regime retention
- 4. Ensure building footprint incursions into the tree protection zones (TPZ) of trees to be retained, are no greater than 10%



Detailed plan location

Yield calculation (m²)

Building ID	Footprint	Assumed Master Plan GFA (75% efficiency of building envelope)	Indicative floorplan GFA
A	1,570m ²	1,178	1,222
В	1,965m²	1474	1,474
С	1,150m²	862.5	909
TOTAL	4,685	3,514	3,604



7.3 Tree canopy

Indicative tree canopy cover targets

The Indicative tree canopy was measured using:

- 1. High Retention Tree arborist report (HRT), produced by Ecological
- 2. Preliminary Arborcultural Impact Assessment (AIA) produced by Ecological
- 3. Proposed tree planting in the Landscape Master Plan produced by JMD Design in the Landscape Report (Attachment I Landscape Design Report)

This was then assessed against the Indicative achievable canopy cover targets table in the Green Infrastructure Report produced by CLOUSTON.

A total of 299 high value trees were identified on site. Of these 150 (50%) have the potential for retention. The preliminary AIA identified an additional 57 trees of medium retention value of which 41 (72%) were classified as medium to no impact with the potential for retention.

Assumptions:

- Assumed existing tree canopy with the potential for retention has been taken from the HRT and AIA reports. It is noted that through future detailed design work there is a higher percentage of medium and low canopy that could be retained along streets and in deep soil zones
- The proposed street tree planting has been assumed from the landscape plan produced by JMD designs and is based of the street sections provided in the master plan section
- Indicative deep soil areas on development lots have a value of 2.64ha (15% of the lot size, based of the DCP requirements). It is noted that the majority of lots have the potential to provide a greater area of deep soil which would contribute to a higher % of canopy cover.
- Proposed tree canopy on deep soil for this exercise has been assumed at 80% of area

Table 1. Indicative canopy cover targets

Key Landscape		•		Proposed canopy cover in 30 years		n 30 years	Analysis of proposed canopy cover against desired
	Setting	ha	% of site area	Area of landscape setting	% of landscape setting	Target % of landscape setting (GI report)	— canopy cover target in Green Infrastructure Report
	Street	8ha	26%	6.2ha	78%	60%	The proposed canopy has the potential to reduce and meet the target with more detailed consideration of basement entries, servicing, lobby entries, on street parking, lighting and street furniture locations.
	Park	4.9ha	16%	1.3ha	27%	40%	Existing open space (Kentucky Road Reserve and Salt Pan Gardens) are existing open space so do not receive additional tree planting. All new open space achieves the 40% minimum
	Private	17.6ha	58%	3.5ha	20%	20%	Inclusive of deep soil and street trees
	Overall	30.5ha	100%	11	36%	30%	Proposal achieves above 30% canopy cover and would likely increase with additional planting in Kentucky Road Reserve



Tree canopy

Tree canopy analysis by stage

As the project will be delivered in stages over the course of approximately 20 years, the impact on existing tree canopy will be a gradual process. Although the existing tree canopy will be impacted by new development, and will take time to reach its current levels, testing indicates that over time tree canopy on site is never lower than 20%.

Assumptions:

- Assessment includes retained tree canopy within open space areas
- Existing tree canopy = 79,498m² (26% tree canopy cover)
- 100L Trees 2500mm -2700mm tall with a spread of 1000mm (diameter) at time of planting
- For purposes of this study assumed tree maturity of 15 years
- For the purposes of this study each stage is a 5 year period
- Assumed tree size at maturity:
 - Large = radius of 8m
 - Medium = radius of 4.5m
 - Small = radius of 2.5m



Tree canopy	area (m²)	% of existing	% of site
Remaining	63,350	80%	21%
Stage 01	8,760	7%	2%
Total	72,110	87%	23%
Loss/gain	-7,388	-13%	-3%

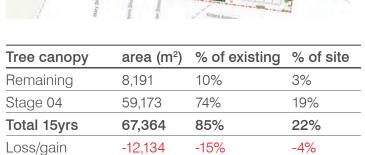


Tree canopy	area (m²)	% of existing	% of site
Remaining	44,896	56%	15%
Stage 02	15,057	19%	5%
Total 5yrs	59,953	75%	20%
Loss/gain	-19,545	-25%	-6%



Tree canopy	area (m²)	% of existing	% of site	
Remaining	29,628	37%	10%	
Stage 03	31,274	39%	10%	
Total 10yrs	60,901	77%	20%	
Loss/gain	-18,596	-23%	-6%	







Tree canopy	area (m²)	% of existing	% of site
Remaining	8,191	10%	3%
After 20yrs	67,407	74%	19%
Total 20yrs	75,598	95%	25%
Loss/gain	-3,900	-4%	-1%



Tree canopy	area (m²)	% of existing	% of site
Remaining	8,191	10%	3%
After 25yrs	81,465	102%	27%
Total 25yrs	89,656	113%	29%
Loss/gain	+10,158	+13%	+3%



0/ 6 !!
% of site
3%
28%
31%
+5%

7.4 Comparison to existing





Open space

	Area (ha)	Area (%)
Open space		
Existing	2.9 hectares	9.5%
Proposed	4.8 hectares	16%

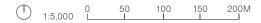
^{*}Area (%) refers to the percentage of the Riverwood Study area

Streets

Ottoots			
	Area (ha)	Area (%)	
Streets			
Existing	7.5 hectares	25%	
Proposed	8 hectares	26%	

Total public domain comparison

	Area (ha)	Area (%)
Total public do	main (streets +	open space)
Existing	10.4 hectares	34.5%
Proposed	12.8 hectares	42%



Josephine Stree

Riverwood Wetlands Playground

Comparison to existing



Tree canopy comparison

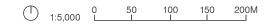
	Percentage canopy cover
Existing	26%
Proposed	30%

*Area (%) refers to the percentage of the Riverwood Study area



Building footprint comparison

	Area (sqm)	Area (%)
Existing	50,020 sqm	16%
Proposed	85,020 sqm	27%



7.5 Analysis of the master plan against CPTED Strategies:

Territorial Re-enforcement

Uses actual and symbolic boundary markers, spatial legibility and environmental cues to 'connect' people with space, to encourage communal responsibility for public areas/facilities, and communicate to people where they should/not be and what activities are appropriate.

The master plan encourages territorial re-enforcement by:

- A clear well-defined delineation between public and private open space and connections.
- All streets and open spaces are to be overlooked by adjacent residential apartments/dwellings.
- The removal/exclusion of any blank facades or fences adjoining public open space and public domain.
- Elements within the open space that activity encourage community ownership – such as community gardens.
- The retention of existing streets and mature trees wherever possible will help to maintain the existing community's connection to and sense of ownership of the public domain.

Surveillance

Natural surveillance is achieved when normal space users can see and be seen by others. This highlights the importance of building layout, orientation and location; the strategic use of design; landscaping and lighting – it is a by-product of well-planned, well-designed and well-used space.

The master plan encourages natural surveillance by:

- Improvements to existing street layout to increase sight lines and visibility to and from public domain and open spaces.
- The layout of apartment buildings provides high levels of natural surveillance to all streets, public domain and open space.
- The removal/exclusion of any blank facades or fences adjoining public open space/public domain.
- All open spaces to be surrounded by either public roads/streets OR directly overlooked by residential apartments with direct ground floor access.
- Landscape design that supports open visual access to and from all public domain/open space.

- Playgrounds are positioned to maximise natural surveillance from surrounding streets and residential apartments/dwellings.
- Well light streets, open spaces and building entries.

Technical/mechanical surveillance is achieved through mechanical/electronic measures such as CCTV, help points and mirrored building panels. It is commonly used as a 'patch' to supervise isolated, high risk locations.

It is envisaged that the delivery of the various stages of the master plan provide for technical and mechanical surveillance as required by the Local Authority and in consultation with the NSW Police. This may include (but not be limited to):

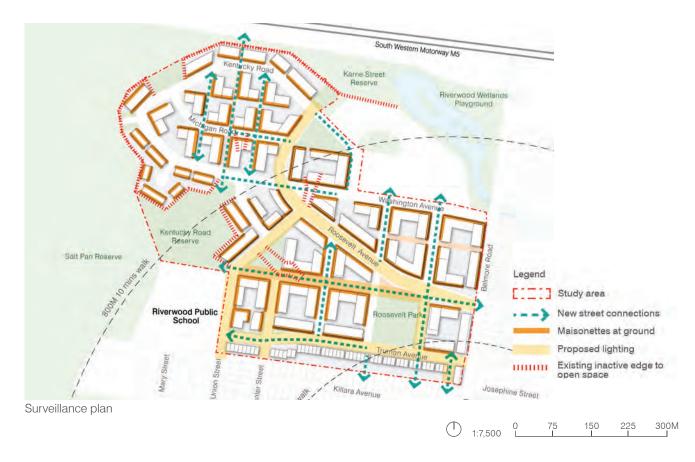
- CCTV along key streets and pedestrian connections
- CCTV covering open spaces and play areas
- CCTV covering building entries
- Help points in key locations as/if required

Formal (or Organised) surveillance is achieved through the tactical positioning of guardians. An example would be the use of on-site supervisors, e.g. security guards at higher risk locations.

It is not envisaged that this is a requirement to be committed to at the master plan level however could be considered as/if required as the project is delivered.



Territorial re-enforcement plan



Analysis of the master plan against CPTED Strategies:

Access Control

Natural access control includes the tactical use of landforms and waterways features, design measures including building configuration; formal and informal pathways, landscaping, fencing and gardens.

The master plan encourages natural access control though:

- The placement of buildings to reinforce streets and natural desire lines.
- The placement of buildings to define public versus private and communal open space.
- Boundary fencing and shrub planting to delineate between all public and private/communal open space.
- Formal pathways (Pedestrian and shared) alongside all streets and between key open spaces and destinations.

Technical/Mechanical access control includes the employment of security hardware.

It is not envisaged that this is a requirement to be committed to at the master plan level however could be considered as/if required as the project is delivered.

Space Activity Management

Space/Activity Management strategies are an important way to develop and maintain natural community control. Space management involves the formal supervision, control and care of the development. All space, even well planned and well-designed areas need to be effectively used and maintained to maximise community safety. Places that are infrequently used are commonly abused. There is a high correlation between urban decay, fear of crime and avoidance behaviour

It is envisaged that the delivery of the various stages of the master plan will provide for space and activity management by:

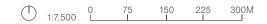
- The master plan and its respective public domain and open spaces have been designed to consider the way spaces will be used by the community.
 It is envisaged that the ongoing delivery of public domain will include additional community consultation to ensure that it is maintains high levels of activity and is a valued asset.
- Streets and open spaces being design with ease of maintenance in mind.
- For the design of all public domain to be done in direct consultation with Council's maintenance and asset management teams.
- All open space and public domain elements particularly street furniture, public art and play equipment to be inspected and maintained on a regular basis with repairs carried out in a timely fashion



Access control plan



Open space plan



7.6 Wind

Wind

Wind Effects

The master plan for Riverwood does not include high rise towers with maximum heights below 41m. Upper levels of buildings are proposed to be set back above 6 storeys and will be no taller than 12 storeys overall.

Neither The City of Canterbury Bankstown Council or Georges River Council have wind assessment criteria for developments.

Given the restricted building heights proposed in the master plan and the relatively mild wind it is not envisaged that future DA's will require wind tunnel testing.

Wind Mitigation

Generally, the master plan allows for the following mitigating measures:

- Maximum building heights do not exceed 41m with the majority of building being 6 storeys or lower.
- Taller buildings (above 6 storeys) are set back from podium levels and street frontages by a minimum of 3m.
- Taller buildings are well spaced from each other to allow breezes to penetrate the streets and spaces in-between them.
- Mature trees are to be retained wherever possible which will aid in minimising the effects of strong winds
- There is generous open space and landscape provision allowing for additional tree planting and vegetation.



7.7 ADG Testing

Building separation

The master plan achieves and in the majority of cases exceeds the minimum building separations as required by the Apartment Design Guide.

Key building separations are outlined below:

- A minimum of 30m separation for perimeter blocks from 8-12 storeys in the Roosevelt precinct
- A minimum of 18m separation for perimeter blocks from 4-6 storeys in the Roosevelt precinct
- A minimum of 18m separation for habitable rooms in the garden apartment at 5 storeys
- A minimum of 12m separation for habitable to non-habitable rooms in the garden apartment at 3 storeys

Envelope length

The master plan provides for/can demonstrate that a variety of building lengths can be accommodated.

- If the building length of any building exceeds 45m, it should be broken into two or more components, so no length is longer than 45m, before which a minimum 3x3m inset is to be provided at all levels.
- Envelope lengths in the garden apartments do not exceed 65m.
- Minimal lot amalgamation of private lots interfaced with Salt Pan Creek Reserve result in shorter building lengths increasing visual permeability through to the regional open space.
- Lots within the Roosevelt precinct with perimeters
 100m should be broken by through site links with a minimum width of 8m



Solar access to apartments - (Winter Solstice)

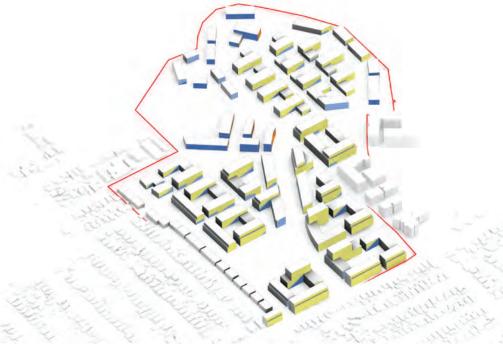
This analysis highlights solar access to the indicative built form envelopes and has been assessed on the winter solstice (June 21st) between the hours of 9am and 3pm.

The ADG requires at least 70% of apartments in a building to receive a minimum of 2 hours direct sunlight between 9am and 3pm mid winter (winter solstice)

High level envelope testing demonstrates the building envelopes capable of achieving compliance with solar requirements in the ADG if they meet the following criteria:

- Buildings with a predominate north-south orientation
 - 70% solar access to both east and west facades
- Buildings with a predominate east-west orientation
 - 100% solar access to northern facade
 - 70% solar access to both east and west facades

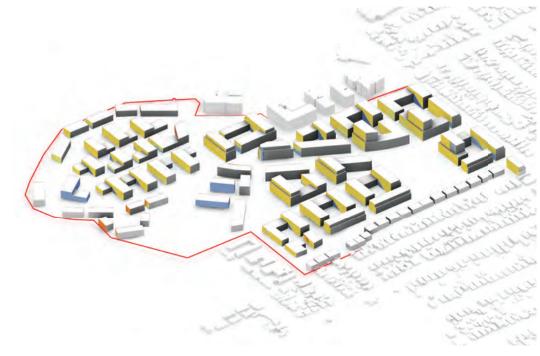
Detailed schematics testing for envelopes that did not meet the above criteria can be found on pg50.

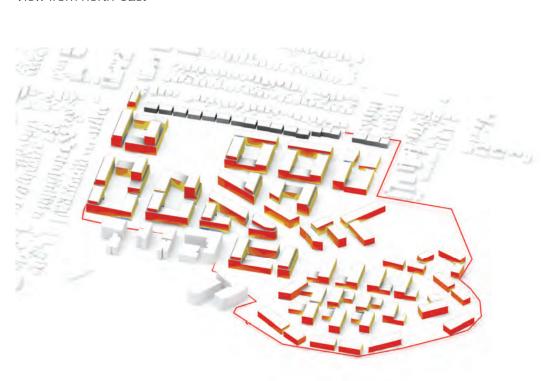


View from south-east



View from north-east



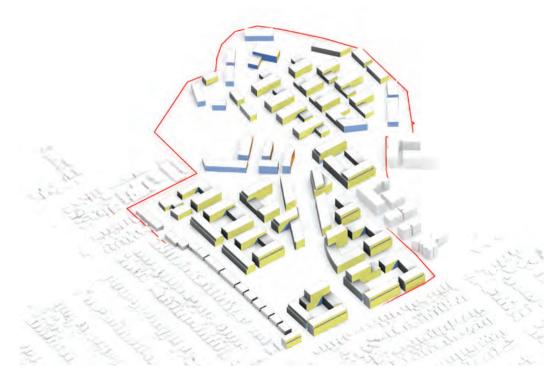


View from north-west

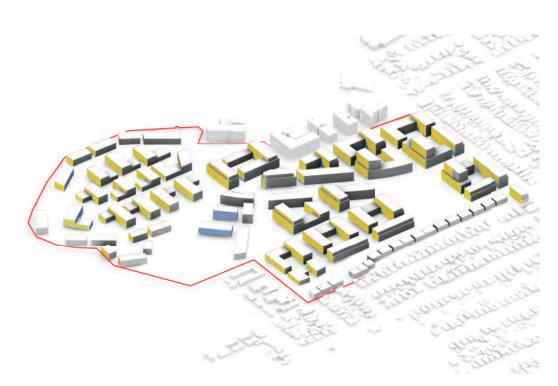


Legend - No. of hours of sunlight >6 hours 5-6 hours 4-5 hours 3-4 hours 2-3 hours 0-2 hours

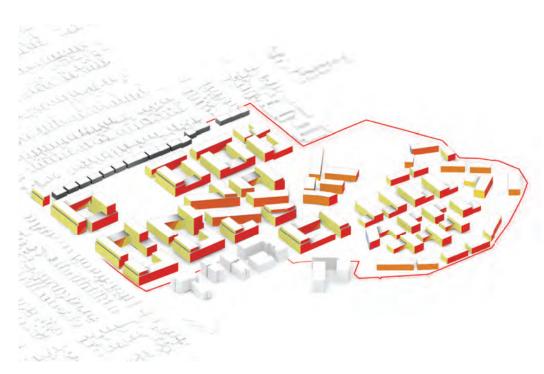
Solar access to apartments - (Spring Equinox)
This analysis highlights solar access to the indicative built form envelopes and has been assessed on the spring equinox (September 23rd) between the hours of 9am and 3pm.



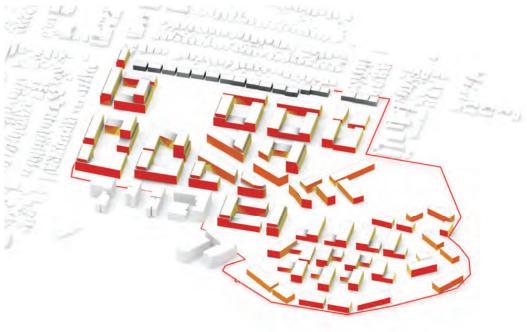
View from south-east



View from south-west



View from north-east



View from north-west

Legend - No. of hours of sunlight >6 hours 5-6 hours 4-5 hours 3-4 hours 2-3 hours 0-2 hours

Solar access - detailed schematics testing
Envelopes which did not meet the criteria in the
facade testing underwent detailed schematics testing
for each level. Typical floorplan shown to the right.

Development blocks selected represent the typologies of all blocks on site. Detailed ADG assessment will occur at DA stage - the following demonstrates the master plan is capable of achieving ADG compliance.

This analysis indicates solar access to indicative apartments based on the envelope testing on the previous pages.

Design Criteria:

At least 70% of apartments in a building to receive a minimum of 2 hours direct sunlight between 9am and 3pm mid winter (winter solstice)

The master plan can therefore demonstrate, through this typology testing, that future development proposals can meet ADG compliance on this requirement.

Sol	ar	access
OUI	aı.	access

20141 400000							
Block ID	Apartment numbers	> 2hrs % solar		Compliant			
1	48	34	70%	•			
5	40	32	80%	•			
7	50	35	70%	•			
9	24	24	100%	•			
10.1	30	23	77%	•			
11	64	45	70%	•			
15	76	58	76%	•			
17	188	158	84%	•			
20	96	70	73%	•			
21	226	194	86%	•			
22	236	204	86%	•			
24	150	121	81%	•			
28.1	164	147	90%	•			
29	346	297	86%	•			



Cross ventilation - typology testing

Development blocks selected represent the typologies of all blocks on site. Detailed ADG assessment will occur at DA stage - the following demonstrates the master plan is capable of achieving ADG compliance.

Design Criteria:

- At least 60% of apartments are naturally cross ventilated in the first nine storeys of the building.
- Overall depth of a cross-over or cross-through apartment does not exceed 18m, measured glass line to glass line

The master plan can therefore demonstrate, through this typology testing, that future development proposals can meet ADG compliance on this requirement.

Cross ventilation (1st 9 storeys)

Block ID	Apartment numbers	Cross ventilated	%	Compliant
1	48	32	67%	•
5	40	28	70%	•
7	50	31	62%	•
9	24	24	100%	•
10.1	30	24	80%	•
11	64	52	80%	•
15	76	48	63%	•
17	188	136	72%	•
20	96	73	76%	•
21	226	160	70%	•
22	236	175	75%	•
24	150	112	75%	•
28.1	164	108	66%	•
29	322	210	65%	•



Solar access to Communal space - (Winter Solstice)

This analysis highlights solar access to the indicative communal open space. It has been assessed on the winter solstice between the hours of 9am and 3pm

- The majority of communal open space, at grade, achieves 50% direct sunlight for a minimum of 2 hours as required in the Apartment Design Guide.
- Rooftop gardens will also provide further opportunity for communal space.

Following recommendations from the ADG, where communal open space, at ground level, does not meet the minimum solar access requirements, communal open spaces located on rooftops in the same block will offer an appropriate alternative.

These blocks include:

- Block 24
- Block 29

The master plan can therefore demonstrate that future development proposals can meet ADG compliance on this requirement.



Solar access to Communal space - (Spring Equinox)

This analysis highlights solar access to the indicative communal open space. It has been assessed on the spring equinox between the hours of 9am and 3pm



Deep soil

The ADG recommends 15% deep soil for large sites over 1,500sqm

The map shows indicative deep soil locations for each development lot at 15% of lot area which equates to 2.7ha of deep soil in the master plan.

At a minimum 2.7ha of deep soil could support the equivalent of 900 medium trees to add approximately 7-12% to the tree canopy of the Study Area within the development lots.

It is recognised that there are opportunities for a higher percentage of deep soil zones across development such as within the Garden Apartments Precinct.

The master plan can therefore demonstrate that future development proposals can meet ADG compliance on this requirement.



ADG testing summary

The proposed built form envelopes across the site were evaluated against the key criteria for residential buildings as laid out in the Apartment Design Guide (ADG), refer to table to the right. These include:

- Building separation
- Cross ventilation
- Day light access to apartments and communal open space
- Deep soil requirements

Following detailed testing of the building envelopes, it can be concluded that all blocks on the site are capable of achieving both cross ventilation and building separation compliance without any difficulties.

The facade and detailed schematics solar testing of the building envelopes revealed that all blocks are capable of achieving the minimum 2 hour exposure to direct sunlight in mid-winter to 70% of dwellings.

All blocks will feature communal open spaces for residents at either ground and/or at roof level. Where communal open spaces at ground level do not achieve the required minimum exposure to direct sun light of 2 hours in midwinter, communal open spaces located at roof level located in the same block will provide optimum exposure to sun light and offer an appropriate alternative space.



Key plan: Block plan

Draft Design and place SEPP Design criteria

The proposed built form envelopes across the site have also been evaluated against the draft revised key criteria for residential buildings as laid out in the Draft Design and Place SEPP, refer to table to the right. These include:

Building separation - no change to separation

Compliant with design guide of 750m² GFA floorplate above 9 storeys

Cross ventilation:

- 60% of apartments for the first 9 storeys
- 50% of apartments at 10 storeys or more

Deep soil for sites:

- $-650m^2-1,500m^2=15\%$ (3m width)
- 1,500m²-3,000m² = 20% (3x6m width, can include 3m setback)
- ->3,000m² = 25% (3x6m width, can include 3m setback)

Communal space:

- Provide communal open space for every development at a rate of 8 m² per dwelling up to 25 per cent of the site area.
- At midwinter (22 June), achieve a minimum of 2 hours direct sunlight between 9 am and 3 pm to a minimum of 50 per cent of the communal open space area.

Note: Communal open space can be located on podiums and rooftops; it does not have to include deep soil areas

Legend

- Compliant
- Compliant with conditions
- Not compliant
- Not applicable

		SEPP 65 Testing against ADG					Draft Design and Place SEPP (Round 3 13 September 2021)			
Block No.	Building envelope separation	Cross ventilation	Solar access apartments	Solar access communal open space (ground floor)	Solar access communal open space (rooftop)	Deep soil (15%)	Maximum GFA of 750m ² above 9 storeys	Cross ventilation	Deep soil	Communal open space
1				•	-		•	-		
2	•	•	•	•	-		•	-	•	•
3	•	•	•	•	-		•	-	•	
4	•	•	•	•	-	•	•	-		•
5	•	•	•	•	-	•	•	-		•
6	•	•	•	•	-	•	•	-		•
7	•	•	•	•	-		•	-		•
8	•	•	•	•	-		•	-		•
9	•	•	•	•	-		•	-		•
10.1	•	•	•	•	-		•	-		
10.2	•	•	•	•	-	•	•	-	•	•
11	•	•	•	•	-		•	-		•
12.1	•	•	•	•	-	•	•	-		•
12.2	•	•	•	•	-		•	-		
13	•	•	•	•	-	•	•	-		•
14	•	•	•	•	-		•	-		
15	•	•	•	•	-	•	•	-		
16	•	•	•	•	-		•	-		
17	•	•	•	•	-	•	•	-		•
19	•	•	•	•	-	•	•	-		
20	•	•	•	•	-		•	-		•
21	•	•	•	•	-		•	-		
22	•			•	-	•	•	-		•
24	•	•	•		•	•	•	-	•	•
25	•		•	•	-	•	•	-	•	•
26.1	•	•	•	•	-	•	•	-		•
26.2	•		•	•	-	•	•	•	•	•
28.1	•	•	•	•	-	•	•	-		•
28.2	•	•	•	•	-	•	•	•		•
29	•		•		•		•	•		•
33				•	_					

Architectus has considered the visual impact of the potential built form on the surrounding area. Views have been selected from the public domain based on our topographic assessment of the local area and from where the site is most visible.

Assessment methodology

This visual assessment method has addressed views from the public domain and from private properties.

The public domain views have been assessed in accordance with the planning principles set by the NSW Land and Environment Court in the case Rose Bay Marina Pty Ltd v Woollahra Municipal Council 2013/1046.

The visual impact assessment method for the public domain views acknowledges the following five step process of the Court planning principles:

- Identify the scope of the existing views from the public domain
- Identify the locations in the public domain from which the interrupted view is enjoyed
- Identify the extent of the obstruction at each relevant location
- Identify the intensity of public use of those locations
- Review any document that identifies the importance of the view to be assessed.

This report has not included a visitation to individual properties and documentation of actual existing views.

Standards for photography

All individual photographs have been taken with a 35mm focal length lens format or equivalent.

This is the accepted standard of the New South Wales Land and Environment Court for approximating the normal human depth of field, so that the size of the image approximates the size of the object as seen by the eye from the same location. Preparation of the masked outline overlays involved the following steps:

- Digital photographs were taken from each of the selected viewpoints in the direction of the proposed development;
- A computer generated 3D model of the proposed building was prepared;
- The 3D model was inserted into the photographs from the key vantage points using the same 35mm focal length and
- The precise RL of the location (plus 1.7m to represent eye height)
- A mask is placed over the location of the 3d model, illustrating its extent in the view.

Disclaimer:

All views are prepared with the information available and all effort has been made to accurately depict the proposal, the following are assumed information:

- RL points were extrapolated from a survey, not from surveyor's precise location of the photographs.
- LPI 2m contours used for the terrain for RL points of the photograph location.

Reading the assessment

- 1. Each assessment should be read with key attributes:
- 2. Proposed built form appears as a white envelope with black outline
- 3. Where proposed built form is hidden by existing built form or vegetation the outline appears as a white line

See example image below



Views Tested

The map adjacent indicated the locations where the visual assessment was taken from.

- Belmore Road and Canterbury Road
 Corner of Belmore Road and Major Street
- 3. Corner of Bell St and Lupin Ave
- 4. Belgium St
- 5. Alverstone Street
- 6. Corner of Belmore Road and Rotary Park
 7. Corner of Belmore Road and M5 overpass
 8. Corner of Belmore Road and M5
- 9. Corner of Hannan's Road and Bonaparte
- 10. Belmore Road from Riverwood Station
- 11. Corner of Union St and Coleridge St
- 12. Riverwood Park
- 13. Thurlow Street at Riverwood station
- 14. Romilly Street
- 15. Bonds Road
- 16. Peakhurst Park



View 1 Belmore Road and Canterbury Road (looking south)

This view is taken at the intersection of Belmore Road and Canterbury Road approximately 1.5km north of the site. As Canterbury Road follows the regional topographical ridge line it offers the highest vantage point to observe built form on the subject site. The viewpoint shows Belmore Road descending into the lower Salt Pan Creek basin where the site is located.

Visual Impact Rating
The visual impact of potential future development is considered to be low in this view. Low-rise development along Belmore Road allows longdistance views into the basin where the built form is visible but not imposing.









Visual impact assessment

View 2 Corner of Belmore Road and Major Street

(looking south)
This view is taken looking south along Belmore Road at its intersection with Major Street. The viewpoint is located 700m north of the M5 South Western Motorway and approximately 1.3km north of the intersection of Belmore Road with Roosevelt Avenue.

Visual Impact Rating
The visual impact of potential future development is considered to be negligible as the site is topographically lower than the viewpoint which means the existing built form and mature vegetation will screen all of the built form.









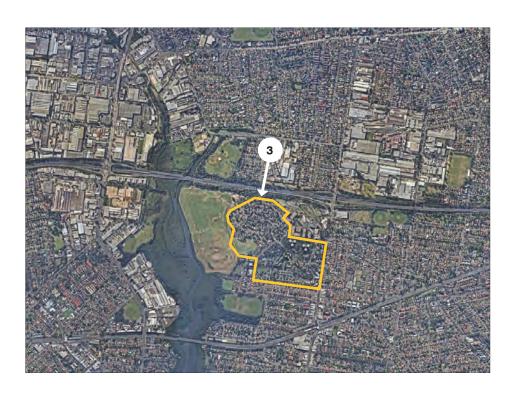
Visual impact assessment

View 3 Corner of Bell St and Lupin Ave

(looking south)

This view is taken looking south along Bell Street at its intersection with Lupin Avenue. The viewpoint is located about 250m north of the M5 South Western Motorway. The view comprises low-rise residential buildings and a dense tree canopy screening the motorway in the background.

Visual Impact Rating
The visual impact of potential future development is considered to be negligible as the low-scale built form on the western part of the subject site will be screened by the mature vegetation along the M5 motorway.









Visual impact assessment

View 4 Belgium St (looking south) This view is taken looking south along Belgium Street about 150m north of the M5 South Western Motorway. Between the trees along the motorway the view shows a recently completed 8-storey-building of the Washington Park development at Vermont Crescent.

Visual Impact Rating
The visual impact of potential future development is considered to be negligible due to the visual obstruction by the existing built form and mature vegetation along the South Western Motorway.









Visual impact assessment

View 5 Alverstone Street

(looking south)
This view is taken looking south along Alverstone
Street about 200m north of the M5 South Western Motorway. The view comprises low-rise residential buildings with large setbacks from the street and mature vegetation screening the motorway in the background. Between this vegetation parts of the recently completed Washington Park development can be seen.

Visual Impact Rating

The visual impact of potential future development is considered to be low as the potential future built form will be screened by existing built form and mature vegetation along the M5 motorway.









Visual impact assessment

View 6 Corner of Belmore Road and Rotary Park

(looking south)
This view is taken looking south along Belmore Road next to Rotary park and shortly before the bridge over the M5 South Western Motorway. The viewpoint is approximately 650m north of the intersection of Belmore Road with Roosevelt Avenue.

Visual Impact Rating
The visual impact of potential future development is considered to be negligible as the elevation of the bridge and mature vegetation along the motorway will screen the future built form.









View 7 Corner of Belmore Road and M5 overpass

(looking south-west)

This view is taken looking south-east towards the subject site from the bridge crossing the M5 South Western Motorway. The viewpoint is topographically higher than the site, revealing larger parts of potential future development than views from further up north along Belmore Road.

Visual Impact Rating

The visual impact of potential future development is considered to be low. The elevation of the bridge allows wider views compared to other regional viewpoints. However, as the site is topographically lower than the viewpoint mature vegetation along the motorway will screen the largest part of future built form in the Study Area.









Visual impact assessment

View 8 Corner of Belmore Road and M5

(looking south)
This view is taken looking south along Belmore
Road from the street island next to Morris lemma Indoor Sports Centre. The viewpoint is approximately 400m north of the intersection of Belmore Road with Roosevelt Avenue and shows low-rise residential buildings east of Belmore Road and currently being constructed apartment buildings west of it.

Visual Impact Rating
The visual impact of potential future development is considered to be low as the Washington park apartments and existing mature vegetation screen the majority of the development.









Visual impact assessment

View 9 Corner of Hannan's Road and Bonaparte

Street (looking west)
This view is taken looking west along Hannan's Road at the intersection with Bonaparte Street. The viewpoint is approximately 450m east of Belmore Road and shows low-rise residential buildings along the local street. The top levels of existing high-rise buildings on the subject site tower above the tree canopy in the background of this view.

Visual Impact Rating

The visual impact of potential future development is considered to be low. Existing built form and mature vegetation screen the majority of the development. Some built form is evident however views of sky are dominant.









Visual impact assessment

View 10 Belmore Road from Riverwood Station (looking north)

This view is taken looking north along Belmore Road from the street elevation at Riverwood train station. The viewpoint is approximately 450m south of the intersection of Belmore Road with Roosevelt Avenue and shows the low-rise commercial strip leading up to the train station.

Visual Impact Rating

The visual impact of potential future development is considered to be low-medium. The built form appears in above the existing tree line however t does not dominate the view. The variation in height creates an interesting skyline while also creating a visual connection enabling way finding from the town centre to the Study Area.









Visual impact assessment

View 11 Corner of Union St and Coleridge St

(looking north)
This view is taken looking north along Union Street at the intersection with Coleridge Street. The view shows low-rise residential buildings south of the subject site and existing mature vegetation on the subject site in the background of this view.

Visual Impact Rating
The visual impact of potential future development is considered to be nil. The built form is screened by the existing built form and mature vegetation.









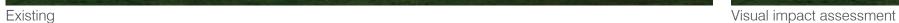
Visual impact assessment

View 12 Riverwood Park (looking north)
This view is taken looking north towards the subject site from the playing field in Riverwood Park. The view is dominated by low-rise residential buildings south of the subject site and existing mature vegetation along Riverwood Park.

Visual Impact Rating
The visual impact of potential future development is considered to be nil. The built form is screened by the existing built form and mature vegetation.







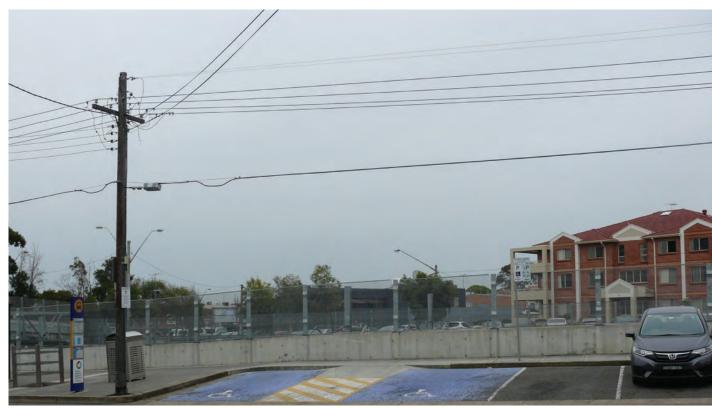


View 13 Thurlow Street at Riverwood station

(looking north-east)
This view is taken looking north-east towards the subject site from Thurlow Street approaching Riverwood train station. The view is dominated by the fencing of the train tracks and residential flat buildings north of the train line.

Visual Impact Rating
The visual impact of potential future development is considered to be low due to the visual obstruction by the existing built form.









Visual impact assessment

View 14 Romilly Street (looking north-east)
This view is taken looking north-east towards the subject site from Romilly Street. The view is dominated by low-rise residential buildings and existing mature vegetation along the street. The train line in the background opens up the view towards the subject site.

Visual Impact Rating
The visual impact of potential future development is considered to be low. The built form is screened by the existing built form and mature vegetation the proposed built form will only be visible in small instances.









View 15 Bonds Road (looking north-east)
This view is taken from the corner of Bonds Road and Meadowland Road looking north-east towards the subject site. This reference point is topographically higher than the subject site, thus the proposed built form becomes a landmark approached from Bonds Road.

Visual Impact Rating

The visual impact nating
The visual impact of potential future development is considered to be low. The majority of the development is screened by existing vegetation. Long views are interrupted for vehicles along Bonds road however the skyline remains relatively similar and views to sky are still dominant.









Visual impact assessment

View 16 Peakhurst Park (looking north-east)
This view is taken looking north-east towards
the subject site from Peakhurst Park. The view
is dominated by mature vegetation and low-rise
residential buildings north of the park.

Visual Impact Rating
The visual impact of potential future development is considered to be nil due to the visual obstruction by the existing built form and mature vegetation.









Visual impact assessment

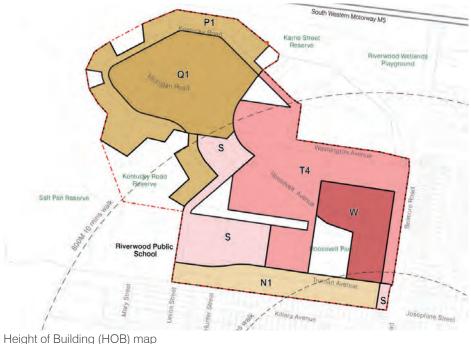


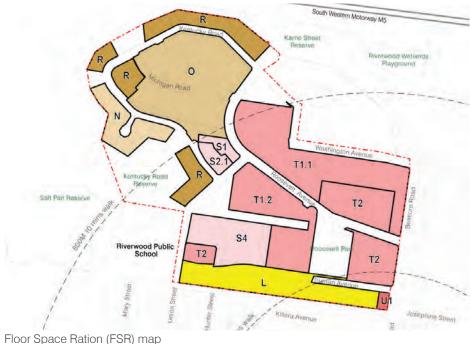
architectus

8 Recommendations

8.1 Draft LEP controls







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Land use zoning

The proposed land use zoning strategy will deliver opportunities for a diverse range of housing throughout the Study Area, supported by retail and community uses. The majority of the site is proposed to retain its current R4 High Density Residential zoning. Land currently zoned R3 Medium Density Residential is proposed to be rezoned to R4 High Density Residential to allow development of residential flat apartment buildings as a permitted use.

A small portion of land in the western portion of the precinct is proposed to be zoned B2 Local Centre to allow a range of mixed uses including residential, retail and commercial uses. These mixed uses will contribute to the activation of Belmore Road and the new Roosevelt Park.

New open space areas are proposed to be zoned RE1 Public Recreation.



Maximum height of building

A range of maximum building height controls are proposed across the Study Area ranging between 12m (3 storeys) and 41 metres (12 storeys), with the exception of land that is proposed to be rezoned RE1 Public Recreation. RE1 Public Recreation zoned land is proposed to have no maximum height.

The proposed height strategy ensures a suitable transition from the lowest buildings in the south of the site, to the tallest buildings in the centre of the site. The proposed maximum height controls have been determined based on the desired future character of each street, and to manage impacts such as overshadowing and solar access.

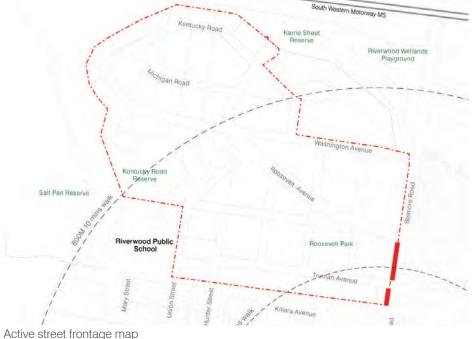
Floor Space Ratio

A range of maximum floor space ratio controls are proposed across the Study Area between 0.9:1 and 2.5:1.

The proposed controls reflect the detailed urban design analysis undertaken in the Urban Design Study and aim to provide a high quality and appropriate built form outcome, consistent with the master plan.

Draft LEP controls







Additional permitted uses map

Minimum lot size

It is proposed to remove the minimum lot size control for the Study Area.

Instead, the proposal seeks to align with the minimum lot sizes, for various land use types, in accordance with the Canterbury Bankstown Consolidated Local Environmental Plan 2020.



Active Street Frontage

A new active street frontage is proposed along certain land with frontage to Belmore Road and Truman Avenue.

The active street frontage control has been determined to encourage land uses that promote pedestrian street traffic on certain street frontages located within walking distance (400m) of Riverwood Train Station.

Additional Permitted Uses

To support the proposed master plan, three (3) APUs are proposed, including:

- Provision for an Additional Permitted Use (APU) on certain land identified as "APU 25" to enable residential flat buildings within the B2 Local Centre
- Provision for an APU on certain land identified as "APU 26" to allow neighbourhood shops up to 250m², a neighbourhood supermarket up to 1,000m² and food and drink premises including cafes and restaurants as an additional permitted use;
- Provision for an APU on certain land identified as "APU 27" to allow neighbourhood shops up to 250m² and food and drink premises including cafes and restaurants as an additional permitted

8.2 Draft Development Control Plan

Development Control Plan (DCP)

To support the proposed changes to the Draft CBLEP, a DCP is proposed to guide future development throughout the Study Area. The DCP includes detailed design controls to support the proposed LEP planning controls and deliver the highest quality design and built form outcome for the site. The DCP includes provisions relating to desired future character, land uses, public domain, local infrastructure, open space and public domain, heritage, built form, parking, tree canopy and tree retention and sustainability.

Once endorsed, the DCP would be used to inform future development proposals within the Study Area. The DCP will be managed and published by DPE, however will be publicly available and will apply to all future development within the Riverwood Estate SSP, irrespective of type or scale. For any DAs for which they are the consent authority, Canterbury Bankstown will also review and consider proposals against this DCP.

The site specific DCP will work in tandem with Council's Consolidating DCP. Where possible, the Estate will be subject to the DCP controls that apply across the Canterbury Bankstown local government area (under the Consolidating DCP). The draft DCP only includes controls that vary or provide site specific outcomes for the Riverwood Estate. Wherever inconsistent, the site specific DCP will apply.

The draft DCP has been informed by the master plan. It allows for some flexibility for continued improvement in design and to adapt to changing environmental, economic and social drivers for development in Riverwood. However, the key objectives, principles and character defining elements of the master plan have been incorporated and reflected in the draft DCP.

Recommended controls to support the design and built form outcomes identified in the master plan are included in the DCP provided at Attachment B.



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8.3 Staging

The redevelopment of the Study Area will occur over a 15-20 year period. The redevelopment will be completed in stages to allow for infrastructure to be delivered over time to meet the growing population and to allow for many existing residents to remain in place while the initial stages are developed. The time required for redevelopment responds to the time required to deliver the new infrastructure and housing, as well as market demand for new housing in Riverwood.

A potential staging plan provides an indicative five stage development layout. Stages 1-4 includes an amalgamation of Council owned roads and parks and LAHC owned land which will enable the delivery of precinct wide infrastructure, including, but not limited to, utilities, parks, streets, and community facilities.

Stage 5 identifies the privately owned land, which is not intended to be acquired or amalgamated with LAHC or Council owned land. The proposal provides the opportunity for privately owned land to be amalgamated with other private land. However, the privately owned land can remain as is or redevelop in accordance with the proposed planning controls at any stage once the land is rezoned.

The potential Stages 1-4 including LAHC and Council owned land are indicative of a potential order of redevelopment to ensure a coordinated program and provision of necessary infrastructure. This potential staging is also provided to ensure that the development of sites can occur independently to the greatest extent possible.

Staging plans will be submitted with any application for residential subdivision within the land identified in Stages 1-4, or for major public domain works within the study area. A planning agreement will specify land area and standard of embellishment of key items such as public open space. Staging plans will address:

 Public domain and open space - improvements will be delivered within all development stages to ensure high-quality public spaces are available to support existing and future residents, as well as the broader Riverwood community.

- Infrastructure delivery For each respective stage, construction of buildings shall not commence until necessary stormwater and flood management works are implemented, along with suitable services provision, to ensure that land is capable of being developed. However, one stage does not need to be completed before another can proceed. The detailed sequencing of the development will be determined following negotiation and confirmation from utilities providers, including Sydney Water, in relation to the approval and delivery of key infrastructure upgrades.
- Community facilities and other services delivery of community infrastructure, shops and
 services are to be staged to keep pace with
 housing delivery and population growth.
- Transport and active links staging is to consider the impact on and improvements required to the local and regional traffic or transport networks, and provide for active transport links through the study area.
- Tree canopy the staging plan is to indicate how tree canopy targets will be met across the study area.
- Sustainability the staging plan is to consider precinct wide environmental sustainability measures (eg. how the 5 star Green Star communities rating can be achieved)
- Housing mix the staging plan will indicate an indicative future mix of social and private housing (and affordable, if relevant) across the Study Area. It is intended that new social housing will be delivered in Stage 1-4 up to a maximum of 30% of all housing within Stages 1-4 but the final amount and mix will be determined as part of the detailed design and future development applications.

The timing and delivery of new housing across the site will be informed by the relocation process of existing and future social housing tenants living across the Study Area. However, this matter will be undertaken by LAHC and Department of Communities and Justice (DCJ), in partnership with other key stakeholders in the area and is not subject to this proposal nor a future development application.

