Prepared for: LIVERPOOL CITY COUNCIL

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21043 | August 2021

REVISED WARWICK FARM STRUCTURE PLAN
URBAN DESIGN REPORT

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REVISED WARWICK FARM STRUCTURE PLAN

Revision	Date	Description	By	Chk	App
01	23/08/21	Revised Warwick Farm Structure Plan Urban Design Report	WW/DW	WW	DN
02	26/08/21	Revised Warwick Farm Structure Plan Urban Design Report Rev 02	WW	DN	

Prepared for: LIVERPOOL CITY COUNCIL | LIVERPOOL THE GREAT SOUTH WEST

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Rosedale Oval

CM+

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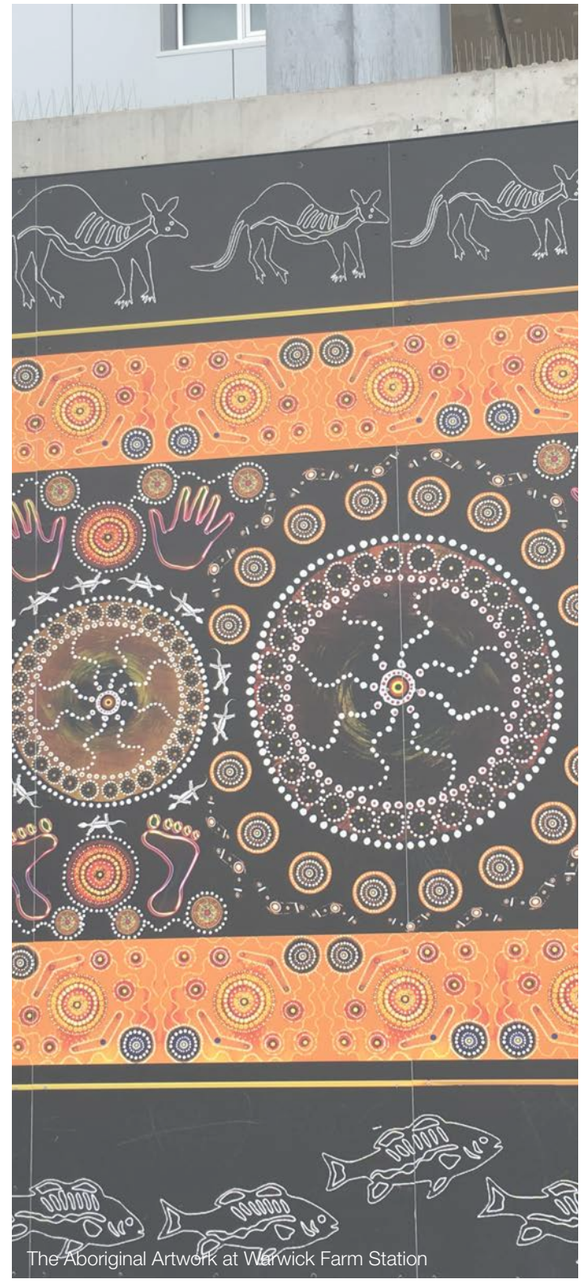


The Aboriginal Artwork at Warwick Farm Station

Warwick Farm Station

1.0 Introduction

1.1 Background Introduction

Conybeare Morrison International (CM+) and the consultant team are engaged by Liverpool City Council (LCC) to conduct a study of the Warwick Farm Precinct (the precinct) and develop a Structure Plan as well as the associated Planning Proposal and Contributions Plan to submit to the Department of Planning, Industry and Environment (DPIE) for Gateway determination.

In the December 2019 Council meeting, Liverpool City Council decided to support a B4 Mixed Use zoning within the precinct and deliver a high quality Urban Renewal Precinct with optimal urban design outcomes. Council has also resolved to support in principle the Planning Proposal at No. 240 Governor Macquaire Drive (GMD), lodged by SJB Planning on behalf of Warwick Farm Central (Projects) Pty Ltd, with reduced height and density as well as a new VPA offer. Subsequently, Council prepared and lodged a Planning Proposal to the DPIE on the 25th of February 2020 seeking to amend the Liverpool Local Environmental Plan 2008 (LLEP 2008).

The draft Structure Plan was developed to include the design described in the previously submitted Planning Proposal for No. 240 GMD. It was then placed on the public exhibition in late 2020 and 20 public submissions were received including submissions from Sydney Water and Transport for NSW (TfNSW). A financial feasibility study was conducted in this period in light of the Liverpool Planning Panel comments and the Council resolution. On 21 September 2020, the Planning Proposal at No. 240 GMD was refused by the DPIE at the gateway determination, citing a lack of strategic merit. The DPIE states in the Gateway determination letter that the Warwick Farm Structure Plan and its associated studies should inform the planning of No. 240 GMD.

In April 2021, Council resolved to further refine the exhibited Warwick Farm Structure Plan to incorporate the feedback received from the community, the DPIE and the latest regional studies. Therefore, CM+ and the consultant team were re-engaged by LCC to update the exhibited Warwick Farm Structure Plan and the associated Planning Proposal and Contributions Plan.

The following issues were considered in amending the structure plan:

- Respond to feedback received during public exhibition of the draft plans.
- Incorporate the outcomes of regional transport, flood, and open space studies.
- Respond to the outcomes of feasibility testing.
- Incorporate the 240 Governor Macquarie Drive site into the draft planning proposal and structure plan, considering DPIE's Gateway refusal and feedback received from public exhibition.
- Conduct a detailed flood impact assessment to better understand land needed for flood mitigation and potential flood mitigation options.

Figure 1: Aerial view of the Warwick Farm Precinct

1.0 Introduction

1.2 The Study Area

The Warwick Farm Precinct is located in the Liverpool Council Local Government Area (LGA), in the suburb of Warwick Farm. The Liverpool CBD, which is the third largest CBD of Metropolitan Sydney, is approximately 1.5km (10-minute drive) to the southwest of the precinct. The Warwick Farm Racecourse is across Governor Macquarie Drive to the northeast of the precinct.

The precinct has an area of approximately 28.4 hectares and is bounded by the Hume Highway to the northwest, the railway corridor to the west, Priddle Street to the south, Horseshoe Pond to the east and Governor Macquarie Drive to the northeast.

It is well connected to the surrounding suburbs, parks, sport and recreational facilities as well as educational facilities. Rosedale Oval, located within the precinct, is an 'A-Grade' Cricket Ground. A children's playground is located within Rosedale Oval along National Street. Hart Park is across the railway corridor to the west of the precinct. Liverpool Hospital is approximately 800m to the southwest of the precinct.

The precinct is also well served by the Hume Highway, major roads, local roads and public transport. Warwick Farm Station, which is serviced by T2 Inner West / Leppington, T3 Liverpool / Lidcombe and T5 Richmond / Leppington lines, provide frequent train services to the major strategic and local centres, including Liverpool CBD, Parramatta CBD and Sydney CBD.

The Warwick Farm Precinct currently has a mix of uses, however most are related to the equine business. Residential, hotel and motel accommodation is scattered within the precinct. A general industrial area is immediately adjacent to the Warwick Farm Precinct to the south, which generates a large amount of heavy vehicle traffic movements through Manning and Munday Streets to Governor Macquarie Drive and the Hume Highway. The conflict of uses between small vehicles, heavy vehicles, pedestrian and horses is one of the major issues within the precinct.

Council, at its December 2019 meeting, has also identified the Manning Street Bypass as a priority project to redirect heavy vehicles away from entering the core of the precinct, therefore facilitating the redevelopment of the precinct to mix of uses, including
B4 Mixed Use zone. The Manning Street Bypass project is at the preliminary stage. Detailed information regarding the proposed Manning Street Bypass will be made available to the public once the design is finalised.

Figure 2: The Warwick Farm Precinct

1.0 Introduction

1.3 Project Objectives

The project aims to:

- Rezone the Warwick Farm Precinct to a mix of uses, including B4 Mixed Use, R4 High Density Residential and RE1 Public Recreation consistent with the Liverpool Local Strategic Planning Statement (LSPS).
- Incorporate 240 Governor Macquarie Drive into the overall precinct planning.
- Develop a well considered Structure Plan for the precinct to guide future development.
- Achieve the objectives and actions identified in the Liverpool Local Strategic Planning Statement (LSPS).
- Mitigate the potential traffic and flooding impacts.
- Improve the public domain, including pedestrian / cycling linkages, wayfinding and new public spaces.
- Deliver public benefits as a result of the redevelopment.
- Reconsider the appropriate height and density across the entire precinct based on the analysis of constraints and opportunities and feedback received.
- Amend the Planning Proposal and Contributions Plan based on the revised Structure Plan to submit to the DPIE for a Gateway Determination.

1.4 The Team

The CM+ led Consultant Team includes the following expertise:

- Project Management - CM+
- Urban Design - CM+
- Strategic, Statutory Planning and Contributions Plan- GLN Planning
- Transport Planning - SCT Consulting
- Flood Management - WMA Water
- Economic and Land Valuations - Atlas Urban Economics
- Quantity Surveying - Mitchell Brandtman
- Social and Community Planning - Cred Consulting

The Consultant Team has worked closely with Liverpool City Council to deliver this project. The team structure is illustrated in Figure 3.

1.5 Methodology

This project has been undertaken in two phases. Phase 1 of the project was focused on development of a draft Structure Plan based on Council's resolution in 2019. Subsequently, the draft Structure Plan was put on public exhibition. Phase 2 of this project is to amend the exhibited Structure Plan addressing the community feedback, the DPIE's Gateway determination on No. 240 Governor Macquarie Drive and the relevant regional studies.

Phase 1 - Draft Structure Plan Methodology

- Attend an Inception Meeting with Council to familiarise with the background information and confirm the project objectives, program and deliverable.
- Conduct a site visit of the precinct and its surrounding context to familiarise with the area.
- Undertake background information review.
- Conduct Urban Design Analysis, planning study, traffic and transport study, flood study and social infrastructure study to identify constraints and opportunities.
- Establish the Urban Design Vision and Principles for the precinct.
- Develop Structure Plan options based on the Urban Design Vision and Principles as well as the input from the Consultant Team.
- Workshop with Council on the Structure Plan options.
- Develop and document the preferred Structure Plan option, based on the feedback from Council and the Consultant Team.
- Present the Structure Plan to Councillors and to the Liverpool Local Planning Panel and finalise the plan addressing comments received.

Phase 2 - Refinement of the Exhibited Structure Plan Methodology

- Review the additional information, the DPIE and community feedback.
- Refine the Urban Design Vision and Principles for the precinct.
- Develop Structure Plan options based on the refined Urban Design Vision and Principles as well as the input from the Consultant Team.
- Workshop on the Structure Plan options.
- Conduct a detailed flood impact assessment.
- Develop and document the preferred Structure Plan option, based on the feedback from Council and the Consultant Team.
- Present the Preferred Structure Plan to Councillors.
- Finalise the revised Structure Plan based on the feedback received.

Figure 3: The team structure

National Street Streetscape

2.0 Planning Context

2.1 Strategic Context

A Metropolis of Three Cities

The Greater Sydney Regional Plan - A Metropolis of Three Cities by the Greater Sydney Commission is a 40 year vision for Metropolitan Sydney. It envisions a 30-minunte city, where residents live within 30 minutes travel of their jobs, education and health facilities, services and great places. The three cities identified in the Plan are:

- The Easter Harbour City
- The Central River City
- The Western Parkland City

The Regional Plan projects that almost half of the population growth in Greater Sydney over the next 40 years will reside west of Parramatta in the Central River City and the Western Parkland City. It is projected that the population of Western Parkland City will grow from 740,000 in 2016 to 1.1 million by 2036 and to over 1.5 million by 2056.

The Regional Plan promotes the ongoing growth of the Western Parkland City. It emphasises the role of collaboration, and encourages urban renewal and new neighbourhood establishment close to the existing centres, including the Liverpool CBD. A place-based approach, that provides great public spaces, and Transport-Oriented Development (TOD), is encouraged to deliver high quality neighbourhoods and a healthy lifestyle in the Western Parkland City.

The Warwick Farm Precinct will contribute to the Liverpool Metropolitan Cluster which comprises civic, health, education, residential, retail and commercial uses. The Hume Highway connects the precinct to the M5 Motorway, which forms part of the Sydney Orbital Network. The precinct is approximately 1.5km to the Liverpool CBD (10-minute drive), 14km to the Parramatta CBD (30-minute drive), 27km to the future Western Sydney Airport (35-minute drive) and 40km to the Sydney CBD (40-minute drive). The precinct is also close proximity to Warwick Farm Station. The revisioning of the precinct presents a TOD opportunity and enables the creation of a high-quality new neighbourhood that fulfils the 30-minute city vision in the Regional Plan.

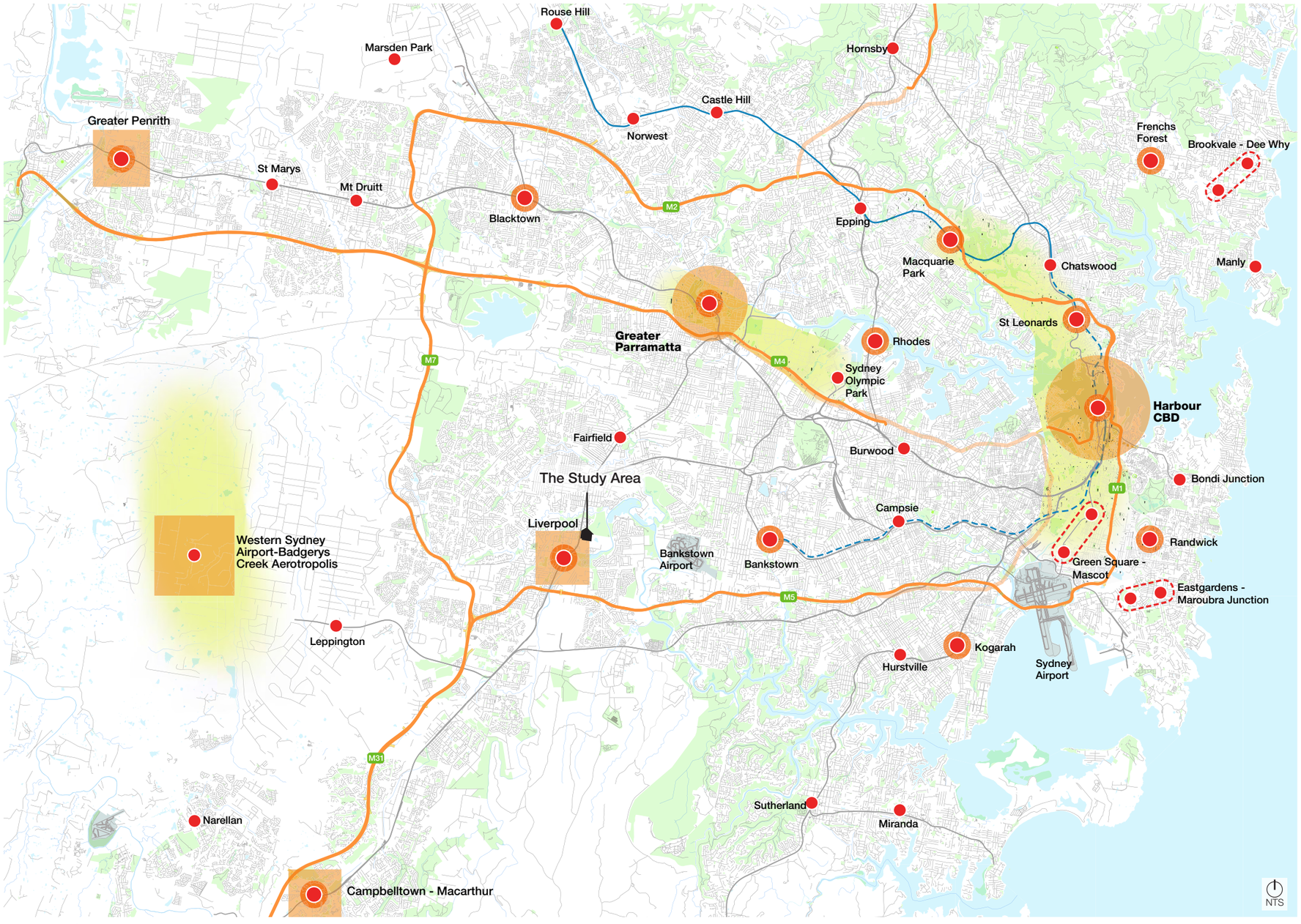


Figure 4: The Study Area in strategic context

2.0 Planning Context

Western City District Plan

The Western City District Plan (the District Plan) is a 20-year plan to manage growth and achieve the 40-year vision identified in the Regional Plan. The District Plan will guide the growth of the Western Parkland City to year 2036.

The District Plan covers eight individual councils, including Liverpool City Council. It is projected that the Western City District will have a population of 1,534,450 by 2036, which is an additional 464,450 people compared with 2016. The Western City District will accommodate 27% of the total population growth in Greater Sydney. An additional 184,500 dwellings are projected by 2036, which comprises 25% of the total housing increase in Greater Sydney. The District Plan also estimates that an additional 370,200 jobs will be created which is 15% of the Greater Sydney total.

The District Plan emphasises the importance of transport infrastructure to facilitate the population and job growth of the district. It promotes housing diversity and easy access to public transport and infrastructure, including schools, hospitals and community facilities. Active transport, including walking and cycling paths, and green links will improve the district's livability.

Collaboration Area - Liverpool Place Strategy

The Liverpool CBD and the Warwick Farm Precinct are identified as part of the Collaboration Area, which promotes rezoning land for additional housing, improving connections, and undertaking urban renewal of the Warwick Farm Precinct. The District Plan nominates a five year housing target of 8,250 for Liverpool. In addition to the housing target, a baseline job target of 36,000 by 2036 (7,000 increase compared with 2016) is nominated for Liverpool.

The 2019 NSW Population Projections by DPIE estimates the population of Liverpool will increase by 229,450 and reach 441,450 people by 2041. A total of 156,800 dwellings is projected by year 2041.

The Liverpool Collaboration Area Place Strategy

The District Plan has identified the Liverpool area as a Collaboration Area as it involves complex urban challenges. The Place Strategy sets out the vision and actions to enable the redevelopment of the area.

The Warwick Farm Precinct is identified as an Innovation / Research / Health / Advanced Manufacturing area under the Place Strategy. The Place Strategy also identifies the need to upgrade the Warwick Farm Station Interchange underpass, the commuter car park and its access as a priority. The vision outlines in the Liverpool Collaboration Area Place Strategy for the Warwick Farm Precinct is included in the Liverpool Local Strategic Planning Statement which has been endorsed by the Greater Sydney Commission.

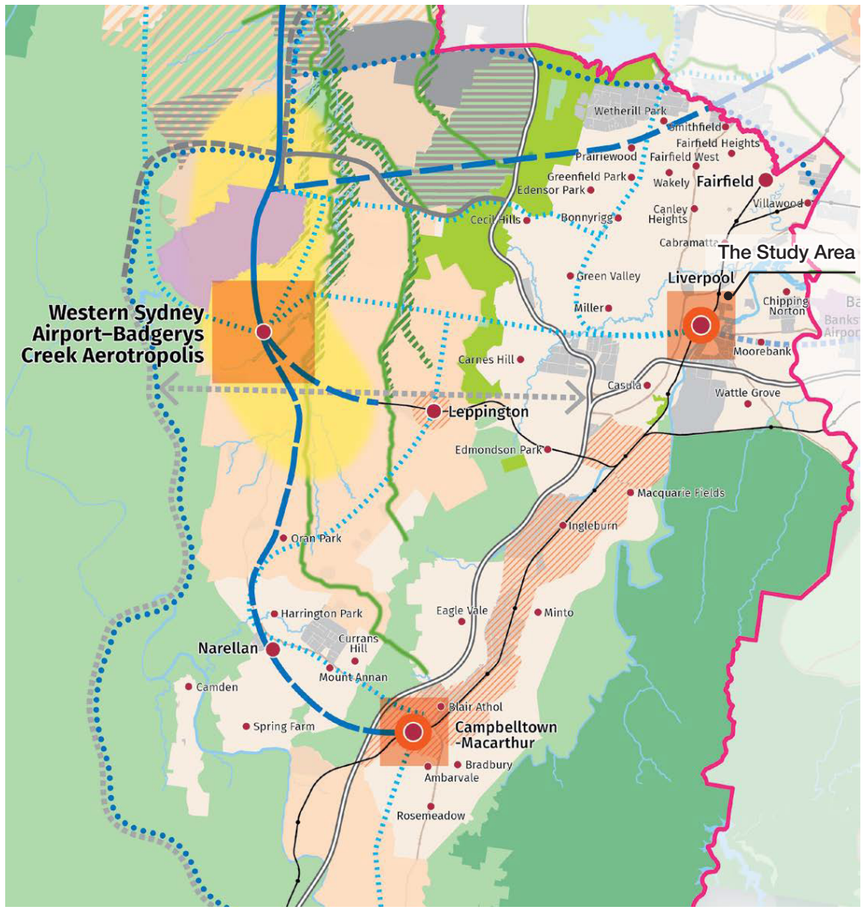


Figure 5: West District Plan

Figure 6: Liverpool Collaboration Area Plan

Key

- Liverpool City Centre – Core
- Diverse residential
- High density residential
- Equine
- Eco / Utility / Recreation
- Business development
- Industrial
- Innovation / Research / Health / Advanced manufacturing
- Mixed use
- Existing use
- Green space
- Green connections
- Rail line
- Bus priority

2.0 Planning Context

River Sensitive Liverpool: Cool, Comfortable, Connected Ideas for the Liverpool Collaboration Area

In February 2019, a two-day workshop was co-hosted by Liverpool City Council and Sydney Water. The workshop intended to explore opportunities to deliver Council's Water Management Policy and implement the priorities and actions of the Liverpool Place Strategy. A report was published by the Cooperative Research Centre for Water Sensitive Cities (CRC) summarising the workshop outcomes.

There were 35 participants from eleven organisations that attended this workshop, including:

- NSW Department of Planning, Industry and Environment (DPIE)
- NSW Office of Environment and Heritage (now a part of DPIE)
- Greater Sydney Commission
- NSW Department of Health
- NSW Environmental Protection Authority
- Sydney Water
- Liverpool City Council
- CRC
- Property developers

The workshop envisaged providing public access to both Horseshoe Pond and the Georges River foreshore area within the Liverpool Sewage Treatment Plant, which are currently owned by Sydney Water (refer to Figure 7).

The workshop also identified the next steps to realise the ideas proposed. It identified that Council and Sydney Water co-develop the strategic masterplan for the Sydney Water site.

Council has been working with Sydney Water to deliver the masterplan for the Sydney Water Site.

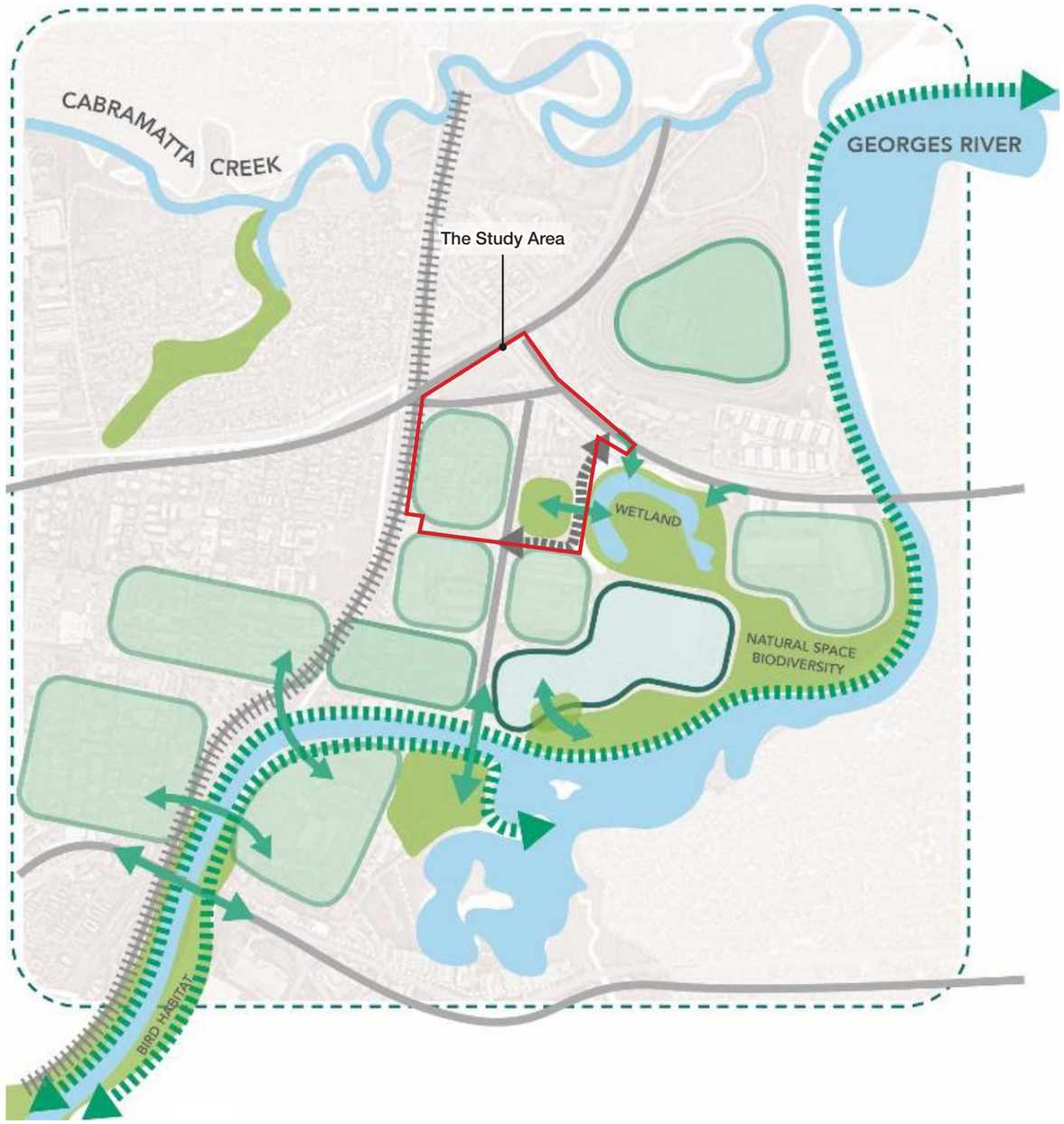


Figure 7: Ecology and accessibility Ideas for the Liverpool Collaboration Area (Courtesy of CRC Water Sensitive Cities)

2.0 Planning Context

Liverpool Local Strategic Planning Statement (LSPS)

In 2018, the DPIE introduced a new requirement for local councils in NSW to prepare an LSPS, which sets out a 20-year land use vision to manage future growth and realise the regional / district plans. The LSPS will also inform the changes to the local level plans including the Local Environmental Plan (LEP) and Development Control Plan (DCP). The LSPS will need to be endorsed by the DPIE or the relevant planning authority (e.g. the Greater Sydney Commission).

Liverpool City Council endorsed the Liverpool LSPS - Connected Liverpool 2040 in December 2019. The Greater Sydney Commission (GSC) has accepted the Liverpool LSPS through its assurance review process. The Liverpool LSPS provides a 20-year vision for the Liverpool Local Government Area (LGA) to facilitate the continuous growth of the area. It identifies 16 priorities across connectivity, livability, productivity and sustainability to realise the vision:

'A vibrant place for people that is community focused, walkable, public transport-oriented, sustainable, resilient and connected to its landscape. A place that celebrates local diversity and history, and is connected to other Sydney centres. A jobs-rich city that harnesses health, research, education, innovation and growth opportunities to establish an inclusive and fair place for all.'

Warwick Farm is identified as a Town Centre. The overall Structure Plan and Action 10.2 identifies the necessity of preparing a Structure Plan and Planning Proposal to rezone the land to a mix of uses, including B4 Mixed Use (Figure 8).

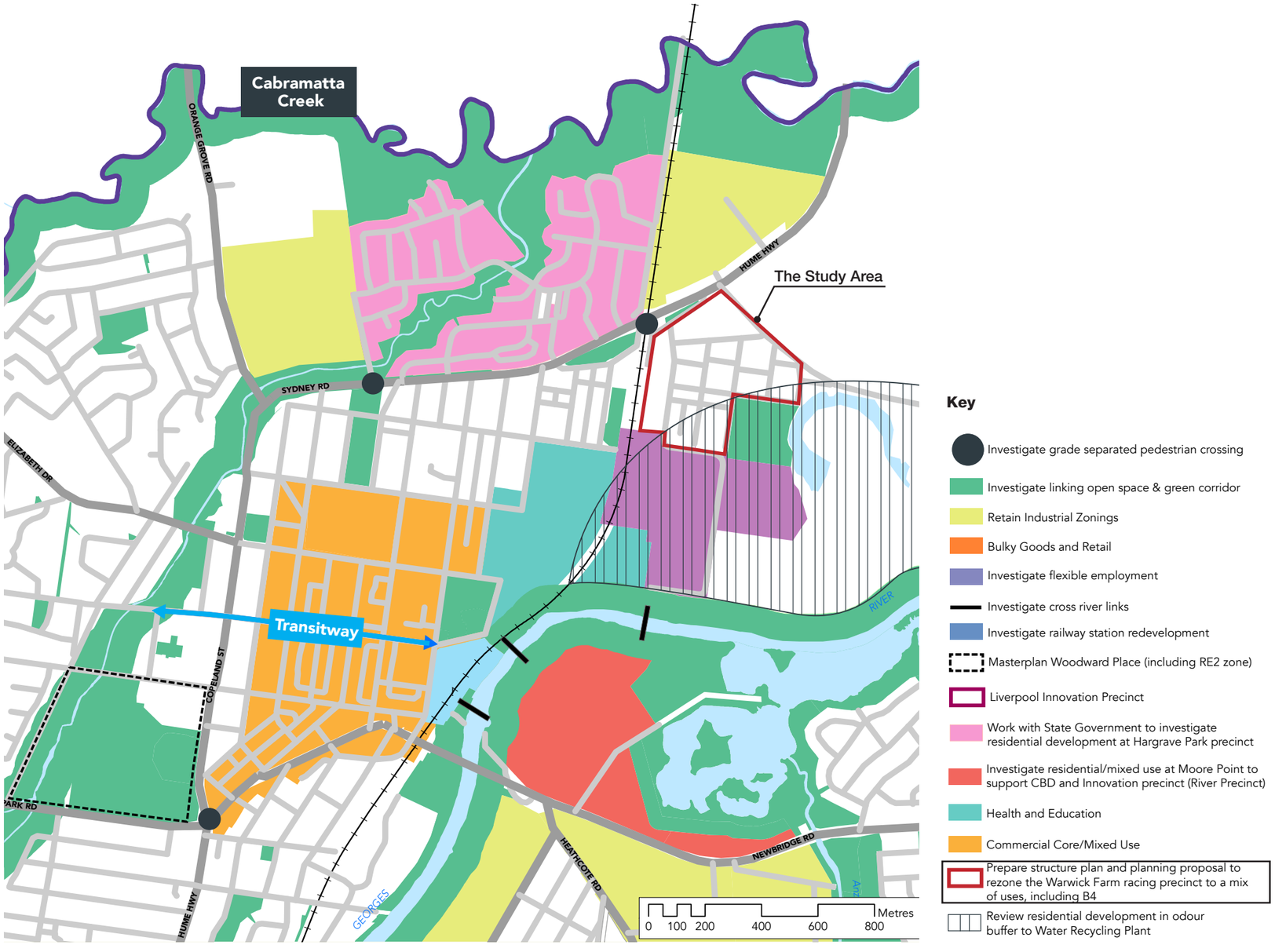


Figure 8: Liverpool LSPS

2.0 Planning Context

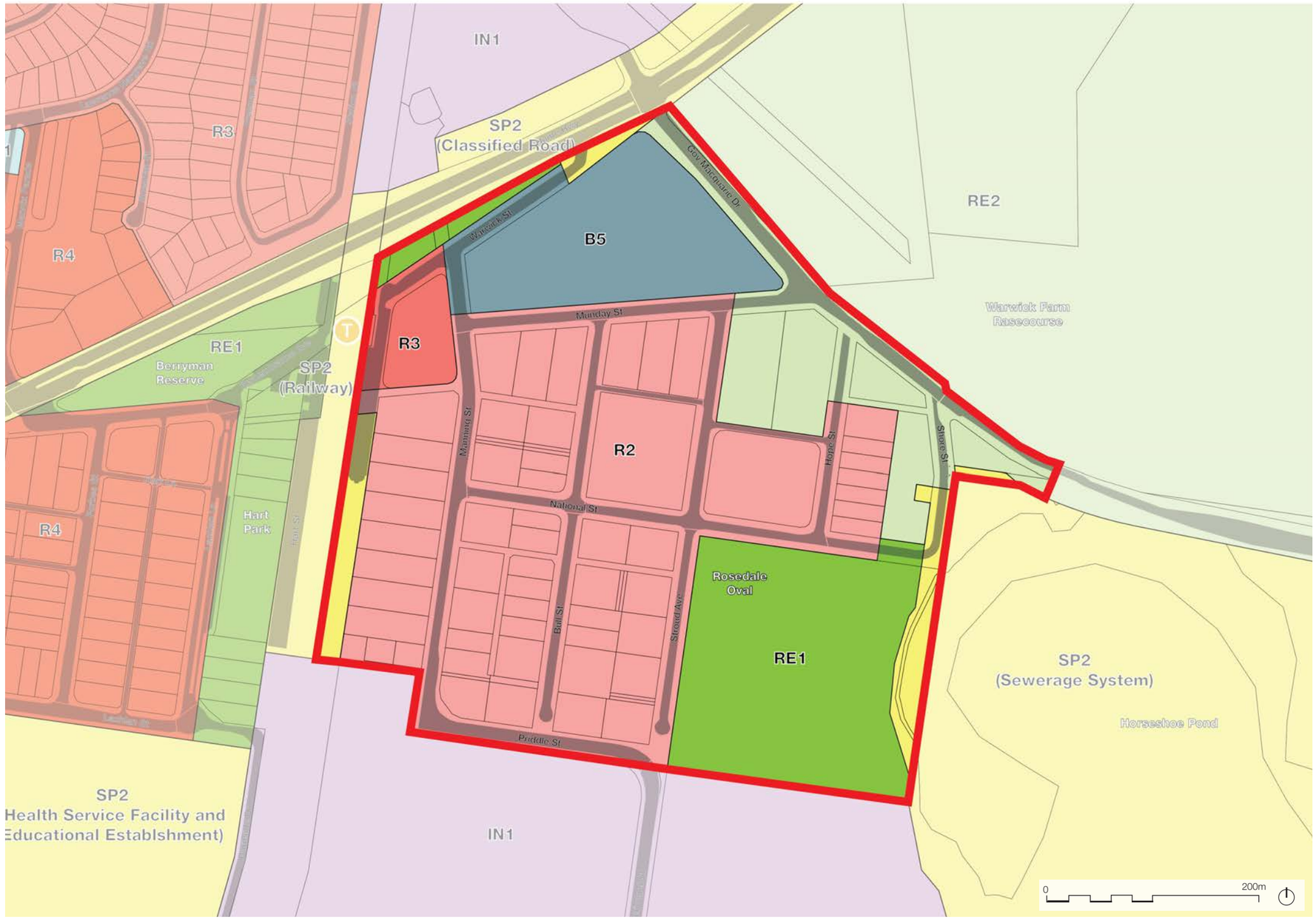
2.2 Liverpool Local Environmental Plan 2008 (LLEP 2008)

Land Zoning

The current zoning that applies to the precinct is illustrated in Figure 9. The majority of the precinct is zoned low to medium density residential. Rosedale Oval is zoned RE`1 Public Recreation, providing a recreational facility to the general public. The triangular land along Governor Macquarie Drive is zoned B5 Business Development, in which warehouse-type businesses are permitted. RE2 Private Recreation zoning can be found along Governor Macquarie Drive close to the Warwick Farm Racecourse.

There is a parcel of land along Rosedale Oval zoned SP2 Infrastructure - Sewage System. SP2 Infrastructure zoning can also be found along the Hume Highway and the railway corridor.

A General Industrial area (zoned IN1) is situated immediately to the south of the precinct.



LEGEND

- Study Area
- B1 Neighbourhood Centre
- B5 Business Development
- IN1 General Industrial
- R2 Low Density Residential
- R3 Medium Density Residential
- R4 High Density Residential
- RE1 Public Recreation
- RE2 Private Recreation
- SP2 Infrastructure

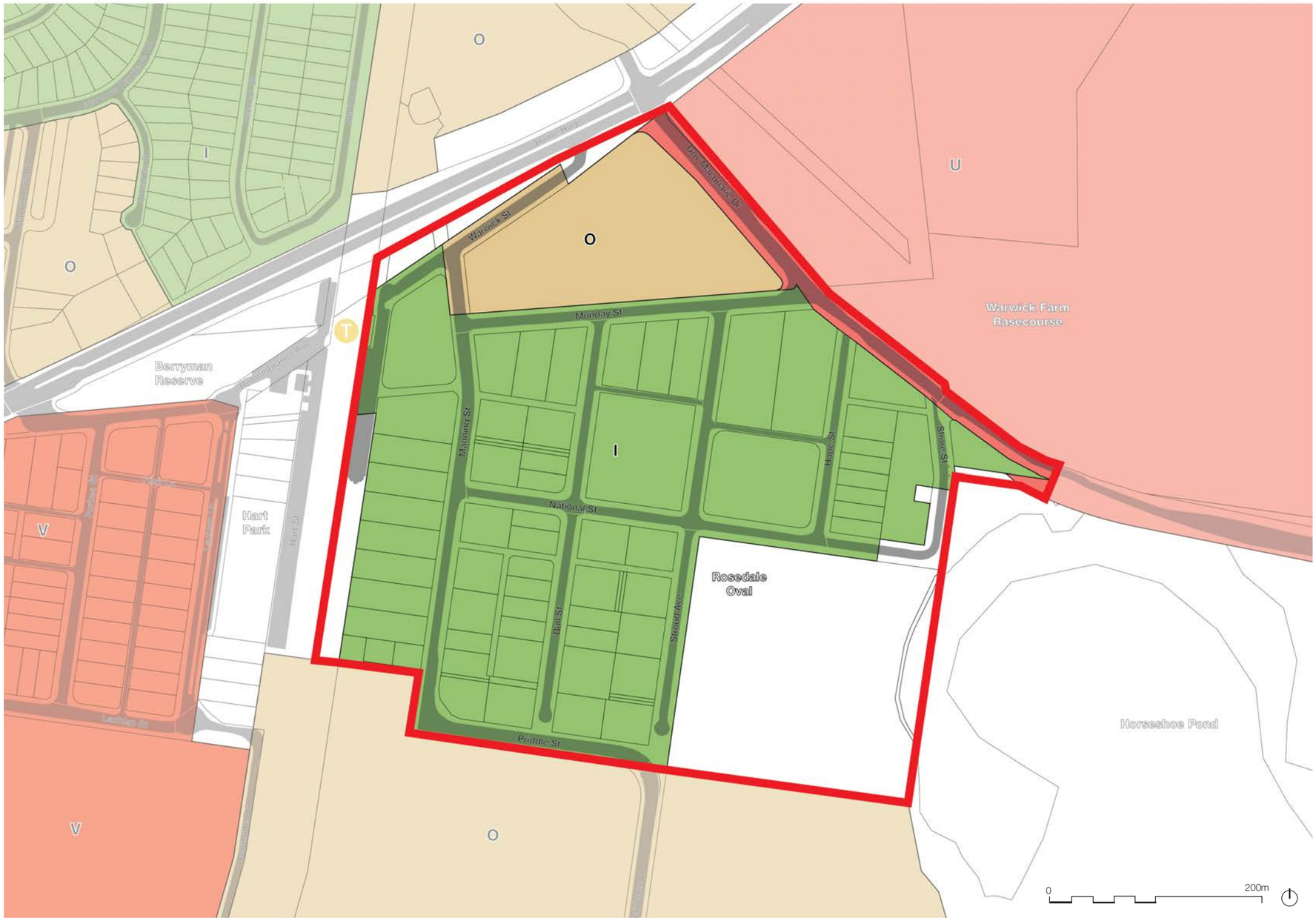
Figure 9: Existing zoning map

2.0 Planning Context

Building Height

The majority of the precinct has a maximum building height of 8.5m (2.5 storeys), with the triangular site along Governor Macquarie Drive with a maximum allowable height of 15m (4 storeys).

The general industrial area to the south has a height control of 15m (4 storeys). The Warwick Farm Racecourse adjacent to the precinct has a height limit of 30m, equivalent to about 9 storeys. The land to the west of the railway corridor has a height limit of 35m which is about 10 to 11 storeys.



LEGEND

I	8.5
O	15
U	30
V	35

Figure 10: Existing building height map

2.0 Planning Context

Floor Space Ratio (FSR)

The precinct is relatively low in density. FSR 0.5:1 applies to the majority of the land, with the highest FSR of 0.75:1 applicable to the triangular site along Governor Macquarie Drive.

The area to the west, across the railway corridor enjoys a higher FSR, ranging from 2.0:1 to 2.5:1. There is no FSR control for the industrial land to the south of the precinct.

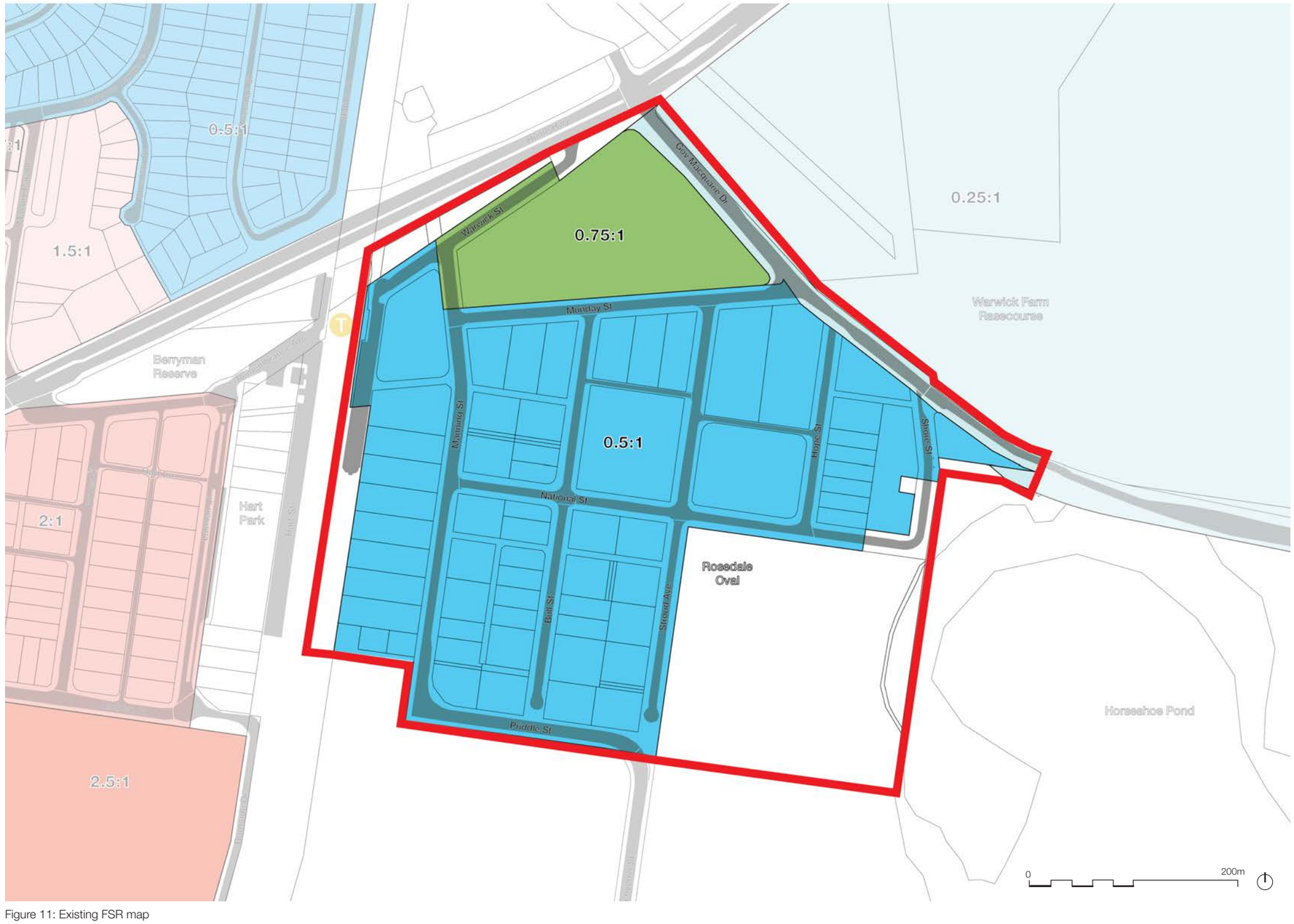


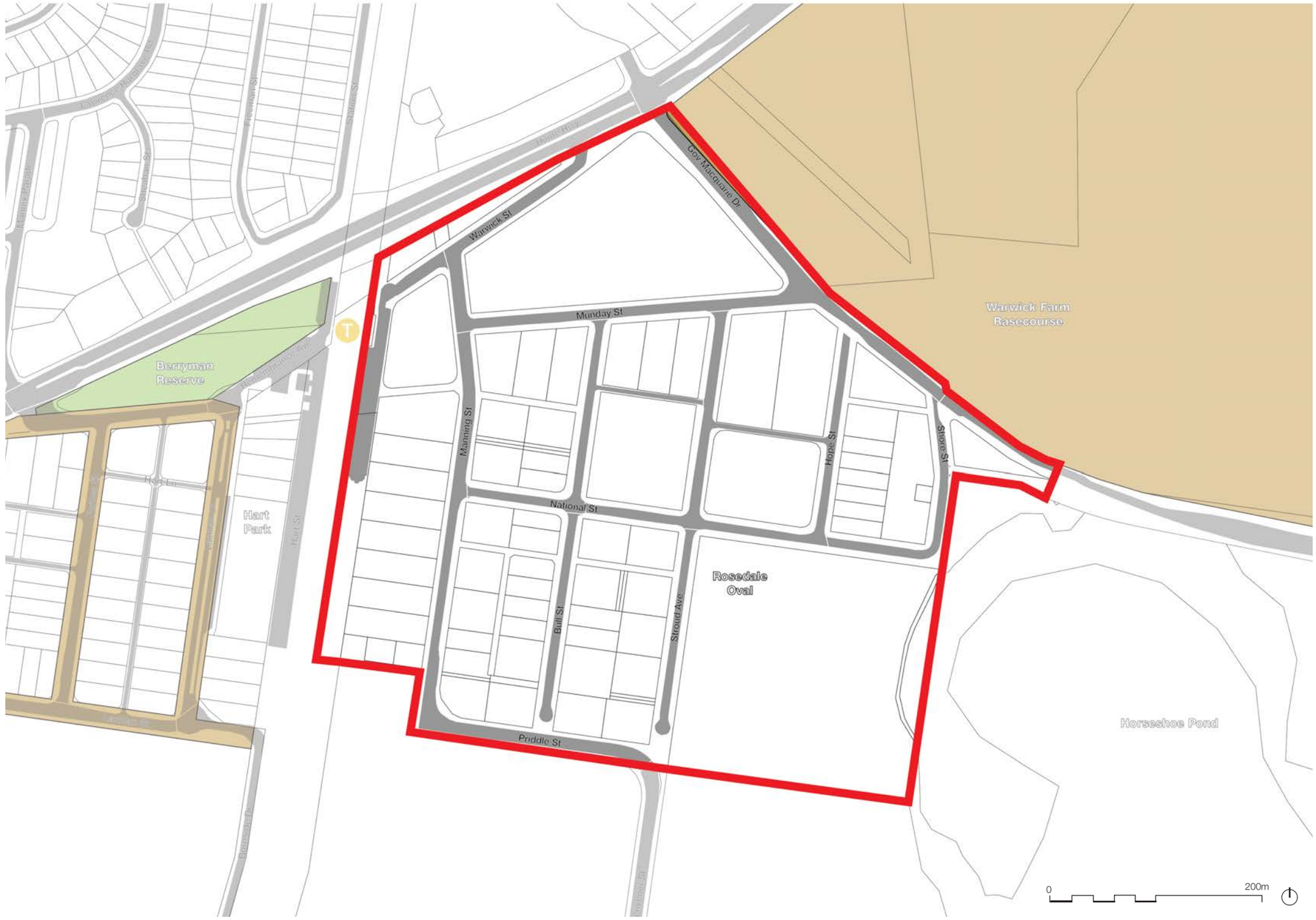
Figure 11: Existing FSR map

2.0 Planning Context

Heritage Item

There is no heritage item or Heritage Conservation Area (HCA) within the precinct. Warwick Farm Racecourse, which is across Governor Macquarie Drive to the northeast of the precinct, is identified as a heritage item with State level significance.

Berryman Reserve along the Hume Highway has a local landscape heritage. The grid of streets to the west of the railway corridor are identified in LLEP 2008 as local heritage, which represent the early Liverpool Town Centre layout which dates back to the 1800s.



LEGEND

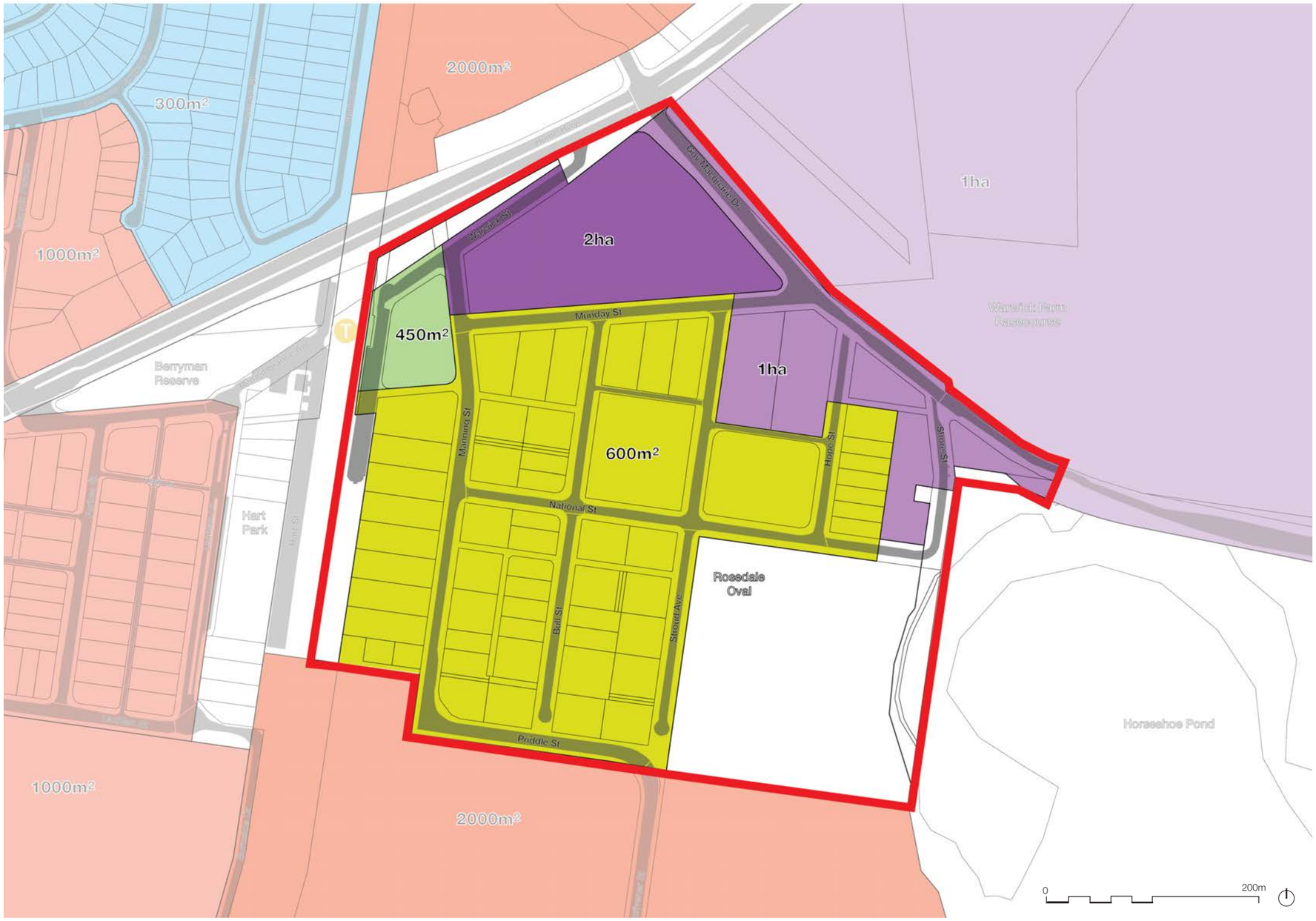
- Item - General
- Item - Landscape

Figure 12: Heritage map

2.0 Planning Context

Minimum Lot Size

The minimum lot size controls ensure that subdivisions and associated developments promote the desired future character of the neighbourhood through consistent lot size, shape, orientation and housing density. The minimum lot size controls within the precinct vary. The land within the R2 Low Density Residential Zoneare set at 600m^2. The site adjacent to Warwick Farm Station, which is zoned R3 Medium Density Residential has a minimum lot size of 450m^2. Larger lot sizes apply to the sites zoned B5 and RE2, with minimum lot sizes of 2ha and 1ha respectively.



LEGEND

- Study Area
- 300m^2
- 450m^2
- 600m^2
- 1000m^2
- 2000m^2
- 1ha
- 2ha

Figure 13: Existing minimum lot size map

Dense mature trees along the edge of Rosedale Oval

3.0 Local Context

3.1 Local Context

The Warwick Farm Precinct is located within the Liverpool Metropolitan Cluster identified in the Western City District Plan. The precinct is close to the Liverpool CBD (about 1.5km), which has a mixed use character, providing civic, educational and recreational facilities as well as retail, commercial and residential uses.

The precinct is well connected to the surrounding areas via public transport and main roads. Warwick Farm Station provides frequent services to Liverpool, Leppington and other major centres including Sydney CBD and Parramatta. The Hume Highway links the precinct to the M5 Motorway. Governor Macquarie Drive provides a crossing point of the Georges River and links the Hume Highway and Newbridge Road, which is another east-west state route providing access to Central River City and Eastern Harbour City. It is envisaged that the whole stretch of Governor Macquarie Drive will be widened to accommodate four-lane traffic, which will further improve the precinct's connectivity and traffic capacity.

Educational facilities, including Warwick Farm Public School, Liverpool Girls High School and Liverpool Public School are within 2km of the precinct to the west of the railway corridor. The precinct is well serviced by sport and recreational facilities. Rosedale Oval and Warwick Farm Racecourse provide sport facilities for both local residents and the broader community. Public open spaces along the Georges River foreshore, Chipping Norton Lake and Cabramatta Creek provide regional level open spaces. Liverpool Hospital and associated medical facilities provide the precinct easy access to public health facilities.

The future public domain improvement projects, including the development of the Georges River Parklands and Chipping Northon Lake Masterplan and Liverpool Water Treatment Facility Masterplan (LCC is currently working with Sydney Water to deliver this masterplan), coupled with the proposed additional bridges across Georges River (refer to Liverpool LSPS) will further improve the precinct's access to surrounding open space. The proposed new bridges will also provide easy access from the Liverpool CBD and the precinct to the future masterplan area - Moore Point Mixed Use Development.

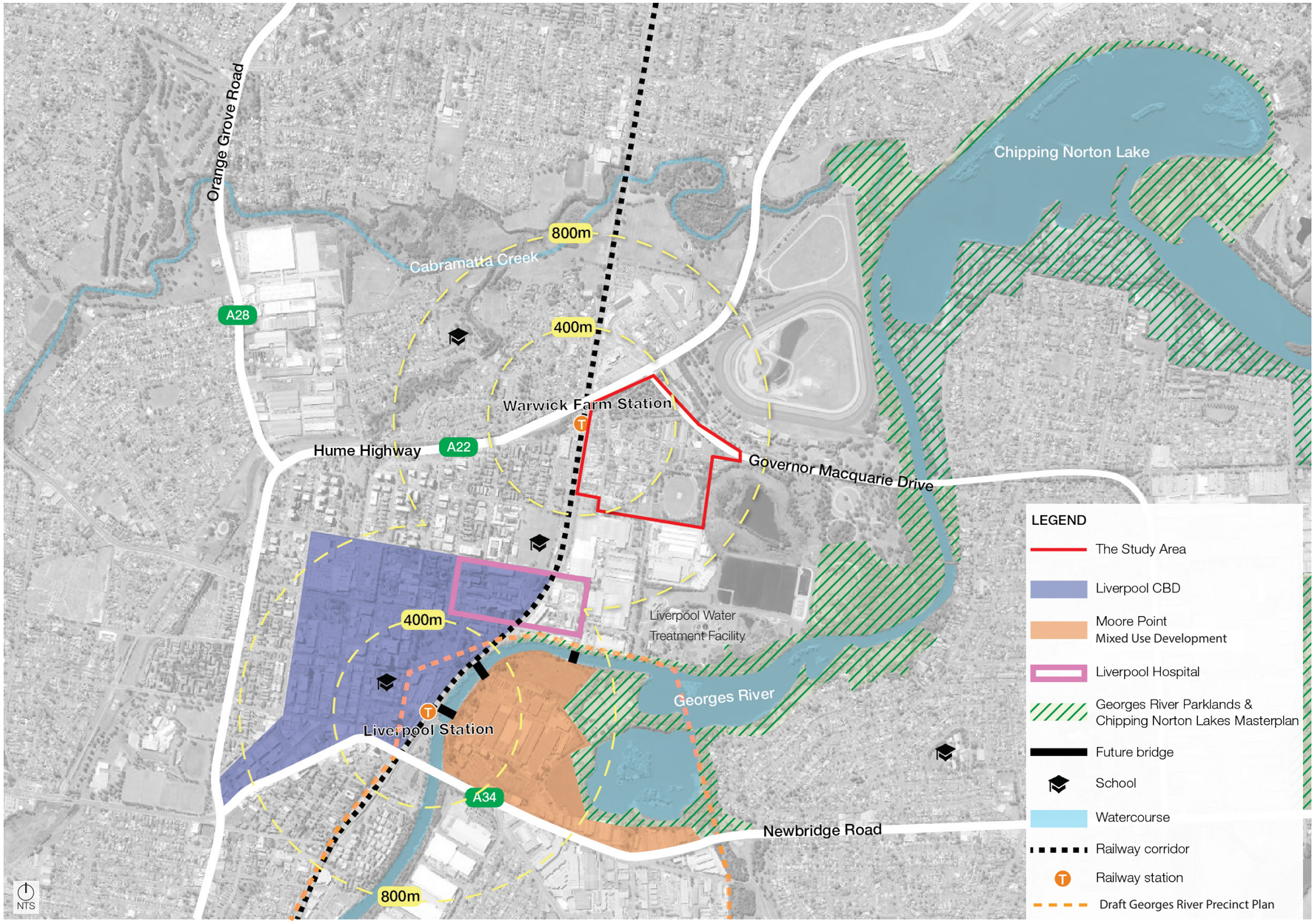


Figure 14: The study area and its context

3.0 Local Context

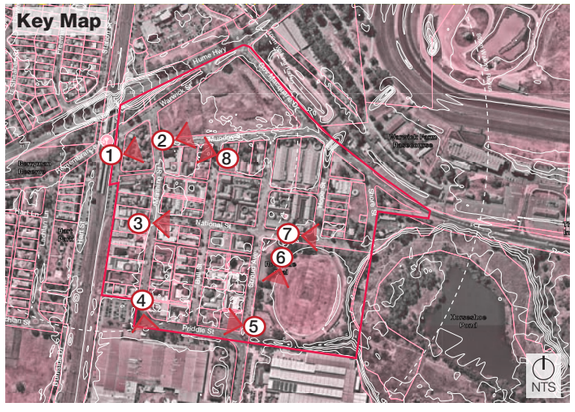
3.2 Existing Site Conditions

The Warwick Farm Precinct is predominantly occupied by equine related facilities (View 5). However, there is a mixture of character and built form within the precinct.

The precinct has a low scale character, with buildings ranging between one to two storeys in height. Low density residential houses spread throughout the precinct and are generally associated with horse training facilities. Poorly maintained houses also exist in the precinct, which contribute negatively to the streetscape character (View 8). Medium density residential dwellings are scattered along Manning Street close to Warwick Farm Station (View 1 and 3).

The industrial area to the south of Priddle Street generates heavy vehicle traffic in the precinct (View 4), as Priddle - Manning - Munday Street provide the only access to Governor Macquarie Drive and the Hume Highway from the industrial area. Conflict of uses among light and heavy vehicles, and pedestrian and horse movement is a major issue (View 2, 4 and 7).

Rosedale Oval (View 6) is the major open space within the precinct, which provides sport facilities and a children's playground. Dense mature Eucalyptus trees define the edge of the oval to its south and east.



4.0 Urban Design Analysis

4.1 Introduction

CM+ has conducted a thorough Urban Design Analysis, informed by the site visit, and a background document review. The Urban Design Analysis assesses the existing conditions of the Warwick Farm Precinct, identifies the constraints and opportunities and establishes the future vision and Urban Design principles to guide the redevelopment of the precinct.

4.2 Topography

The precinct is relatively flat with most of the area at RL 8m Australian Height Datum (AHD). Rosedale Oval is lower than the rest of the precinct and sits at RL 7m AHD.

The Hume Highway is higher than the precinct. It rises up gradually towards the railway corridor, and reaches its highest point at RL 15m AHD above the railway line

The land to the west of the railway corridor is higher than the precinct, and sits at RL 9m AHD and above.

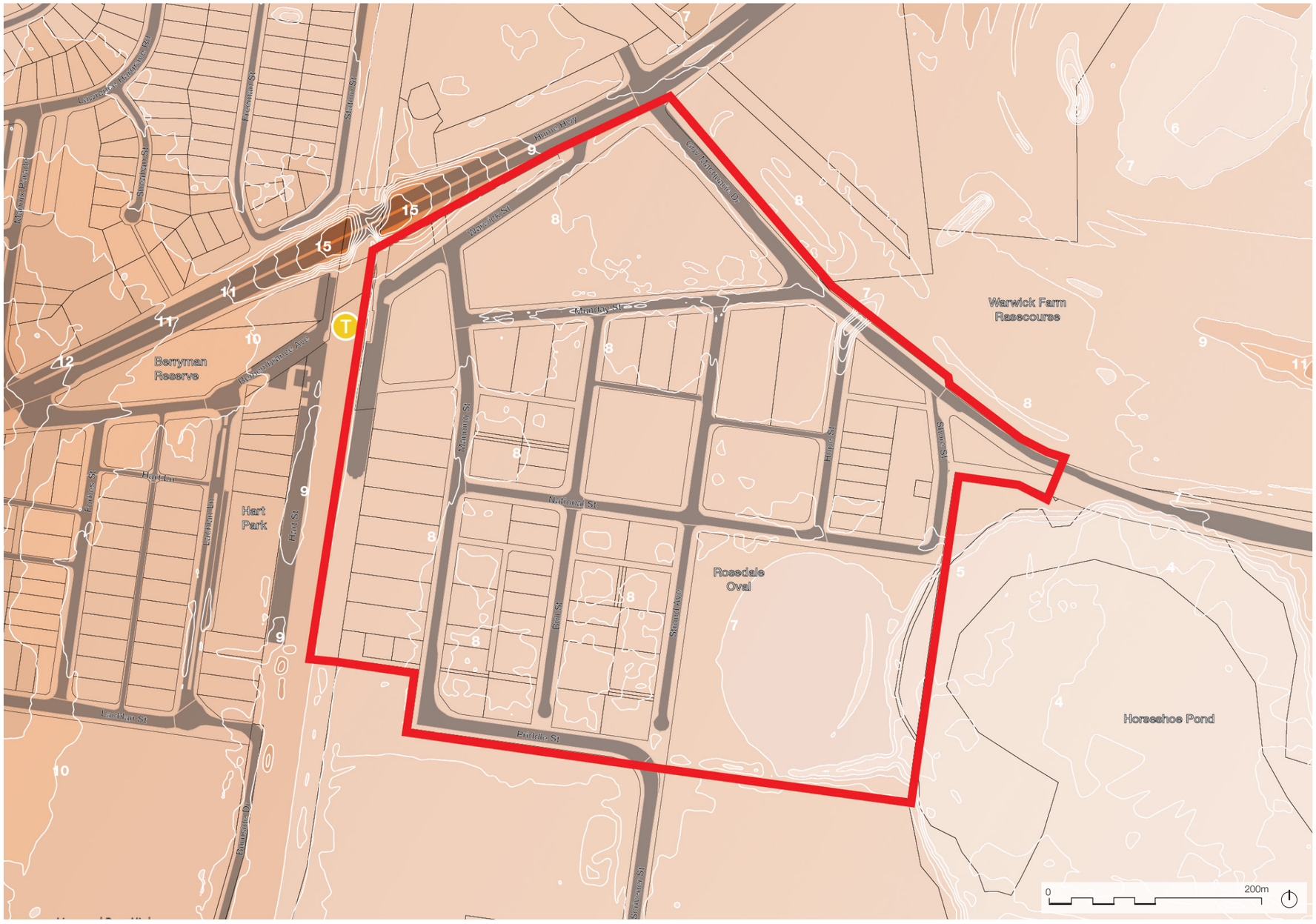


Figure 15: Existing topography

4.0 Urban Design Analysis

4.3 Flooding

The existing peak flood depths and extents within the study area are derived from the 2004 Georges River Floodplain Risk Management Study and Plan and are shown in Figures 16 and 17, and are summarised below:

1. 1% Annual Exceedance Probability (AEP) is 8.5m AHD
2. Probable Maximum Flood (PMF) is 10.8m AHD

A key issue with this development is the evacuation of residents during a flood. Shelter in place is not appropriate and therefore there must be appropriate access from every building in events larger than a 1% AEP. The key features of the evacuation approach are:

1. All floors to be at or above 9m AHD (1% AEP + 0.5m).
2. All floors must be at least 0.3m above the surrounding ground / road to allow for local drainage.
3. All internal roads to be at or above 8.5m AHD (1 % AEP).
4. All roads or pedestrian access used for evacuation must rise to the PMF.
5. There must be either pedestrian or vehicle access from all floors that is always at or above 8.5m AHD (1 % AEP) to above the PMF.

Another important factor is the need to ensure the new development proposed will not result in net loss of the flood storage at 1% AEP namely RL 8.5m AHD. Therefore, balancing the cut and fill in the precinct is critical in the development of the structure plan.

Refer to Warwick Farm Flooding Assessment Report by WMA Water.

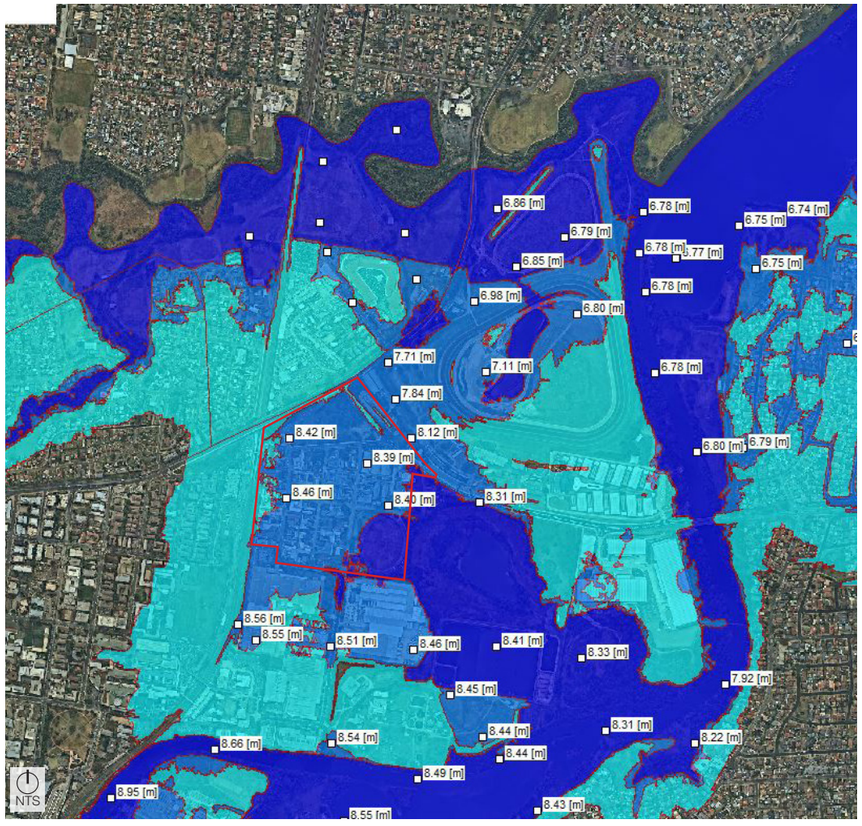


Figure 16: 1 in 100 flood level (Source: MIKE-11 model)

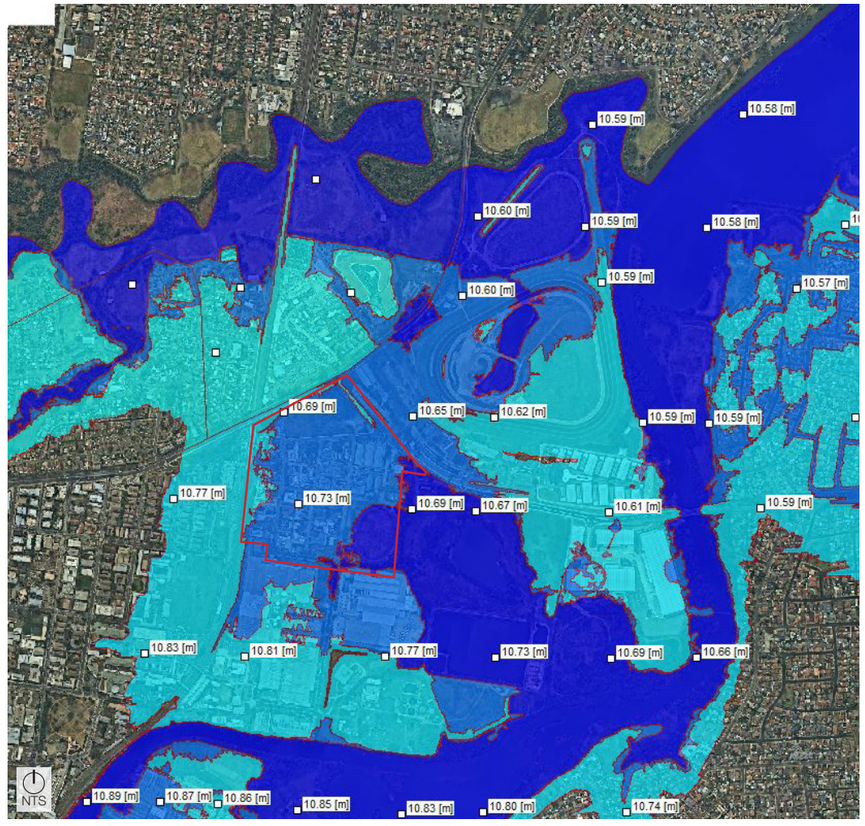


Figure 17: PMF level map (Source: MIKE-11 model)

Note in both diagrams: Light blue = PMF extent, mid blue = 1% AEP extent

4.0 Urban Design Analysis

4.4 Community Facility, Open Space Benchmark and Significant Landscaping

Social infrastructure and open space have significant impacts on the wellbeing of the local community, as they provide community services, places for social gathering and recreational uses. Landscaping plays an important role shaping the character of the precinct and has significant impacts on the visual and residential amenity.

There are no multipurpose or hireable community facilities within the precinct. The closest one - Warwick Farm Community Hub is about 800m to the northwest of the precinct; however, it is ageing and is not available for general community hire.

Rosedale Oval, which is approximately 5ha in size, is a major open space within the precinct providing recreational uses and a children's playground. There are no local parks within the precinct; however, smaller parks, including Hart Park and Berryman Reserve are immediately to the west of the precinct.

The open space benchmark is very important to guide the planning of the precinct. It requires the future development to comply with the nominated benchmark to deliver adequate open spaces. The benchmark applied to the precinct when the exhibited Structure Plan was made was 2ha per a thousand population. However, this benchmark is revised by the latest Open Space Needs Analysis for the Liverpool Collaboration Area to 1.5ha per 1,000 residents. Refer to Section 7.2 of this report for more information.

A cluster of dense mature Eucalyptus trees are located within Rosedale Oval, especially along its southern and eastern boundaries. Munday Street and National Street present some consistency in street tree planting. However, the trees cover within the precinct is generally low.

LEGEND

- The Study Area
- Major open space recreational facility
- Tree canopy
- Surrounding Parks

Figure 18: Existing tree canopies and open space

4.0 Urban Design Analysis

4.5 Traffic and Transport

Road Network

The characteristics of the roads surrounding the subject precinct are:

- Hume Highway is a primary road connecting Liverpool to Sydney's Inner West. It is a state road (A22) and has three lanes in each direction. In the vicinity of the precinct, there is a footpath on the northern side and a shared pedestrian/cycle path on the southern side. Pedestrian crossings are provided at the intersection of Hume Highway / Governor Macquarie Drive (except on the east side) and an underpass is available to the west of Warwick Farm Station to connect Warwick Farm to the south of Hume Highway with Station Street to the north of Hume Highway.
- Governor Macquarie Drive is a distributor road. It intersects with Hume Highway to the north and Newbridge Road to the south. The road has only one lane in each direction between Munday Street and the signalised access to Warwick Farm Racecourse. The road has recently been upgraded to two lanes in each direction plus turning lanes between the Warwick Farm Racecourse and Georges River. The section of the road between Georges River and Newbridge Road remains one lane in each direction, with future plans to be upgraded to two lanes in each direction. Footpaths are not provided on the west side in the vicinity of No. 240 Governor Macquarie Drive. Pedestrian crossings are present on all approaches of the Munday Street intersection.
- Warwick Street is a local road that connects Warwick Farm Station and Manning Street with Hume Highway. It has one lane in each direction. Except for the recently completed shared path on the south side of the road close to the station, there is no footpath on either side of the road, making it unattractive for walking.
- Munday Street / Manning Street / Priddle Street is the local collector road that connects Governor Macquarie Drive with the industrial area to the south of the Warwick Farm precinct. It has one traffic lane and one parking lane in each direction. A recently completed shared path is provided on the northern side.
- Shore Street is a one way (northbound) one lane local road that mainly services the residences and visitors of the Rosedale Oval and nearby racecourse. It currently terminates at a left-out only intersection with Governor Macquarie Drive.

Active Transport

Shared pedestrian / cycle paths are provided on the southern side of Hume Highway, on the northern side of Munday Street, and a small section of Manning Street and Warwick Street connecting to the station. A shared path crossing of Hume Highway is provided via an underpass located to the west of the Warwick Farm Station, although the underpass is in poor condition. There is an extended shared path network to the southwest of the precinct to connect to Liverpool CBD, providing potential opportunity to promote cycle use in the local area.

Footpaths are provided on some internal streets within the precinct in various qualities. Along Governor Macquarie Drive, there is no footpath on the western side between Munday Street and Hume Highway and on the eastern side between Munday Street and Shore Street.

Refer to Traffic and Transport Impact Assessment by SCT for more information.

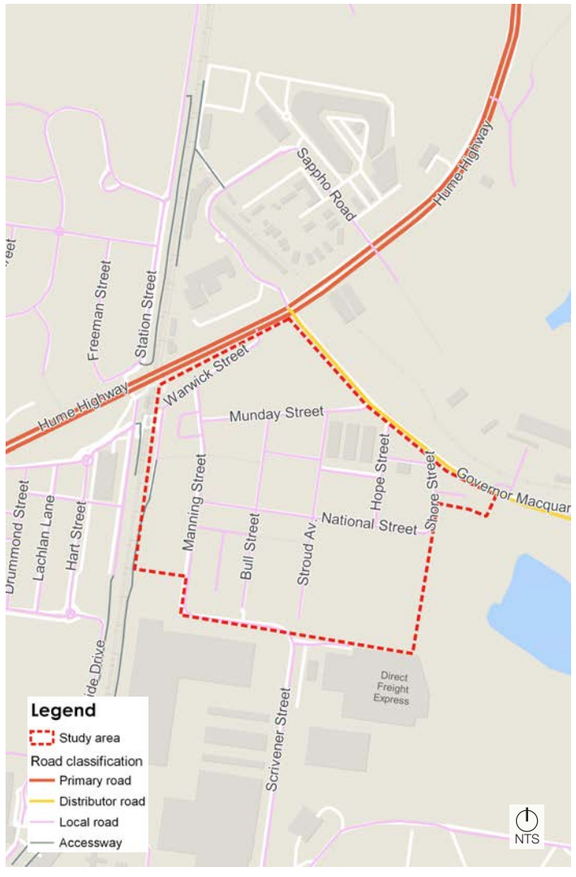


Figure 19: Road network (Source: SCT Consulting)

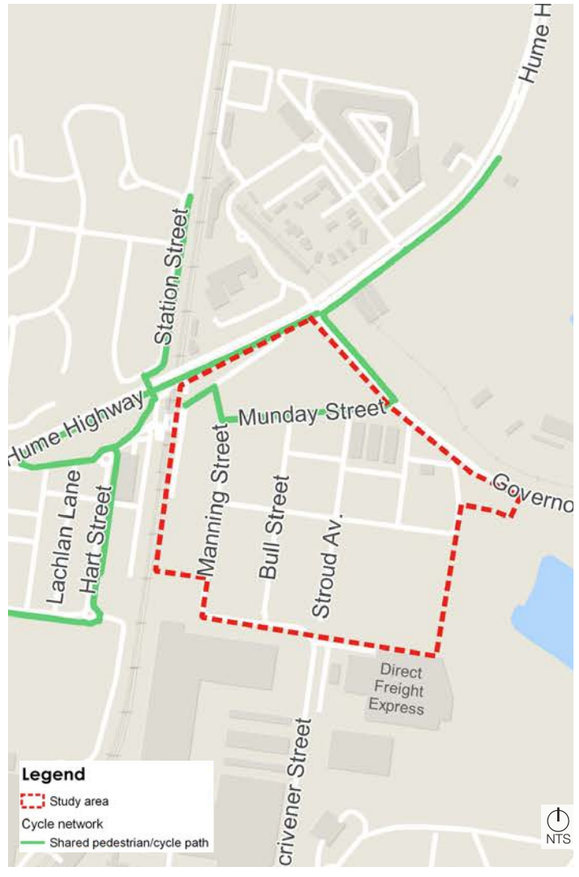


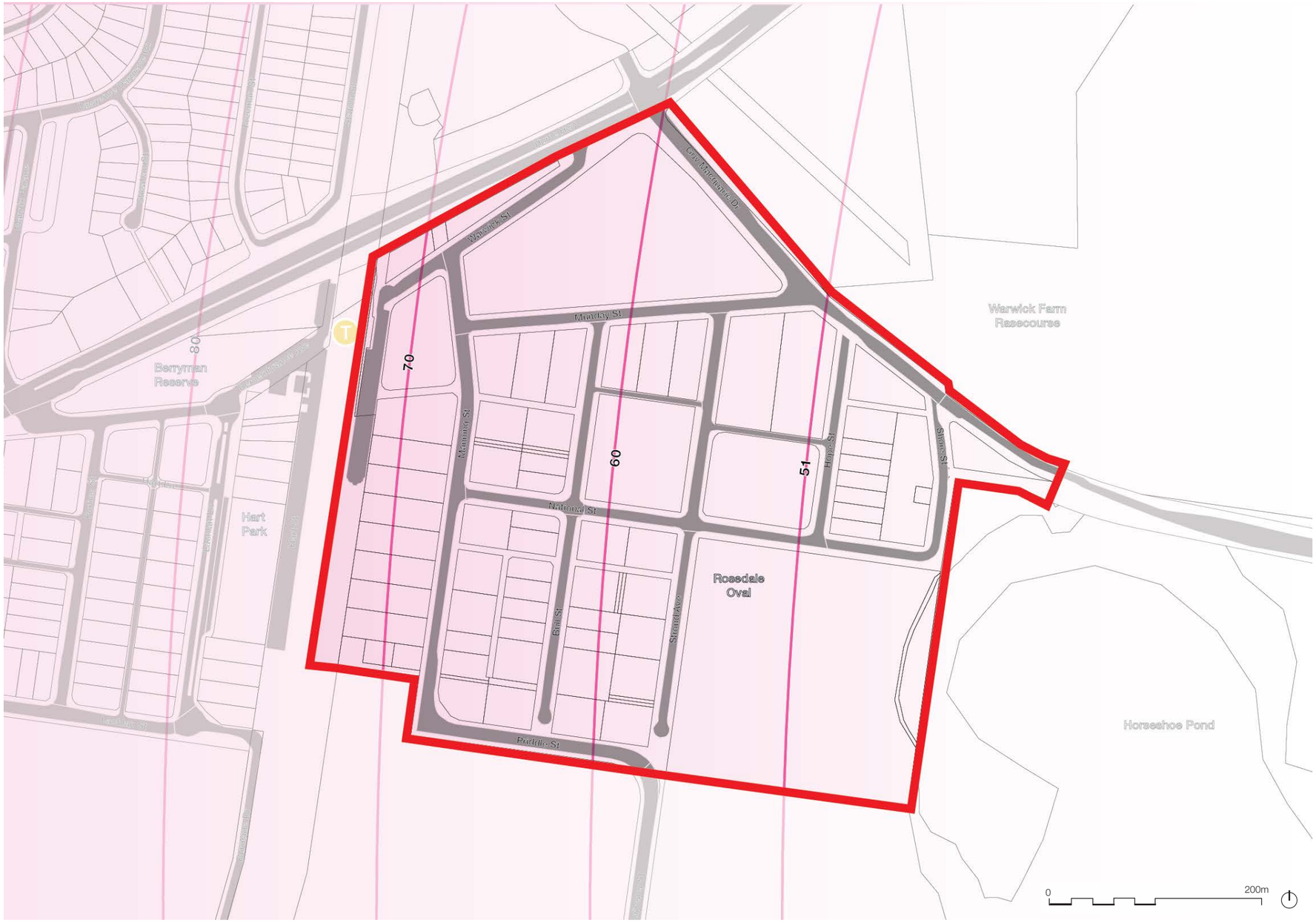
Figure 20: Existing shared pedestrian / cycle path (Source: SCT Consulting)

4.0 Urban Design Analysis

4.6 Bankstown Airport Obstacle Limitation Surface (OLS)

The Warwick Farm Precinct is in an area affected by the operational requirements for Bankstown Airport, which is located approximately 9.5km to the east of the precinct. Obstacle Limitation Surface is used to define the airspace that is protected from obstacles to ensure the safety of aircraft during takeoff and landing phases.

The nominated Bankstown Airport OLS ranges between RL 51m AHD and RL 70m AHD. Considering the existing ground level height of RL 8m AHD, the Bankstown Airport OLS limits the building height within the precinct to a maximum of 62m (about 20 storeys) close to Warwick Farm Station.



LEGEND

- The Study Area
- Bankstown Airport Obstacle Limitation Surface Contours (m AHD)

Figure 21: Bankstown Airport OLS controus

4.0 Urban Design Analysis

4.7 Odour Buffer

Liverpool Sewage Treatment Plant is situated adjacent to the Warwick Farm Precinct and generates odour that impacts surrounding areas. The odour buffer zone provided by Sydney Water indicates that the southeast portion of the site is within the odour buffer zone, including Rosedale Oval.

The LSPS and Sydney Water Guidelines seek to avoid residential development within the odour buffer. A reduction of the odour buffer size may be achievable as a result of upgrading the Sewage Plant facilities. The exhibited Structure Plan adopts the odour buffer outlined in Figure 22. For the latest information on this odour buffer, Refer to the Section 7.2 of this report.

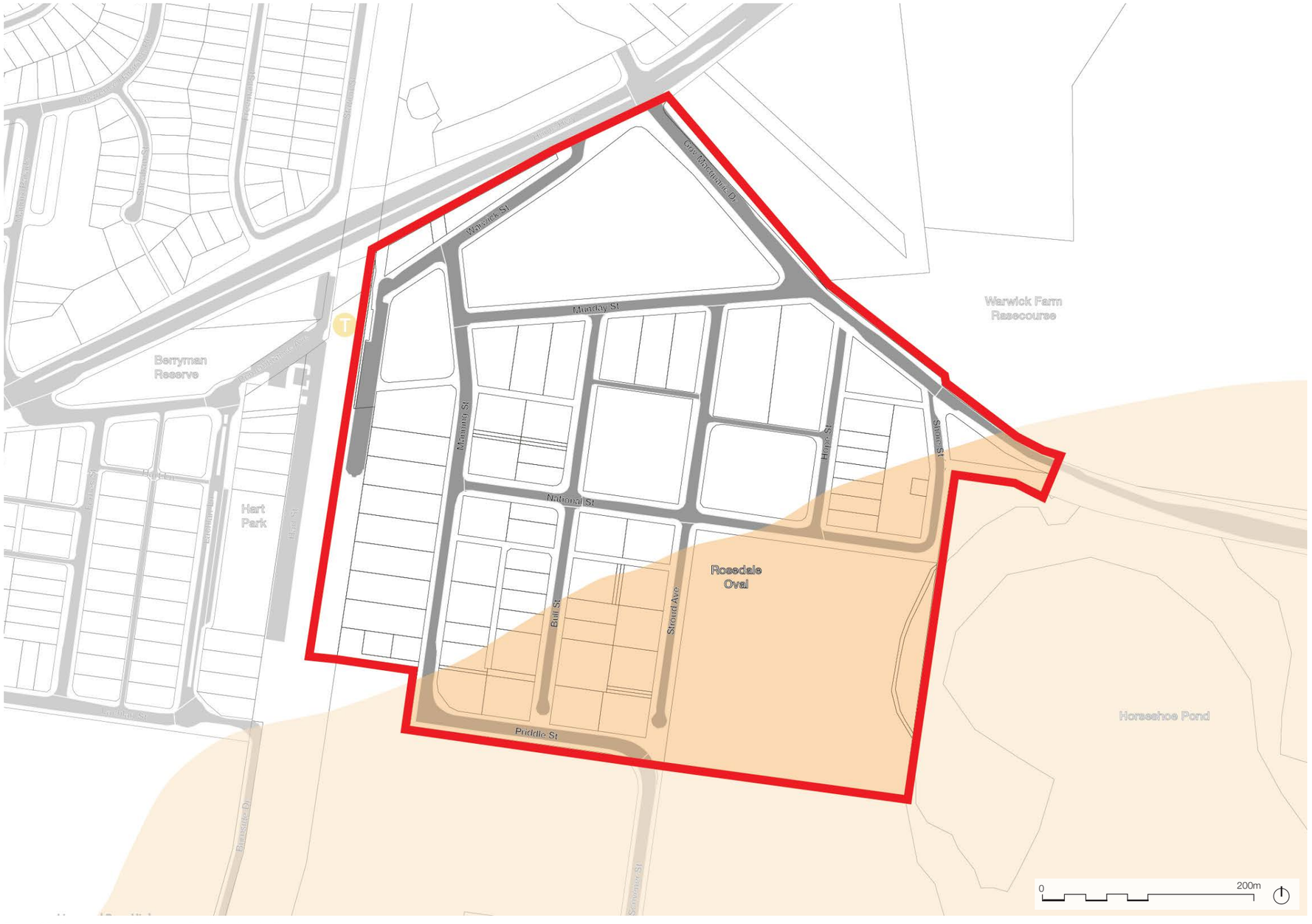


Figure 22: Sydney Water Treatment Facility odour buffer

4.0 Urban Design Analysis

4.8 Planning Proposal and Development Applications

The study has identified sites that are subject to a Planning Proposal or an approved Development Application (DA). The Planning Proposal site is:

1. 240 Governor Macquarie Drive
   (refer to Figures 24-26) - this proposal has been rejected by the DPIE at the Gateway determination)

Recently approved DAs include:

2. 12 Munday Street
3. 2 Stroud Avenue
4. 6 Manning Street
5. 8 Manning Street
6. 13 Bull Street
7. 21C Manning Street
8. 1 Stroud Avenue
9. 11 Manning Street
10. 7 Bull Street
11. 9A Bull Street
12. 11A Bull Street
13. 10 Stroud Avenue
14. 14 Manning Street
15. 12 Bull Street
16. 17 Stroud Avenue
17. 14 Bull Street

The majority of the DAs listed above are in relation to horse training facilities and alteration and additions to existing residential dwellings.

Figure 23: Currently Planning Proposal and Development Applicatons

4.0 Urban Design Analysis

240 Governor Macquarie Drive (GMD)

This Planning Proposal was endorsed by Liverpool City Council and submitted to the DPIE for Gateway determination on 25 February 2020. The Planning Proposal was under assessment by the DPIE when the exhibited Structure Plan was developed. Thereby, the exhibited Structure Plan adopted the built form and height strategy outlined in this Planning Proposal. However, the Planning Proposal was rejected at Gateway by the DPIE on 21 September 2020. Refer to Section 7.2 of this report for the implication of the Gateway determination.

Note that the plan and 3D views on this page illustrates the built form and height strategy for No.240 Governor Macquarie Drive that are rejected by the DPIE for reference purposes.

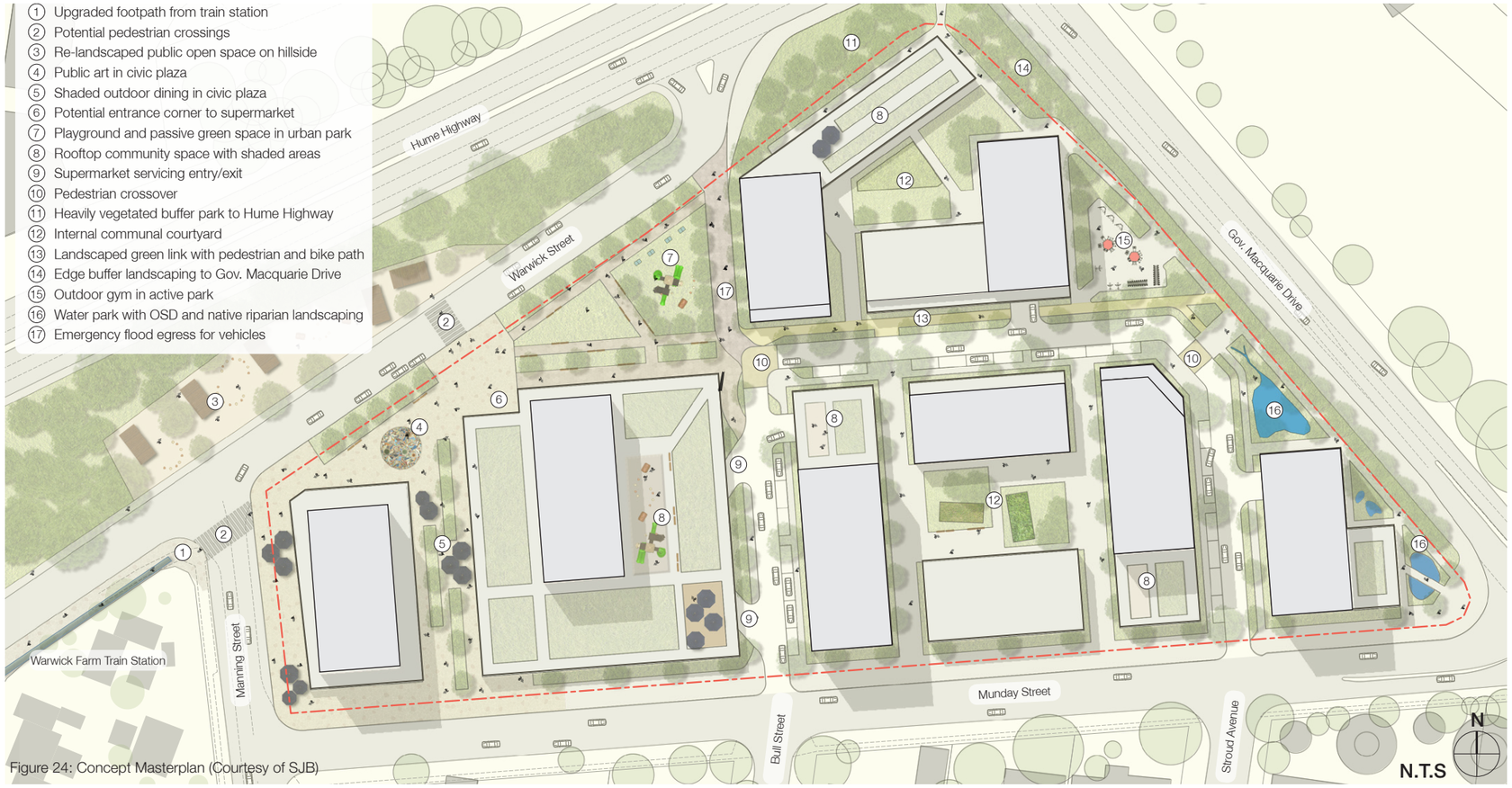


Figure 24: Concept Masterplan (Courtesy of SJB)

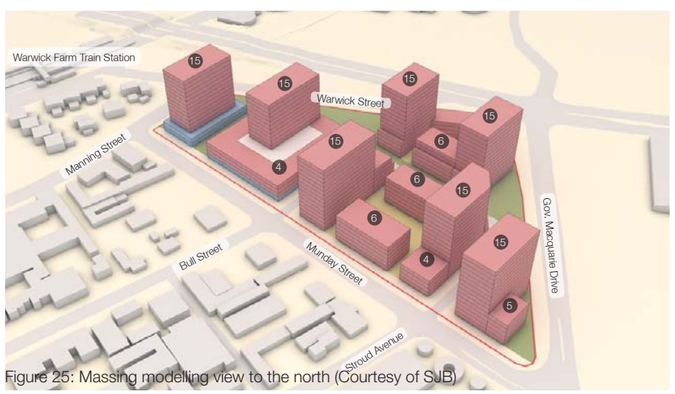


Figure 25: Massing modelling view to the north (Courtesy of SJB)

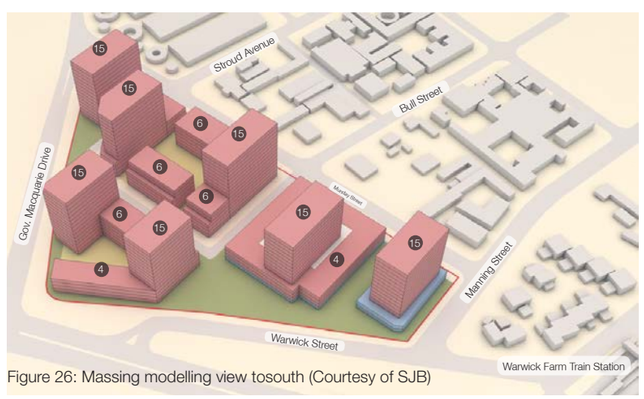


Figure 26: Massing modelling view tosouth (Courtesy of SJB)

4.0 Urban Design Analysis

4.9 Ownership Pattern

The Warwick Farm Precinct has a relatively fragmented ownership, with some large land holdings in the precinct.

Rosedale Oval and a strip of land along the Hume Highway are Council owned land. There are some small land parcels close to Warwick Farm Station that are owned by Transport for NSW (TfNSW). Sydney Water owns a piece of land adjacent to Rosedale Oval, which is known as Liverpool Sewage Treatment Plant. Another Sydney Water facility is located along Shore Street.

The large vacant site at No. 240 Governor Macquarie Drive is under one ownership. The Australian Turf Club (ATC) owns several properties along Governor Macquarie Drive, which are currently occupied by horse training facilities.

Darley is another private landowner within the precinct. It owns two large lots along National Street, close to Rosedale Oval, which are also occupied by equine related uses.

The land opposite Warwick Farm Station is strata constrained, which has over 20 separate owners. Land with strata constraints presents less opportunity to be redeveloped in the short to medium term; however, there are precedents in the Metropolitan Sydney area where strata titled land has been consolidated and redeveloped.

LEGEND

- The Study Area
- Sydney Water owned land
- Transport for NSW owned land
- Liverpool City Council owned land
- Australian Turf Club owned land
- Darley owned land
- Land under one ownership
- Land under one ownership
- Other private owned land
- Strata constrained land
- 240 Governor Macquaire Drive Site

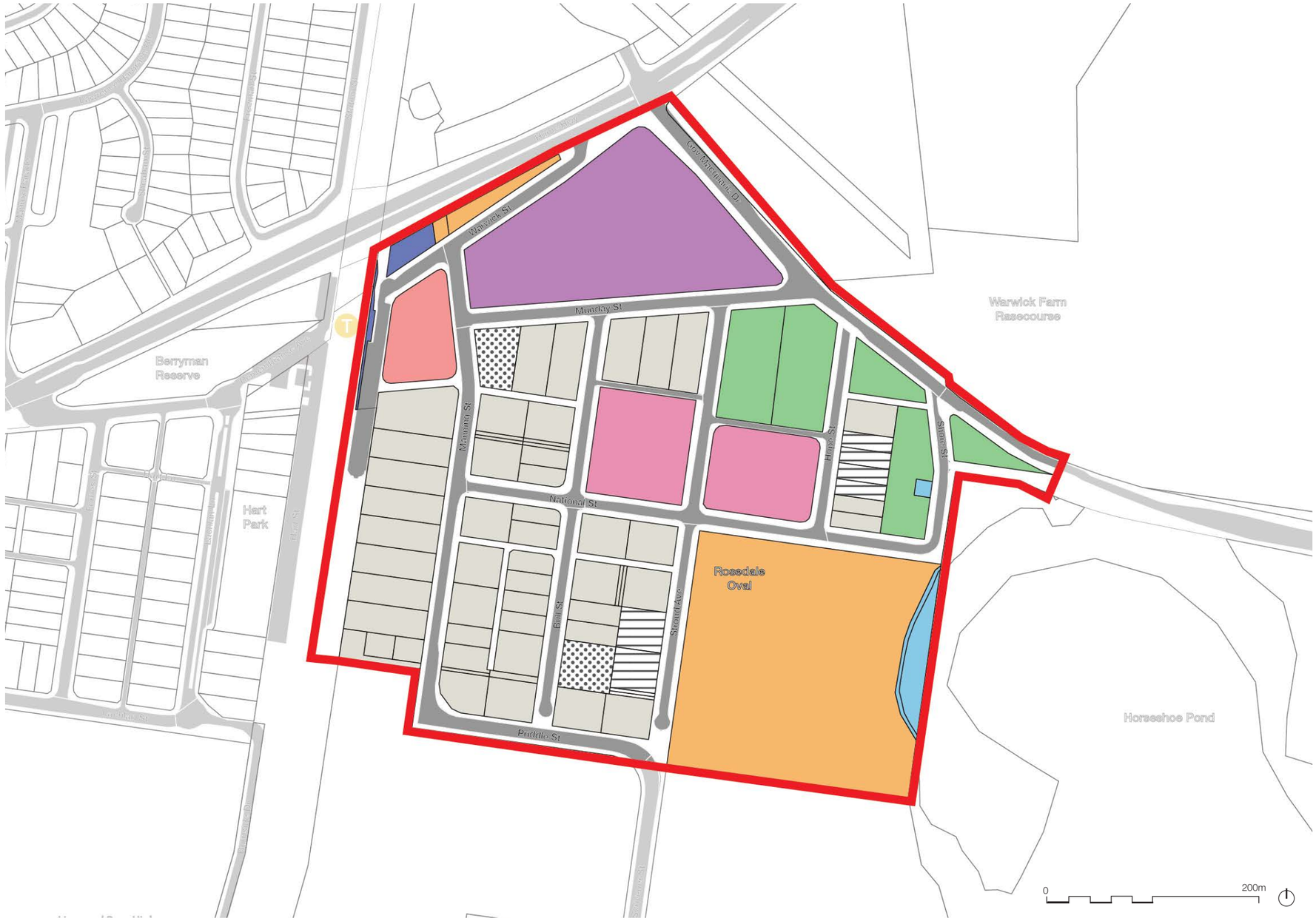


Figure 27: Current landownership pattern

The existing child playground near Rosedale Oval

5.0 The Exhibited Structure Plan

5.1 Executive Summary

The exhibited Structure Plan was developed informed by the comprehensive Urban Design analysis and the information / studies available at that time. In developing the original Structure Plan, CM+ and the consultant team had tested several options and conducted strengths and weakness analysis for each option. This chapter of the report extracts the key information from the exhibited Structure Plan. Council's website provides additional information about the exhibited Structure Plan.

The exhibited Structure Plan presents a maximum building height of 15 storeys (near Warwick Farm Station), and overall density (FSR) of approximately 0.8:1. Approximately 2,295 dwellings (including No. 240 Governor Macquarie Drive) and 4.7ha of additional open space is proposed.

The precinct is subject to flooding issues. The exhibited Structure Plan has carefully considered the floodplain water displacement by balancing the associated cut and fill. The tables on the next page provide a high level summary of the yield proposed in the exhibited Structure Plan. Note that the cut and fill calculation in the yield table is based on the data available at the time the exhibited Structure Plan was developed.

The draft Structure Plan, associated yield and studies were put on public exhibition between September and October 2020. A virtual community session was held on 22 September 2020. A total number of 20 submissions were received during the public exhibition period. Refer to the next chapter of this report for the high-level summary of the submissions.

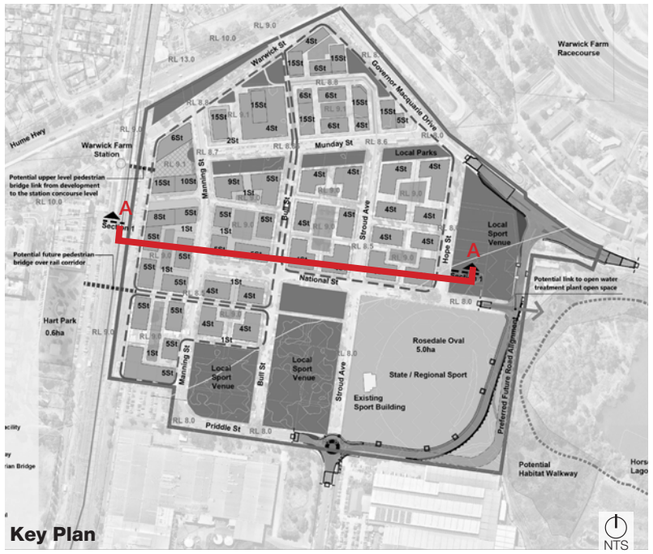
Notes:

1. *The built forms at No. 240 Governor Macquarie Drive correlate with the Council endorsed Planning Proposal (Planning Proposal No. 81, by Liverpool City Council, dated 25 February 2020)*
2. *New stormwater pipelines will be introduced to the future Local Sport Venue open spaces to drain the areas during a flood event. It is acknowledged that detailed measures in regard to hazard reduction and hydraulic engineering design will need to be undertaken in the detailed design stage.*

+ The location of the proposed community facility shown on the plan is indicative only. The final form and location will be determined in the detailed design stage

Figure 28: Exhibited Structure Plan

5.0 The Exhibited Structure Plan



Exhibited Structure Plan - Long Section

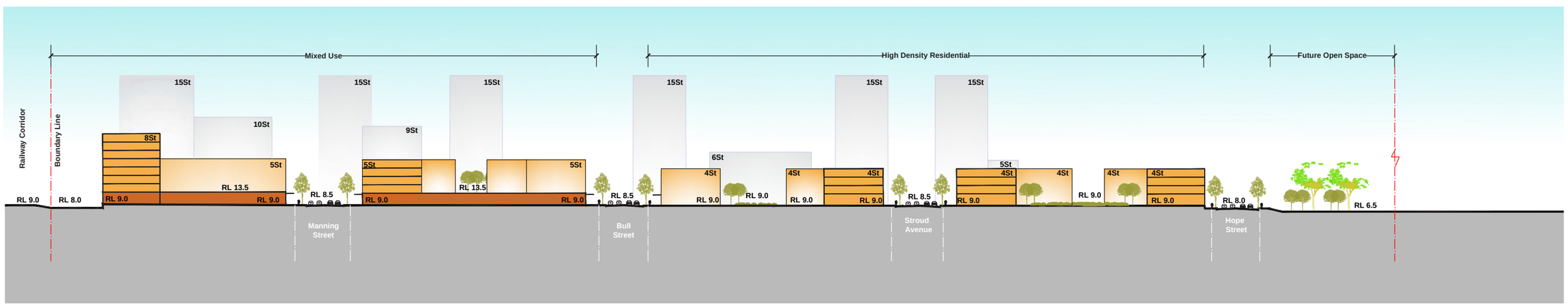


Figure 29: Exhibited Structure Plan - Section A

5.0 The Exhibited Structure Plan

Exhibited Structure Plan - Yield Summary

240 Governor Macquarie Drive (GMD)+	
Residential GFA	82,300 m²
Commercial GFA	5,000 m²
Total GFA	87,300 m²
Site Area	29,307 m²
No. of Dwellings	830
FSR	3.0:1

Development Parameters (Excl. 240 GMD)	Total GBA (m²)	Efficiency	Total GFA (m²)	Dwelling Size (m²)	No. of Dwellings
Residential	166,047	75%	124,535	85*	**1,465**
Commercial (GF)	25,425	70%	17,798	N/A	
Commercial (1st Floor)	2,601	85%	2,211	N/A	
Total GFA			**144,544**		
Site Area			**254,735**		
Overall FSR			**0.56:1**		

Overall Development Parameters (Incl. 240 GMD)	
Residential GFA	206,835 m²
Commercial GFA	25,008 m²
Total GFA	231,843m²
Site Area	284,042m²
No. of Dwellings	2,295
FSR	0.82:1

Open Space Calculation	
Open Space 1 (OS1)	2,490 m²
Open Space 2 (OS2)	4,948 m²
Open Space 3 (OS3)	13,507 m²
Open Space 4 (OS4)	26,887 m²
Total Proposed Local Open Space++	**47,832 m² (16.8% of the site area)**
Rosedale Oval	**49,927 m²**
Total Open Space Area	**97,759 m² (34% of the site area)**

Floodplain Displacement Calculation (approximate only)	
Existing Building Footprint (EBF)	50,000 m²
Proposed Developed area (PDA)	137,000 m²
FILL**	43,500 m³
CUT (in OS3 & OS4)***	44,300 m³

+ The yield is extracted from the approved Planning Proposal Urban Design Report by SJB dated 27/06/2018.

++ This does not include Hart Park, which has an area of approximately 0.66ha. The total local open space percentage will be approximately 18.8%.

* The average dwelling size does not apply to 240 GMD.

** The volume of fill = (PDA-EBF) X 0.5m

***The volume of cut = OS3 Cut Volume + OS4 Cut Volume

Note: 0.5m is an average depth calculated based on the level difference between 1%AEP (RL8.5) and average existing level of the site (RL8.0). Detailed floodplain displacement will need to be undertaken in the detailed design stage.

Key Plan

Rosedale Oval

6.0 Public Exhibition Feedback Summary

6.1 Public Exhibition Overview and Summary

The draft Structure Plan, associated yield and studies were put on public exhibition between September and October 2020. Council used a number of means to make people aware of the opportunities to comment on the Structure Plan on exhibition. A Community Session was also held on 22 September 2020.

The community provided the comments via 'Have Your Say' website, emails and letters between 14 September and 12 October 2020. The exhibited Structure Plan and the associated studies were also forwarded to the DPIE, the Greater Sydney Commission (GSC), Transport for NSW (TfNSW) and Sydney Water for feedback. A total of 20 submissions were received, including submissions from Sydney Water and TfNSW. However, the DPIE and GSC declined to provide submissions at this stage of planning process.

They key themes raised in the submission are summarised by Council in Figure 30. Refer to Chapter 7 of this report for the responses to the community feedback.

In summary, the key issues can be categorised into:

- Flooding:
  - flooding was no longer an issue.
  - land should be found elsewhere to compensate for the loss of flood storage.
- Odour buffer zone:
  - odour buffer zone should be ignored.
  - Warwick Farm sewage treatment facility would inevitably be upgraded therefore would reduce the odour buffer over time.
  - Sydney Water objects to the original structure plan as there is some development shown within the confines of the current odour buffer zone.
- Open space:
  - concerns over the quantum of open space provided.
  - proposed open space is not evenly distributed and concentrated in the vicinity of the least-dense residential areas.
- Feasibility:
  - the proposed development standards are not feasible to encourage redevelopment.
  - question regarding how future development can practicably proceed.
- Traffic:
  - concerns relating to an increase in traffic congestion that would occur from increased density within the area.
- 240 Governor Macquarie Drive:
  - support the redevelopment of the site.
  - concerns over the proposed built form outcome and unequitable distribution of dwellings in the precinct.
  - employment uses are preferred to be located on this site.

Refer to Council's Community Engagement Report for the detailed summary of the submissions received.

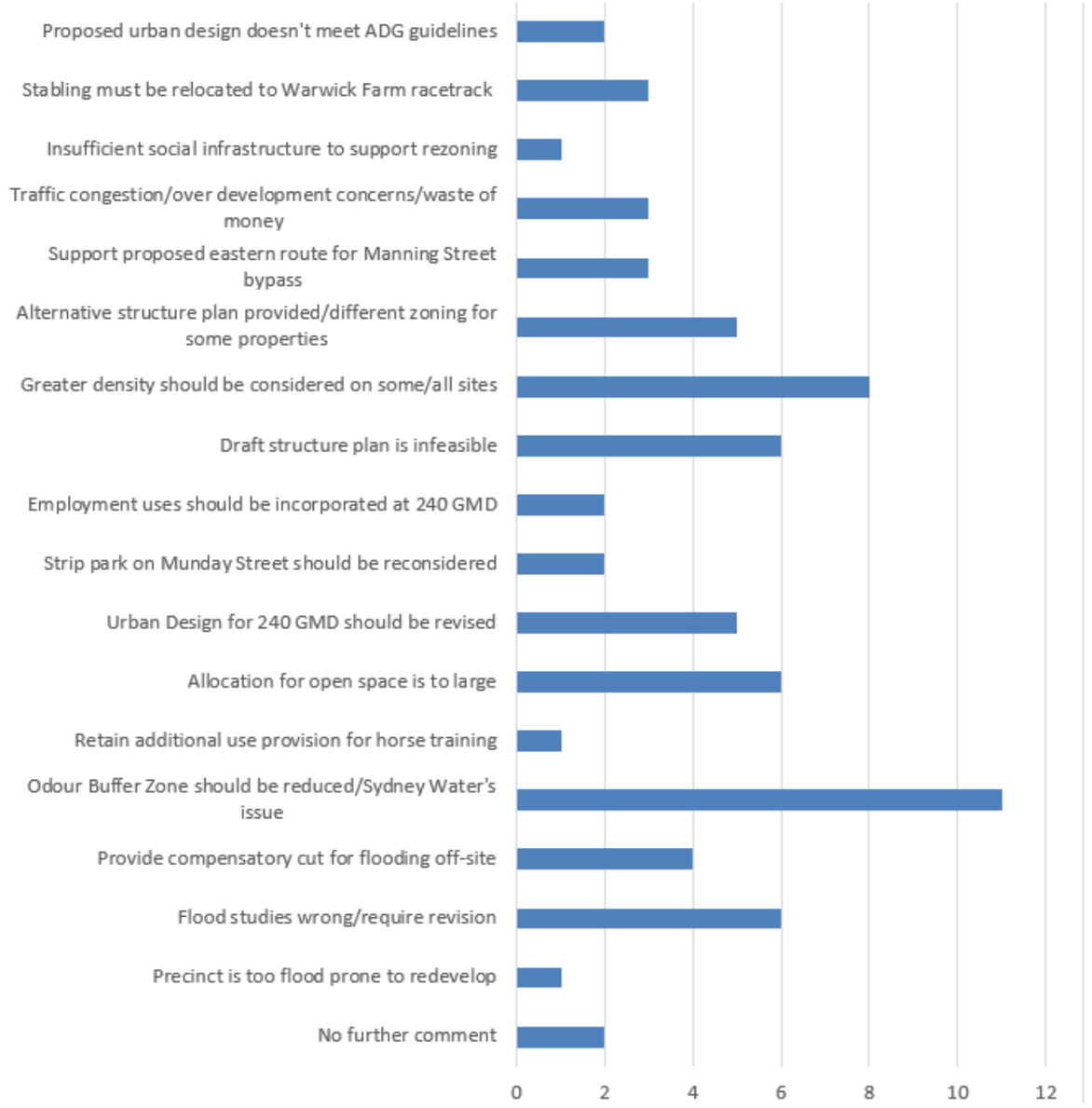


Figure 30: Public Exhibition Submission Summary (Source: Liverpool City Council)

Manning Street Streetscape

7.0 Revised Structure Plan

7.1 Executive Summary

Council at its meeting on 28 April 2021 resolved to refine the exhibited Warwick Farm Structure Plan to reflect more detailed information and the community feedback received during the public exhibition in 2020. In amending the exhibited Structure Plan, the project team has carefully considered this information and its implications, including:

- Department of Planning, Industry and Environment (DPIE) gateway refusal on 240 Governor Macquarie Drive - 240 Governor Macquarie Drive has been incorporated into the overall structure plan.
- Community feedback - All the feedback are reviewed and assessed. The revised structure plan has considered and incorporated some of the feedback where appropriate. Section 6.1 of the report provides a brief summary of the key community engagement outcomes. Refer to Section 7.7 of this report and Council's Community Engagement Report for the responses to the submissions.
- Atlas Urban's Feasibility Testing Report - The revised structure plan has incorporated the suggestions by reducing the overall non-residential GFA, contributions cost and rerun the testing for three typical sites to ensure they are financially viable. Refer to Section 7.2 on this page for more information on the implication of this study.
- New regional studies including Liverpool Collaboration Area Open Space Needs Assessment, Liverpool Collaboration Area Strategic Transport Infrastructure Assessment and Liverpool Collaboration Area Regional Flood Evacuation Strategy - The consultant team reviewed the new regional studies and their implications. The revised Structure Plan reflects the outcomes from the regional studies.
- Bypass Road - Two options have been identified by Council: one to the south and east of Rosedale Oval and the other utilising the existing road network. The final design of this bypass road is yet to be determined.

A detailed assessment of the potential flood impacts and the proposed floodplain displacement has also been conducted to minimise the potential risks and to comply with the relevant guidelines and Council strategies. A staged approach has also been adopted to realise the redevelopment of the precinct in a coordinated and feasible way.

7.2 Implications of the New Information

Economic Feasibility Testing

In October 2020, Atlas Urban Economics conduced an economic feasibility study against the exhibited Structure Plan. The study determined that the planning controls proposed in the exhibited Structure Plan were not financially viable. It also suggested ways to reduce the contributions rates associated with new infrastructure and to decrease the non-residential GFA to 5% to 10% of the overall floor space in the mixed use zone.

An iterative approach has been adopted in developing the revised Structure Plan. Economic feasibility testing of three typical blocks was conducted to ensure that the proposed planning controls will make the most of the blocks financially feasible. The financial feasibility tipping points of 3.35:1 for B4 Mixed Use zone and 2.2:1 for R4 High Density Residential zone were identified. The economic feasibility testing did not test every single block within the precinct. Instead, the findings on the typical blocks were extrapolated to the larger precinct and a generic approach was taken to test the typical blocks.

Open Space Benchmark

An Open Space Needs Analysis for the Liverpool Collaboration Area was prepared by Council to set a more appropriate open space benchmark for the urban renewal areas, including the Warwick Farm precinct. The study nominates a regional level open space benchmark of 1.5 hectares per 1,000 residents compared with the previous Council metric of 2.0 hectares per 1,000 residents. The revised Structure Plan considers the nominated open space benchmark.

Odour Buffer

Council has been liaising with Sydney Water regarding their plan to upgrade the facilities. However, no updated information is available at this time. Therefore, the revised Structure Plan adopts the current odour buffer information available and complies with the relevant guidelines in regard to residential development within an odour buffer.

240 Governor Macquarie Drive Planning Proposal

This Planning Proposal was rejected at Gateway by the DPIE on 21 September 2020. One of the recommendations from the DPIE is to consider the regional level technical studies and incorporate the site into the development of the Warwick Farm Structure Plan. Council resolves in its meeting on 28 April 2021 that:

The consultant is to consider the site's relationship to the entire precinct in terms of distribution of density, proposed zoning and SEPP 65 concerns, while also addressing the reasons for DPIE's Gateway refusal.

The revised Structure Plan therefore reconsiders the development potential on No. 240 GMD and its relationship with the rest of the precinct.

The Bypass Road Options

The Manning Street Bypass road was identified by Council in 2019 as a priority project to redirect heavy vehicles from entering the core of the precinct, therefore facilitating the redevelopment of the precinct to mix of uses, including B4 Mixed Use zone.

Two design options are being considered by Council:

1. Construct a new bypass road to the south and east of Rosedale Oval connecting Scrivener and Shore Streets with Governor Macquarie Drive.
2. Upgrade the existing road network to construct a new bypass road through Scrivener Street - Stroud Avenue - National Street - Shore Street.

The Manning Street Bypass design is a separate project to the Warwick Farm Structure Plan project and it is at the preliminary stage. Therefore, both of the options are shown in the revised structure plan.

Detailed information regarding the proposed Manning Street Bypass will be made available to the public once the design is finalised.

7.3 Flood Related Information

It is Council's direction at its April 28 Meeting to conduct a detailed flood impact assessment against the revised Structure Plan. It recommends that:

The completion of a detailed flood impact assessment to better understand land required for flood mitigation and alternative flood mitigation options.

Subsequently, Council has provided the TUFLOW hydraulic model used in the Draft January 2020 Georges River Flood Study to the consultant team to undertake the flood impact assessment.

It is important to note that the TUFLOW hydraulic model from the Draft January 2020 Georges River Flood Study is provided to the proponents for flood assessments; however, Council still adopts the design flood levels from the 2004 Georges River Floodplain Risk Management Study and Plan.

The 2004 Georges River Floodplain Risk Management Study and Plan uses a Mike-11 hydraulic model to determine design flood levels rather than TUFLOW hydraulic model. Therefore the nominated 1% Annual Exceedance Probability (AEP) and Probable Maximum Flood (PMF) design flood levels in Section 4.3 of this report are used in the revised structure plan. Refer to the Flood Assessment Report by WMA Water for more information.

7.0 Revised Structure Plan

7.4 Constraints and Opportunities

The Urban Design Analysis of the Warwick Farm Precinct in terms of its strategic, local and planning context and existing conditions, has identified a suite of constraints and opportunities. New information, coupled with the community feedback received, has further informed the understanding of the constraints and opportunities for the precinct.

Constraints

The constraints include:

- The precinct is prone to flood. The majority of the land is identified as having medium flood risk. Rosedale Oval has high flood risk. Flooding issues would affect the design of buildings, places, land uses and earth works. The two key flood related issues are the evacuation route in a flood event and balancing cut and fill to avoid net loss of flood storage.
- Residential development within the Liverpool Sewage Treatment Plant odour buffer zone is to be avoided.
- The only through site vehicular access (Priddle Sreet - Manning Street - Munday Street) linking the industrial area to the south of the precinct to the Hume Highway limits the area's permeability. It also creates conflicts of uses among pedestrian, light and heavy vehicles.
- The Warwick Farm Station concourse provides the only east-west cross railway corridor access for pedestrians and cyclists, which limits the precinct's access to surrounding recreational, educational, and health facilities as well as the Liverpool CBD.
- The Hume Highway underpass adjacent to the precinct is narrow and lacks maintenance, which provides an unsafe environment for pedestrians and cyclists.
- The vehicular traffic along the Hume Highway and the railway corridor generate noise to the precinct, which affects the area's acoustic amenity.
- Bankstown Airport OLS contours limit the maximum building height within the precinct.
- The industrial area immediately to the south of the precinct could potentially affect the area's residential amenity.
- The lots in the precinct are in fragmented ownership. It may be challenging to achieve amalgamation.
- The strata constrained land opposite Warwick Farm Station would potentially retain its current form in the short to medium term.
- Governor Macquarie Drive is currently at capacity. Future development within the precinct needs to assess and address the potential traffic impacts to Governor Macquarie Drive.
- There are no multipurpose or hireable community facilities within the precinct. The closest one - Warwick Farm Community Hub, is 800m away from the precinct and is ageing.
- Tree coverage along the main streets is minimal.

Refer to Figure 31

Opportunities

The precinct presents the following opportunities:

- To provide a high quality mixed-use, Transport Oriented Development (TOD) close to Warwick Farm Station.
- To incorporate No. 240 Governor Macquarie Drive into the overall precinct planning.
- To create an urban centre close to Warwick Farm Station, providing a mix of uses and community facilities.
- To activate the main streets close to the urban centre by providing a mixed-use building typology with ground floor retail / commercial uses fronting the streets.
- To concentrate height and density close to Warwick Farm Station and transitioning down towards Rosedale Oval.
- To enable the redevelopment of the precinct by moving horse training facilities and stables to the Warwick Farm Racecourse (subject to agreement with ATC).
- To facilitate the future growth of the precinct by improving the capacity of Governor Macquarie Drive.
- To provide a bypass road redirecting heavy vehicles from entering the heart of the precinct.
- To improve the pedestrian amenity and streetscape along Priddle Street - Manning Street - Munday Street and reduce use conflicts in light of the reduced through site heavy vehicle traffic.
- To promote active transport (walking and cycling) within and around the precinct.
- To improve east-west cross railway corridor connection by improving the station concourse and providing a new link.
- To upgrade the Hume Highway underpass improving the precinct's access to Warwick Farm northwest and Cabramatta Creek.
- To provide future pedestrian and cyclist accesses to Georges River Foreshore via Governor Macquarie Drive and Horseshoe Pond.
- To improve access to Liverpool Boys High School, and the surrounding open spaces via existing and new links.
- To create 'green links' connecting east and west of the precinct.
- To protect the existing mature trees and improve the precinct's tree coverage by planting additional street trees along main streets.
- To provide flood escape route from the precinct to the flood free area along the Hume Highway.

Refer to Figure 32.

7.0 Revised Structure Plan

Constraints Diagram

Legend

- The study area
- The only through site vehicular access.
- Existing Warwick Farm Station concourse, providing only over rail corridor access
- Existing Hume Highway underpass
- Noise impact from the rail corridor and the Hume Highway
- Odour buffer zone
- Industrial area to the south of the precinct
- Fragmented ownership
- Strata titled property
- Governor Macquarie Drive is at capacity
- Bankstown Airport OLS
- Warwick Farm Station
- Existing tree canopy
- Cadastre
- Rosedale Oval

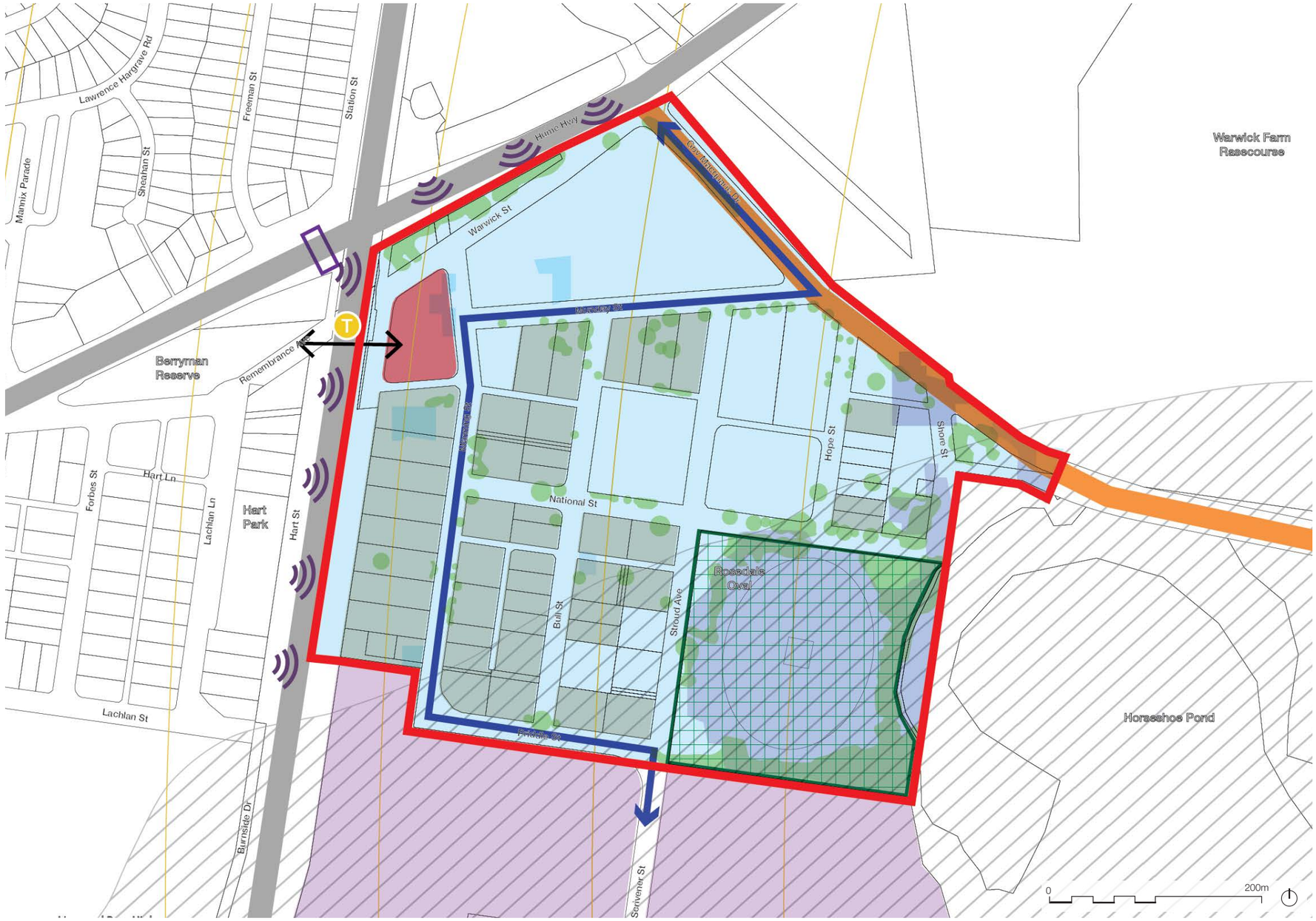


Figure 31: Constraints

7.0 Revised Structure Plan

Opportunities Diagram

Legend

- The study area
- No. 240 GMD
- Existing tree canopy
- Existing Hume Highway underpass
- 400m and 800m Walking distance from the station
- Big land holdings
- Existing local open space
- Existing active transport connection
- Existing Warwick Farm Station concourse, providing only over rail corridor access
- Potential second cross rail corridor access
- Potential 'green links'
- Potential to create a town centre / hub
- Potential to improve pedestrian / cyclist environment
- Potential to increase Governor Macquarie Drive capacity
- Potential to relocate horse training facilities to Warwick Farm Racecourse
- Flood free area
- Additional tree planting
- Proposed bypass road (the plan only shows one option)
- Warwick Farm Station
- Cadastre
- Rosedale Oval

Figure 32: Opportunities

7.0 Revised Structure Plan

7.5 Urban Design Vision Statement

The Urban Design Study, the input received from Council, public submissions and the consultant team in regard to flooding, traffic and social infrastructure requirements as well as the latest regional studies have informed the development and amendments to the Urban Design Vision and the structure plan for the precinct.

Urban Design Vision

The Warwick Farm Precinct will be a new mixed-used community, providing living and employment close to Warwick Farm Station. It will be a precinct that addresses the community needs by leveraging the surrounding natural and built assets as well as delivering new high quality urban spaces. Its rural character will be transferred to a vibrant and multifunctional community that facilitates urban living.

Its character will be defined by diverse built forms and uses; and further strengthened by the precinct's rich history. Leafy streets and prime open spaces will complement the high quality urban living and distinct the precinct from the surrounding suburbs.

A new urban centre will be formed close to Warwick Farm Station, facilitating greater density and height. The new urban centre will become a 'community heart' providing high quality urban spaces and community facilities for the precinct and the suburb of Warwick Farm.

Mixed-use buildings will provide active street frontages and living and working opportunities in convenient proximity. The urban environment will gradually transition down in height towards Rosedale Oval providing a sensitive approach interfacing with the public domain.

The pedestrian and vehicular accessibility of the precinct will be improved. Governor Macquarie Drive will be widened to facilitate the future growth of the area. The proposed bypass road, which is Council's priority project, will provide an alternative route to access to the industrial area, thereby improving the road amenity and streetscapes in the heart of the Warwick Farm Precinct. The east-west connectivity across the railway corridor will be improved via upgrading the existing station concourse and additional crossing.

Active transport, including walking and cycling, will be encouraged, connecting the precinct to the surrounding suburbs, facilities and open spaces. Tree line streets together with active street frontages will improve public domain amenity and passive surveillance.

The precinct's amenity and appearance will be further improved by the proposed local parks, which will be provided within walking distance from any medium to high density development. Local parks coupled with tree-line streets will form 'green grids' linking the precinct to the surrounding regional and local open space networks.

The access to the regional parks will be enhanced. Rosedale Oval will continue to accommodate recreational uses for different age groups. The future pedestrian and cycle link to Horseshoe Pond and Georges River foreshore, through the Sydney Water site, will provide the community with additional access to the picturesque natural assets of the region.

Flooding issues that impact the precinct will be carefully dealt with through managing cut and fill and adopting Water Sensitive Urban Design (WSUD). The proposed open space network will also play an important role, facilitating flood water runoff and water storage.

Rouse Hill Town Centre

7.0 Revised Structure Plan

7.6 Urban Design Framework

The Urban Design framework identified below has formed the basic structure and principles to guide the redevelopment of the precinct, as well as fulfilling the Urban Design Vision outlined in Section 7.5.

1. Create a high quality, lively 'community hub' near Warwick Farm Station, comprising new community infrastructure and a mix of uses.
2. Concentrate higher built from and density around the future town centre and transition the height / density down to the lower lying areas to the southeast
3. Create a mixed use town centre in close proximity to Warwick Farm Station providing living and job opportunities.
4. Promote high quality residential living in the precinct, utilising the existing and proposed parks and natural resources.
5. Recognise Rosedale Oval as a valuable asset to the broader community as well as to future residents in the precinct.
6. Deliver new local open spaces throughout the precinct, providing amenity to the future community and to primarily address flood water displacement.
7. Create 'green links' and tree lined boulevards, utilising streets, laneways, existing and future open spaces.
8. Improve cross rail corridor accessibility via upgrading the old connection and exploring a new link.
9. Explore opportunities to harness the natural assets of the area, in particular Horseshoe Pond and the Georges River foreshore, to enable the general public access to picturesque areas.
10. Upgrade the road infrastructure in the precinct to prevent heavy vehicles from entering the precinct, whilst promoting active transport and local traffic within the precinct.
11. Improve streetscapes within the precinct via tree planting, footpath upgrades and ground floor activation.
12. Mitigate the flood impact through design and management and implementing Water Sensitive Urban Design (WSUD) measures.
13. Ensure the proposed flood storage open spaces are functional for recreational purposes and are safe for all in any flood event.
14. Manage the potential amenity impacts of the Sydney Water treatment facility by locating built form beyond the current odour buffer zone.

Legend

- The study area
- Improve site connection and access to the surroundings
- Potential connection to the surrounding open spaces
- Upgrade the Hume Highway underpass
- Provide an arrival plaza with retail / commercial uses
- Create a town centre providing mix of uses and amenity
- Activate the key streets by encouraging mixed use
- Widen Governor Macquarie Drive to accommodate the growth of density within the study area
- Locate higher built forms close to Warwick Farm Station
- Provide lower building height away from the station
- Provide additional open spaces at different scales that primarily addresses flood displacement
- Provide a bypass road removing heavy vehicle traffic from the town centre roads
- Existing open spaces
- Odour buffer zone
- Warwick Farm Station

7.0 Revised Structure Plan

Precedent Images

Projects across Australia have been studied to identify the most appropriate examples the nominated vision, framework and development standard for the Warwick Farm Precinct. The examples also facilitate the visualisation of the proposed changes.

The precedent images on this page illustrate the desired quality for the future public domain, including local parks, urban plaza, streets, and built form.

Examples of the large recreational open spaces while also serving floodwater storage / drainage can be found overleaf. The success of these places in Zetland demonstrate that it is possible to balance recreational uses whilst providing flood storage / drainage through thoughtful design. The precedents also illustrate the intended design outcome for these future open spaces.

Hassett Park, Campbell ACT

Main Street, Rouse Hill NSW

Rouse Hill Town Square, Rouse Hill NSW

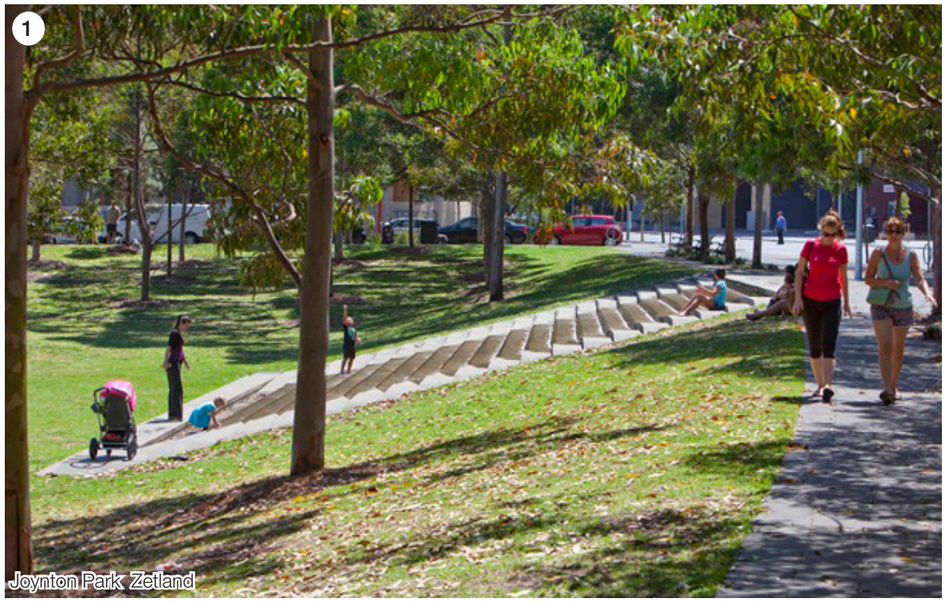
World Square Plaza, Sydney

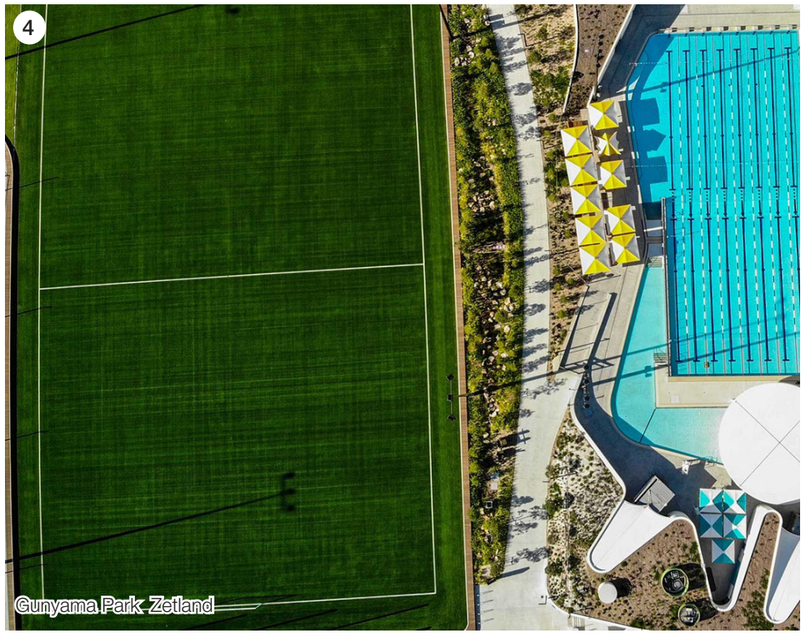
Main Street, Rouse Hill NSW

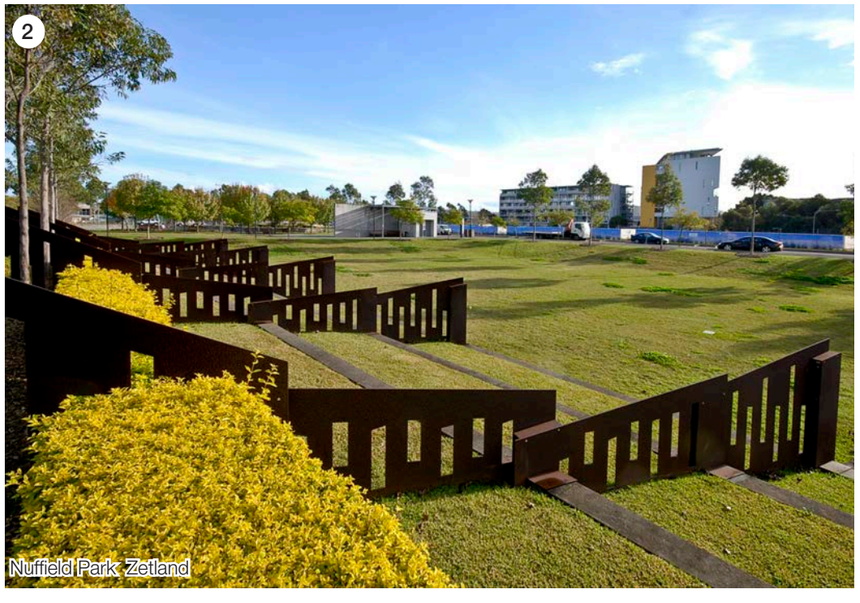
A Building along Anzac Pde, Kensington NSW

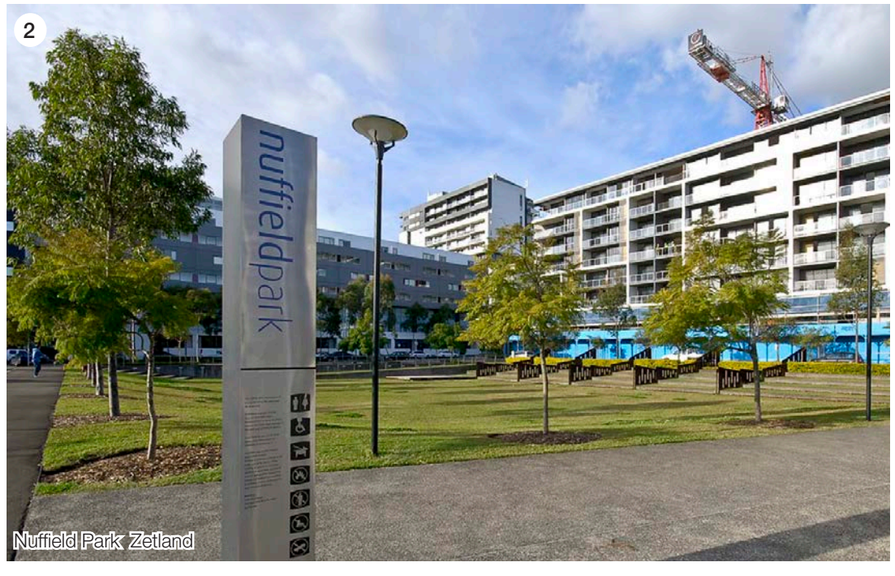
7.0 Revised Structure Plan

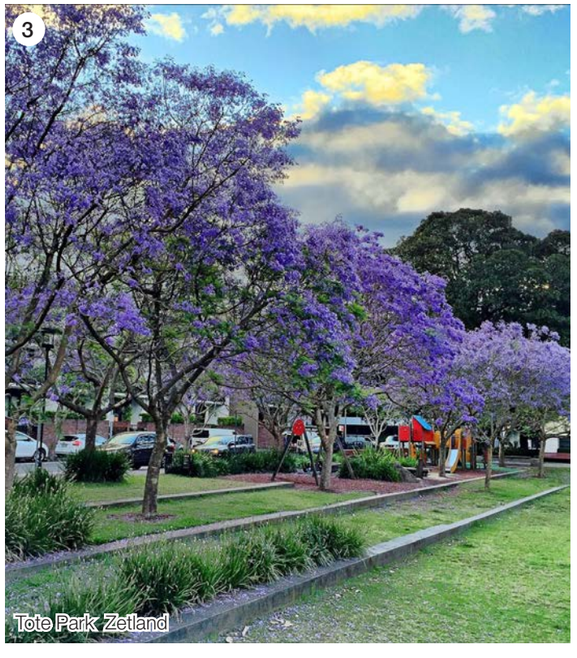
Precedent Images - Water Parks











7.0 Revised Structure Plan

7.7 Revised Structure Plan

The revised Structure Plan was informed by the urban design vision and framework, community feedback, economic feasibility study, latest regional studies, and feedback from the DPIE regarding the 240 Governor Macquarie Drive Planning Proposal.

The revised Structure Plan considers the economic feasibility input to ensure each development block can achieve the nominated tipping points for different zoning (refer to Section 7.2 of this report for more information). It presents a maximum building height of 15 storeys (near Warwick Farm Station), and overall density (FSR) of approximately 1.04:1. Approximately 3,224 dwellings (including No. 240 Governor Macquarie Drive) and 3.9 ha of additional open space is proposed. Refer to Section 8.2.4 of this report for the yield summary.

The revised Structure Plan has carefully considered flood evacuation and floodplain water displacement by balancing the associated cut and fill. The volume of cut will be accommodated in the nominated proposed open spaces only (refer to Section 7.7.3 Floodplain Displacement).

The buildings illustrated on the revised structure plan are envelopes only. No articulations or architectural treatments are introduced. The building envelopes illustrated present the potential maximum building outlines projected onto each block. It is anticipated that building widths will vary between 18-22m.

Figure 33: Revised Structure Plan

Notes:

Appropriate drainage system will be developed for the future Local Sport Venue open spaces to drain the areas during and after a flood event. Detailed measures in regard to hazard reduction, warning signs and hydraulic engineering design will need to be undertaken in the later design stage.

The detailed design of the open spaces in the later stages will need to comply with the relevant requirements, provide appropriate edge transitions to mitigate the changes in levels and ensure easy access. Flood warning signs and other hazard reduction measures are to be facilitated in the detailed design stage.

⁺ The location of proposed community facility shown on the plan is indicative only. The final form and location will be determined in detailed design stages.

7.0 Revised Structure Plan

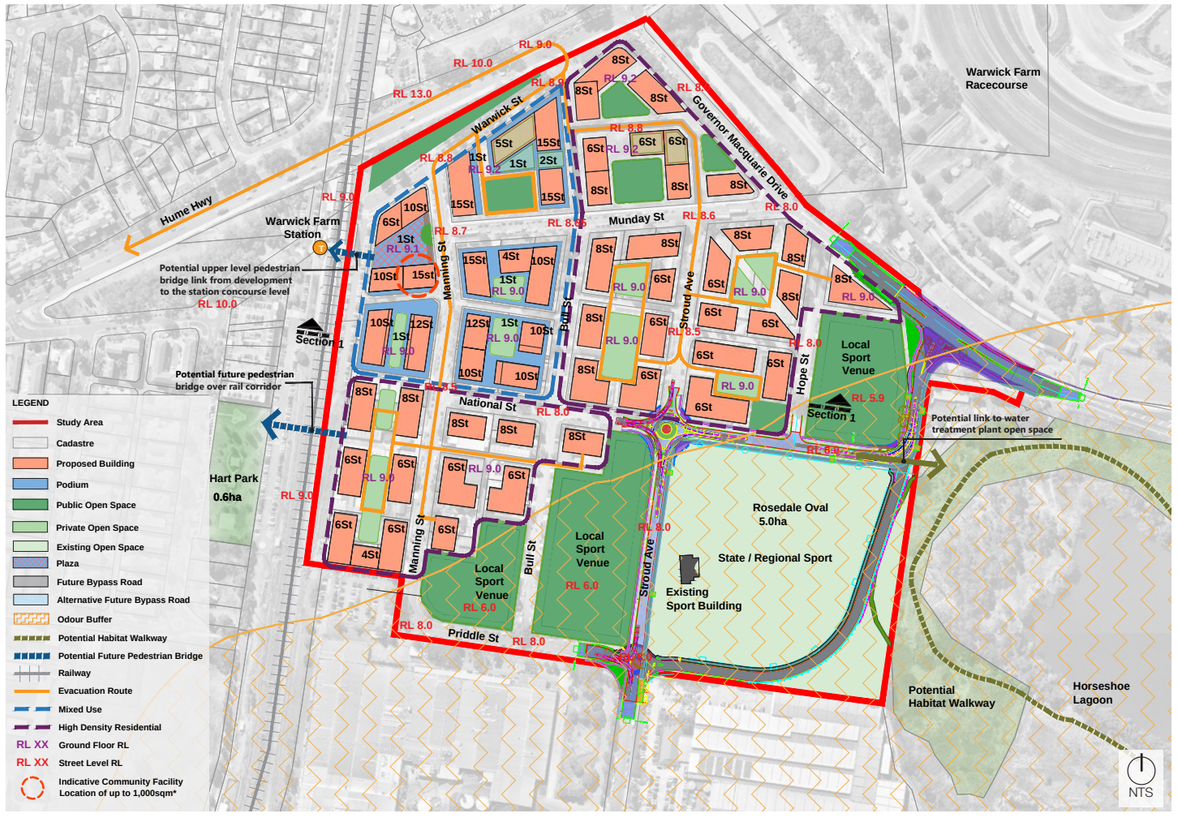
7.7.0 Plan Comparison

The revised Structure Plan preserves various Urban Design initiatives developed from the exhibited Structure Plan, including road network, precinct accessibility and height transition. However, it also adopts a suite of changes to reflect the new information. The key changes are:

- 240 Governor Macquaire Drive - This land has been incorporated into the overall structure plan. The proposed built forms and height distribution now aligns with the overall Urban Design strategy and presents a more contextual fit.
- Open space configuration - The configuration of the open spaces has been changed reflecting the increased overall development areas, latest open space benchmark and the floodplain displacement needs. The larger open spaces close to Rosedale Oval also align more closely to the odour buffer zone.
- Munday Street Linear Parks - The linear parks are removed. Instead building setbacks are proposed along Munday Street to form Munday Street boulevard. Several publicly accessible open spaces in different sizes are nominated on No. 240 Governor Macquarie Drive. These open spaces will have improved amenity, be more useful and contribute to the proposed residential and non-residential uses.
- Building height and massing - Refined built form height and massing are proposed to reflect the financial feasibility study and the latest regional level studies including the new open space benchmark. The revised building height and massing also reflect the redistribution of height and density on 240 Governor Macquarie Drive.

Refer to the following sections of this report for the detailed information regarding the revised Structure Plan.

Exhibited Structure Plan



Revised Structure Plan

7.0 Revised Structure Plan

7.7.1 Response to Community Feedback

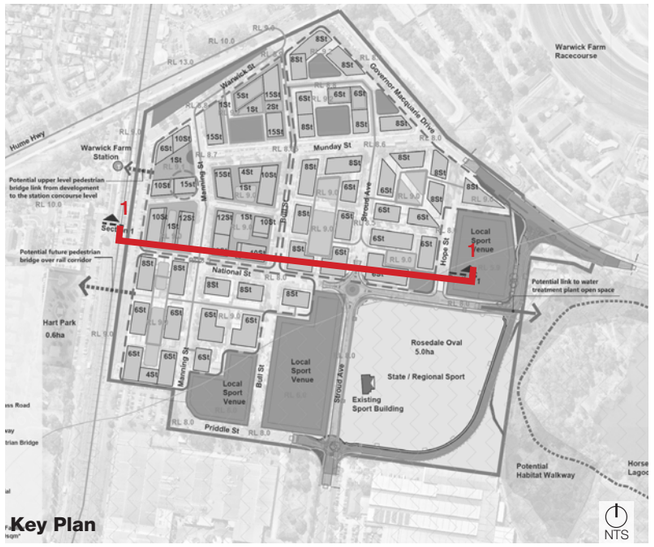
The revised Structure Plan has been developed with consideration of the community feedback received. The table on this page highlights how community commentary has influenced the ongoing development of the Structure Plan. The topics in the table have been taken from the summary of key concerns provided in Chapter 6 of this report.

Key Areas of Concerns and Responses

Key Topics	Responses
Topic 1 - Flooding	
Flooding was no longer an issue.	The precinct is constrained by flooding issues. The Structure Plan needs to consider two key issues related to flooding. One is the evacuation of residents during a flood event. The other issue is the need to ensure the new development proposed will not result in net loss of the flood storage, within the site, at 1% AEP namely RL 8.5m AHD. Refer to Warwick Farm Flooding Assessment Report by WMA Water.
Land should be found elsewhere to compensate for the loss of flood storage.	The floodplain displacement is proposed to be located within the Warwick Farm Precinct. Refer to the relevant Council policies and Warwick Farm Flooding Assessment Report by WMA Water.
Topic 2 - Odour buffer zone	
Odour buffer zone should be ignored.	Council has been liaising with Sydney Water regarding their plan to upgrade the facilities. However, no updated information is available at this time. Therefore, the revised Structure Plan adopts the current odour buffer information available and complies with the relevant guidelines in regard to residential development within an odour buffer.
Warwick Farm sewage treatment facility would inevitably be upgraded therefore would reduce the odour buffer over time.	
Sydney Water objects to the original structure plan as there is some development shown within the confines of the current odour buffer zone.	The revised Structure Plan has removed all the proposed residential development within the current odour buffer zone.
Topic 3 - Open space	
Concerns over the quantum of open space provided.	The quantum of open spaces proposed is to comply with the required open space benchmark for the future population and also to facilitate floodplain displacement. The revised Structure Plan has reduced the amount of the proposed open spaces reflecting the latest open space benchmark for the area and the floodplain displacement modelling.
Proposed open space is not evenly distributed and concentrated in the vicinity of the least-dense residential areas.	The larger open spaces have been located to facilitate floodplain displacement and as a response to the need to avoid development within the odour buffer zone. The revised Structure Plan provides a more usable approach to the configuration of the smaller sized local open spaces.
Topic 4 - Feasibility	
The proposed development standards are not feasible to encourage redevelopment	The revised Structure Plan has reviewed and considered the previous economic feasibility study for the exhibited Structure Plan. An iterative approach has also been adopted in developing the revised Structure Plan. Economic feasibility testing of three typical blocks was conducted to ensure that the proposed planning controls will make the most of the blocks financially feasible. Refer to Section 7.2 of this report.
Question regarding how future development can practicably proceed.	An indicative staging plan is provided. Refer to Section 8.5 of this report.
Topic 5 - Traffic	
Concerns relating to an increase in traffic congestion that would occur from increased density within the area.	The revised Structure Plan has considered the potential traffic impact. No major concern is identified. Refer to SCT Consulting's high level commentary against the revised Structure Plan.
Topic 6 - 240 Governor Macquarie Drive	
Support the redevelopment of the site.	Noted.
Concerns over the proposed built form outcome and unequitable distribution of dwellings in the precinct.	The revised Structure Plan has reconsidered the configuration of development on No. 240 GMD and its relationship with the rest of the precinct. The proposed building envelopes and heights on No. 240 GMD have been revised to reflect the overarching Urban Design vision and principles for the precinct and provide a more contextual fit.
Employment uses are preferred to be located on this site.	Employment uses (non-residential uses) are proposed on the land close to Warwick Farm Station, including No. 240 GMD.

7.0 Revised Structure Plan

7.7.2 Indicative Section



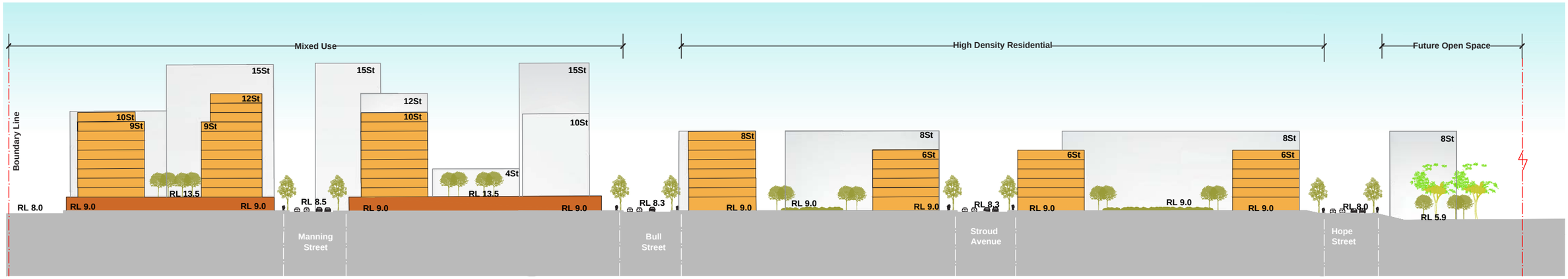


Figure 34: Revised Structure Plan Site Section 1-1

7.0 Revised Structure Plan

7.7.3 3D View - Preferred Built Form

Figure 35: Revised Structure Plan Bird's Eye View

Note: This is an indicative building envelope diagram only and does not include detailed articulation, or topography. The model anticipates that built forms will be between 18m to 22m wide.

7.0 Revised Structure Plan

7.7.4 Floodplain Displacement

The precinct is constrained by flooding issues. One of the important flood considerations is to ensure that the new development will not result in net loss of the flood storage at 1% Annual Exceedance Probability (AEP) namely RL 8.5m AHD. Therefore, it is critical to balance the cut and fill within the precinct. Three open spaces, Open Spaces 1, 2 and 4 in Figure 36, are identified as the places to accommodate the required excavation. Other open spaces will not provide compensatory excavation. Rosedale Oval currently is at RL 7m. No excavation is proposed to Rosedale Oval. The proposed cuts are summarised as follows:

- Open Space 1 - 2.0m cut from the existing level (RL 8m).
- Open Space 2 - 2.0m cut from the existing level (RL 8m).
- Open Space 4 - 2.1m cut from the existing level (RL 8m).

An average of 1:4 slope to the edges is proposed to the above open spaces to facilitate edge transitions. This will enable universal access compliance and mitigate the changes in levels in detailed design stages.

Appropriate drainage systems will be developed to the future Local Sport Venue open spaces to drain the areas during and after a flood event. It is acknowledged that detailed measures in regard to hazard reduction, warning signs and hydraulic engineering design will need to be undertaken in the detailed design stage.

A detailed flood impact assessment has also been conducted through TUFLOW hydraulic model to determine the change in 1% AEP flood level with the structure plan fully implemented.

The results are shown in Figure 37 and indicate no increase in flood level outside the Structure Plan area. There is a slight reduction in peak level (generally less than 0.05m) downstream towards the Warwick Farm Racecourse due to the restriction in flow caused by the proposed development (increase in building density and raised roads). The table below Figure 37 summarises the floodplain displacement data from the TUFLOW hydraulic model, which indicates the volume of cut and fill is 99.93% balanced. Considering the structure plan is a high level strategy, the variation is therefore within the acceptable tolerance level. The revised Structure Plan indicates its capability of balancing cut and fill in the detailed design stage.

Refer to Warwick Farm Flood Assessment Report by WMA Water for more information.

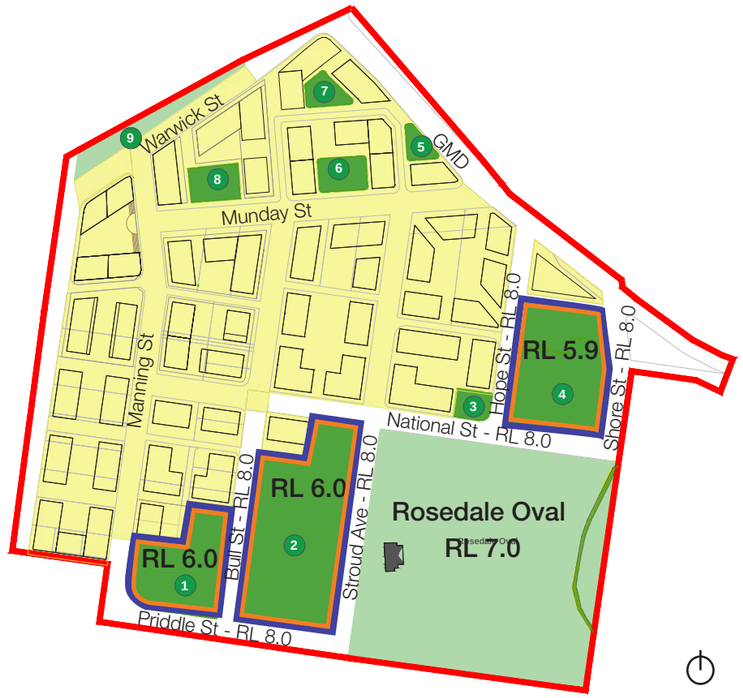
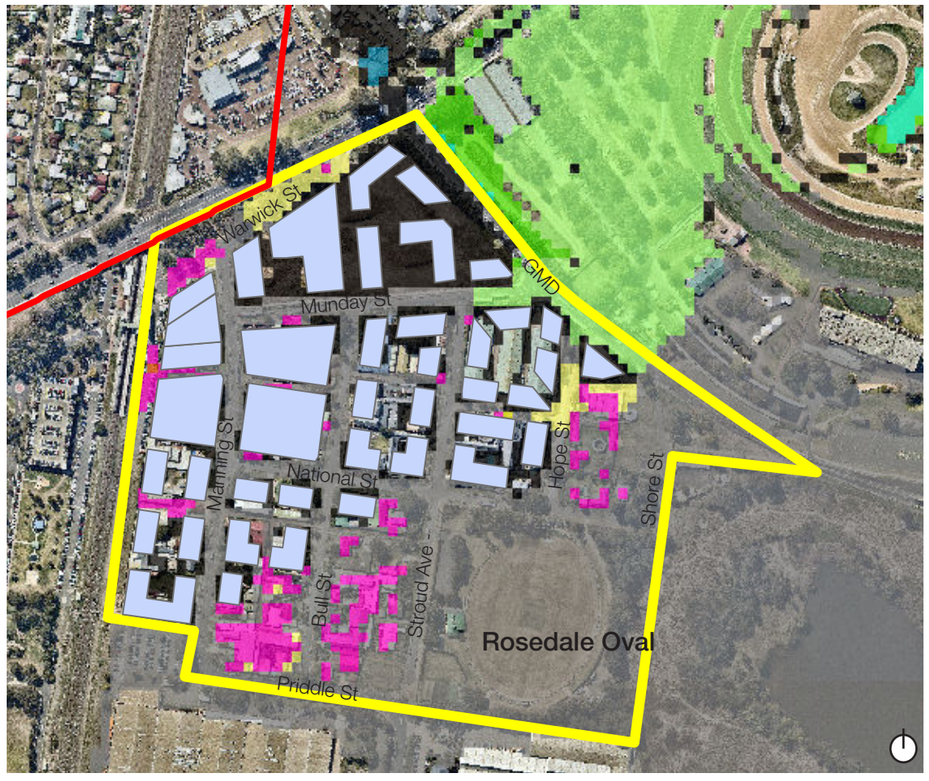


Figure 36: Proposed Areas of Excavation for Floodwater Displacement



Floodplain Displacement Calculation	
Existing Building Footprint (EBF)	50,000 m^2
Proposed Developed area (PDA)	143,860 m^2
Existing Volume at RL8.5*	209,384.3 m^3
Proposed Cut Volume at RL8.5*	209,236.1 m^3

* The data is from the detailed TUFLOW modelling based on the revised structure plan conducted by WMA Water.

Note:

The proposed excavation for the flood water retention only applies to Open Spaces 1,2 and 4.

Figure 37: TUFLOW Modelling Testing the Revised Structure Plan

8.0 Proposed Controls

8.1 Key Strategies in Developing the Controls

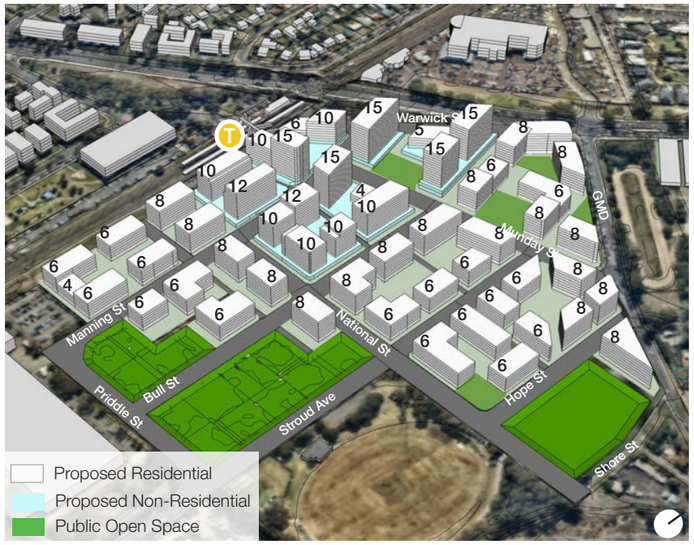
The revised Structure Plan illustrates the desired Urban Design outcome for the Warwick Farm Precinct. The nominated building footprints present the maximum envelopes the future development can fulfil. Building articulations and architecture details will need to be introduced in the detailed design stage. Therefore, it is important to introduce the right suite of controls which is easy to reference to and enables the delivery of the proposed structure plan whist providing a certain level of flexibility.

A two-step approach is adopted in developing and rationalising the floor space ratio (FSR) control:

1. Calculate the development yield based on the revised preferred structure plan building envelopes - the resultant FSR for each block fluctuates slightly; however the FSRs are all above the tipping points.
2. Determine a consistent zoning and density (FSR) approach - this is to rationalise the proposed planning controls to avoid having multiple density controls over different blocks within a same zoning that is based on both the model and the feasibility tipping points and building width between 18m and 22m.

A generic approach is also introduced to the building height control. It nominates the maximum height within a block to form the building height map. The building height control coupled with the Urban Design Control - height in storeys will further define the desired height distribution across the entire precinct.

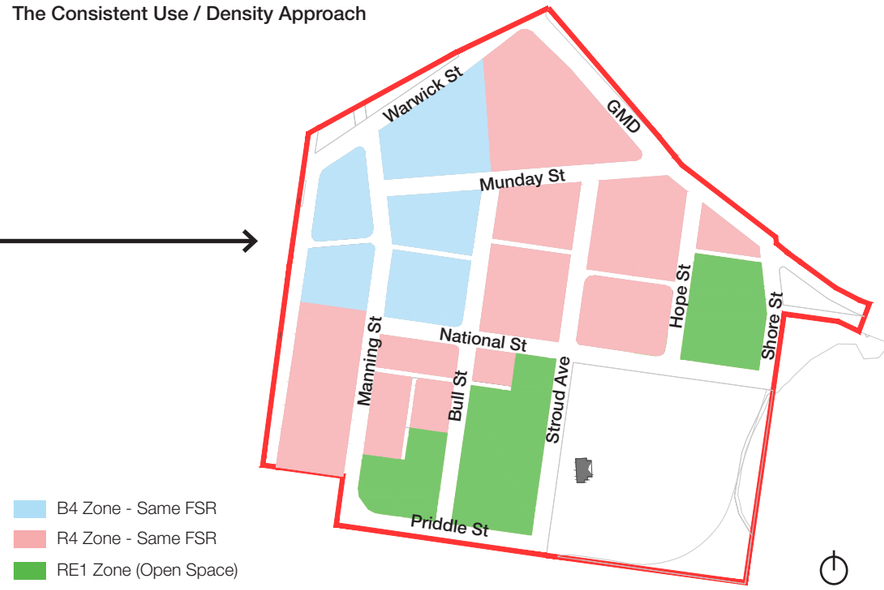
3D Building Envelopes from the Revised Structure Plan



Note:

This is an indicative building envelope diagram only and does not include detailed articulation, or topography. The model anticipates that built forms will be between 18m to 22m wide.

The Consistent Use / Density Approach



8.0 Proposed Controls

8.2 Proposed Planning Controls

8.2.1 Proposed Zoning

Proposed changes to zoning controls to facilitate implementation of the revised Structure Plan includes:

1. B4 Mixed Use Zone - In close proximity to Warwick Farm Station and the future town centre.
2. R4 High Density Residential Zone - Adjacent to the proposed B4 Mixed Use zone to its east and south.
3. RE1 Public Recreation Zone - Adjacent to Rosedale Oval.

The revised Structure Plan also identifies a number of smaller sized local open spaces along Munday and National Streets, namely Open Spaces 3, 5, 6, 7 and 8 (refer to the diagram below). The proposed zoning does not intend to zone these local open spaces to RE1 zone, which means that the abovementioned open spaces will be under private ownership. Open Spaces 3, 5, 6, 7 and 8 form important parts to the proposed open space network. They are also critical to fulfil the local open space requirement identified in the Community Needs Assessment by Cred Consulting. Therefore these privately owned open spaces are required to provide the general public access. The Planning Proposal Report by GLN Planning provides more detailed information on the mechanism of achieving this arrangement.

The nominated Open Spaces in the revised Structure Plan

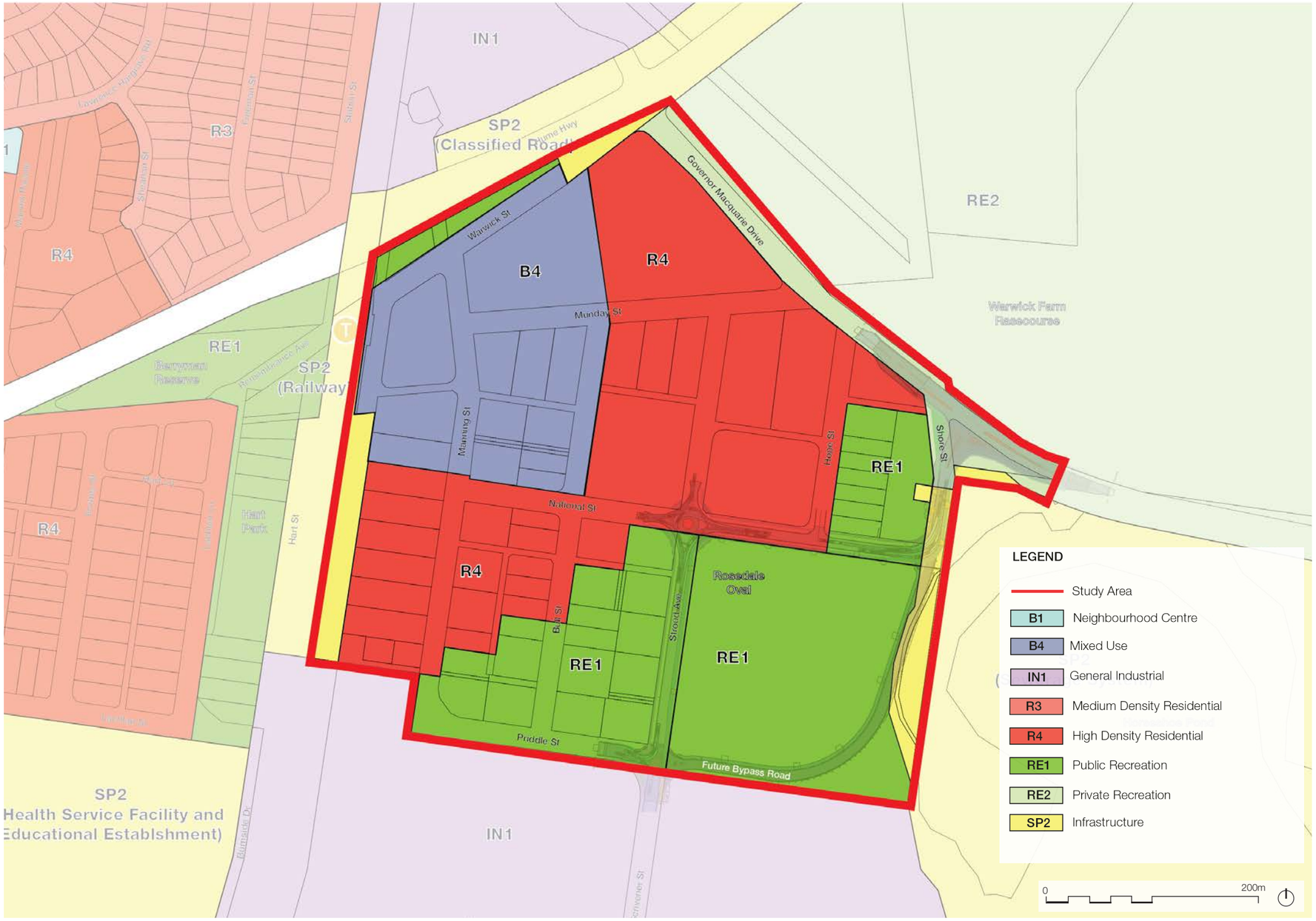


Figure 38: Proposed Zoning Map

8.0 Proposed Controls

8.2.2 Proposed Density Control - Floor Space Ratio (FSR)

The revised Structure Plan introduces a generic approach to the proposed FSR. The nominated FSR on this page is developed based on the approach nominated in Section 8.1 of this report:

1. B4 Mixed Use zone enjoys a maximum of 3.35:1 FSR.
2. R4 High Density Residential zone has a maximum FSR control of 2.20:1.

Non-residential floor space in the B4 mixed use zone is required to provide employment opportunities and facilitate the proposed street activation (refer to Section 8.3.2).

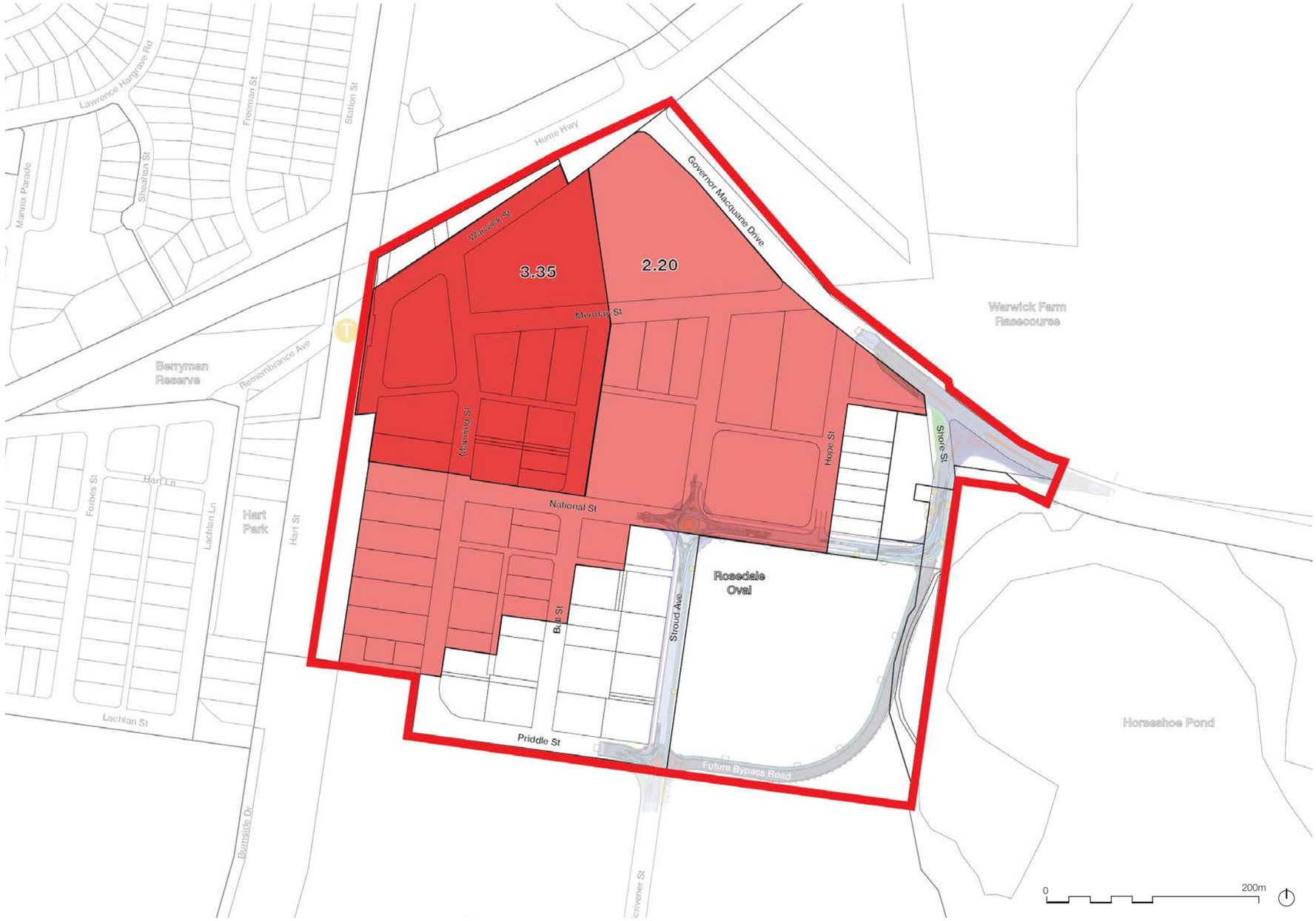


Figure 39: Proposed FSR Map

8.0 Proposed Controls

8.2.3 Proposed Building Height Control

An increase in building height is proposed in the precinct. The revised Structure Plan proposes building height ranges from 6 storeys up to 15 storeys in the future town centre, close to Warwick Farm Station.

The proposed height transitions down from 50m (approximately 15 storeys) near the transport node (Warwick Farm Station) to 21m (6 storeys) towards the edge of the precinct, which provides a sensitive built form transition towards Rosedale Oval as well as the future open spaces.

The recommended maximum building height control (in metre) is illustrated in Figure 40. The maximum achievable height for any built form on any given site will also determined by impacts with respect to overshadowing, privacy or other loss of urban amenity.

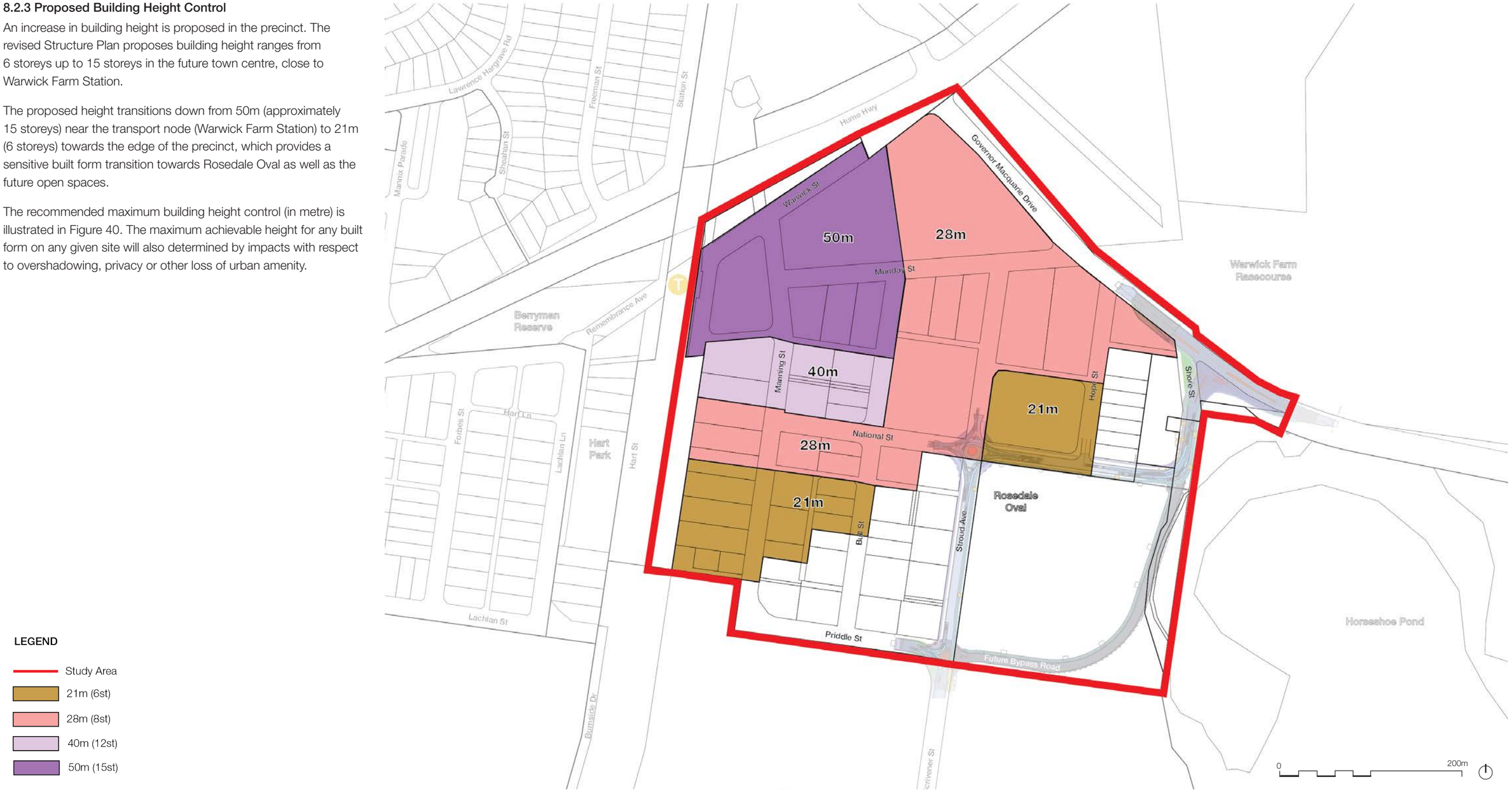


Figure 40: Proposed Building Height Control

8.0 Proposed Controls

8.2.4 Proposed Yield Summary

The following yield summary is based on the nominated planning controls.

Overall Development Parameters (Incl. 240 GMD)	
Residential GFA	274,053 m²
Non-Residential GFA	20,109 m²
Total GFA	294,162 m²
Site Area	284,042 m²
No. of Dwellings *	3,224
Population Projection++	7,383
FSR	1.04:1
% Non-Resi	7%

240 Governor Macquarie Drive (GMD)	
Residential GFA	69,781 m²
Non-Residential GFA	7,260 m²
Total GFA	77,401 m²
Site Area	29,307 m²
No. of Dwellings*	821
FSR	2.64:1

Open Space Calculation	
Open Space 1 (OS1) (Proposed RE1)	7,200 m²
Open Space 2 (OS2) (Proposed RE1)	16,360m²
Open Space 3 (OS3)**	910 m²
Open Space 4 (OS4) (Proposed RE1)	10,374m²
Open Space 5 (OS5)**	690 m²
Open Space 6 (OS6)**	1,480 m²
Open Space 7 (OS7)**	1,014 m²
Open Space 8 (OS8)**	1,575 m²
Total Proposed Local Open Space+	**39,603m² (14% of the site area)**
Open Space 9 (OS9)	**2,678** m²
Rosedale Oval	**49,927 m²**
Total Existing Open Space Area	**52,605 m²**
Total Open Space Area	**92,208 m² (32% of the site area)**
The Resultant Open Space Benchmark	
	1.25ha / 1,000 residents

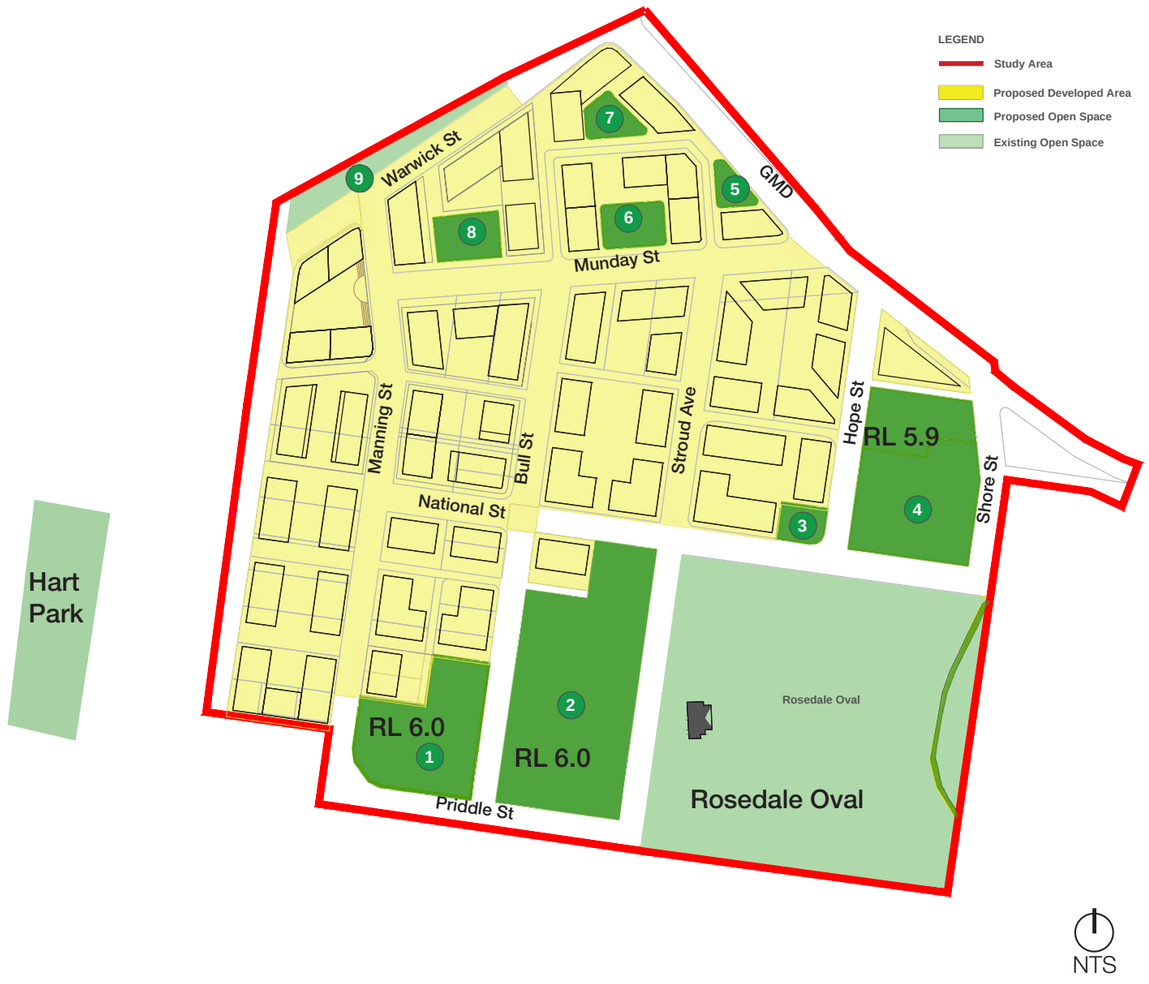


Figure 41: Key Plan for the Yield Calculation

Notes:

Gross Building Area (GBA) is the entire building footprint.

Gross Floor Area (GFA) means the sum of the floor area of each floor of a building measured from the internal face of external walls, or from the internal face of walls separating the building from any other building, measured at a height of 1.4 metres above the floor, excludes common vertical articulation, car parking, services and voids. Refer to the Liverpool LEP 2008 for the detailed defination.

GFA is used to calculate FSR.

* The average dwelling size used in the calculation is 85sqm.

** Private owned publicly accessible open space.

\+ This does not include Hart Park, which has an area of approximately 0.66ha.

++ A household size of 2.29 has been used to forecast the future population.

- The GBA to GFA efficiency rate used for residential uses is 75%.
- The GBA to GFA efficiency rate used for ground floor non-residential uses is 50% and 85% for the 1st floor.

8.0 Proposed Controls

8.3 Urban Design Controls

The following Urban Design controls are proposed. The Urban Design Controls will dovetail with the proposed planning controls to realise the vision for the Warwick Farm Precinct.

8.3.1 Proposed Building Height in Storey

The nominated height in storeys will comfortably sit within the proposed building height controls.

15-storey built forms are concentrated to the future town centre in the B4 Mixed Use zone, close to Warwick Farm Station. The building height cascades down to six storeys in the periphery of the precinct fronting Rosedale Oval and the future open spaces.

The recommended building height in storeys is illustrated in Figure 42.

LEGEND

- Study Area
- 1 Storey
- 2 Storey
- 4 Storey
- 5 Storey
- 6 Storey
- 8 Storey
- 9 Storey
- 10 Storey
- 12 Storey
- 15 Storey
- Plaza

Figure 42: Proposed Building Height in Storey

8.0 Proposed Controls

8.3.2 Active Street Frontages

Streets play an important role in shaping the amenity and character of an area. Active street frontages, in the form of retail and commercial uses define the streets, and bring vibrancy to the area, provide passive surveillance and create an attractive town centre. Refer to Figure 43 for the nominated active street frontages. The general principles are:

1. Active street frontages are required along the local streets within the future town centre (B4 Mixed Use Zone).
2. Active street frontages along laneways and internal roads are desired.
3. Active uses, including retail, commercial shop front, civic uses, display windows and the like should define the active frontages.
4. High quality pedestrian environment along active street frontages should be provided through improving footpath condition, tree planting and awnings all support this street activity.
5. Reduce long sections (i.e. greater than 40m) of blank walls, building services (i.e. substation) and minimise vehicular access points and width along active frontages to improve pedestrian safety and footpath continuity. Buildings that require to have active street frontages should have a minimum 85% of their ground floor building length activated.

LEGEND

- Study Area
- Active Street Frontages - Required
- Active Street Frontages - Preferred

Figure 43: Active Street Frontages Plan

8.0 Proposed Controls

8.3.3 Street Wall Height

Street wall height defines the character of an urban space. It forms and shapes the urban experience from the street level. A proper street wall height will assist creating a human-scale streetscape and provide a consistent urban setting. Figure 44 illustrates the desired street wall height. The key principles are:

1. Provide one to two storey street wall height within B4 Mixed Use zone.
2. Promote human scale through a well proportioned, consistent street wall height.
3. Make the upper levels distinct from the street wall height.
4. Include active and employment generating uses within the building podium level(s) to activate the street and to provide local employment.

LEGEND

- Study Area
- 2 Storey Street Wall
- 1 Storey Street Wall

Figure 44: Street Wall Height Map

8.0 Proposed Controls

8.3.4 Open Space Network and Benchmark

The open space network is based on the proposed open spaces in the revised Structure Plan, which identifies the locations of the additional RE1 Recreational zone as well as private owned publicly accessible open spaces along Munday and National Streets. The proposed network provides a structure for the future public domain improvements. It also adjoins the adjacent existing / proposed open spaces and forms a part of Liverpool's green network.

Future residential development will benefit from the proposed large and small size local open spaces within walking distance from the door step, providing amenities and views.

Green links along Munday Street, National Street and laneways will improve the precinct's permeability. They will provide east-west spines linking the community to the west of the railway corridor to the future habitat walkway in Horseshoe Pond (subject to the collaboration with Sydney Water) through the heart of the precinct.

Tree-lined streets within the precinct coupled with Munday Street boulevard will provide shades to pedestrian and cyclists and improve the overall streetscape.

The future open spaces will provide multi-purpose sport facilities (in the larger open spaces close to Rosedale Oval), playground, natural based discovery facilities, BBQ and picnic areas.

It is noted that the proposed overall open space metric of 1.25 ha per 1,000 residents is slightly lower than 1.5 ha identified in the Open Space Needs Analysis for the Liverpool Collaboration Area. Considering the proposed open space network will improve the precinct's connection to Hart Park and Horseshoe Pond, the amount of the open spaces proposed is considered acceptable to Council.

LEGEND

- Study Area
- Proposed Main Green Corridor
- Potential to Extend the Green Corridor to the Surrounding Open Space
- Potential Habitat Walkway
- Proposed Open Space
- Existing Open Space
- Plaza
- Street Tree
- Landscaping Tree

Figure 45: Open Space Network Map

8.0 Proposed Controls

8.3.5 Active Transport

Active transport, which priorities walking and cycling, will improve the quality of the public domain as well as the wellbeing of residents.

The precinct currently has a shared path (pedestrian and cyclists) along Warwick Street, Manning Street, Munday Street and Governor Macquarie Drive, linking Warwick Farm Station to the Hume Highway (refer to Figure 46). The walking and cycling environment will be further strengthened via improved existing footpaths / through site laneways and new footpath / shared way.

The over railway corridor connections are indicative only and will be improved via additional pedestrian / cyclists over bridge and updated station concourse. The proposed active transport network in the precinct will also link to the Chipping Norton Cycleway, which provides access to the Georges River foreshore. The potential link to Horseshoe Pond will provide a habitat walkway through the scenic area and create another access to the Georges River foreshore.

Figure 46: Active Transport Map

8.0 Proposed Controls

8.4 Evacuation Route

The precinct is subject to flooding issues. A key issue with the proposed development is the evacuation of residents during a flood. Shelter in place is not appropriate and therefore there must be appropriate access from every building in events larger than a 1% Annual Exceedance Probability (AEP). The key features of the evacuation approach are:

1. All floors to be at or above 9m AHD (1% AEP + 0.5m).
2. All floors must be at least 0.3m above the surrounding ground / road to allow for local drainage.
3. All internal roads to be at or above 8.5m AHD (1 % AEP).
4. All roads or pedestrian access used for evacuation must rise to the Probable Maximum Flood (PMF).
5. There must be either pedestrian or vehicle access from all floors that is always at or above 8.5m AHD (1 % AEP) to above to the PMF.

The proposed evacuation route fulfils the abovementioned requirements by providing a continuously rising route from 8.5m AHD to 10.8m AHD (PMF) and above along the Hume Highway. The proposed evacuation route will be detailed later in the Development Application (DA) stage. Refer to Warwick Farm Flooding Assessment Report by WMA Water.

LEGEND

- Study Area
- Evacuation Route

Figure 47: Evacuation Route Plan

8.0 Proposed Controls

8.5 Indicative Staging Plan

Staging is important in delivering the revised Structure Plan. The delivery of the required infrastructure, including open spaces, flood storage excavation, raising roads for flood evacuation and the building of the bypass road etc., is critical, however expensive. A high level staging plan has been developed to facilitate the realisation of the structure plan in a coordinated and feasible way. The staging strategy on this page is of high level. A detailed implementation plan will be needed in later stages to further test and refine the proposed staging boundaries and the associated infrastructure.

In general, three stages are proposed:

- Stage 1 - The land parcels close to Warwick Farm Station along Munday Street.
- Stage 2 - The properties to the north of National Street.
- Stage 3 - The remainder of the precinct.

To ensure the proposed staging will not result in net loss of the flood storage, the three large open spaces nominated for accommodating compensatory cut are also designated to each development stage:

- Open Space 2 is to be delivered in Stage 1 - It has an area of roughly 16,360 m^2 to compensate the amount of fill by Stage 1.
- Open Space 4 is to be delivered in Stage 2 - It has an area of roughly 10,374 m^2 to compensate the amount of fill by Stage 2.
- Open Space 1 is to be delivered in Stage 3 - It has an area of roughly 7,200 m^2 to compensate the amount of fill by Stage 3.

The table on this page summarises the yield for each stage.

Stage 1 Yield	
Dwelling Number	1,360
Population Projection	3,114
Open Space 2 Area	16,360m^2
Fill Volume	23,632m^3
Cut Volume	29,448m^3
Cut Depth (on Open Space 2 only)	2m
Stage 2 Yield	
Dwelling Number	1,193
Population Projection	2,733
Open Space 4 Area	10,374m^2
Fill Volume	17,206m^3
Cut Volume	19,607m^3
Cut Depth (on Open Space 4 only)	2.1m
Stage 3 Yield	
Dwelling Number	671
Population Projection	1,536
Open Space 1 Area	7,200m^2
Fill Volume	6,593m^3
Cut Volume	12,960m^3
Cut Depth (on Open Space 1 only)	2m
Total Dwelling Number	**3,224**
Total Population Projection	**7,383**

Notes:

- The average dwelling size used in the calculation is 85sqm.
- A household size of 2.29 has been used to forecast the future population.
- The cut and fill volumes are of high level.

Figure 48: Indicative Staging Plan

8.0 Proposed Controls

8.6 Conclusion

The exhibited Structure Plan has been updated to respond to:

- Department of Planning, Industry and Environment gateway refusal on 240 Governor Macquarie Drive .
- Community feedback.
- Financial Feasibility Testing results.
- New regional studies including Liverpool Collaboration Area Open Space Needs Assessment, Liverpool Collaboration Area Strategic Transport Infrastructure Assessment and Liverpool Collaboration Area Regional Flood Evacuation Strategy.
- The latest flood model.

The revised Structure Plan presents the following key changes:

- 240 Governor Macquaire Drive - This land has been incorporated into the overall structure plan. The proposed built forms and height distribution now aligns with the overall Urban Design strategy and presents a more contextual fit.
- Open space configuration - The configuration of the open spaces has been changed reflecting the increased overall development areas, latest open space benchmark and the floodplain displacement needs. The larger open spaces close to Rosedale Oval also align more closely to the odour buffer zone.
- Munday Street Linear Parks - The linear parks are removed. Instead building setbacks are proposed along Munday Street to form Munday Street boulevard. Several publicly accessible open spaces in different sizes are nominated on No. 240 Governor Macquarie Drive. These open spaces will have improved solar amenity, be more useful and contribute to the proposed residential and non-residential uses.
- Building height and massing - Refined built form height and massing are proposed to reflect the financial feasibility study and the latest regional level studies including the new open space benchmark. The revised building height and massing also reflect the redistribution of height and density on 240 Governor Macquarie Drive.

The revised Structure Plan has provided a blueprint for the redevelopment of the Warwick Farm Precinct. The structure plan envisions incremental changes to the precinct over the coming years. The Warwick Farm Precinct will gradually change from the low density suburb characterised by its equine related facilities to a mixed use higher density area providing housing choice and local employment opportunities.

Figure 49: Revised Structure Plan Bird's Eye View

Note: This is an indicative building envelope diagram only and does not include detailed articulation, or topography. The model anticipates that built forms will be between 18m to 22m wide.