

Western Sydney Neighbourhoods Project

Walkable 15 Minute Neighbourhood
Intervention Pilot Test Study

September 2025



Acknowledgement of Country

The Western Sydney Planning Partnership acknowledges more than 60,000 years of continuous Aboriginal connection to the land that makes up NSW.

We acknowledge and pay our respects to the traditional custodians of Country within Western Sydney. As part of the world's oldest living culture, the traditional Aboriginal owners and custodians share a unique bond to the Country – a bond forged through thousands of years of travelling across lands and waterways for ceremony, religion, trading, and seasonal migration.

We acknowledge that Western Sydney is home to the highest number of Aboriginal people of any region in Australia and that the primary Aboriginal custodians with obligations for Country and connection to the place for many generations including the Dharug/Darug, Dharawal/Tharawal, Gundungurra/Gandangara, and Darkinjung people.

Western Sydney Planning Partnership partner organisations:

Blacktown City Council, Blue Mountains City Council, Camden Council, Campbelltown City Council, Hawkesbury City Council, Liverpool City Council, Penrith City Council, Wollondilly Shire Council, NSW Department of Planning, Housing and Infrastructure, Transport for New South Wales, and Sydney Water.

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Disclaimer

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Introduction

The 15-Minute Neighbourhood Intervention Pilot Test investigates how targeted urban design and planning strategies can transform greenfield areas across Western Sydney into walkable, vibrant, and sustainable neighbourhoods.

Grounded in the principle that most daily needs should be within a walkable 15-minute walk or bike ride, the pilot identifies practical interventions to deliver more connected, liveable communities.

Prepared collaboratively by Hill PDA and e8urban, and building on strategic work by Arup, the study is a hypothetical design exercise using greenfield context associated with an area such as Marsden Park. We tested how the 15-minute neighbourhood could be delivered by applying the design principles.

From a design perspective, we propose a modest shift in greenfield development strategies, focusing on increased density, enhanced public domain outcomes, and a more diverse mix of uses within the local centre.

The work was presented to the Western Sydney Planning Partnership, with input from local councils, Transport for NSW and Stockland's design teams, ensuring the proposals were tested, practical and aligned with regional planning priorities.

Methodology

The study employed a robust, multi-layered approach:

- Spatial Analysis: Using tools such as network-based pedestrian catchment modelling, revealing realistic 7.5-minute and 15-minute walking distances to centres and key services based on street networks.
- Urban Design Framework: Developing a hypothetical proposals for a enhanced public realm network, and higher-density built form around centres, guided by the Western Sydney Street Design Guidelines.
- Dwelling Typology Modelling: Testing various medium-density housing types—including terraces, loft apartments, shop-top housing, and consolidated-lot apartments—to achieve target densities and support housing diversity.
- Land Budgeting and Yield Analysis: Conducting detailed calculations to assess how different dwelling typologies and land allocations can meet population and dwelling yield targets within the identified catchments.

Key Outcomes

- Enhanced Walkability: Redesigned street networks and upgraded crossings improve safe, direct pedestrian access to neighbourhood centres.
- Density Uplift: Hypothetical densities of up to 30 dwellings per hectare across the 15-minute catchment (and 47 dwellings per hectare within the inner 7.5-minute core) support local services, public transport, and active transport use.
- Mixed-Use Centres: Compact neighbourhood centres - of circa 7,000 sqm GFA - anchored by supermarkets and supported by diverse retail, services, and community spaces, with active street frontages and integrated public realm.
- Housing Diversity: A significant shift away from predominantly low-density detached housing toward a broader mix of terraces, apartments, and shop-top housing.
- Public Realm Quality: Streetscapes incorporate continuous canopy cover, flexible spaces, and human-scaled active edges.
- Sustainable Transport Integration: Connectivity improvements focus on walking and cycling infrastructure rather than expanding car-based networks.

Document Structure

This document is structured to guide readers through the elements of a 15-minute neighbourhood in Western Sydney.

It begins with an introduction explaining the purpose, background, and collaborative nature of the Hypothetical Pilot Study, outlining objectives for creating walkable, vibrant communities

Following this, the recap of the Stage 1 Study sets out desired outcomes and objectives, defining goals such as proximity to services, quality public spaces, and diverse housing.

The principles section outlines key urban design concepts like mixed-use centres, green infrastructure, and integrated transport.

The hypothetical design study is then presented - defined through a waling catchment analysis - the hypothetical study is presented as layers, including density and typology, street types and the pedestrian network.

Stage 1 – Desired Place Outcomes and Objectives

PREPARED BY ARUP FOR THE WESTERN SYDNEY NEIGHBOURHOODS PROJECT

1. Proximity

- 90% of dwellings within 800 m of a centre offering daily needs and services (Proposed Outcome Framework)

2. Experience Quality

- Streets and spaces that are safe, shaded, attractive, and vibrant

3. Movement Efficiency

- Walking and cycling prioritised over cars within the neighbourhood

4. Service Accessibility

- Equitable access to shops, health, education, and open space

5. Density and Diversity

- Minimum 25–30 dwellings per hectare near centres
- Diverse housing to suit household types and life stages (should also include House & Land near centre)

6. Centre Activation

- Centres with at least 3–4 key daily functions (e.g. grocery, childcare, GP)

7. Public Realm Quality

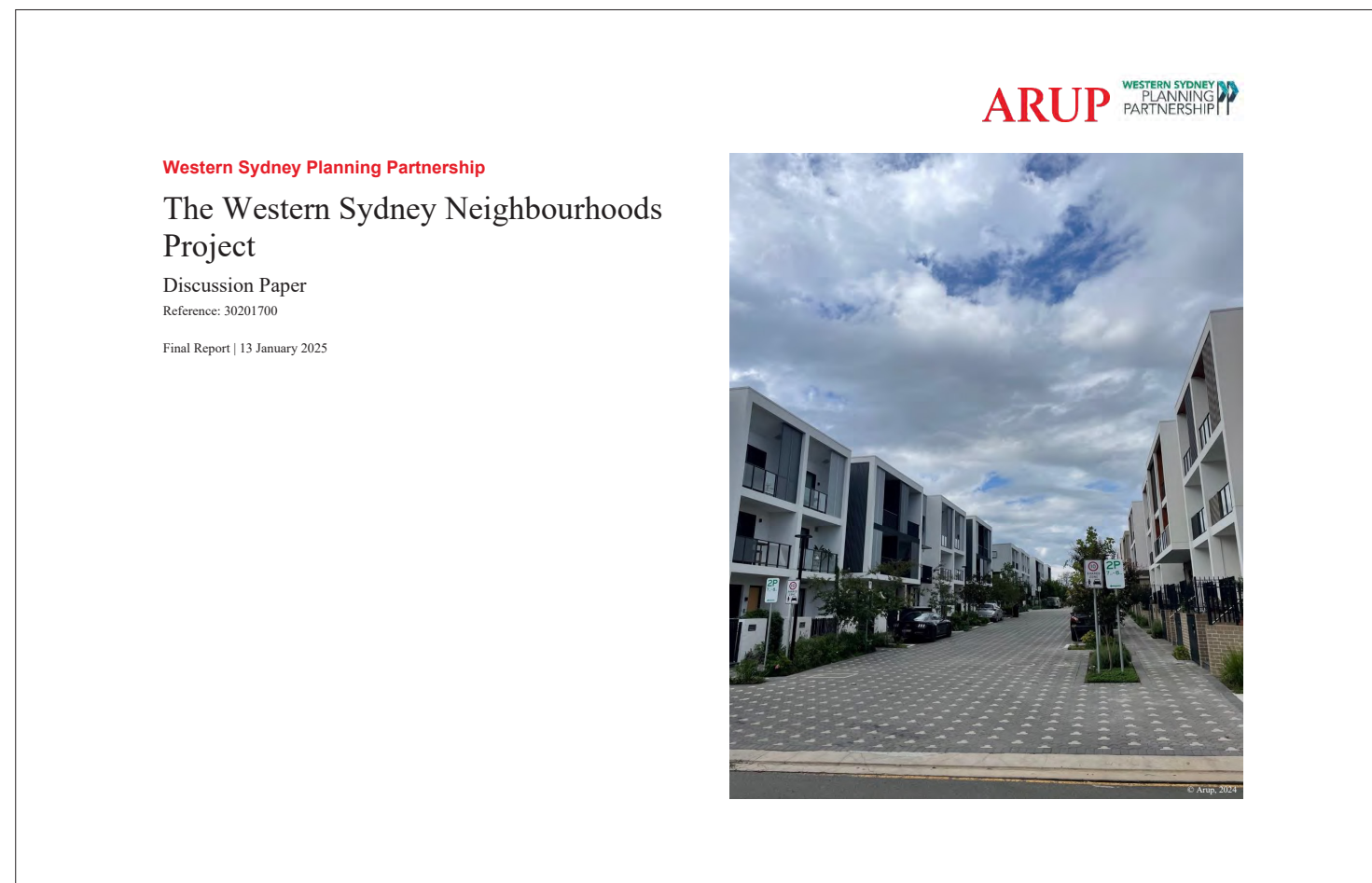
- Continuous canopy, lighting, street furniture, and urban greening

8. Time-Based Accessibility

- Most residents can reach key destinations within 15 mins by foot or bike

9. Complete Neighbourhood

- Schools, open space, community facilities within walking catchments



Design Principles from Stage 1

ARUP'S STRATEGIC FRAMEWORK

1. Walkable and Permeable Street Networks

- Fine-grain block structures (ideally 80–150 m)
- Direct, legible, and shaded pedestrian routes
- Prioritisation of walking and cycling over vehicles

2. Mixed-Use and Compact Centres

- Neighbourhood centres that cluster retail, services, open space, and community facilities within 400–800 m of most dwellings
- Active street frontages and multi-purpose buildings
- Avoidance of large-format or standalone uses

3. Integrated Public Realm and Green Infrastructure

- Continuous tree canopy (aiming for 40% cover)
- Pocket parks and civic spaces in walkable locations
- Shade, water, and rest infrastructure to support all ages and abilities

4. Street-Oriented and Fine-Grain Built Form

- Buildings address the street, not internal car parks
- Zero or minimal front setbacks in centre zones
- Human-scaled design—ground-floor activation is critical

5. Housing Diversity Within Walking Distance

- A mix of low-rise and mid-rise forms (e.g. terraces, townhouses, apartments)
- Minimum density thresholds near centres to support services and transport
- Design for adaptable and intergenerational living

6. Integrated Transport Nodes

- Co-location of centres with frequent bus or rail stops
- Active transport links to transit within 10 minutes' walk
- Avoidance of “park and ride” land uses in core walkable areas

7. Safe and Inclusive Design

- CPTED principles embedded in layouts and lighting
- Inclusive play spaces and seating for older people, children, and carers
- Universal design integrated across housing, paths, and public space

8. Local Identity and Contextual Response

- Centre design reflects community character, local history, and Country
- Materials, planting, and built form guidelines tailored to local place

9. Phased and Complete Delivery

- Infrastructure, centres, and transport arrive early—not years after housing
- Urban design frameworks ensure centres are functional from day one

10. Design Governance and Delivery Tools

- Use of structure plans, design guides, and urban design panels
- Form-based codes, development front-loading, and place-led assessment

Marsden Park Axonometric

EXISTING URBAN CONDITION AND PEDESTRIAN CATCHMENT AREAS (7.5 & 15-MINUTE WALKS)



Hypothetical Pilot Study - Spatial Design Brief

DEVELOPED THROUGH A SPATIAL FRAMEWORK INFORMED BY BENCHMARK ANALYSIS, INTERDISCIPLINARY CONSULTATION, AND PRECEDENT RESEARCH.

INTERVENTION 1: LOCAL CENTRE WITH A SUPERMARKET

The Centre – General Description:

- A small-to-medium neighbourhood centre anchored by a full-line or large-format supermarket (e.g., 2,500–4,000 sqm) that serves a walkable catchment and also draws from a broader local trade area.

Retail Composition & Key Metrics:

- Supermarket anchor: typically 2,500–4,000 sqm.
- Specialty retail: 10–20 tenancies and generally include liquor, café, bakery, butcher, food services (restaurant, take-away or combined – 3 to 6 tenancies), pharmacy
- Possible fruit and veg store, news agency
- Total centre GFA: ~4,000–7,000 sqm.

Non-retail uses may include:

- Medical/health (~100–500 sqm)
- Community space (room/hall ~200–500 sqm)
- Post office
- Financial service
- Real estate
- Childcare
- Gym

Surrounding Density (Dwelling Units per Hectare):

- To support a full-line supermarket within a 1-1.5 km walkable radius, a catchment of ~12,000–15,000 people is typically required.
- This implies residential densities of 25–30 du/ha within the core catchment area.

These densities are most commonly achieved through mixed lot typologies (200–350 sqm), terraces, low-rise apartments and shop-top housing (although feasibility is challenging).

Particular Features:

- At-grade or rooftop parking provision is typical due to grocery shopping car use.
- Parking under retail is preferable (less ramping / travelator distance and more convenient) but basement car parking is expensive. Can work on gentle sloping sites with car parking accessed from lower level.
- Centres are often co-located with public open space, schools, or community hubs.
- Shop-top housing is encouraged, though feasibility challenging.
- Active frontages are common DCP inclusions.

Hypothetical Pilot Study - Process and Assumptions

PREPARED BY E8URBAN AS PART OF A PILOT SPATIAL FRAMEWORK, DRAWING ON BENCHMARK ANALYSIS, STAKEHOLDER CONSULTATION, AND PRECEDENT-BASED RESEARCH.

PROCESS

1. Define Catchments 15 min walk / 1,000 metres distance using Pedshed Analysis
2. Establish the main access routes that will connect the population to the Centre
3. Identify opportunities for an improved pedestrian environment - crossing, canopy, small-scale open spaces
4. Identify opportunities for changes to street typologies utilising the Western Sydney Street Design Guidelines
5. Deploy medium density / missing middle housing typologies assuming amalgamations to existing lots
6. Refine design of Neighbourhood Centre. Translating spatial planning principles and benchmark data into a context-responsive design for the local centre.

ASSUMPTIONS

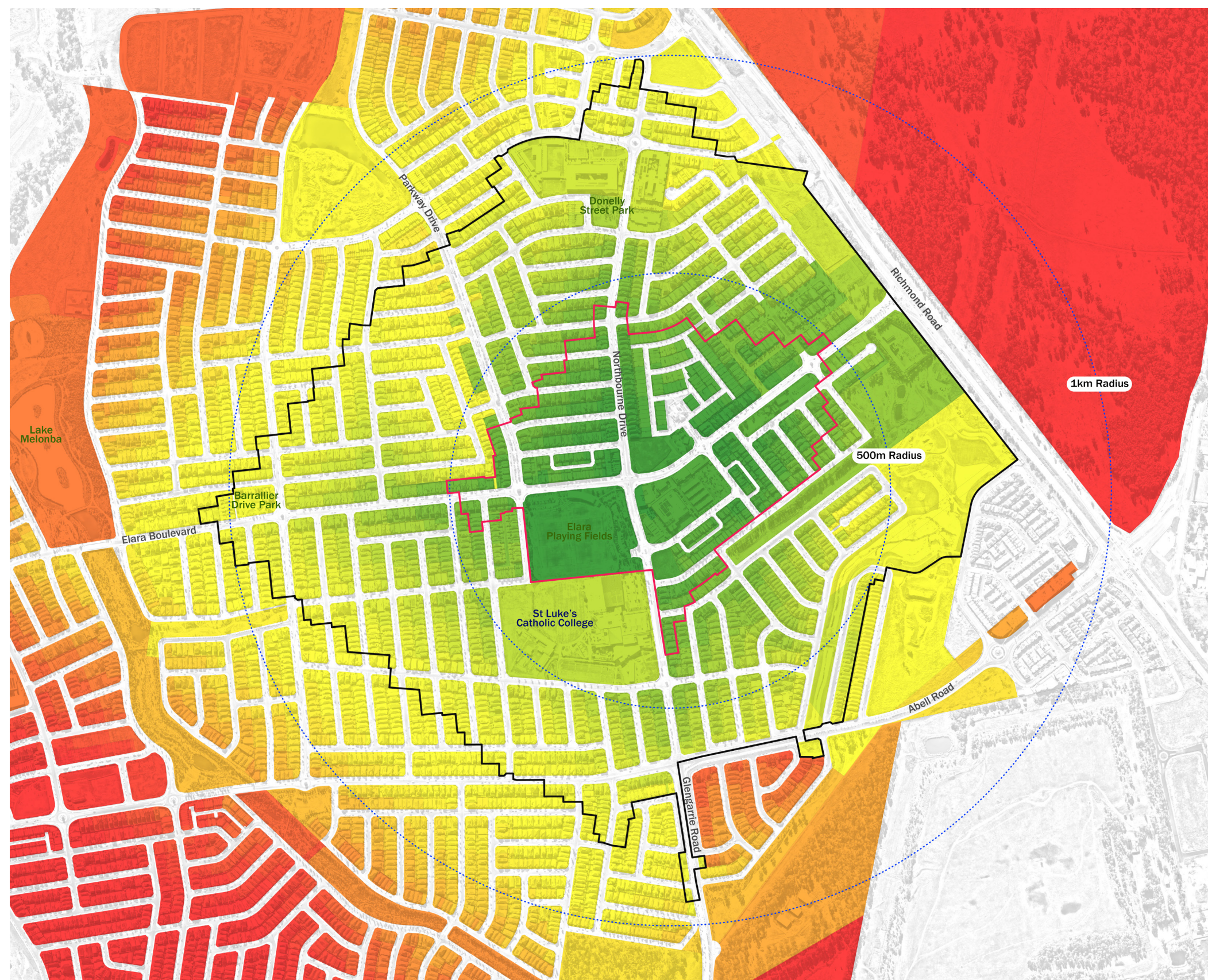
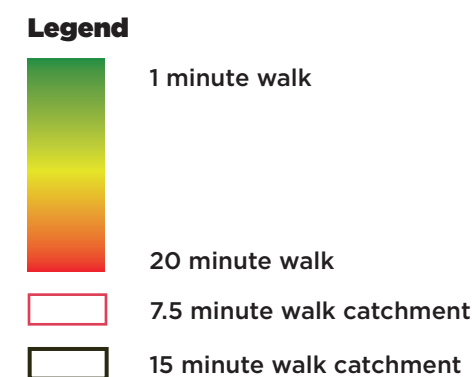
1. No significant changes to urban structure - changes limited to insertion of laneways and new links and allocation of new pocket parks along key access ways
2. Changes to streetscapes based on Western Sydney Street Design Guidelines (Version 1.0)
3. No changes to bus routes - although higher densities could potentially lead to expanded network
4. Densities based on Hill PDA brief
5. Typologies based on 'Missing-Middle' Typologies
6. Mix of typologies across development - allow for standard detached and 'CDC-friendly' product to provide diversity
7. Neighbourhood Centre land budget based on Hill PDA Brief - circa 7,000 GFA. Noting no major changes to existing layout

Hypothetical Pilot Study - Catchment

We used Grasshopper's shortest route analysis to define the 15-minute neighbourhood catchment based on road centreline data.

The analysis calculated network-based walking distances from the existing Neighbourhood Centre, creating a catchment that reflects real street connectivity.

This method enabled a clear understanding of areas accessible within a 15-minute walk, providing a robust basis for assessing local accessibility, service provision, and the spatial logic of future neighbourhood planning.



Hypothetical Pilot Study - Key Access Links

The walking catchment analysis was used to identify key trunk routes that would form the most frequently used pedestrian paths to the existing Neighbourhood Centre.

By analysing the shortest paths within the 15-minute catchment, we mapped likely desire lines and concentrated foot traffic corridors.

These routes inform the prioritisation of densification, streetscape upgrades, pedestrian safety measures, and public realm improvements to enhance walkability and connectivity to the Centre from surrounding residential areas.

Legend

- 7.5 minute walk catchment
- 15 minute walk catchment
- Neighbourhood Centre
- Primary Connection - Main Access to Centre
- Cadastre
- Enhanced Pedestrian Crossing



Hypothetical Pilot Study - Transport and Connectivity

The Western Sydney Street Design Guidelines have guided suggested modifications to streets within the inner catchment to improve pedestrian connectivity, enhance canopy cover, and support active transport. Those changes can be seen in the allocation of cycleways (in collector streets and yield streets) and flex zones (in collector streets).

These changes also provide opportunities to strengthen local character and differentiate key routes.

Upgrades have been aligned with higher density areas near the centre, with no anticipated changes to the existing bus network.

Legend

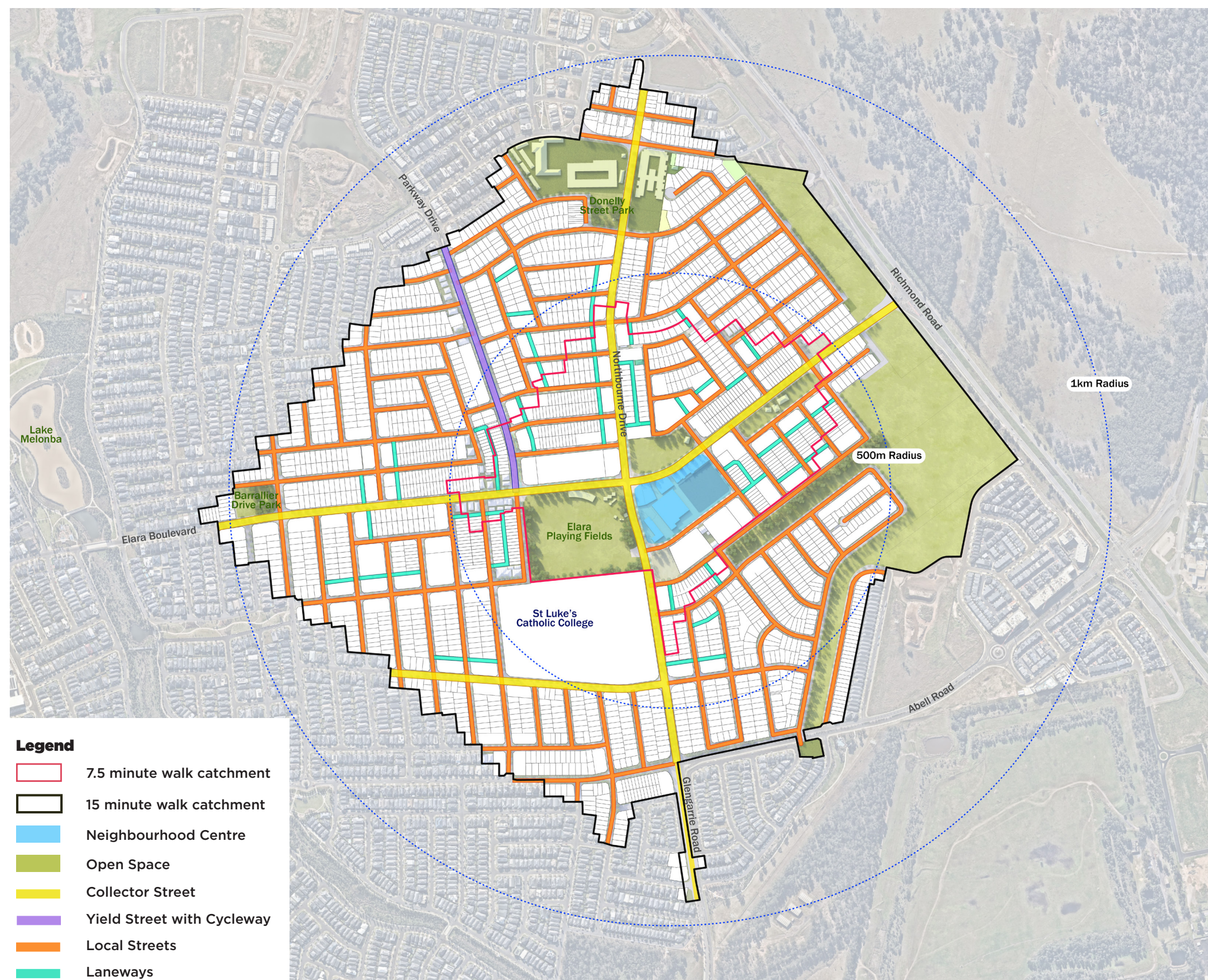
- 7.5 minute walk catchment
- 15 minute walk catchment
- Neighbourhood Centre
- Open Space
- Pocket Parks
- Enhanced Pedestrian Crossing
- Existing Bus Route
- Primary Cycle Route
- Bus Stops



Hypothetical Pilot Study - Street Typologies

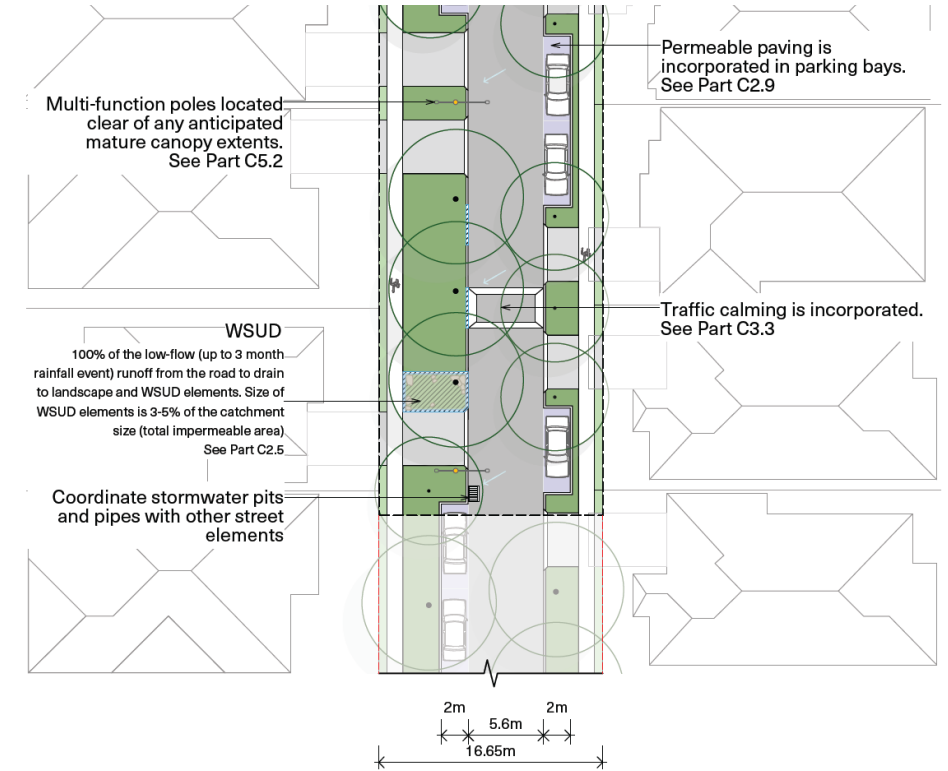
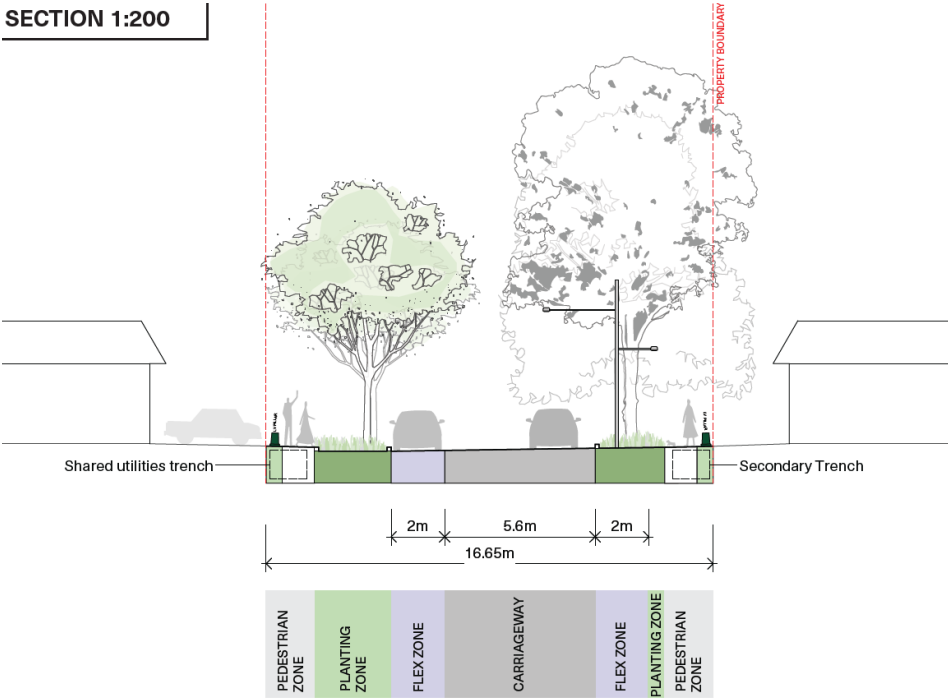
We maintained the existing road reserve widths and conducted an analysis of the current street typologies in Marsden Park. Building on this foundation, we introduced future-ready elements such as cycle zones and flex zones—while preserving the existing carriageways, planting zones, and pedestrian areas.

These additions were seamlessly integrated without altering the original road reserve dimensions, thereby retaining the established street typologies while enhancing their functionality and adaptability.

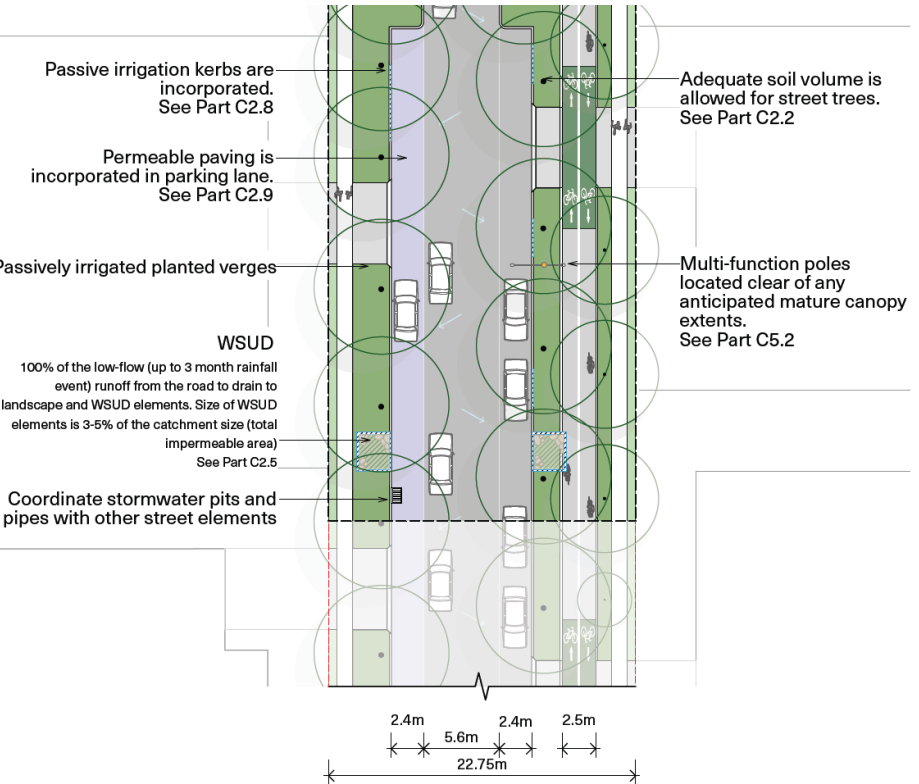
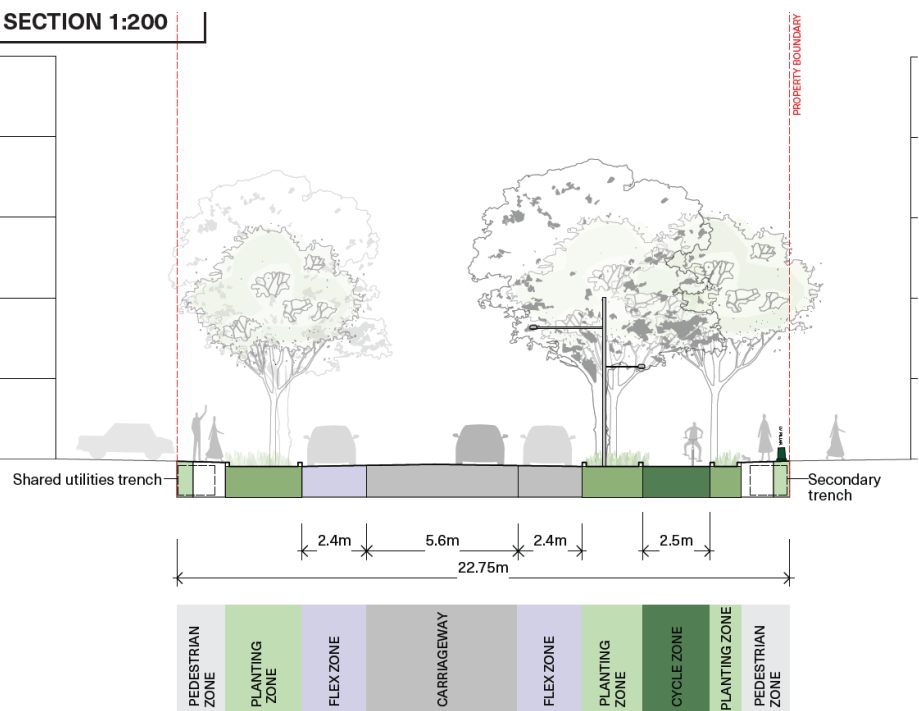


Hypothetical Pilot Study - Street Typologies

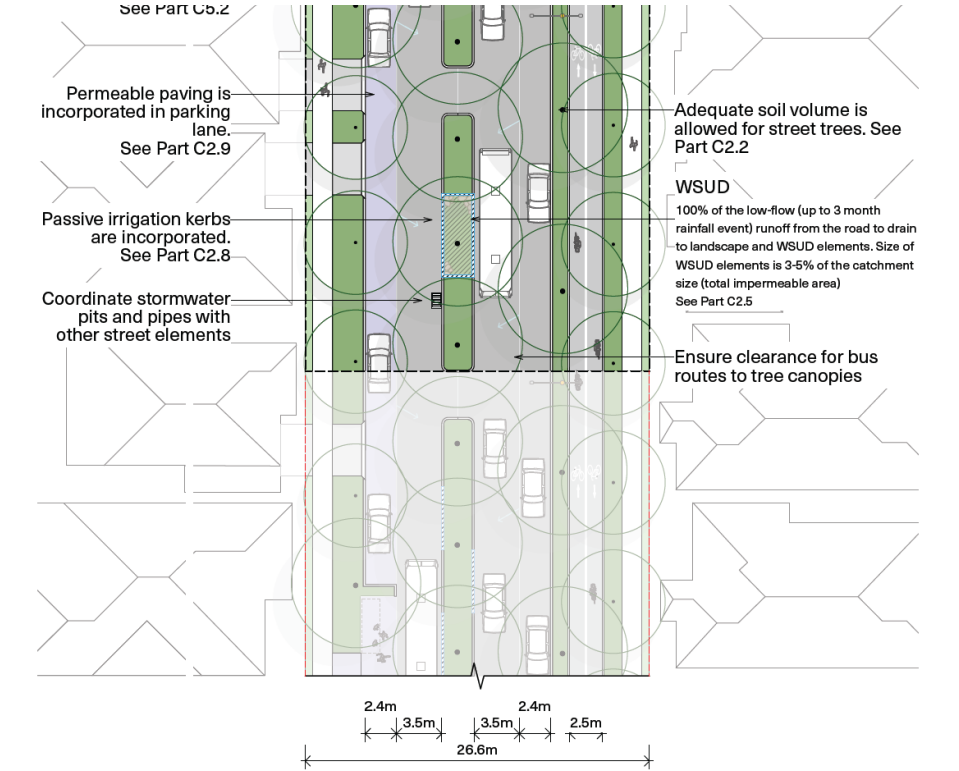
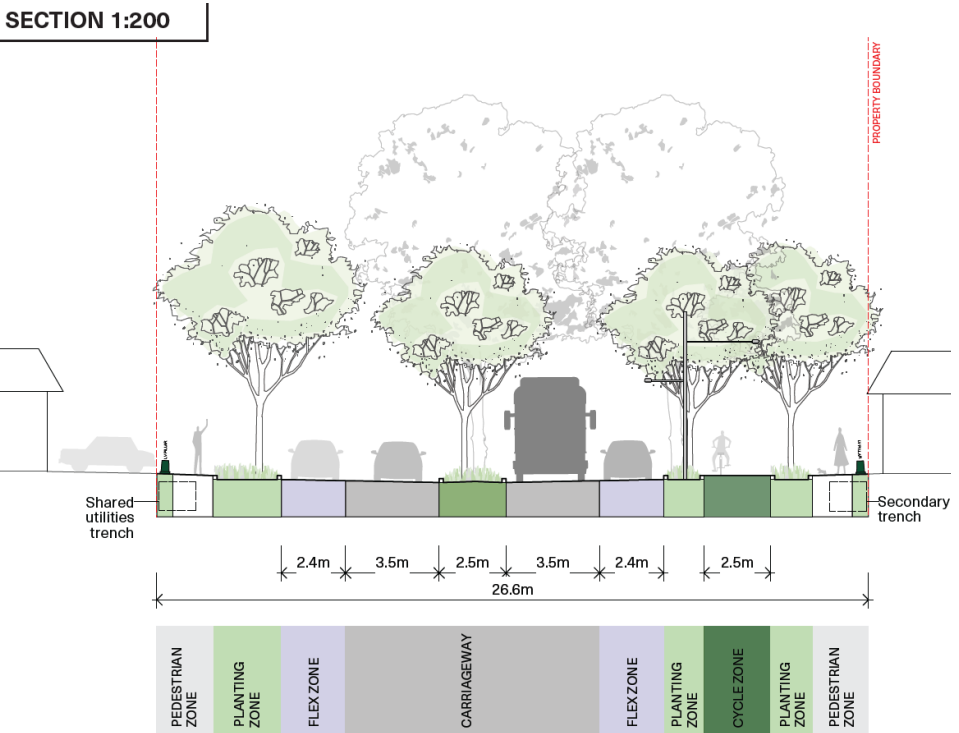
Local Street



Yield Street with Cycleway

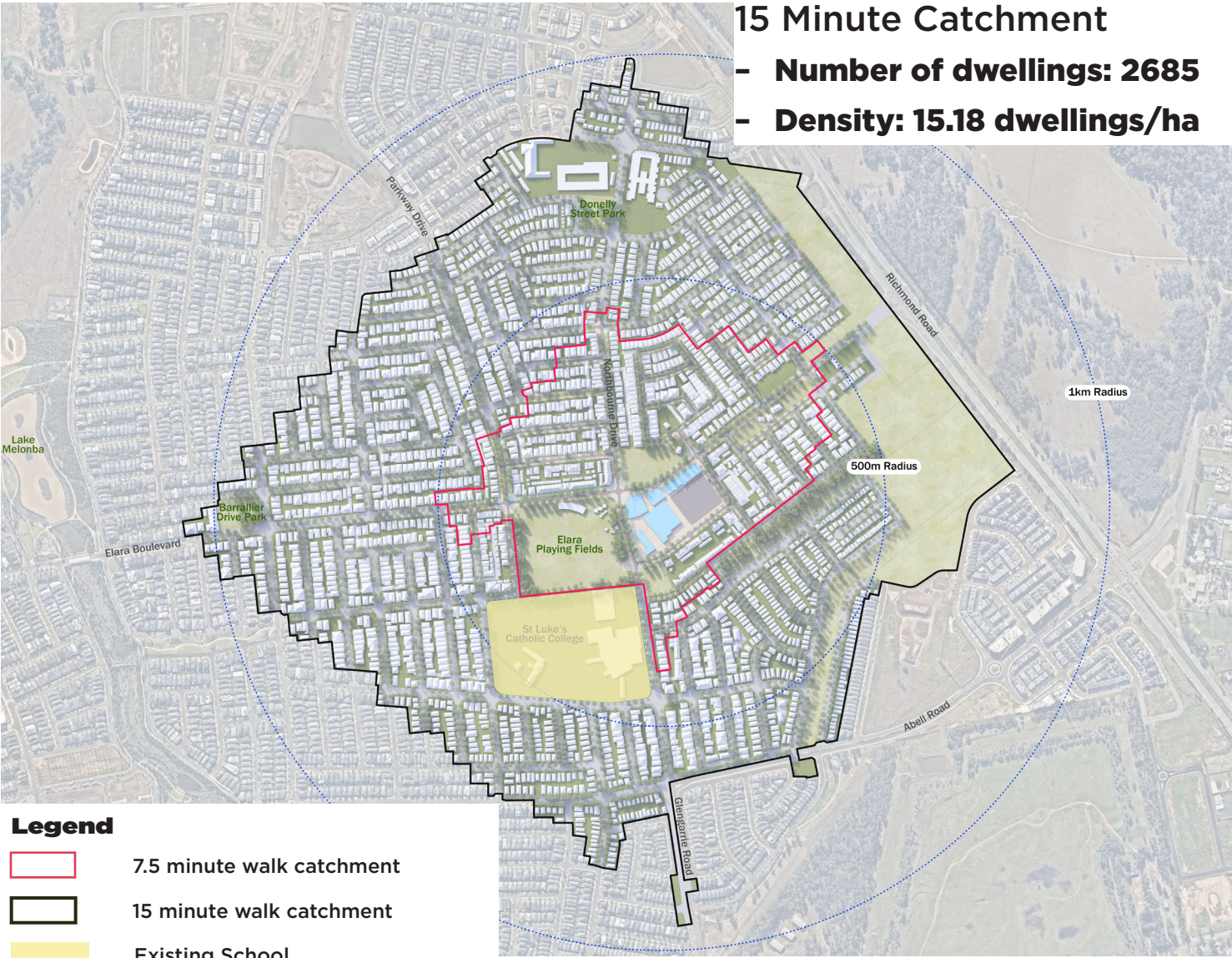


Collector Street



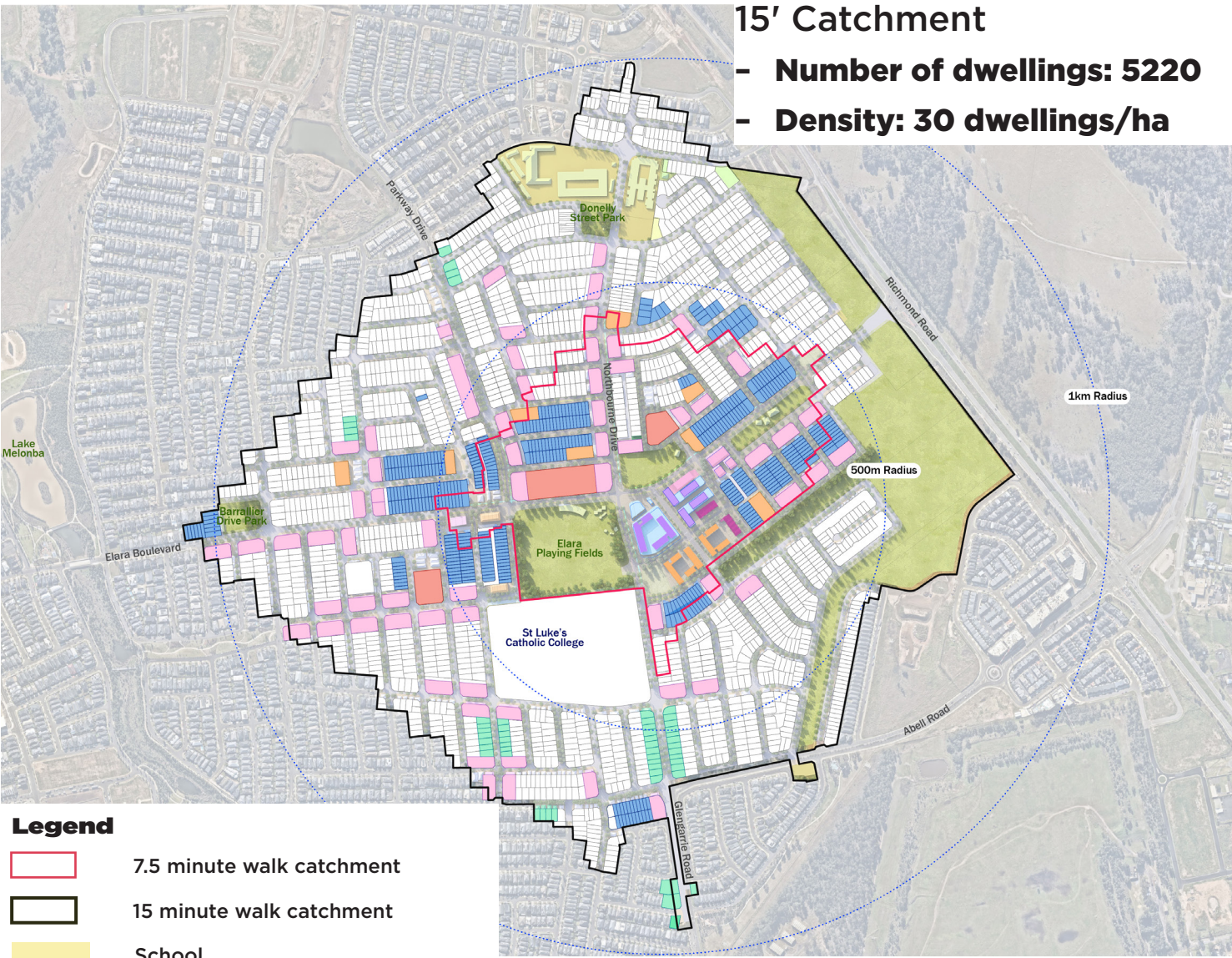
Hypothetical Pilot Study - Built Form Strategy

PLAN OF THE EXISTING BUILT FORM



The predominant built form consists of single detached residential dwellings, situated on lots ranging from 250 sqm to 360 sqm. While these low-density housing products may offer suburban appeal, their spatial distribution and dwelling yield fall short of achieving the 30 dwellings/ha to support a 15 minute neighbourhood.

PLAN OF THE HYPOTHETICAL BUILT FORM



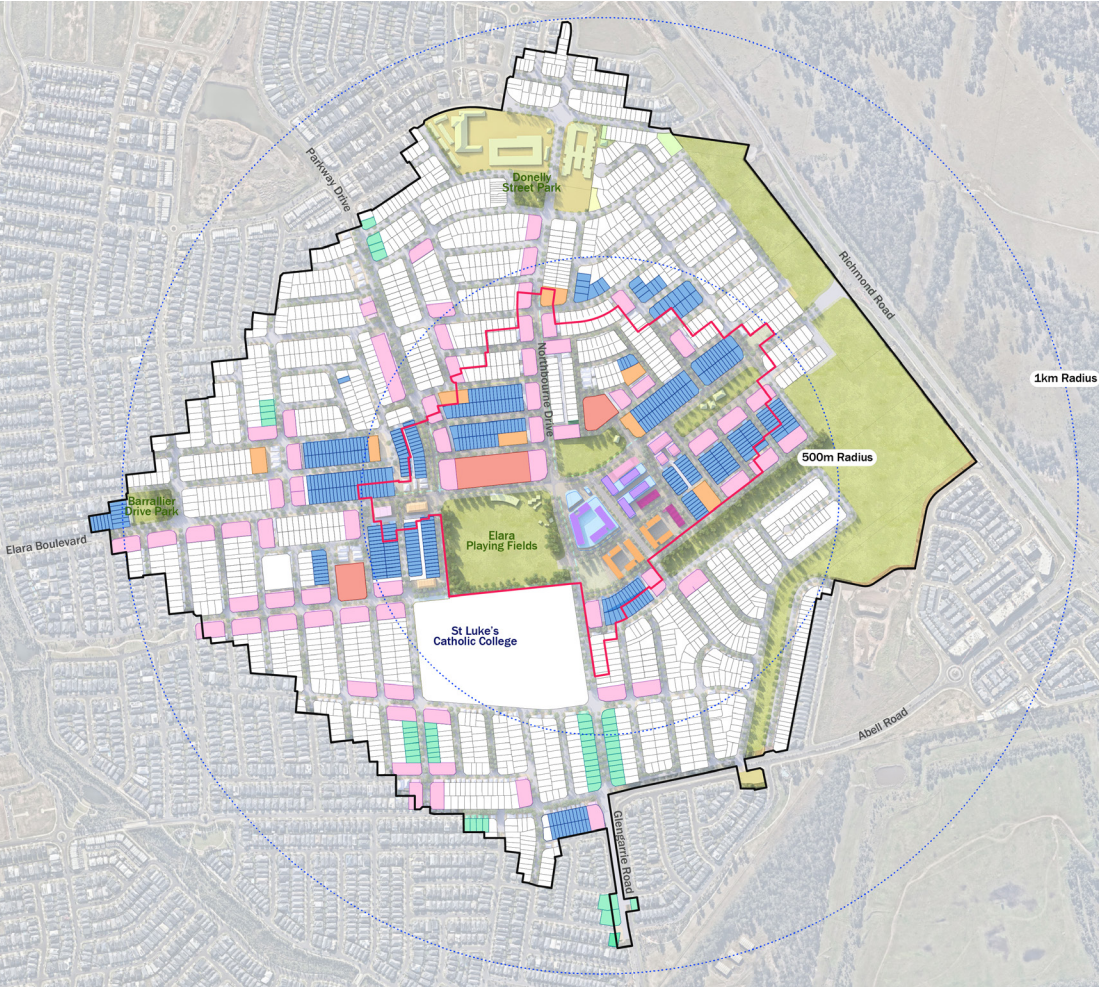
The hypothetical built form aims to intensify urban density in proximity to the local centre and along key transit corridors. It introduces a diverse mix of medium-density typologies, supporting a more compact and walkable urban structure while reinforcing connectivity to essential services and transport routes.

Hypothetical Pilot Study - Dwelling Typologies

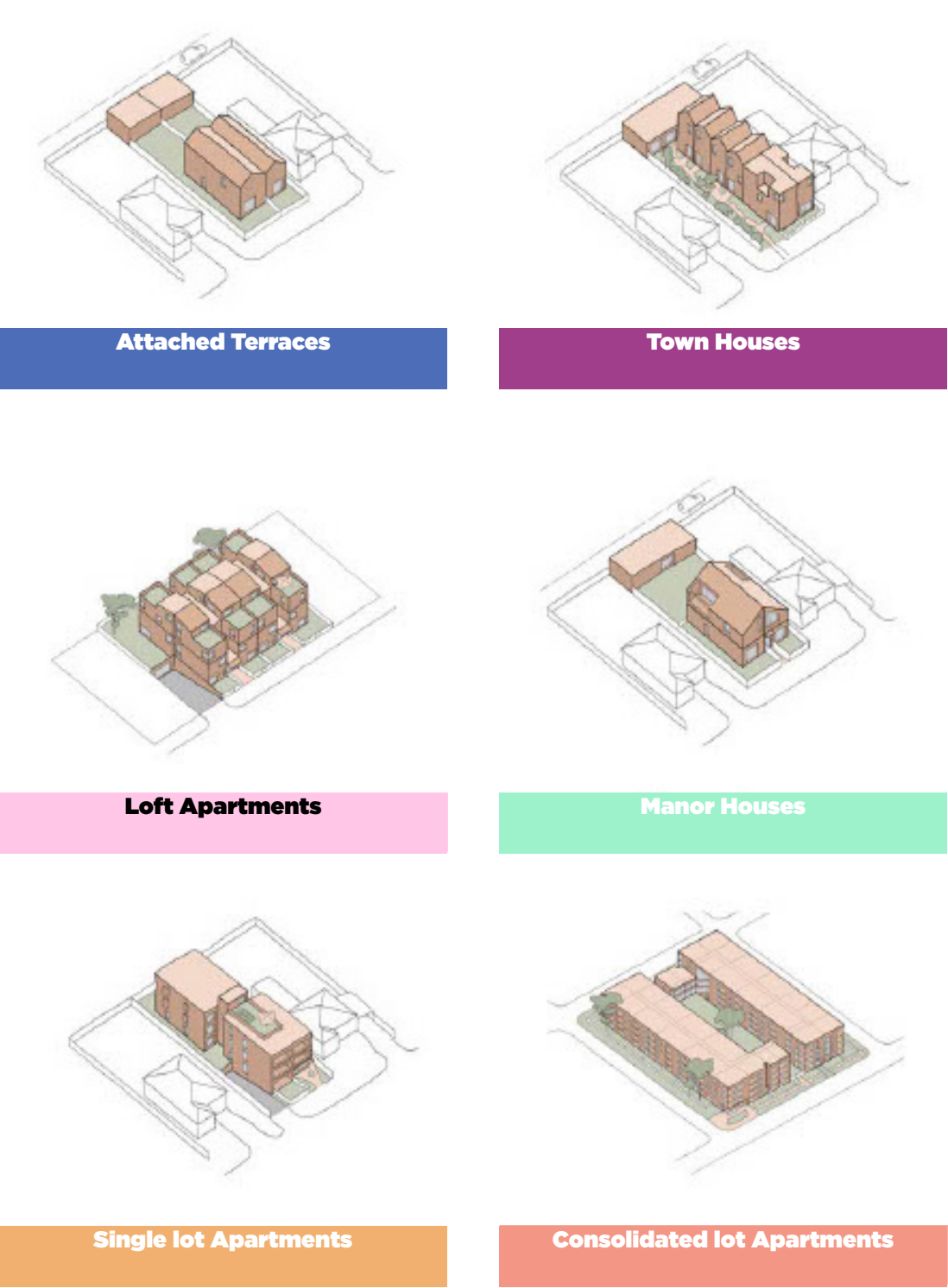
The hypothetical density has been developed to align with population targets, supporting a sustainable and walkable neighbourhood structure.

We replace single residential homes with apartments, shop-top housing, terraces, integrated housing, and compact front-loaded dwellings. Increased densities are concentrated around the Neighbourhood Centre and along key pedestrian access routes identified through walking catchment analysis.

HYPOTHETICAL TYPOLOGIES IN 15 MINUTE CATCHMENT



MISSING MIDDLE DWELLING TYPOLOGIES



TPOLOGIES AND TOTAL LOT AREA

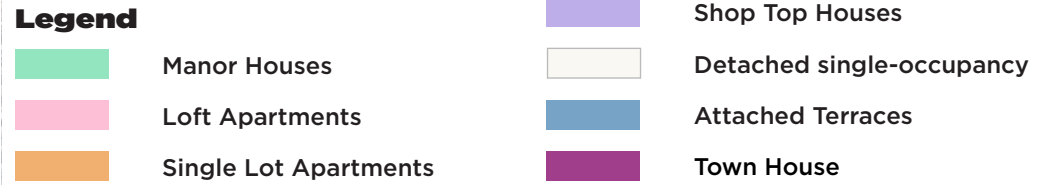
	Typologies	Number of Dwellings	Total Lots Area
Residential Neighborhoods	Detached single-occupancy	1546	553,916.0 sqm
	Attached Terraces	458	100,137.0 sqm
	Town Houses	18	4,000.0 sqm
	Single lot apartments	533	27,898.0 sqm
	Consolidated lot apartments	460	28,943.0 sqm
	Manor Houses	316	24,040.0 sqm
	Loft Apartments	1832	115,129 sqm
	Shop Top Houses	167	12,698.0 sqm
TOTAL		5329	

Hypothetical Pilot Study - Catchment Density

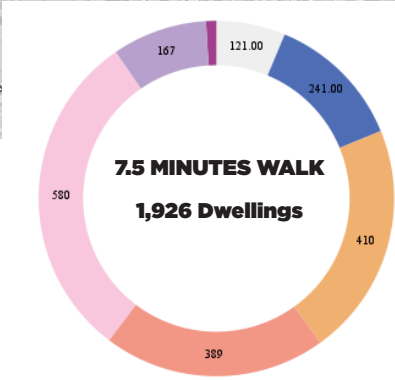
The density within the inner 7.5-minute (500 metre) walking catchment is 47 dwellings per hectare, reflecting a mix of medium-density housing types, including low-rise apartments, townhouses, and some detached dwellings.

The overall density across the full 15-minute (1,000 metre) walking catchment is 30 dwellings per hectare.

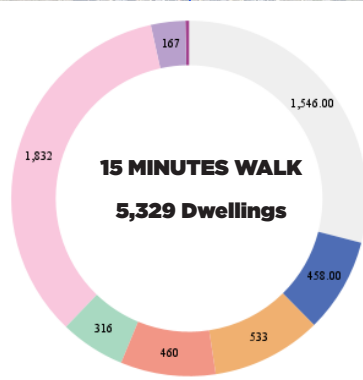
This represents an increase from the existing density of 15 dwellings per hectare, supporting a more walkable, service-rich neighbourhood structure aligned with 15-minute neighbourhood principles.



Population 15 minute catchment		177.65 ha		
Built Form Typology	Number of Dwellings	Population Assumption	Total Population	
Detached single-occupancy	1,546.00	3.35	5,179	
Attached Terraces	458.00	2.5	1,145	
Single lot apartments	533	1.95	1,039	
Consolidated lot apartments	460	1.95	898	
Manor Houses	316	3.35	1,057	
Loft Apartments	1,832	1.95	3,572	
Shop Top Houses	167	1.95	325	
Town Houses	18.00	2.5	45	
Total	5,329		13,214	

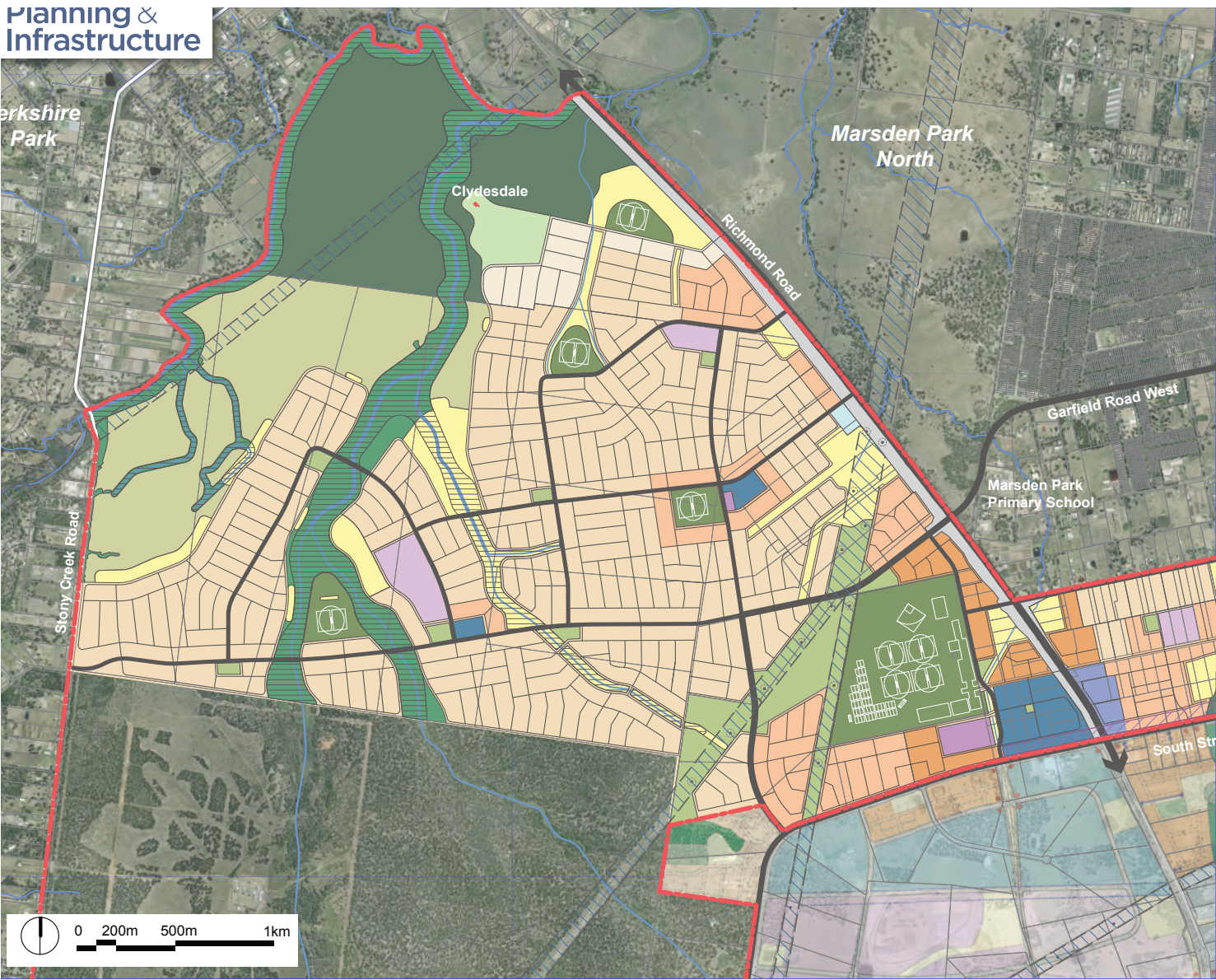


Population 7.5 minute catchment		39.28 ha		
Built Form Typology	Number of Dwellings	Population Assumption	Total Population	
Detached single-occupancy	121.00	3.35	405	
Attached Terraces	241.00	2.5	603	
Single lot apartments	410	1.95	799	
Consolidated lot apartments	389	1.95	759	
Manor Houses	0	3.35	0	
Loft Apartments	580	1.95	1,131	
Shop Top Houses	167	1.95	325	
Town Houses	18.00	2.5	45	
Total	1,926		4,022	



Hypothetical Pilot Study - ILP Overlay

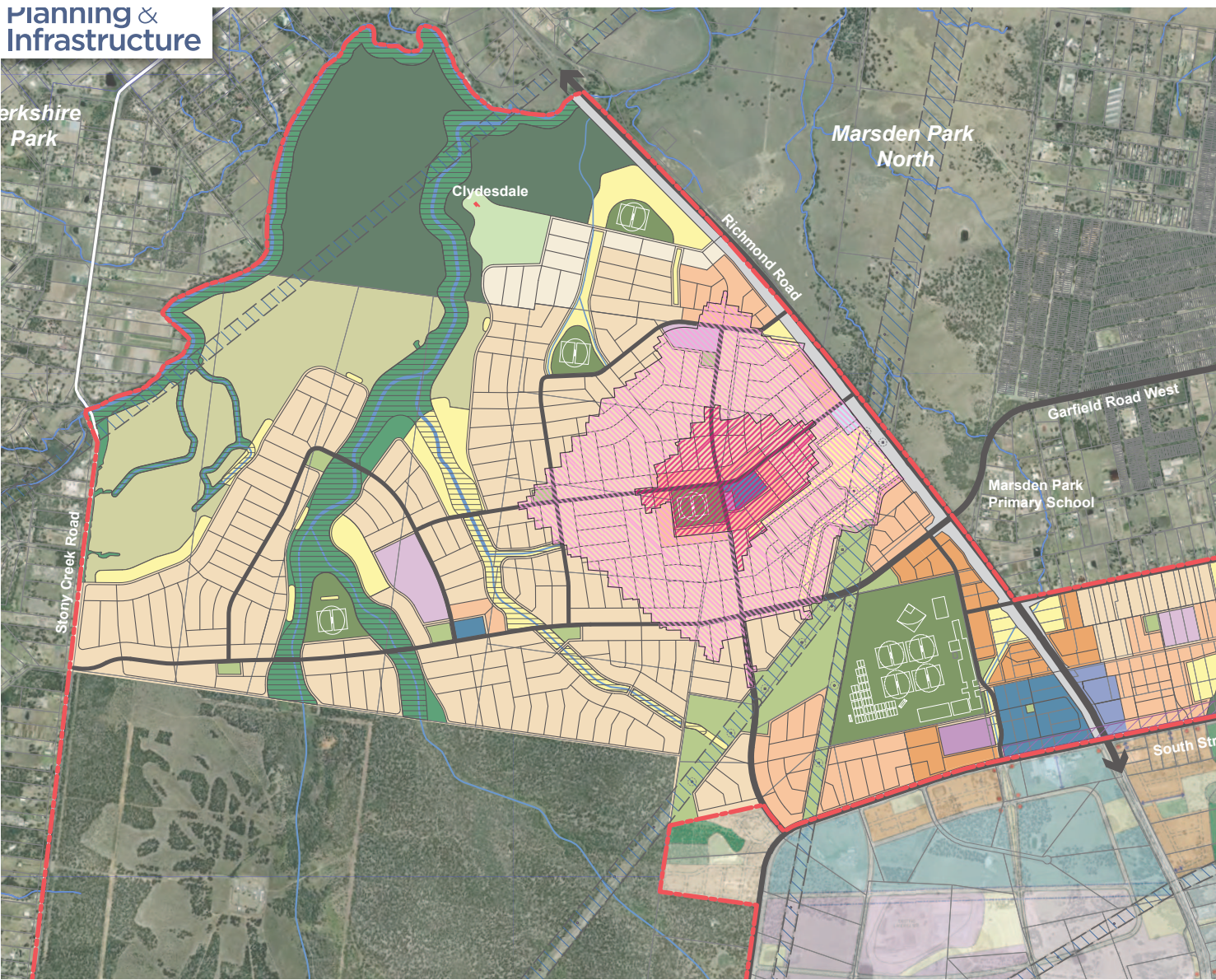
Existing ILP



MARSDEN PARK PRECINCT
Indicative Layout Plan

- | | |
|---|--|
| Precinct Boundary | Transition |
| Low Density Residential (11 dwellings per hectare) | Sporting Field |
| Low Density Residential (15 dwellings per hectare) | Local Park |
| Medium Density Residential (25 dwellings per hectare) | Private Open Space (Clydesdale Estate) |
| High Density Residential (35 dwellings per hectare) | Environmental Conservation |
| Retail Centre | Environmental Management |
| Indicative School Site | Riparian Corridor |
| Community Use | Water Management |
| Mixed-use Zone | Transmission Easement |
| | Transport Corridor |
| | Substation Site |

Hypothetical Study Area Overlaid on the ILP



Legend

- | | |
|--|--------------------------|
| | 30 dwellings per hectare |
| | 47 dwellings per hectare |

Existing Centre



To inform the context of the pilot study, the local centre at Marsden Park was reviewed as a representative example. The centre features big-box retail surrounded by expansive surface parking and minimal tree canopy. While shade structures are present, the public realm lacks greenery, comfort, and walkability.

Surrounding housing includes some medium-density development, but large areas of low-density housing represent a missed opportunity in terms of character, scale, and walkable catchment support.

The centre's car-oriented design limits amenity, mixed-use potential, and fails to align with 15-minute neighbourhood principles of access, vibrancy, and local identity.

Hypothetical Pilot Study - Neighbourhood Centre



Hypothetical Pilot Study - 15 Minute Neighbourhood



