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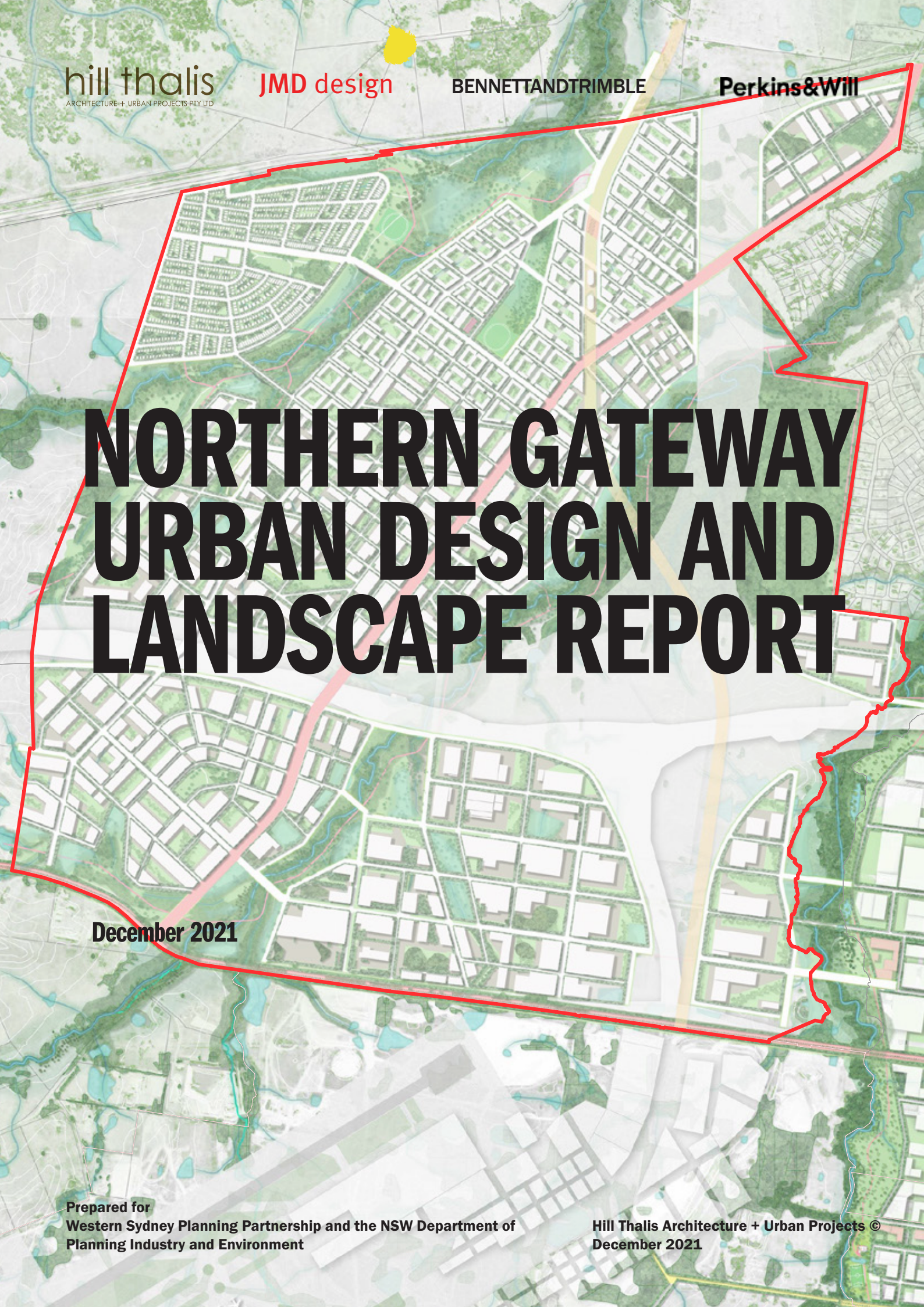

NORTHERN GATEWAY URBAN DESIGN AND LANDSCAPE REPORT

December 2021

Prepared for
Western Sydney Planning Partnership and the NSW Department of Planning Industry and Environment

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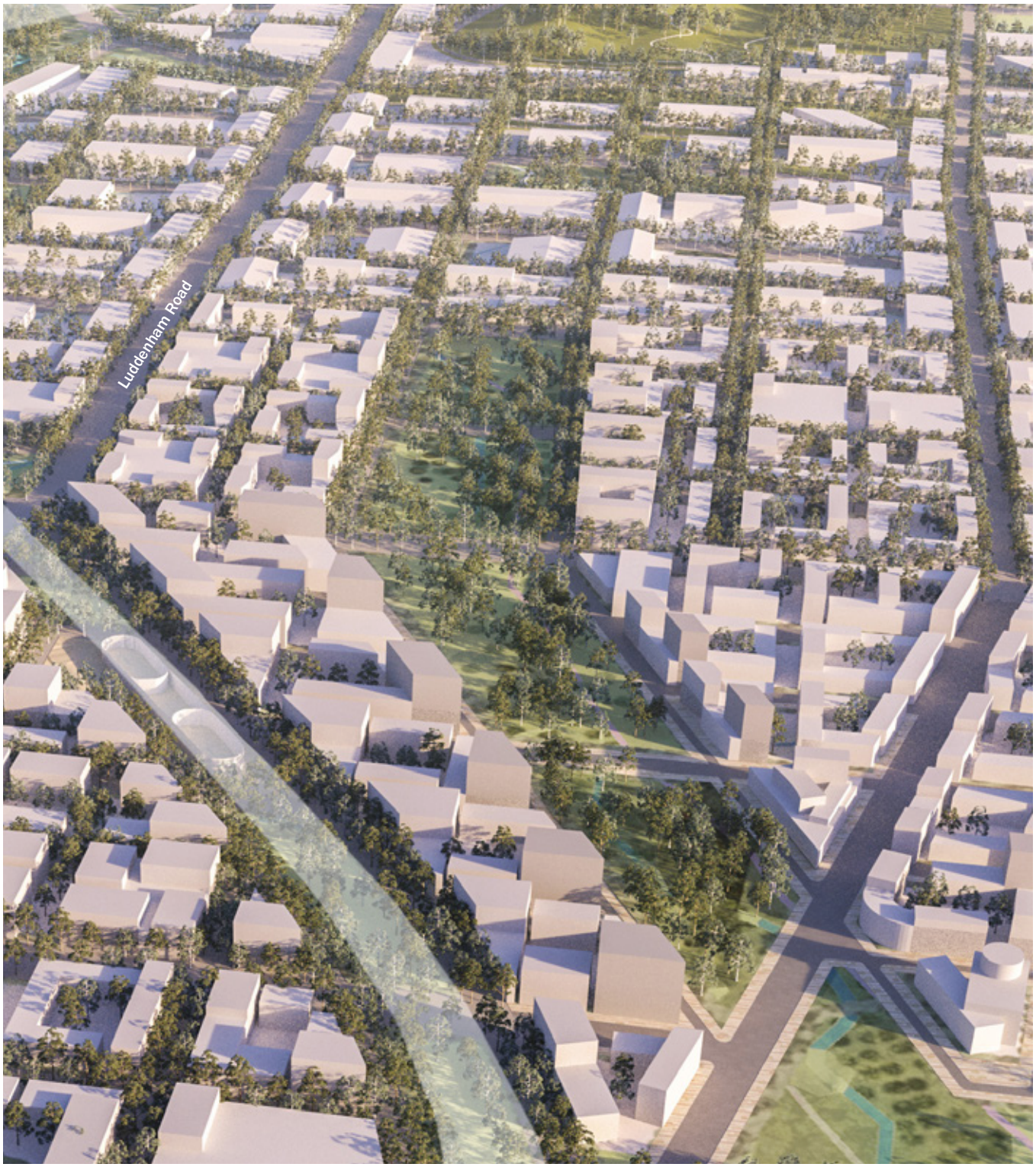
Contents

This report is Part 4 of the 5 part Western Sydney Aerotropolis Urban Design and Landscape Plan Report. It should be read in conjunction with the other parts of the report.

PART 4: THE PRECINCT PLAN

Planning for the Aerotropolis precincts establishes a pathway for landscape-led design outcomes. Country, water and parkland frame dense urban neighbourhoods and other employment lands, where a sustainable city model will emerge over the next forty years.



Aerial view from the north

NORTHERN GATEWAY PRECINCT

The Northern Gateway Precinct is an ambitious urban project that will guide for decades to come the development of this strategic 1,616 hectare new piece of metropolitan Sydney. Along with the Aerotropolis Core, Badgerys Creek and Wianamatta-South Creek Precincts adjoining to the east, and Agribusiness Precinct connecting to the west, these major precincts will develop relationships of reciprocal benefits with the new Western Sydney International (Nancy-Bird Walton) Airport that stands in the centre. The scale of this coordinated planning has never been attempted in Sydney before.

The Northern Gateway Precinct is to the immediate north of the major entry to the airport itself. It adjoins to Wianamatta-South Creek to the West , Agribusiness to the south and is also bounded by the future North Luddenham precinct to the West. Currently it has only one major road through it. The Precinct will provide important links north into the greater Penrith area via the major transport infrastructure of the metro, motorway, freight, main road, strategic bus way and cycleway connections. The precinct will become a hub for manufacturing, warehouse and distribution functions, while the inclusion of a new metro station in the proposed Sydney Science Park (SSP) will offer scope to create a vibrant and well-connected mixed use Specialised Centre.

One of the overarching objectives of the Aerotropolis is to Recognise Country. The precinct's unique natural landscape features are at the heart of the plan. The creek lines, with their remnant vegetation, potential archaeology and flood capacity roles, will be protected and form the primary Green Grid across the precinct and connecting to the adjoining areas. The more dominant conical hilltops in the south west of the precinct will be designated as future parks. These parks will enjoy a panoramic outlook across the precinct, southwards to the expanse of the airport itself, and west to the nearby Blue Mountains. They will be a centre piece in developing the Aerotropolis in a way that Recognises Country.

The connective, distributed street system will create a new generous and environmentally-attuned public space framework. The primary street grid follows the alignments of the historic Luddenham Road and Cosgroves Creek to its east. This grid is skewed to the topography, allowing the streets to have right angled intersections with both the creek and main road frontages. A sister street parallel to Luddenham Road is located between 630 and 860 metres to its west, creating a connective and relatively level traverse of the precinct.

The street layout is fully integrated with extensive parklands, as all parks will have defined public frontages. Most streets will have open vistas to parklands and beyond to the broader landscape. The generous street sections will provide ample space for a tree canopy to develop, and for innovative water management. Together the streets and parks will lead the implementation of sustainable green infrastructure, and will provide essential walking and cycling links across the territory.

Over time the Northern Gateway Precinct will develop as a support precinct for the airport, with jobs in warehousing and distribution, and manufacturing. The proposed Sydney Science Park (SSP), which benefits from the new metro station and the rapid bus network, can provide a higher density centre and specialist employment and mixed use opportunities. Local centres are distributed across the precinct, giving the opportunity for some retail mixed with social uses such as clubs and community buildings.

View towards the specialised centre. A connective green network of streets with generous tree canopy.

URBAN DESIGN FRAMEWORK

The structure of the landscape is key to generating the urban form of the precinct plan. The alignment of existing creeks and significant riparian floodplains, the conical hills and natural vegetation have been fundamental in determining the alignment of the street network and the block structure. The significant riparian floodplains are framed and addressed by continuous edge streets, while the perpendicular streets all terminate with open vistas to the landscape and open sky. As a result the urban form is calibrated to and celebrates the rolling topography of the Western Sydney landscape.

The Precinct Plan's structure also draws its inspiration from the existing alignment and character of Luddenham Road, creating a complementary paired 'sister' street to Luddenham on the slopes west of the ridgeline. Between these two primary structuring streets is a robust north-east oriented grid which forms efficient rectilinear blocks that optimises use of the gentler terrain for development, deforming rationally around hilltops and creek lines to form a coherent public domain network

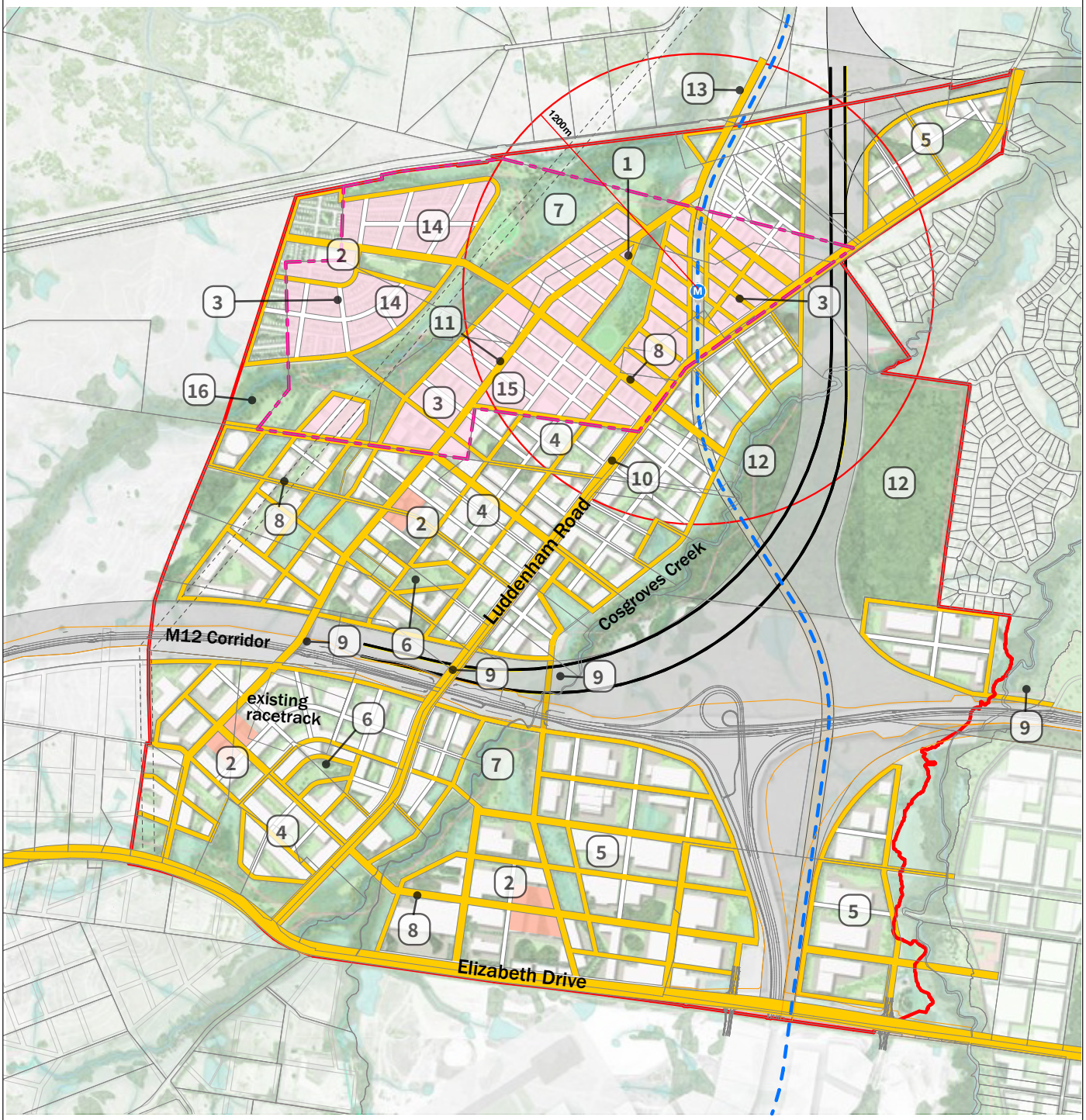
Where ground is flattest in the south adjacent to the airport, the street and block structure broadens to make larger sites available for logistics and large format uses. Where the terrain rolls more in the centre and north of the precinct the street and block structure reflects a greater density of smaller footprint building types tailored to the terrain.

In the north and to the west of Luddenham Road, a Specialised Centre is established within the approved Sydney Science Park boundary and around the new Metro station, with commercial buildings and housing to assist with activation. Its layout of the street network is designed to allow residents, workers and visitors to orient themselves directly to significant local and regional open space in the west.

The addition of a new Metro station will further catalyse the Precinct and provide for new opportunities for connectivity throughout the broader Precinct.

Annotations

1. Specialised Centre. A hub with focus on innovation, science, technology as well as other mix of uses such as housing. Contains Metro station. Integrated with the creek parkland
2. Local centre, each with its own focus and amenity (non-residential).
3. Mixed used zoning to support the Specialised Centre and other enterprise areas throughout the precinct.
4. Finer grain employment area with smaller building types on steeper land. Lot sizes are smaller to minimise extent of cut and fill associated with larger scale building typologies.
5. Larger scale employment area located on flatter parts of the precinct. These areas will accommodate larger block typologies.
6. Hilltops retained as Local Parks. They provide connection to Country by celebrating the natural landscape and providing scenic views across the precinct and beyond.
7. District Parks incorporate riparian zones, creeks, open space and existing woodland retained. In lower risk flood zones these areas contain active recreation and a range of shared passive open spaces. Water storage is also incorporated into these parks as part of the open space.
8. Connection to creeks through wide collector streets and sub-arterial roads that create green boulevards. Large verges allow for extensive tree planting and rain gardens in a park like setting with and a range of shared active connections, between creeks.
9. Critical connections across major infrastructure corridors. The M12, and planned OSO corridors disconnect the precinct into alienated fragments of land. In order to achieve maximum walkability and connectivity throughout the precinct, active and vehicular crossings are proposed over and under these corridors. Crossings are not funded in the M12 business case and will be subject to future investigation and funding commitments to enable delivery.
10. Luddenham Road. This is the primary urban roadway and serves as the major freight and regional rapid bus corridor.
11. Paired street to Luddenham Road. This is a major structuring spine and will serve as a main frequent bus and active transport corridor.
12. Remnant woodland becomes conservation area.
13. Potential strategic crossing over the Warragamba Pipeline (subject to future investigation) to improve connectivity to the Greater Penrith to Eastern Creek (GPEC) investigation area. New road bends slightly to cross pipeline next to Metro line. This would also serve as an active crossing.
14. Lower density dwelling types outside the 1.2km Metro Catchment, consisting of single dwellings, dual occupancies and semi detached dwellings fronting open space.
15. Opportunities for 'Missing Middle' type housing located within the 1.2km catchment, such as terraces or walk up apartments.
16. Approved future Integrated Water Recycling Hub.



Mixed Use Specialised Centre
including education, employment generating uses, health and science. Note any changes to approved residential yield subject to masterplanning process

Local Centre
(residential uses within Sydney Science Park only)

Primary Roads and Streets
A road or street in a location that is integral to the urban form and to the connectivity of the structure plan

Secondary Roads and Streets
A road or street at a more local scale that should be designed to meet the principles of the Planning Report and connect into the Primary Roads and Streets. Confirmation of location, type and connectivity at application stage.

Precinct Boundary
Sydney Science Park Boundary
Cadastre/Lot Boundary
Metro Station
Metro centreline
Outer Sydney Orbital/Freight Rail
M12 Corridor

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0m 250 500 750 1000 1250

OPPORTUNITIES AND CHALLENGES

INFRASTRUCTURE

Challenge

- The planned M12,M9 and OSO corridor cuts through the precinct alienating large areas of the site.
- Connectivity between these segregated areas is key to a sustainable urban development

Opportunities

- Create enlivened urban environments and open space utilising infrastructure

URBAN CAPABLE LAND

Challenge

- The proposed M12,M9 and OSO corridor cuts through the precinct alienating large areas of the site.
- Connectivity between isolated areas is key to a functioning urban environment and future growth.

SALINITY

Challenge

- Managing areas with high soil salinity on steeper topography

Opportunities

- Restore existing vegetation to improve salinity with a landscape-led approach.

SHADING BUILDINGS

Challenge

- Shading buildings on sloped sites and provision of adequate tree canopy

Opportunities

- Develop a new approach providing deep soil and canopy within pubic space to ensure 40% tree coverage and shading of buildings

LUDDENHAM ROAD

Challenge

- Retain the connection to country, existing trees and adapt sensitively the rural character of Luddenham Road to create a tree lined boulevard.

TOPOGRAPHY

Challenge

- The Northern Gateway is characterised by undulating topography and steep hills in parts.
- The majority of the precinct is zoned enterprise and the majority of development envisaged is medium to larger scale industrial developments.
- The topography will be a challenge as these types of developments are more suited to flatter areas.
- A new approach to this typology is needed rather than the business as usual approach of levelling out sites and building large retaining walls to deal with level change.

Opportunities

- Celebrate the hilltops and ridges, connect with country and repair the Cumberland Woodland, celebrating endemic species.

THE GPEC AND BROADER WESTERN SYDNEY CONTEXT

Opportunities

- A major opportunity exist to connect the Northern Gateway and the Aerotropolis precinct to wider Western Sydney

Challenge

- Warragamba Pipeline

SYDNEY SCIENCE PARK

Challenges

- The existing planning approval for the Sydney Science Park has been in place since 2016, prior to confirmation of a Metro station and comprehensive precinct planning

Opportunities

- Integrate Sydney Science Park as a key part of the whole Northern Gateway Precinct
- Leverage off the Metro Station to create a vibrant mixed use quarter
- Diversify and intensify land uses to increase employment opportunities.
- Provide catalyst for the development of the whole Northern Gateway area.
- Create a public space network of streets and parklands that seamlessly connects to the wider Northern Gateway Precinct.

Statutory Context

- There is an approved master plan for the site as indicated on the adjacent plan. It complies with the current Penrith City Council DCP and LEP.
- In the light of recent announcements and planning investigations for the Aerotropolis, a planning proposal or masterplan for the site can be submitted and assessed under the WSA SEPP, the Precinct Plan, WSA Stage 2 DCP and the Master Plan Guidelines.

Ensure precinct specific principles are met

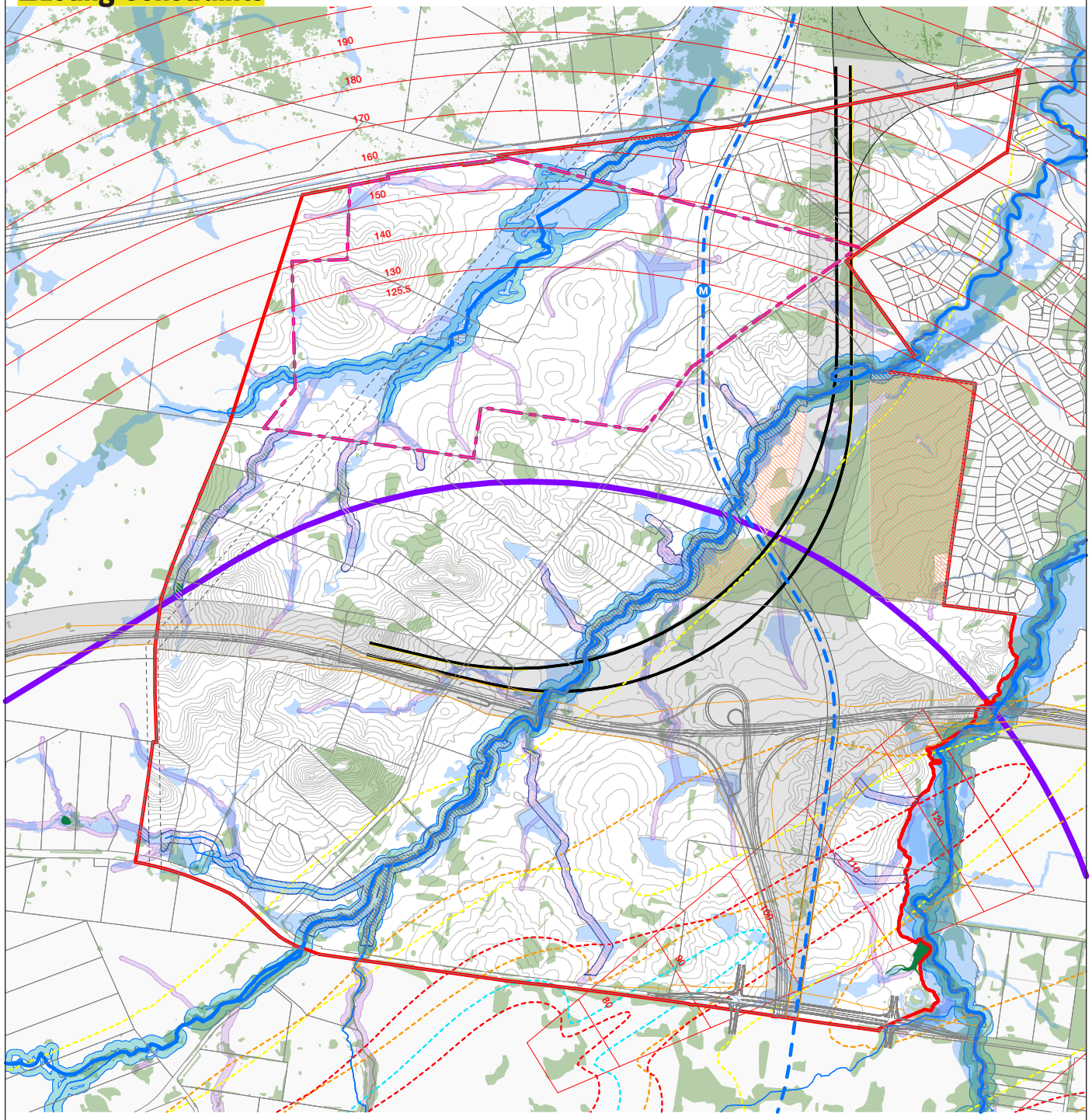
- Review the plans in view of a landscape-led approach that considers connection to country, orienting urban development to creek spines, in close proximity to confirmed major public transport.
- Consider plans in the light of recently confirmed Metro, public and active and transport framework is to deliver sustainable transport
- Adapt existing plans to the transport hierarchy, incorporating the metro corridor, allowing for the widening of Luddenham Road and creation of connective bus routes through the area
- Provide for excellent spatial connectivity within and between precincts in line with the Blue-Green grid

AIRPORT CONSTRAINTS

Challenges

- Given the precinct's location to the airport, there are constraints associated with noise and building height limitations associated with the OLS. Parts of this precinct are in ANEF contours 20 or greater which will limit the types of land use within the southern portion of the site.

Existing Constraints



- 1% AEF
- 2m Contours
- CPCP Environmental Lands and Ecological Communities
- CPCP Avoided Lands
- 3km Wildlife buffer zone
- Strahler First and Second Order Creek
- Strahler Third Order and above Creek
- ANEC 35 Contour
- ANEC 30 Contour
- ANEC 25 Contour
- ANEC 20 Contour
- OLS Chart Line

- Precinct Boundary
- Sydney Science Park Boundary
- Cadastre/Lot Boundary
- Metro Station
- Metro centreline
- Outer Sydney Orbital/Freight Rail
- M12 Corridor

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Existing Character


Rural character of Luddenham Road


Steep hills

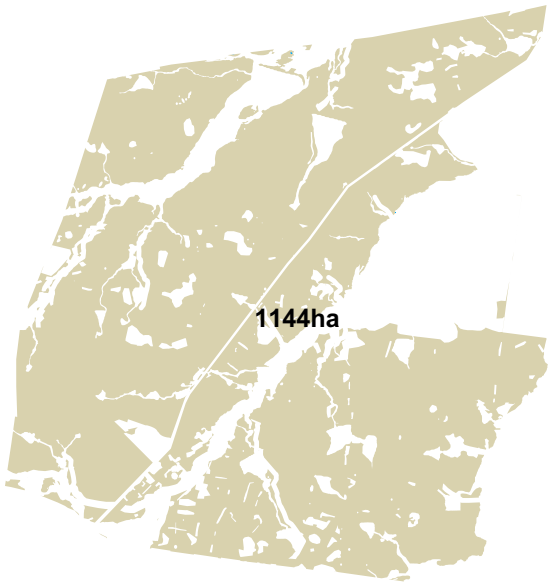

Cumberland Plain woodland


Undulating topography

Images:
Photographs showing scenes throughout the Northern Gateway precinct.

Urban Capable Land Calculation Deducting Constraints

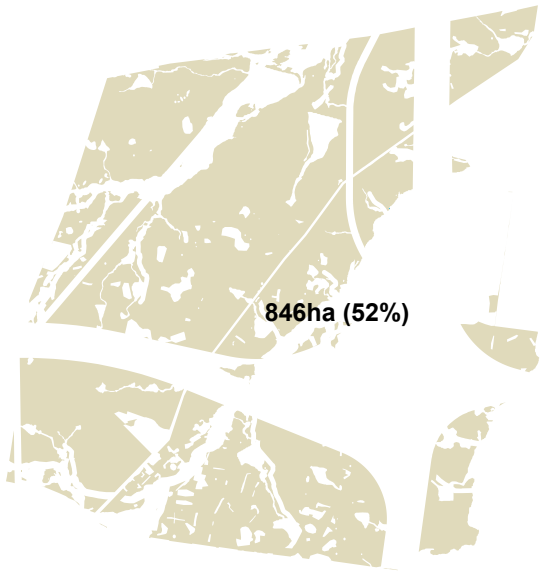
SITE AREA 1616ha



SITE AREA 1616ha

CONSTRAINTS:

-28	ha exist. streets	= 2%
-222	ha exist.woodland	= 14%
-195	ha flood (1 in 100)	= 12%
-27	ha exist. environmental protection zone	= 2%

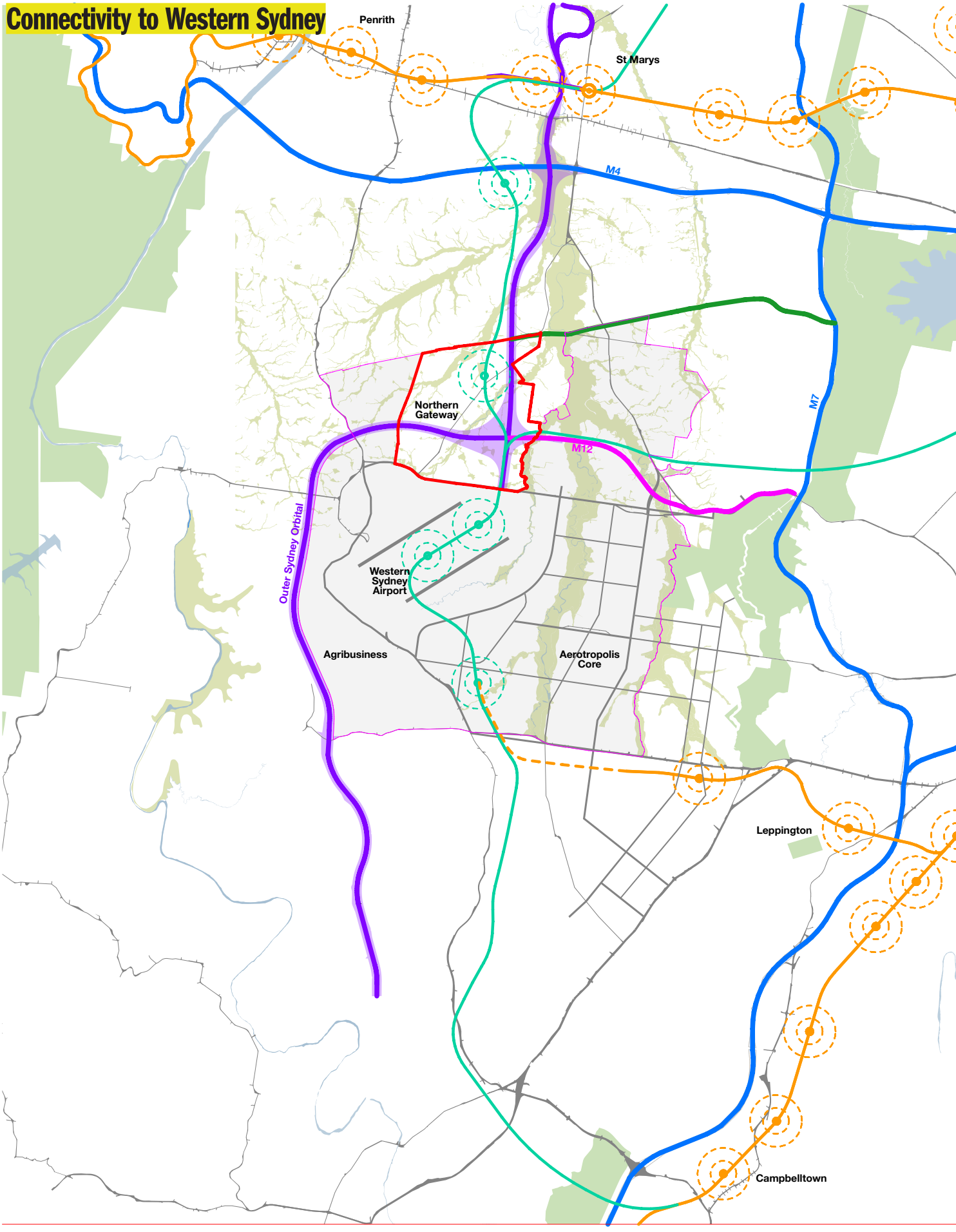


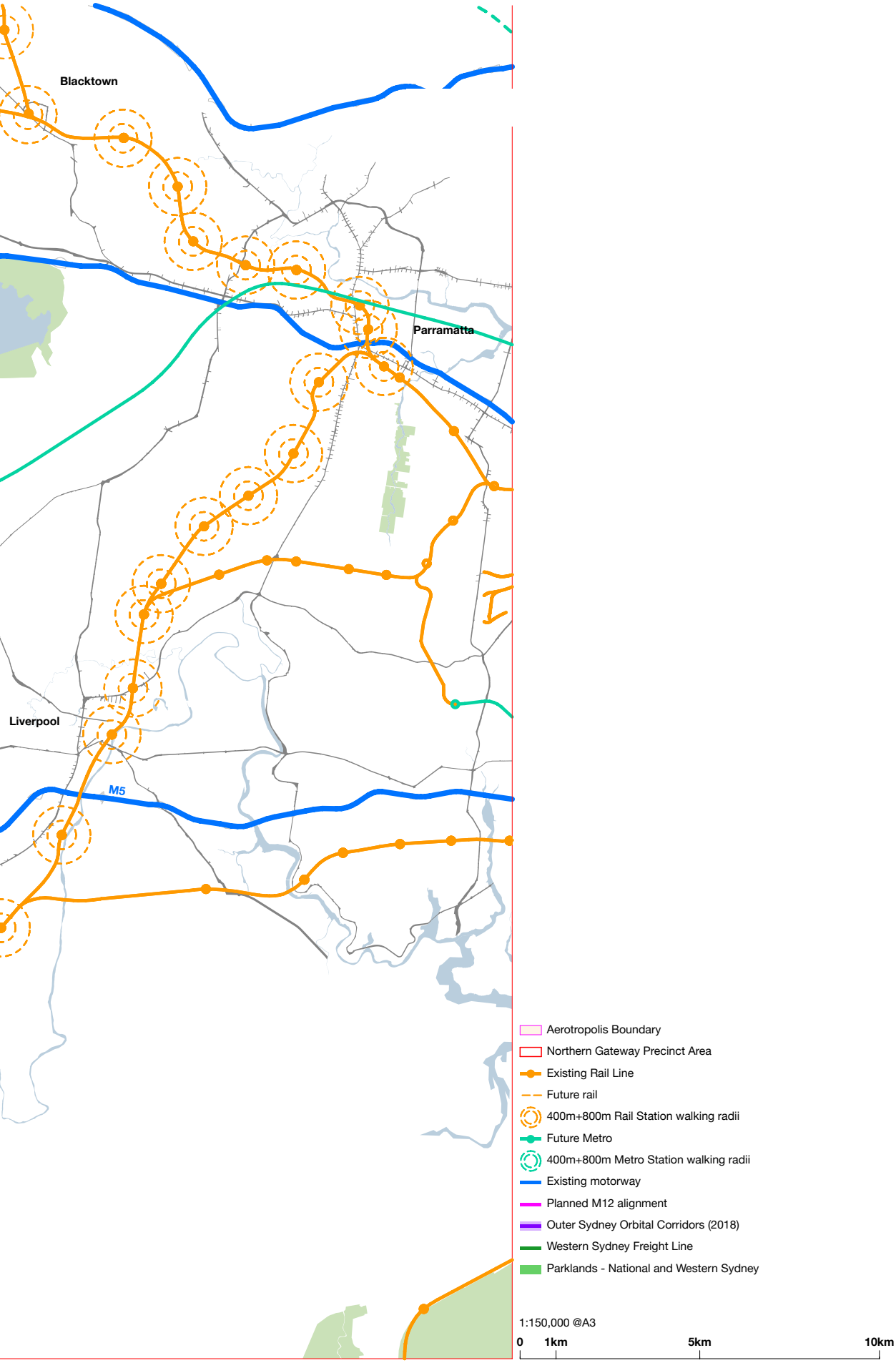
SITE AREA 1616ha

CONSTRAINTS:

-28	ha exist. streets	= 2%
-222	ha exist.woodland	= 14%
-195	ha flood (1 in 100)	= 12%
-27	ha exist. environmental protection zone	= 2%
-296	ha proposed infrastructure	= 18%

DEVELOPABLE AREA 846ha


Connectivity to Western Sydney
Penrith
St Marys
M4
M7
M12
Northern Gateway
Outer Sydney Orbital
Western Sydney Airport
Agribusiness
Aerotropolis Core
Leppington
Campbelltown


Blacktown
Parramatta
Liverpool
M5
Aerotropolis Boundary
Northern Gateway Precinct Area
Existing Rail Line
Future rail
400m+800m Rail Station walking radii
Future Metro
400m+800m Metro Station walking radii
Existing motorway
Planned M12 alignment
Outer Sydney Orbital Corridors (2018)
Western Sydney Freight Line
Parklands - National and Western Sydney
1:150,000 @A3
0
1km
5km
10km
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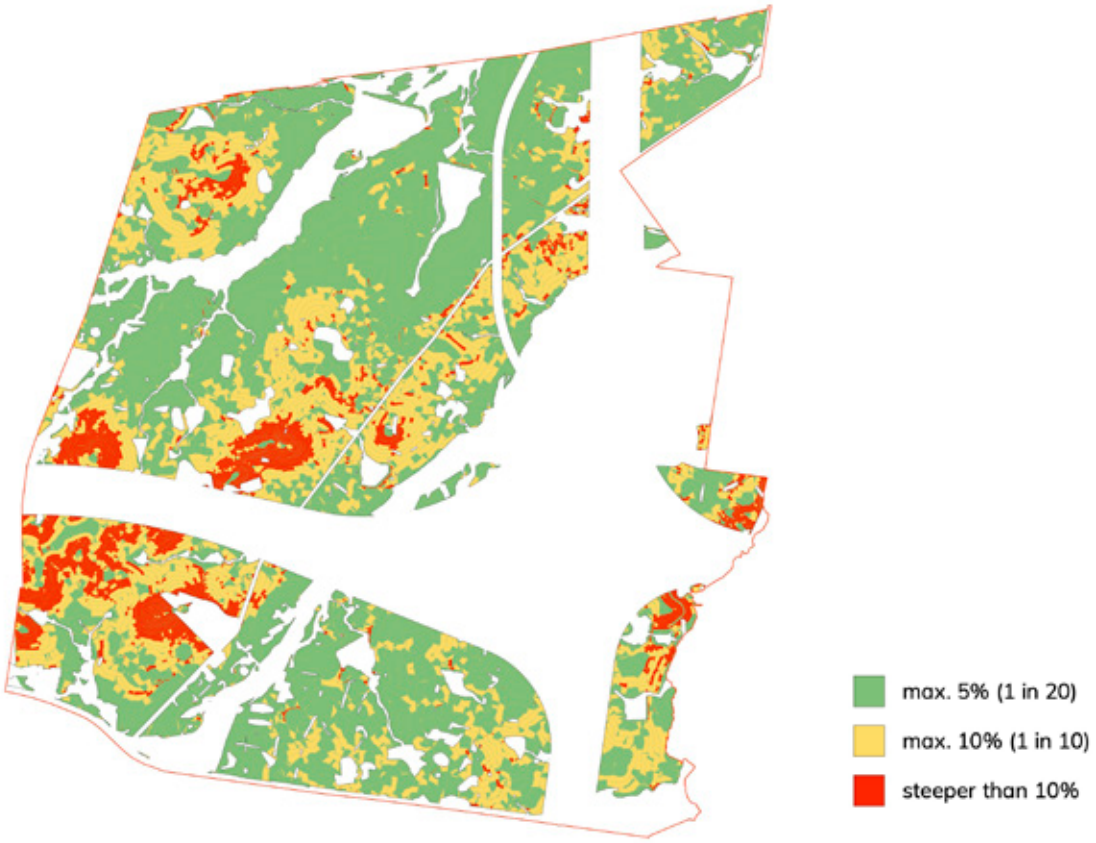
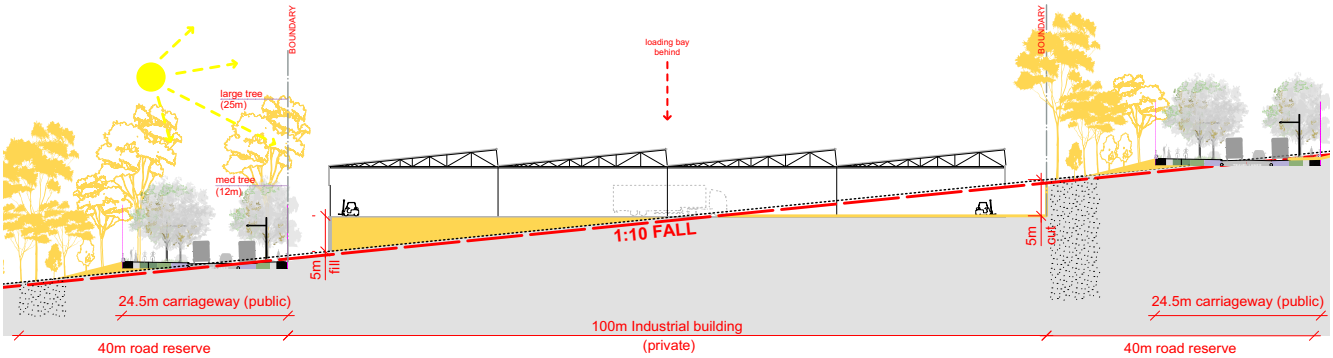
Topography and The Building Typology Challenge



Slope analysis - many parts of the precinct steeper than 10% gradient

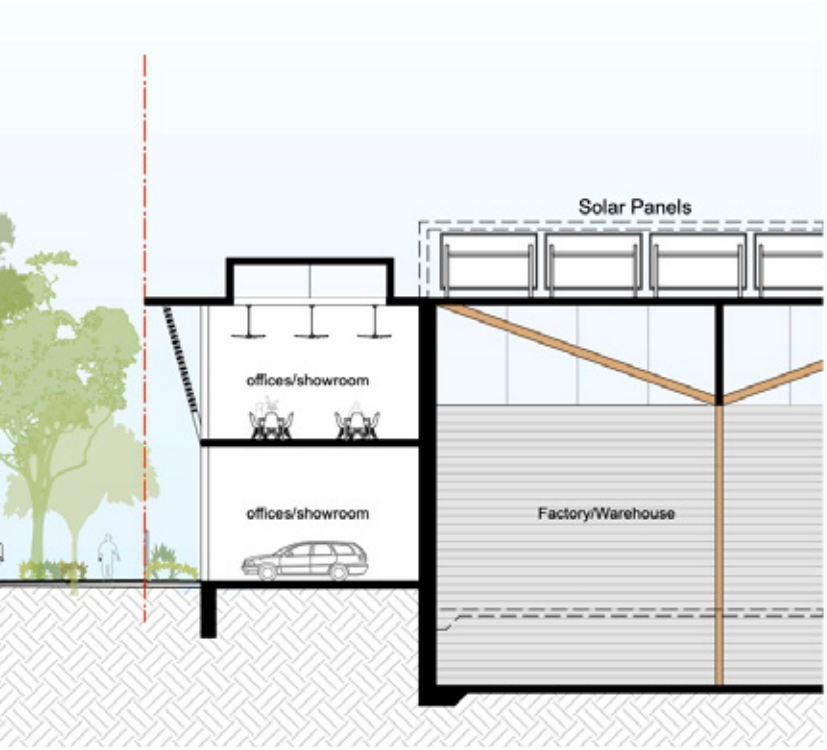
A New Approach to Industrial Building Typology - Creating active frontages on steeper sites

Refer to Industrial Built Form on P86, for more detail.



A typical approach to building large footprint on steeper terrain - deactivated street frontages

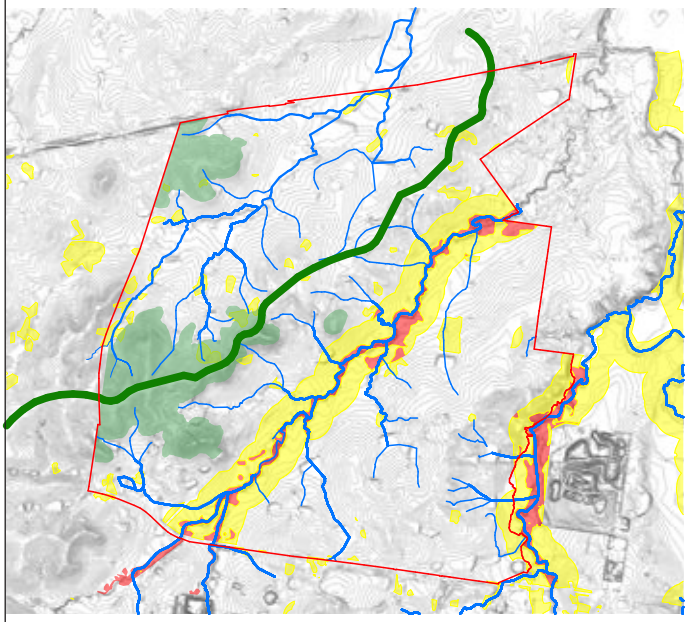
Prestons - Business as usual example of industrial building on steeper terrain - deactivated frontage



The Roofscape as Resource

- The roofscapes within the Northern Gateway precinct should be utilised to harvest rainwater, produce solar power or green roofs.
- Water harvested can be re-used within the Northern Gateway in a closed or open system depending on scale.
- Energy produced can be used on site or linked to the broader energy network to support the Aerotropolis and Greater Sydney.

PRECINCT PRINCIPLES AND STRUCTURE



1. CONNECTING TO COUNTRY

Establish Hilltops as safe places, vantage points, and markers in the landscape
Ridgelines define the primary site structure

Aboriginal Heritage Sensitivity High

Aboriginal Heritage Sensitivity Moderate

- Map, record, and investigate indigenous heritage beyond landscape connections, including archeology, natural heritage, and culture.

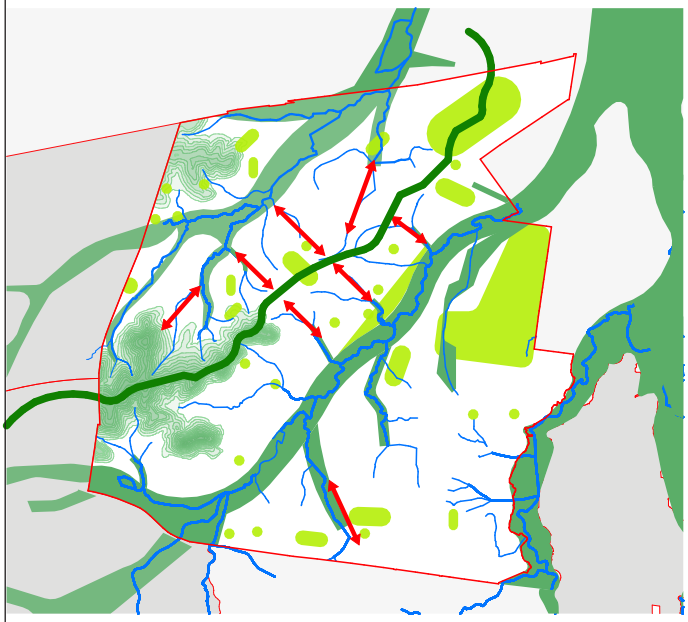
2. PRESERVE AND PROTECT WATER ASSETS

Define floodplain (1% AEP) perimeter to establish riparian corridors, recreation areas, and developable area

Creeks of 3rd order and larger retained.

1st and 2nd order to be retained within high environmental areas where possible.

Retain and 1st order creeks where possible and realign where necessary
Provide a creek to creek landscape connection



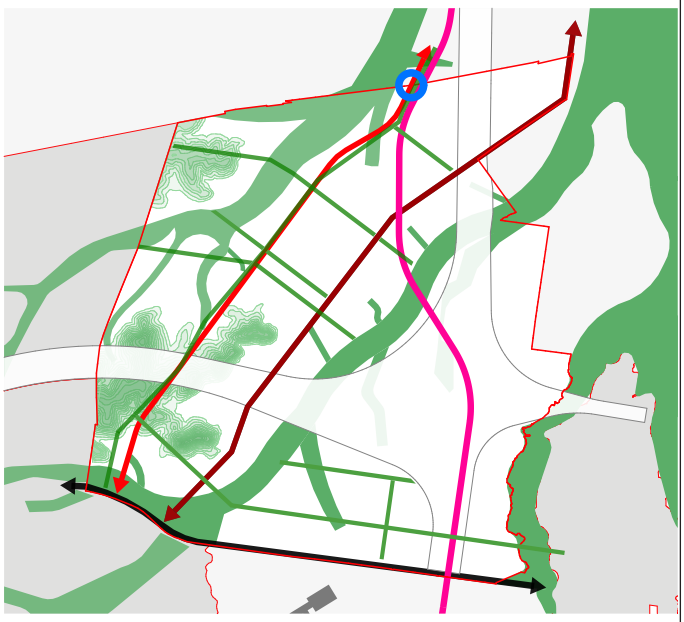
3. PRESERVE AND PROTECT LANDSCAPE ECOLOGY

Position primary open space at hilltops

Retain and protect Cumberland Plain Conservation Plan (CPCP) NSW Threatened Ecological Communities

Use floodplain (1% AEP) for riparian corridors, recreation areas, open space

Connect the ridges to creeks with green spines and open space corridors



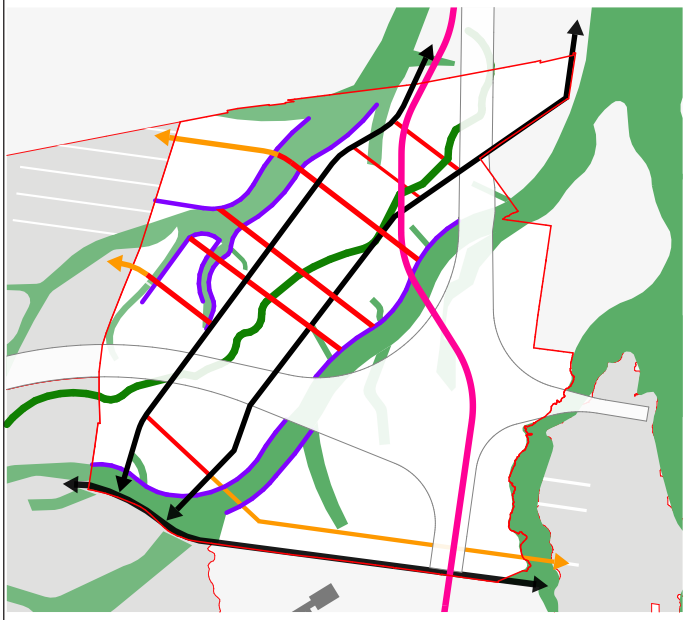
4. KEY STREETS

Retain Luddenham Road as the key road through the precinct.

Blue/Green Streets

Make new north/south road between the creeks and parallel to Luddenham Road to:

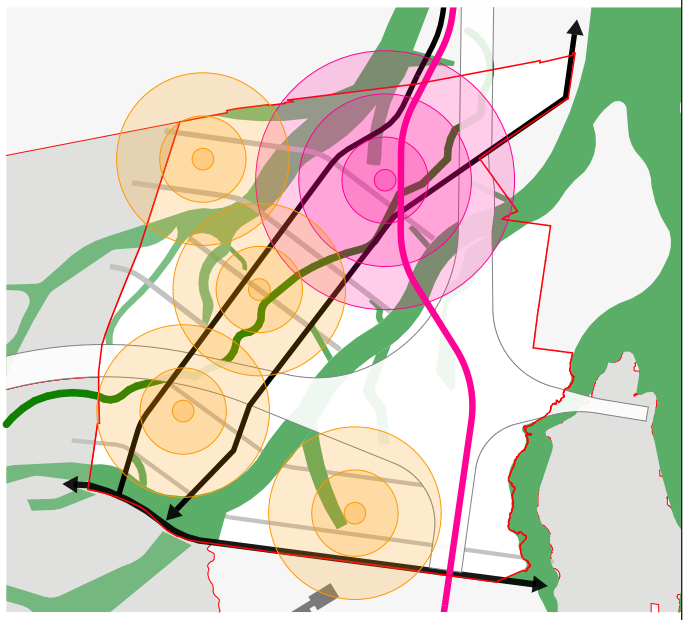
- **Structure the future precinct alignment to the creeks and ridgelines**
- Share the public transport and traffic load on Luddenham Road
- Explore a second crossing over the Warragamba pipeline.



5. PRECINCT STRUCTURING PRINCIPLES

East West connections structure the precinct based on topography, landscape connections, and development efficiency.

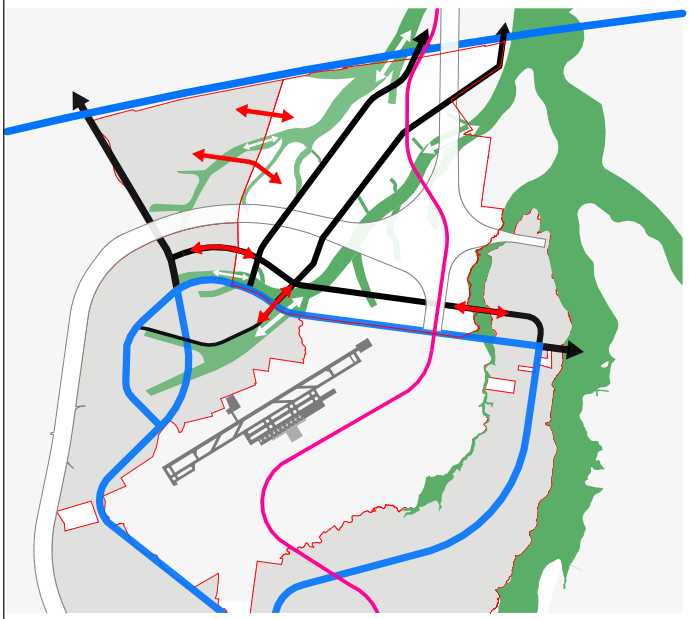
- Between the creeks street are oriented to the Creeks and Luddenham Road.
  Streets run from creek to ridge, with the ridge framed against the sky.
- Outside the creeks, streets are oriented to the Western Sydney Grid
- Edge streets define and provide access to riparian zones and open space



6. CENTRES

- Specialised Centre at Metro Station. 400/800/1200m pedestrian/cycle catchment
  Local Centres (non-residential uses) distributed throughout precinct. 400/800m pedestrian catchment

Locate Local Centres throughout precinct to provide varied public, community, dining, and retail activities. Distribute centres throughout precinct to enable walkability from employment areas.



7. INTEGRATION AND CONNECTIVITY WITH AEROTROPOLIS AND CONTEXT

- Connect and integrate development areas, open space, water, and local centres with adjacent Aerotropolis Precincts and immediate context.

- Green Grid connections
- Aerotropolis link road

THE BLUE-GREEN INFRASTRUCTURE FRAMEWORK

The Draft Cumberland Plain Conservation Plan is an important instrument for protecting avoided lands for their high value biodiversity, and the biodiversity value along riparian corridors.

The River-Flat Eucalypt Forest is listed as an Endangered Ecological Community (EEC) under the *Biodiversity Conservation Act 2016* (NSW).

Swamp Oak Forest is also a listed EEC under the *Biodiversity Conservation Act 2016* (NSW) and Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth)

The presence of River-Flat Eucalypt Forest and Swamp Oak Forest is along Cosgroves Creek in the Northern Gateway precinct.

Other EEC include the Shale Plains woodland and Shale Hills woodland located in some of the elevated hilltop areas of the precinct.

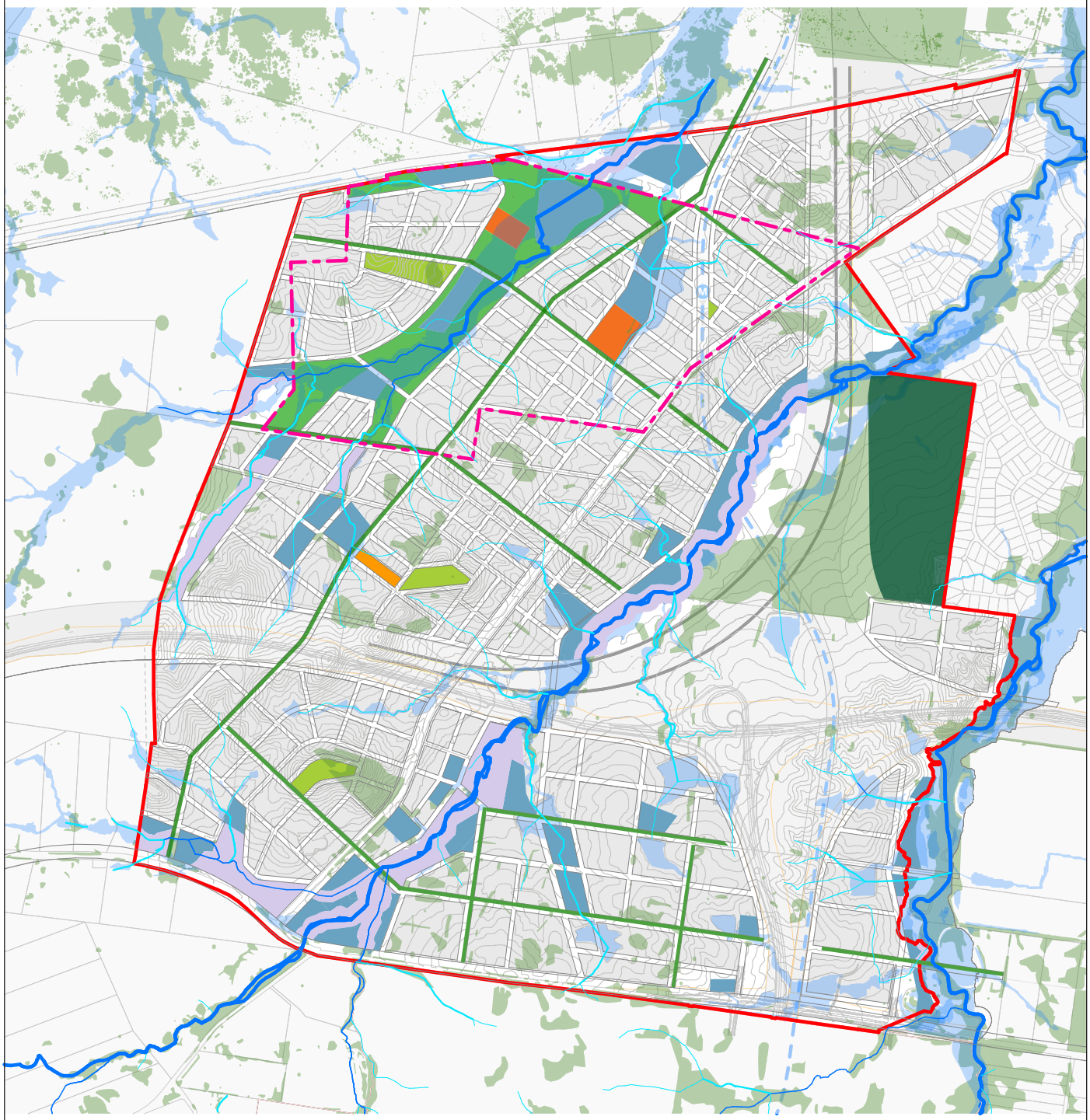
Where appropriate development shall avoid, minimise and mitigate impacts to biodiversity. Where possible, developments should seek to minimise impacts and reduce disturbance to riparian corridors. Developments must also consider the requirements under the *Water Management Act 2000 (NSW).*

Investigations are still being conducted to identify and acquire land for a future water detention basin as part of the delivery of the Sydney Metro - Western Sydney Airport. Land near the proposed M12 and Metro entrance into the Airport, on University of Sydney owned land, may be affected by the future delivery of this infrastructure. Further detail can be found in the *Environmental Impact Statement for the Sydney Metro – Western Sydney Airport,* on exhibition from 21 October – 02 December 2020.

The regional approach to stormwater management across the Aerotropolis will retain water in the landscape through rehabilitating the existing waterways and creek systems and detention basins that will store and treat stormwater to meet waterway health targets.

The Blue-Green Infrastructure Framework is an interconnected network of open spaces, streetscapes, and retained waterways in the landscape. Vegetation and planted areas on private lots also contribute to this framework.

The Precinct Plan



- District Park
- Local Park
- Active Open Space
- Stormwater infrastructure land
- Riparian Parkland / Corridors
- CPCP Strategic Conservation Areas
- Streetscape Open Space
- CPCP Environmental Lands and Ecological Communities

- 1% AEF
- 2m Contours

- Precinct Boundary
- Sydney Science Park Boundary
- Cadastre/Lot Boundary
- M Metro Station
- Metro centreline
- Outer Sydney Orbital/Freight Rail
- M12 Corridor

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PUBLIC DOMAIN PLAN

PROVIDE OPPORTUNITY TO CONNECT TO COUNTRY

- The public domain retains existing visual and physical connections to the landscape.
- It will reveal the topography, distant views and big sky, providing opportunities to connect to Country.

REPAIR AND PROTECT THE WATERWAYS AND TRACES OF WATER

- Healthy creeks, dams, floodplains
- Public space to front all riparian crossings
- Integrate stormwater management into public space
- Allows water to travel through the public domain at a slow pace
- Preserves creek corridors
- Connect creek corridors to ridges and hilltops

REPAIR AND PROTECT THE CUMBERLAND PLAIN

- Protect trees, birds, animals, insects and grasslands
- Plant endemic species
- Celebrates the existing Western Sydney landscape
- Streets trees provide sun protection to street surface and adjacent buildings
- Generous public domain edges to all parks and riparian corridors

PROTECT AND NURTURE THE SOIL

- Connected mycorrhiza sponge, to combat salinity
- Carefully manage cut & fill
- Make contiguous areas of soil & natural ground
- Use permeable surfaces
- Smaller blocks on steep land
- Preserves soil and provide maximum opportunity for soil biota and water retention by minimising pavements

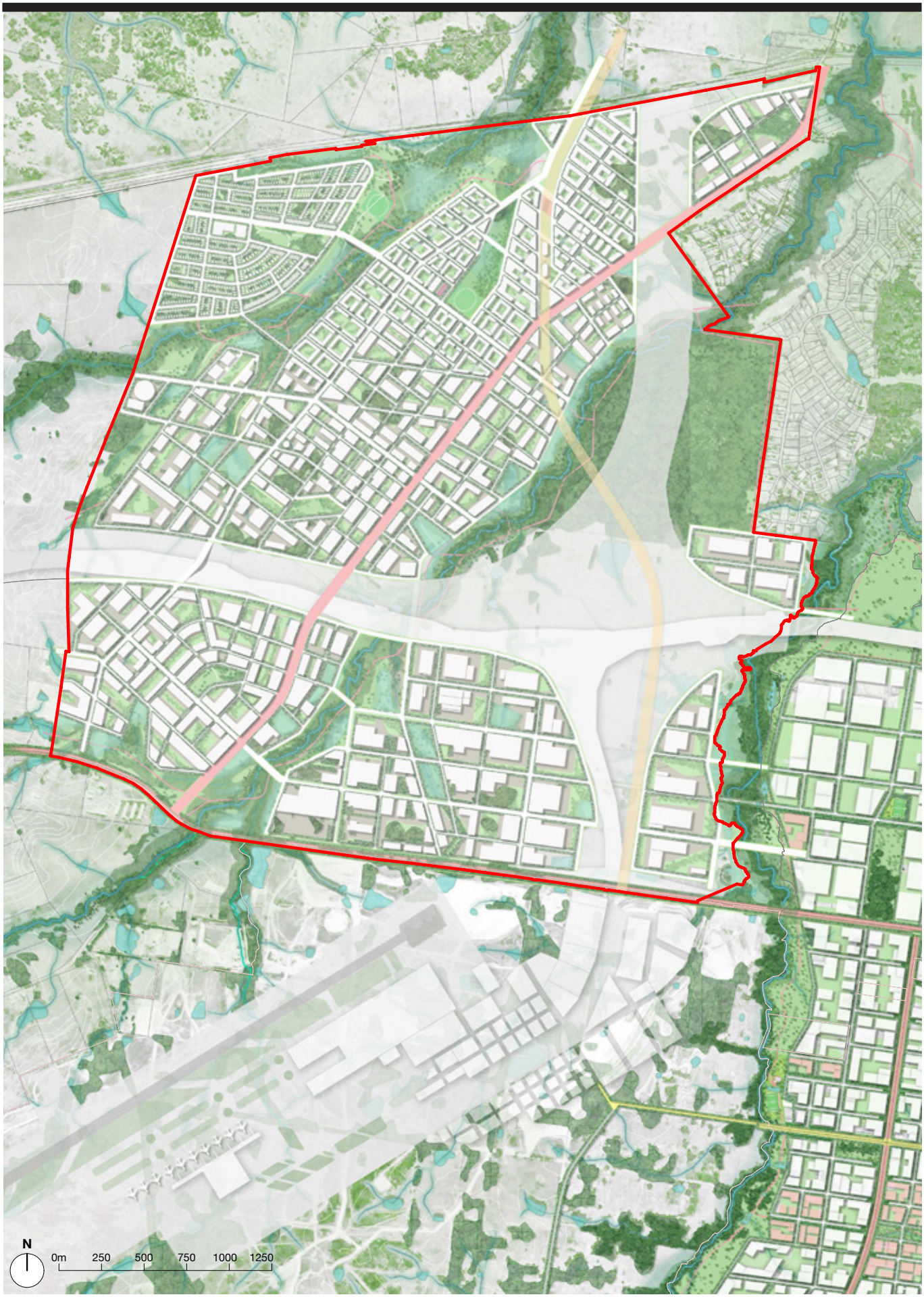
CELEBRATE THE TOPOGRAPHY

- Emphasise ridges, valleys, hills, slope, views
- Retain ridges & hilltops
- Use roads and open space to make topography legible
- Manage cut and fill to echo the landscape form of undulating topography.

LAYOUT AND STREETS

- Streets should provide orientation, address, a clear and legible hierarchy and allow for flexibility and changes in use over time.
- They must discretely provide for the needs of servicing and practical movement
- Overwhelmingly they must provide evocative and highly memorable ways of moving through the landscape. This movement should be celebratory and experientially rich - for pedestrians, cyclists and vehicles alike.

The public domain is the framework for civic and social life. Streets, parks and public spaces create networks for casual socialisation and active recreation. The Northern Gateway public domain should preserve the inherent qualities of Western Sydney landscape.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OPEN SPACE TYPOLOGY

The open space framework across the Aerotropolis comprises local, district and regional parks. The Northern Gateway consist primarily of District and Local Parks.

District Parks

- → District Parks are easily accessible by active transport and public transit, homes are generally within 2 km of district parks (as a maximum). Parks contain district level social and recreational infrastructure.
- → In the Northern Gateway They are located along the often-ephemeral creeks and play an important role in riparian vegetation preservation and waterway health.
- → This network of open space is an important connector and forms the armature to the parkland city.
- → Waterways of Strahler Order 2 and higher will generally be maintained in a natural state, including the maintenance and restoration of riparian area and habitat such as fallen debris. Where a development is associated with or will affect a waterway of Strahler Order 2 or higher, rehabilitation will occur to return that waterway to a natural state to enable natural processes and functionality to be maintained.
- → District parks provide passive and active recreation, cycle and pedestrian connectivity across the precinct allowing for extensive off street journeys. Active recreation and park community amenities of a district character are included outside of 1% AEP flood zone.
- → In locations of biodiversity and environmental preservation, a non structured low impact recreation focus of will ensure no negative impact on the remnant vegetation community
- → The parklands also play an important role in the water management in particular when water is held higher in the catchment and away from saline and sodic soils.
- → Sydney Water assets such as storage basins will be consolidated within these open spaces. They will be designed to not only serve as storage but to function as recreational open spaces, provide areas of urban greenery and cooling.
- → These cater to a variety of landscape requirements, such a vegetation protection, new tree canopy, water management, soil preservation .
- → They will be designed to incorporate recreational open spaces into their water storage function and are located to connect the green blue grid.

Local Parks

- → Local Parks include smaller parks with a minimum area of 0.5 Ha and service local areas within a 400m walking catchment.
- → One of the key characteristics of these parks within the Northern Gateway is that they are established on the local high points, incorporating significant hilltops. This allows them to capture the breeze and allow for long vistas providing other opportunities to connect with Country.
- → Due to their topography, they contain more passive recreation in the form of lookouts, picnic areas and walkways.
- → They can cater to more active recreational needs through the provision of community amenities, playgrounds and fitness nodes at a scale appropriate to its designation and location.

Streetscape

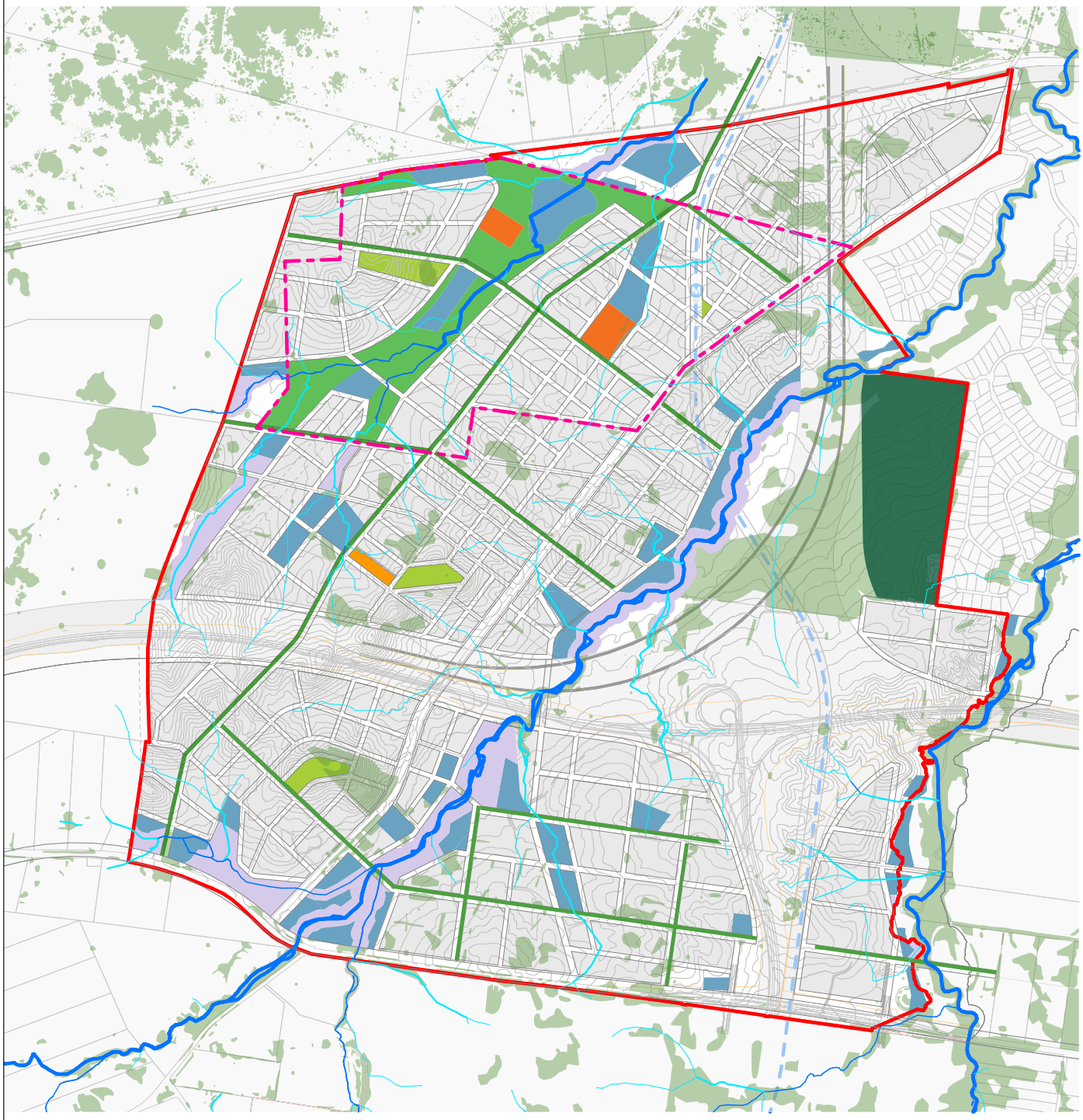
- → Streetscape is an integral component of the overall open space framework and provides the opportunity for continuous tree canopy and ground cover planting rich in diversity that allows for wildlife to migrate through the urban fabric.
- → The streets also provide important shaded connections from creek to ridge for pedestrian connectivity.
- → Street planting shades adjacent facades to help mitigate urban heat island effects and provide pleasant micro climate for activation.

Environmental protection lands

- → Areas proposed around protected existing native vegetation.
- → These areas are often incorporated within linear parklands.
- → A non structured, low impact recreation focus of a district and local character is incorporated, ensuring no negative impact on the remnant vegetation community.

Sydney Science Park

- → Open space within the Sydney Science Park shall at a minimum, be provided with the quantum in the Voluntary Planning Agreement relating to the land.


District Park
Local Park
Active Open Space
Stormwater infrastructure land
Riparian Parkland / Corridors
CPCP Strategic Conservation Areas
Streetscape Open Space
CPCP Environmental Lands and Ecological Communities
2m Contours
Precinct Boundary
Sydney Science Park Boundary
Cadastre/Lot Boundary
Metro Station
Metro centreline
Outer Sydney Orbital/Freight Rail
M12 Corridor
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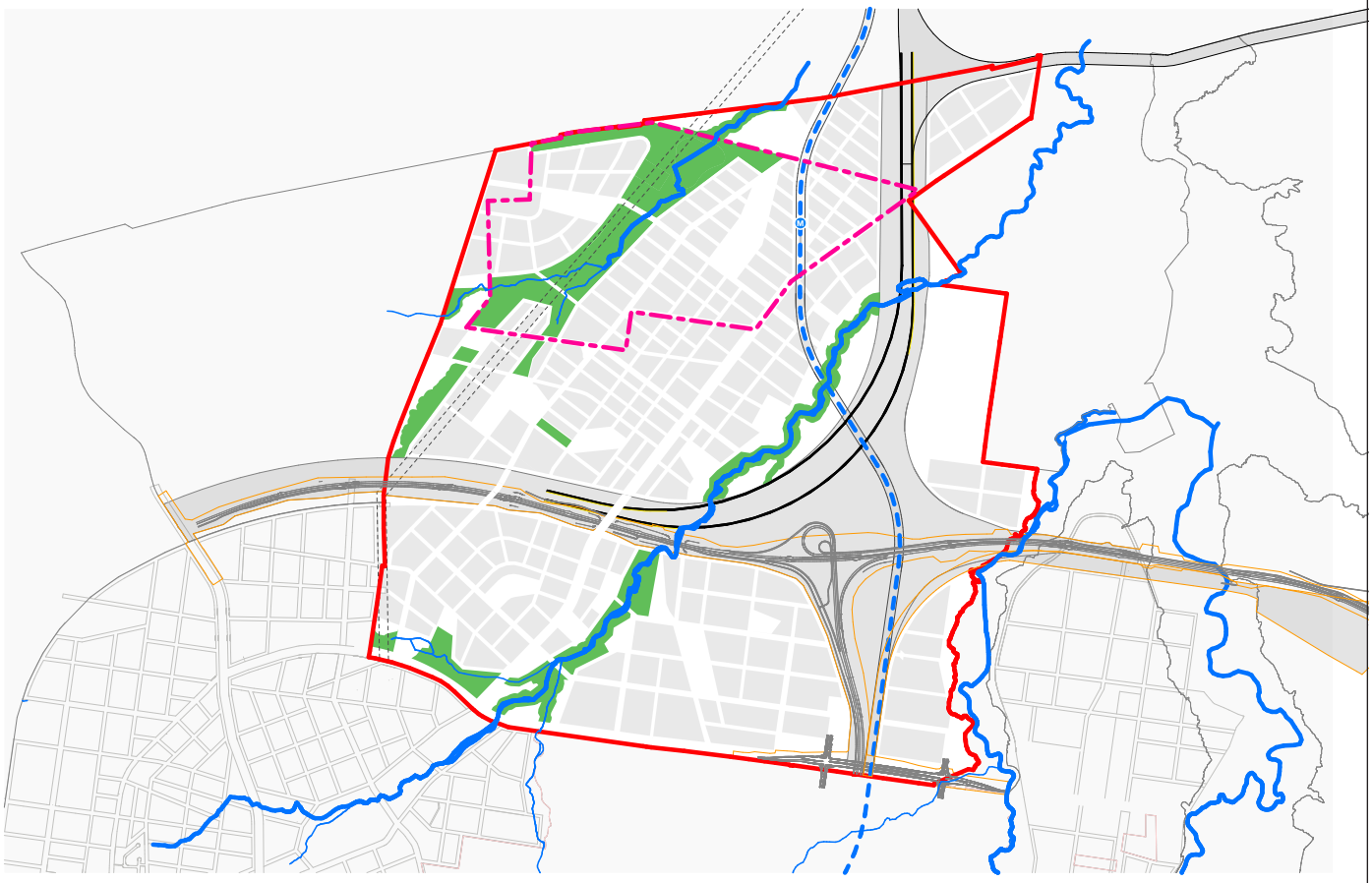
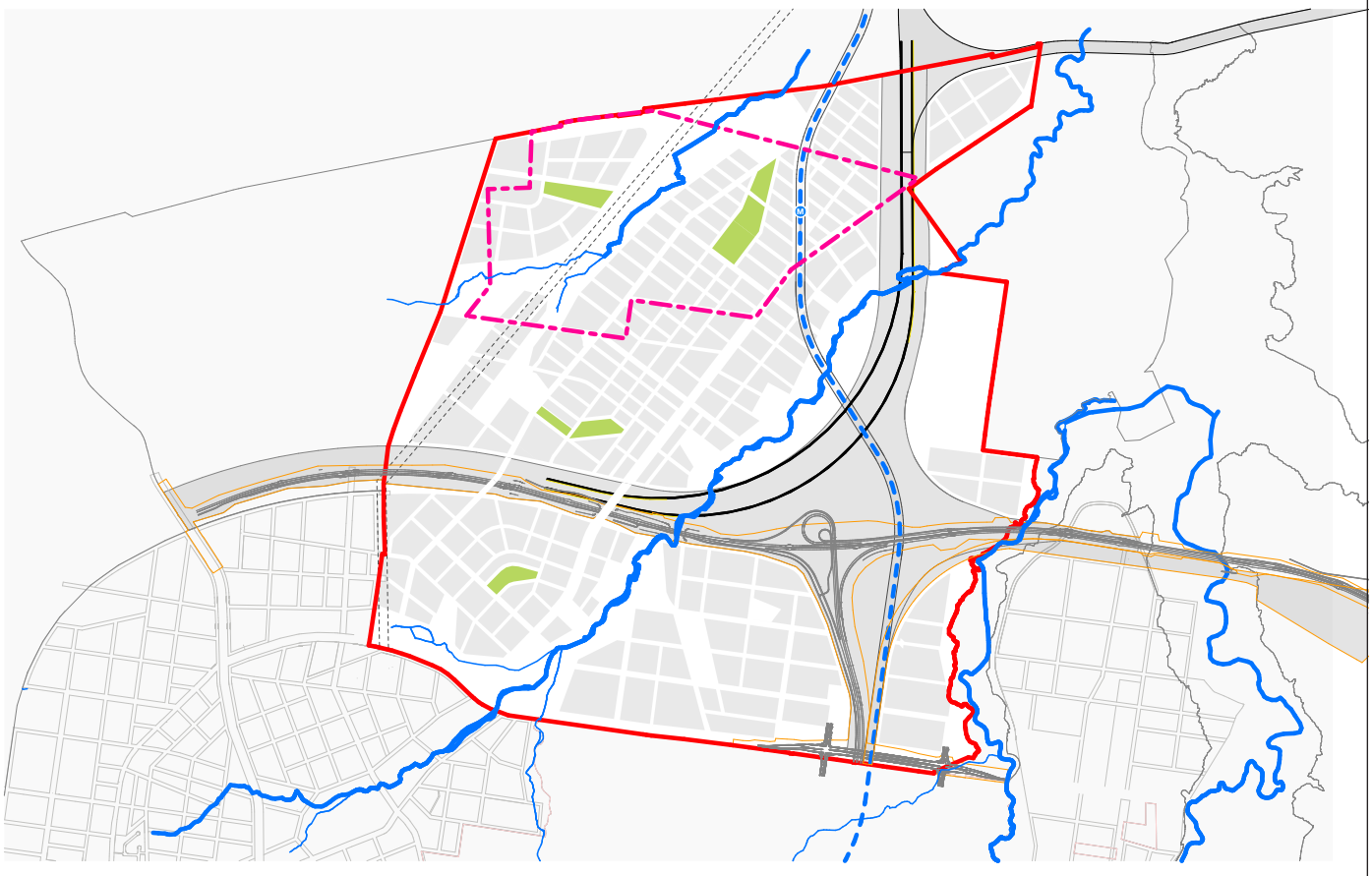
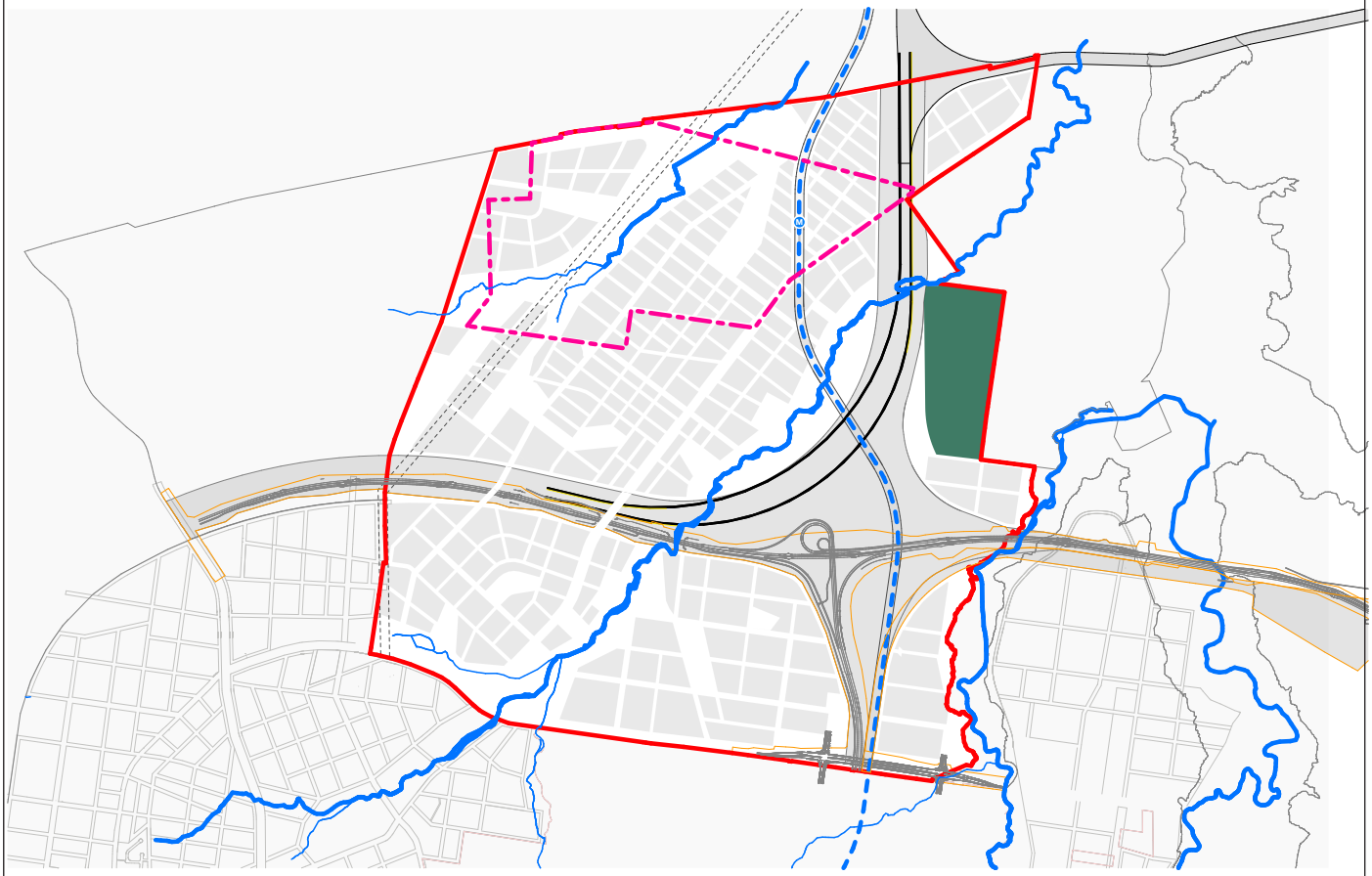


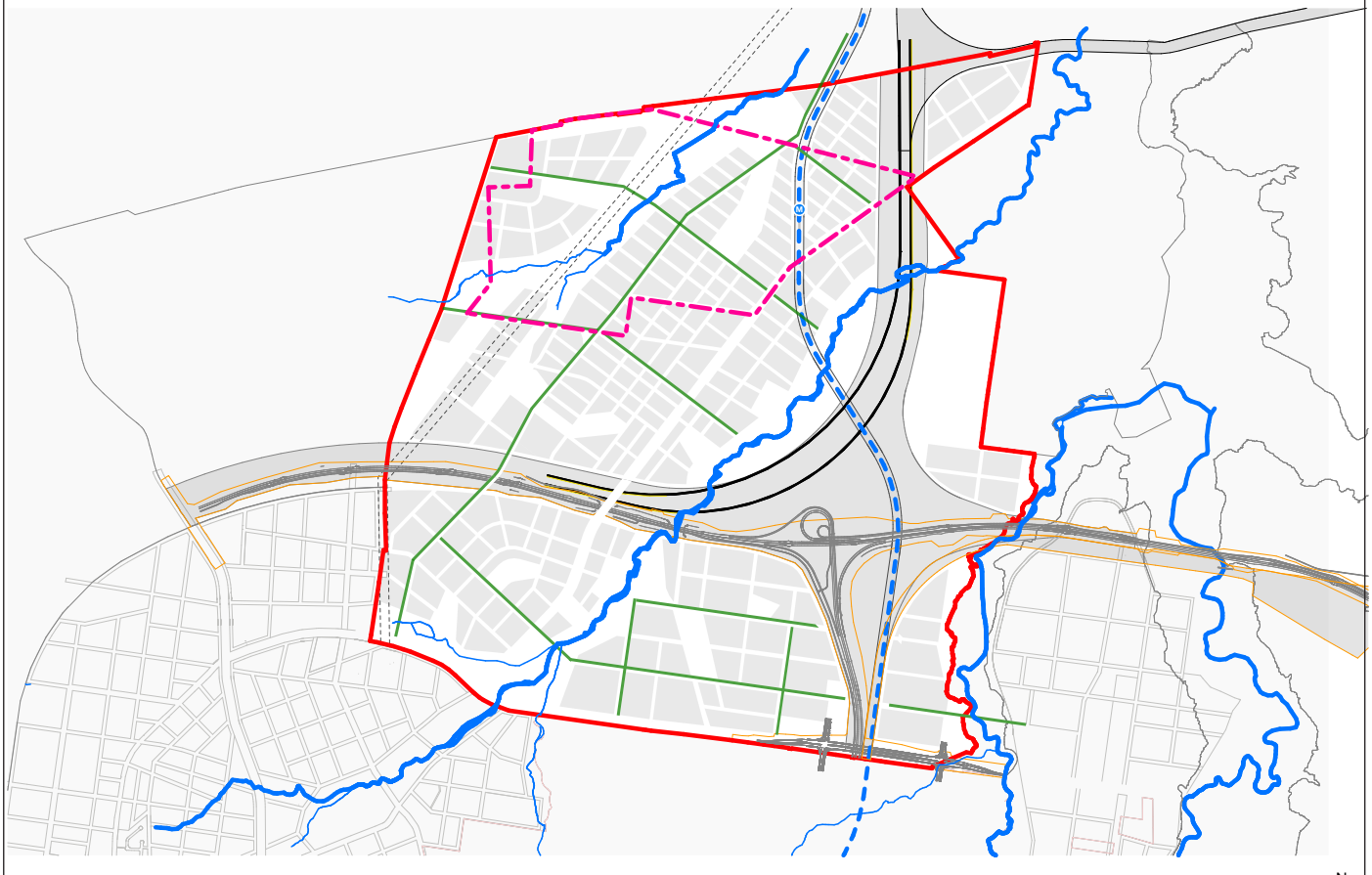
District Open Space



Local Parks

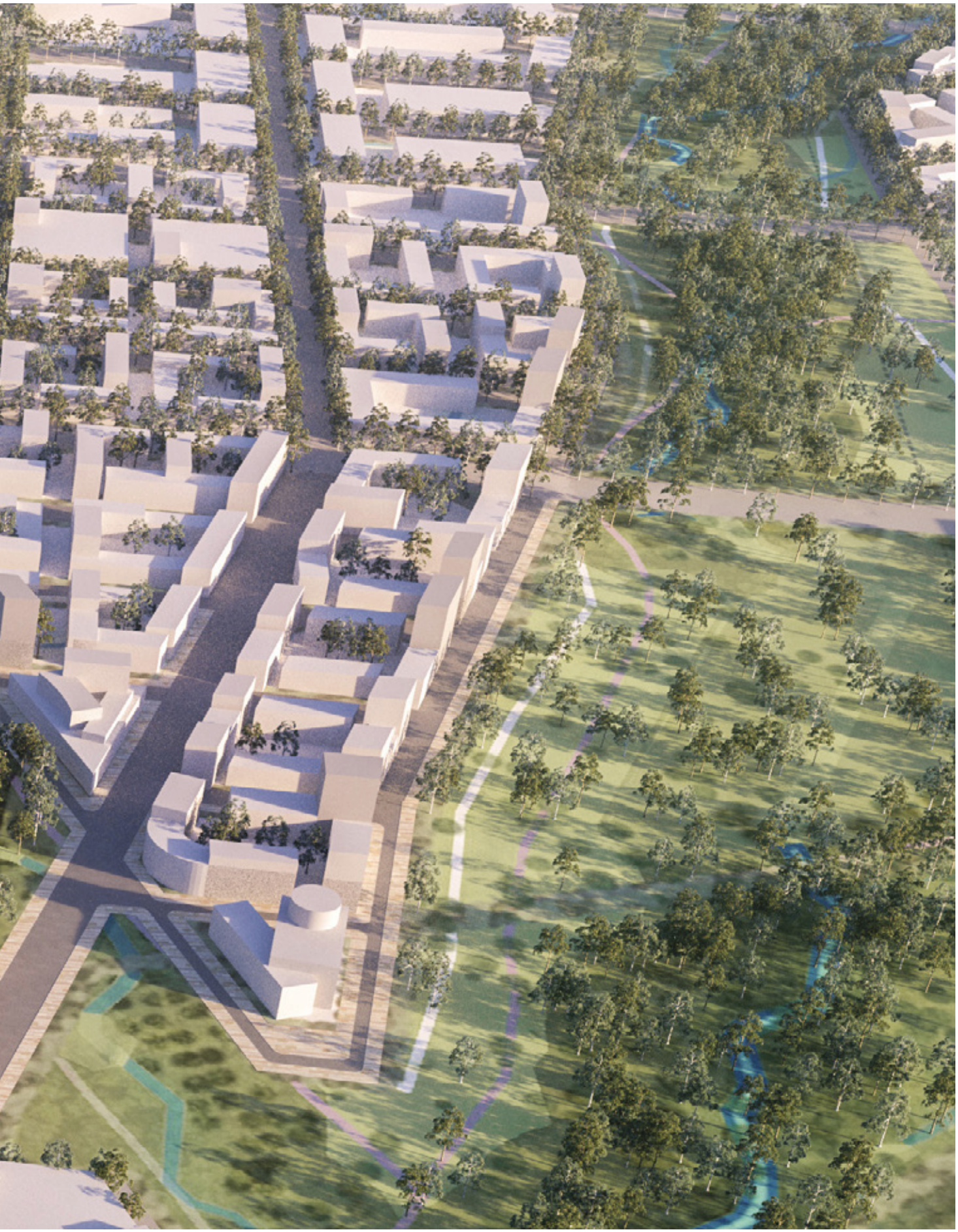


Environmental Protection Area



Streetscape open space

Indicative aerial view looking over the Sydney Science Park from the north



View down valley of District Park in the Sydney Science Park, looking towards the Specialised Centre.

CULTURAL LANDSCAPES AND HERITAGE

Evolving concepts of Connection to Country underpin the Precinct Plan. Specifically, the retention of the creek corridors as generous green spines, the identification of the hilltops for new parks, and green links between these two primary topographic features interpret indigenous patterns of occupation and movement across the territory.

Additionally the alignment of historic Luddenham Road, which cuts across the original land grants, has been recognised as following an Aboriginal track. There is also a significant stand of trees along part of the eastern side of Luddenham Road, that should be retained in any upgrade.

The curved part of Elizabeth Drive's alignment adjoining the Agribusiness Precinct may also have an indigenous basis. The infrastructure upgrade of these roads needs to respect their rich historical associations.

The adjacent map indicates that areas of the highest Aboriginal heritage sensitivity are within the open space, riparian corridors allowing for considerable scope to develop local initiatives such as marked walking trails with potential direct links to Aboriginal culture.

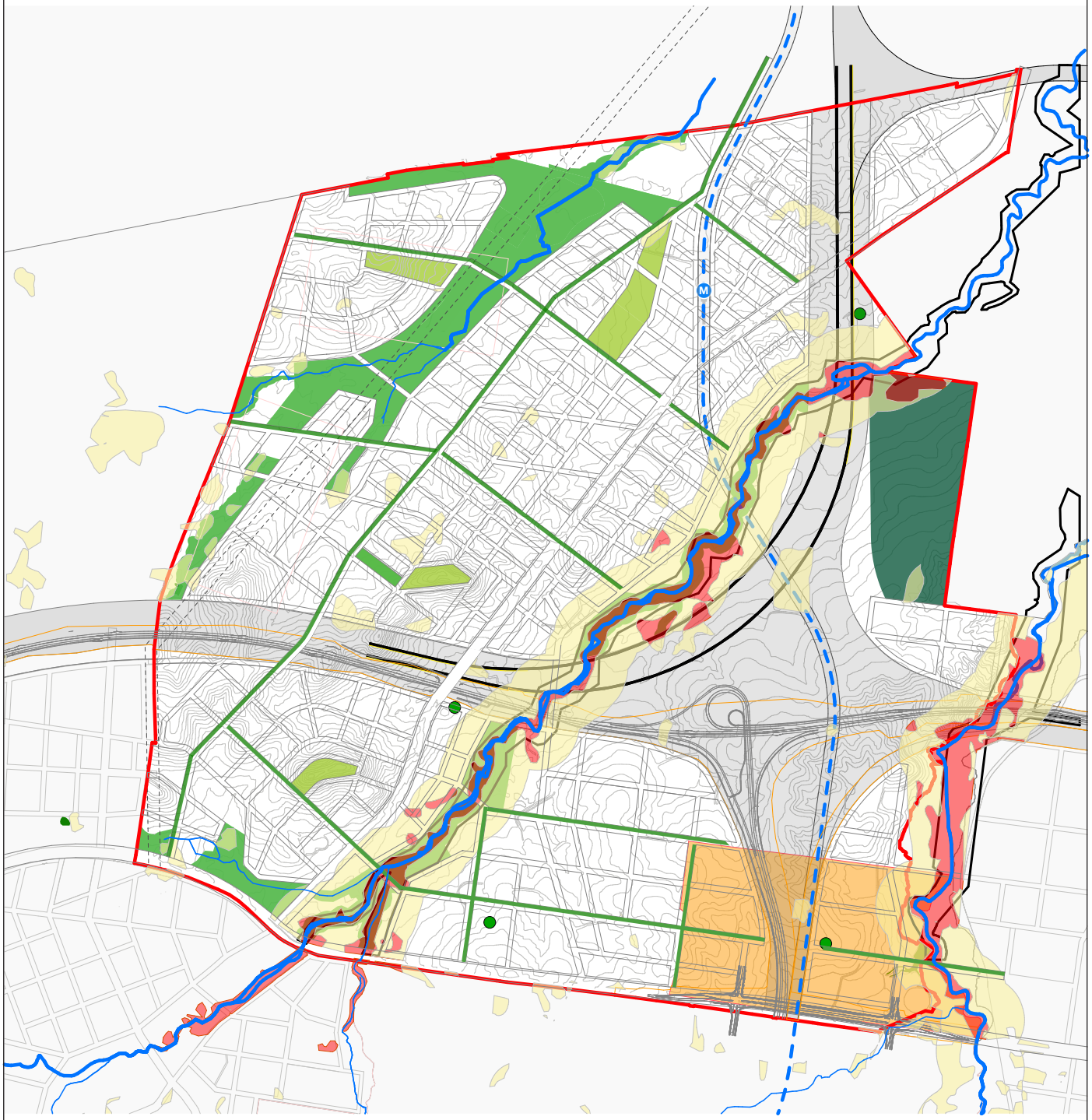
There is also considerable scope to develop cultural and heritage interpretation strategies that are particular to the area. These could detail local level initiatives such as public art, the interpretation of artefacts, and native plantings that also provide opportunity for direct links to Aboriginal culture.

In addition, several Aboriginal artefacts and potential archaeological deposits have been identified and two potential conservation corridors have been mapped. These potential corridors relate to cultural values and show locations where locals and visitors can experience a sense of what the Cumberland Plain was originally like, providing opportunities to connect to Country. These potential corridors have been incorporated into the broader open space network and encompass landforms of ridgeline, spur, hillslope, creek flats, creekline and views. These corridors are indicative only and will be confirmed in the final precinct plans

The former McGarvie Smith Farm, west of Badgerys Creek and north of Elizabeth Drive, is a locally listed heritage item. It is significant for its use as a veterinary research centre for Sydney University since 1936 and contains buildings that demonstrate representative qualities of an Inter-War research facility.

The Northern Gateway also includes four potential heritage places of significance which are to be further investigated, retained and conserved, where possible. Of particular importance is the McMaster Field Station, located north of Elizabeth Drive and west of McGarvie-Smith Farm along Cosgroves Creek. The McMaster Field Station was used for pastoral and agricultural research undertaken by CSIRO from the mid-1930s. This experimental farm worked collaboratively with McGarvie-Smith and cultivated fields, built dams, livestock yards, dwellings, farm buildings and other infrastructure such as sheep dips. As such the land was culturally modified for work specific to this agricultural research. For some time, parts of this item were also used in radio-astronomy research.

The farm was the site for early experiments in "keyline design" of dams and creeks by PA Yeomans. This became Yeomans keyline design technique which was developed into a series of publications, such as *Water for Every Farm: A practical irrigation plan for every Australian property.* The technique underpins the permaculture approach. This property is affected by the infrastructure corridor works.



Aboriginal Heritage Sensitivity High
Aboriginal Heritage Sensitivity Moderate
Proposed Street network
Proposed District Park
Proposed Local Park
CPCP Strategic Conservation Areas
Proposed Streetscape Open Space
Potential conservation corridors
LEP Heritage Item
Unlisted heritage item

Precinct Boundary
Sydney Science Park Boundary
Cadastre/Lot Boundary
Metro Station
Metro centreline
Outer Sydney Orbital/Freight Rail
M12 Corridor

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OPEN SPACE SCENIC VIEWS

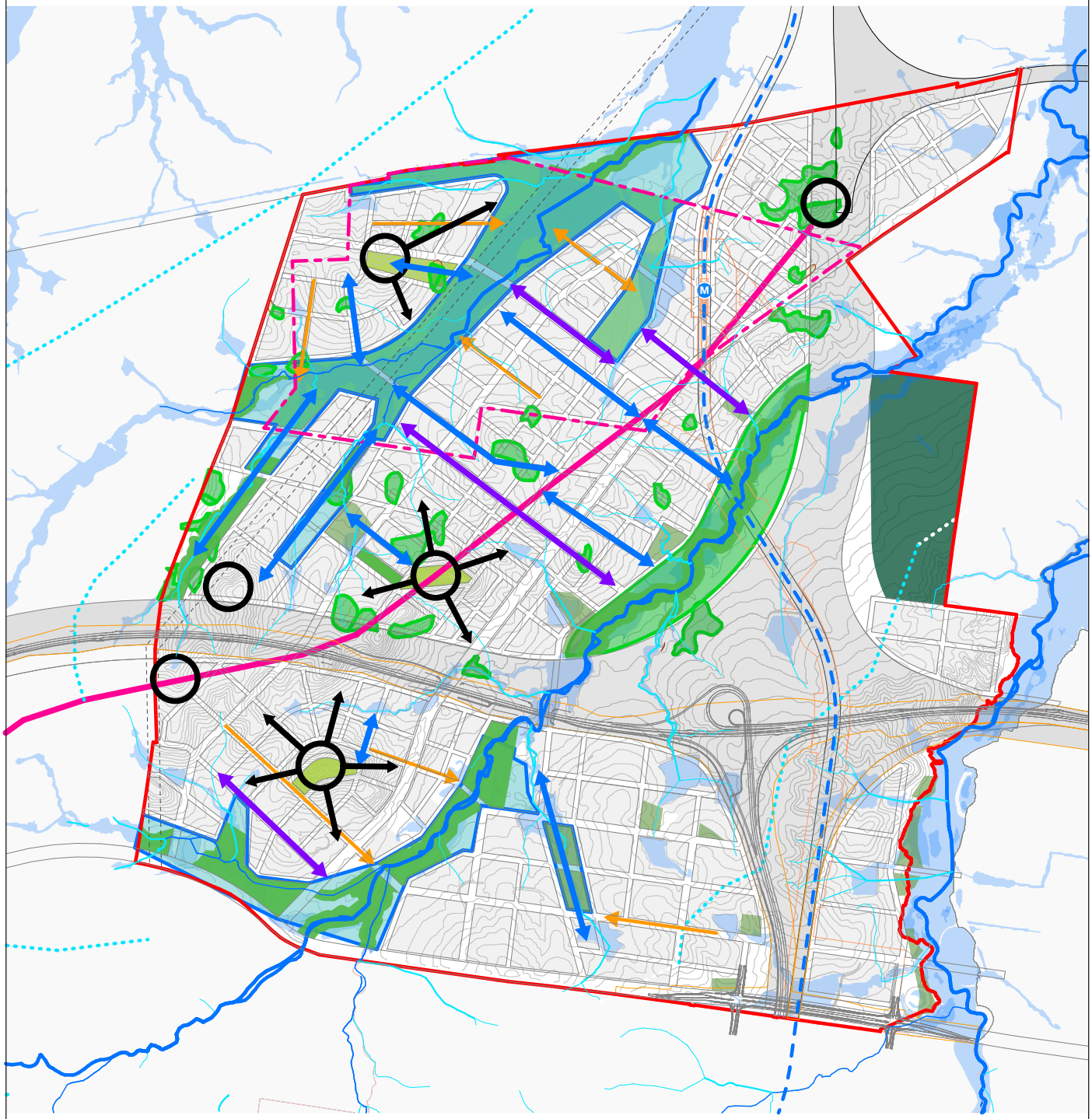
The street and park layout have been carefully worked to create a range of memorable and high-quality spaces that connect the urban form to its cultural setting and past.

The creek corridors, which extend into adjoining precincts, will become a generous Green Grid that traverse and connect the various areas around the aerotropolis.

Edged by local streets and connected under the new road infrastructure, they will become favoured walking and cycling routes. The creek netwrok will extend deep into the urban areas. These creeks have historically been dammed for farm use, however the stormwater and infiltration functions will be adapted and renewed to serve the contemporary needs of the Northern Gateway precinct.

Distinct conical hills have been identified for Local Parks. These parks will also be edged by local streets, and will allow views across Country, to the landscape, south to the activity and open expanses of the Airport, and westward to the profile of the nearby Blue Mountains. As their steep grades make them unsuitable for the type of employment uses allowed for under the zoning, their use as Local Parks will add to the parkland principles of the Aerotropolis.

Some of the identified hilltops maintain green connections to the creek corridors. This allow opportunities for broader walking and cycling network across the territory and further opportunities to connect to Country.


Ridges - currently predominately open
Creek to ridgetop connection through open space (visual and physical)
Creek to creek connection through open space
Views from streets towards the creeks and broader landscape (street grid oriented to terminate on a view towards creeks and ridge line)
Hilltops, ridgetops, and local high points
Views from hillptop parks
Creek riparian corridors with associated vegetation framing long views
Existing remnant vegetation - framing long views
Precinct Boundary
Sydney Science Park Boundary
Cadastre/Lot Boundary
Metro Station
Metro centreline
Outer Sydney Orbital/Freight Rail
M12 Corridor
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DISTRICT PARK SECTION

Flood risk:

extent of PMF varies

Low flood risk

Medium flood risk

Program & Activation

Park street
active edge

raingarden

Recreation & leisure - both
structured and non structured

_Sportfields
_Playspaces
_Picnic & BBQ areas
_Dogparks
_Community gardens
_Event space / Showground
_Parkland and community amentities
_Shared path

Low impact
non structured recreation

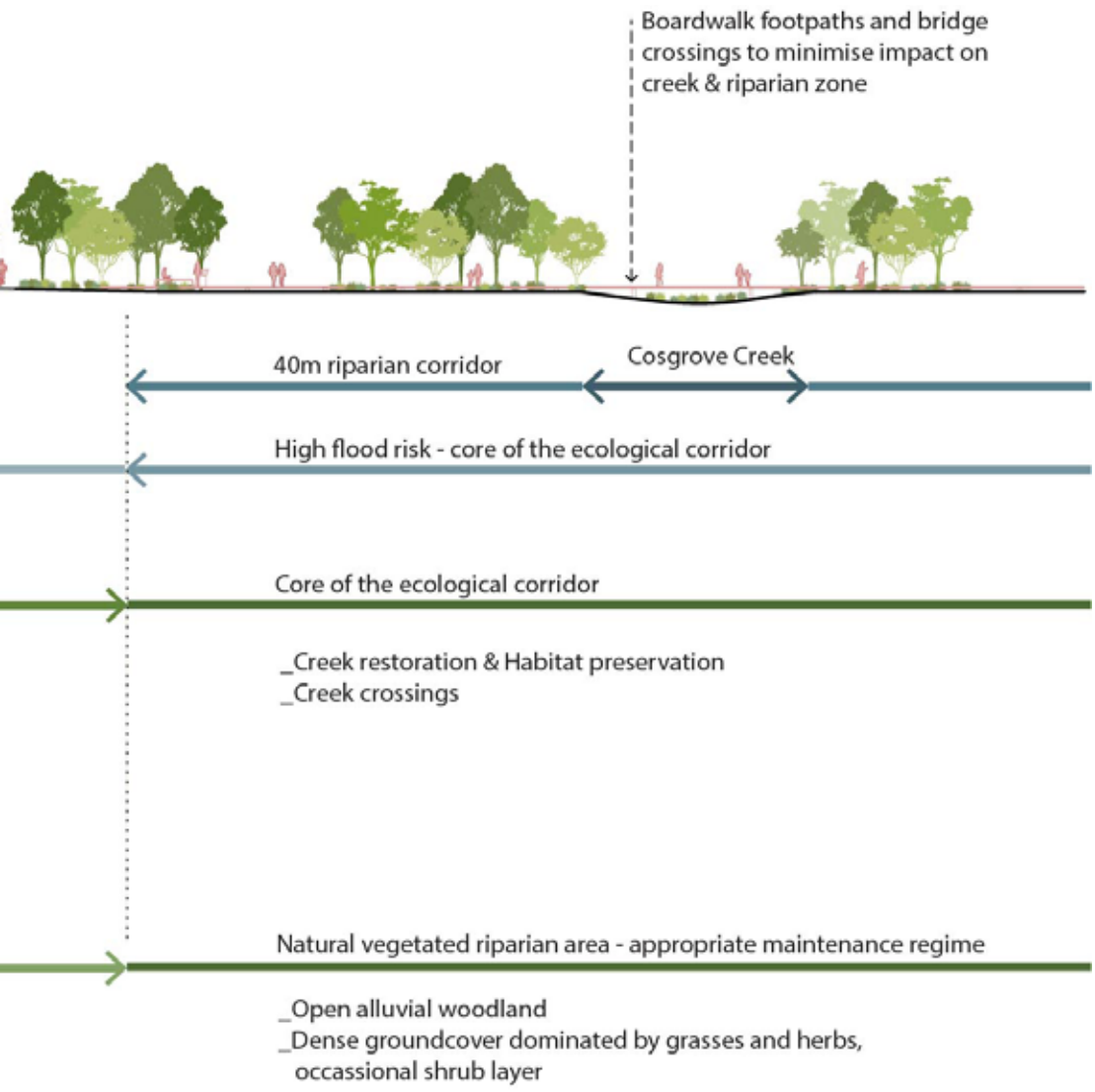
_Boardwalk trails
_Viewing platforms

Landscape Typology &
Maintenance regime

Streetscape

Broader parkland landscape with areas of more intensive maintenance

_Groups of trees with grassland understory
_Clear sight lines
_Areas of mown lawn for leisure & recreation
_Strip of mown grass along pathways



Cosgroves Creek District Park Typical Section

SPECIALISED CENTRE

The future Specialised Centre is located in the Sydney Science Park, its importance now strengthened by the inclusion of a metro station. This area will become the magnet for public transport provision, jobs and a variety of activities to serve the wider Northern Gateway Precinct.

The urban plan has a connective grid of streets that run off the historic alignment of Luddenham Road to the east. A parallel sister street one and a half kilometres to the west provides local access to the wider precinct, and will become an important bus corridor. Between these two organising streets, and grid of regular streets and blocks is traversed by a major urban park that follows the line of an existing creek as it runs northward through the precinct. The treatment and celebration of water will be a major feature of this generous urban parkland.

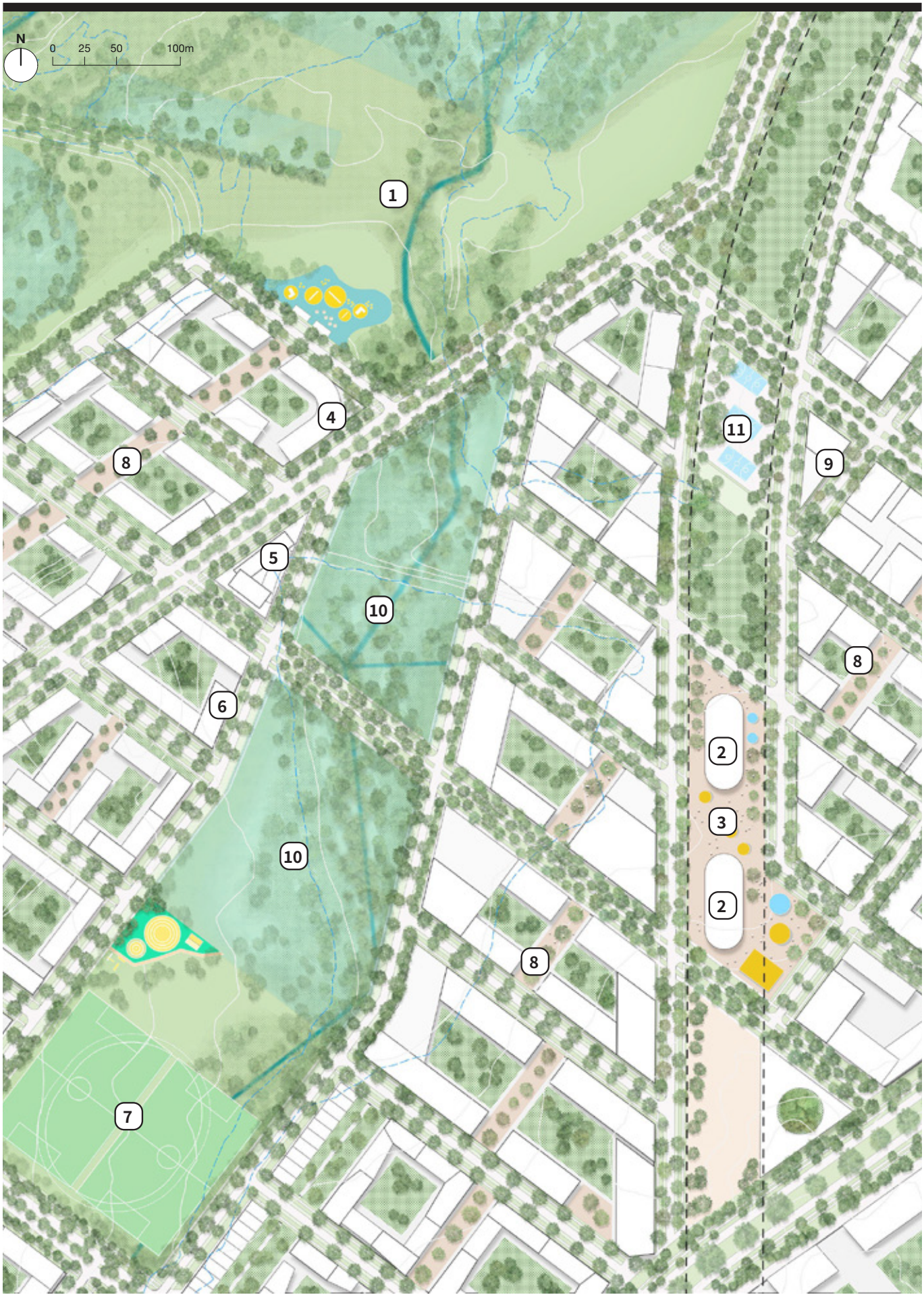
In time the area will develop as a compact medium density mixed use precinct, with the higher building forms lining the parklands' edge streets – the opportunity for new models of density combined with amenity.

Annotations

1. District park
2. Proposed Metro Station
3. Main square
4. Cultural facility
5. Co-located library and district community facility
6. District Indoor courts
7. Playing Fields
8. Mid block pedestrian and cycle links
9. District Local Community place
10. Potential for Sydney Water basins to be incorporated into open space as a wetland park. Subject to further investigation with Sydney Water.
11. Potential location for outdoor courts subject to Metro approval.

Artist impression of the new Luddenham Metro station in the specialised centre. Source Sydney Metro

The Precinct Plan



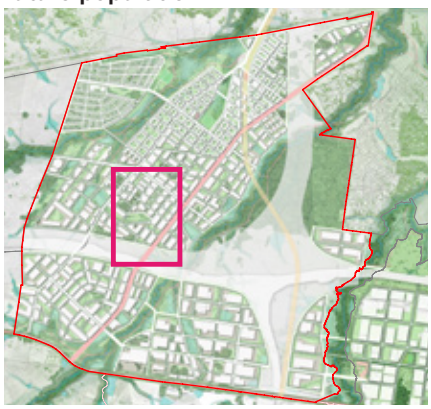
View of the central riparian park within the Mixed Use Specialised Centre

LOCAL CENTRE WITH LOCAL PARK

The extensive Northern Gateway Precinct will need multiple local centres in addition to its Specialised Centre around the metro station. These are distributed across the terrain, in relationship to the new streets and parklands, the proposed bus routes and cycleways. The intention is to decrease car dependence and use by providing more local choices for shopping and a range of community and commercial services.

This centre is located along the sister street to Luddenham Road that traverses the precinct, adjacent the place where the distinctive hilltop District Park connects to the creek corridor park system. A number of bus routes pass nearby, while the parklands and streets incorporate cycleways. The generous street system has walkable blocks in well-planted and shaded streets – creating an improved environment for the pedestrian.

The parklands are destinations in their own right and will offer a range of recreational opportunities to the future population.

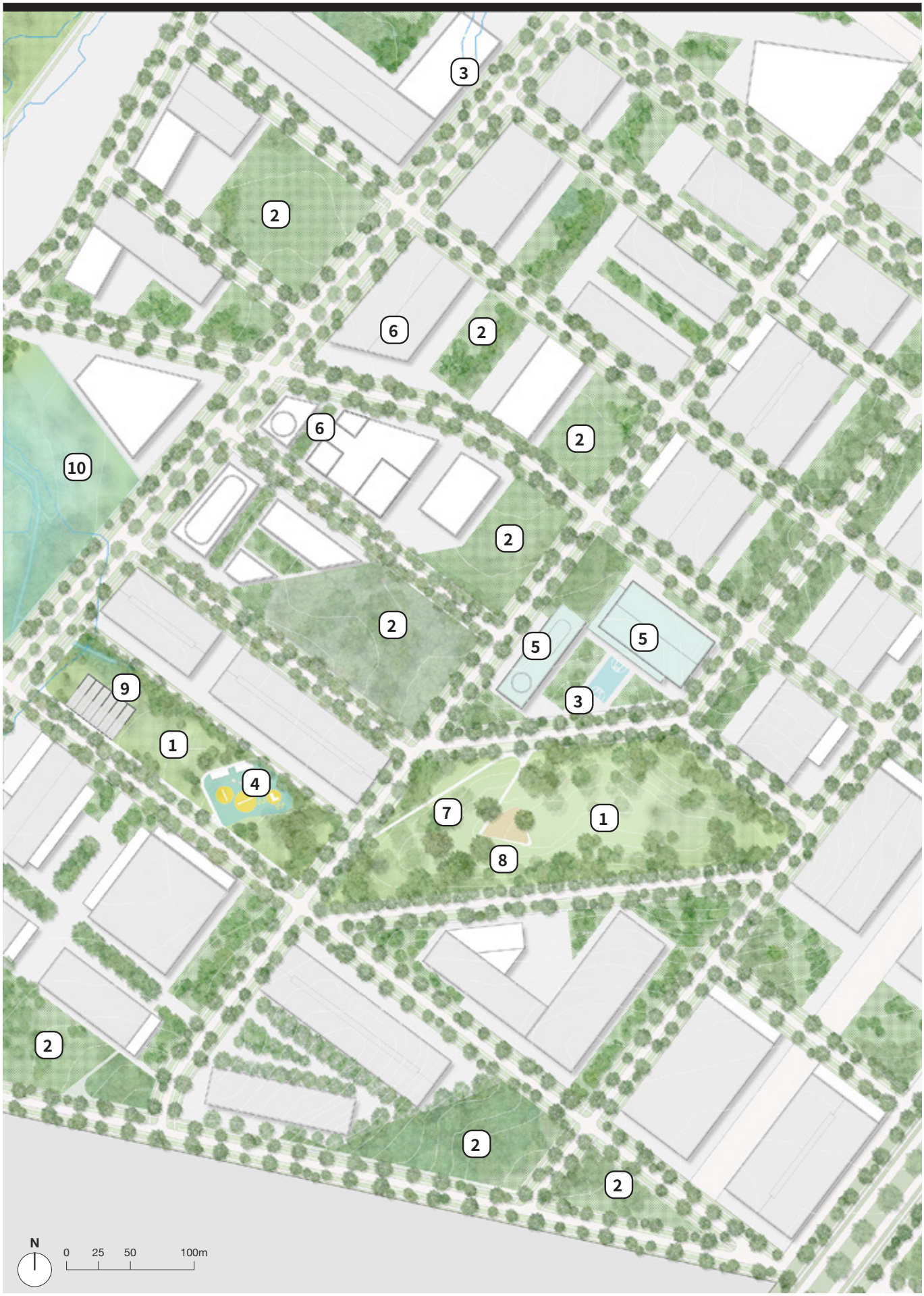


Annotations

1. Local Park. Hill top, existing vegetation and Threatened Ecological Communities (TEC) incorporated into open space
2. Existing TEC to be incorporated into private open space as part of the open space requirements within lots.
3. Potential location of outdoor courts
4. Playground and associated facilities
5. Potential Secondary School
6. Local centre (non-residential)
7. Walking trail
8. Lookout
9. Sporting facilities (cricket nets)
10. Open space incorporating Sydney Water Basins

James St Market Brisbane - Small scale local centres

Glenmore Ridge - JMD Design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View from District park in the enterprise zone, looking north towards the Specialised Centre.

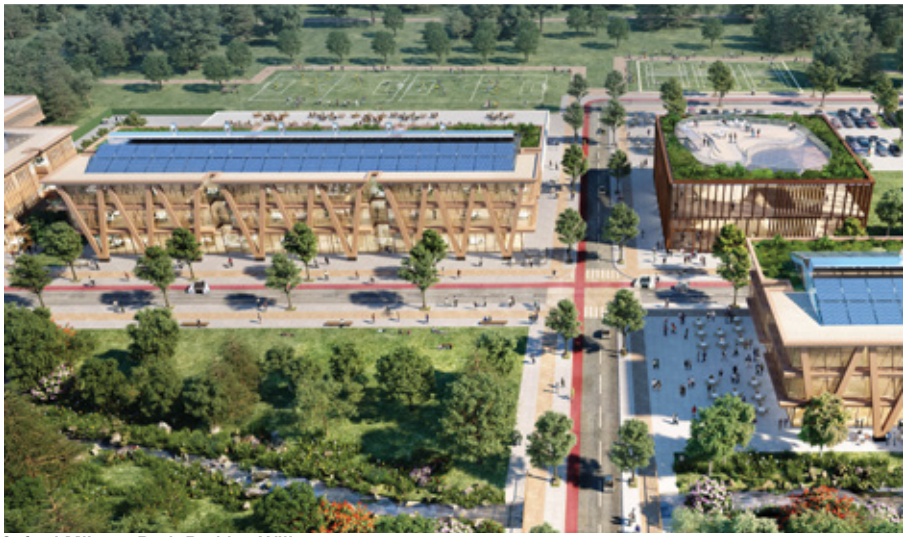
LARGER SCALE ENTERPRISE AREA WITH RIPARIAN PARK

The areas immediately to the north of Elizabeth Drive will have best access to the airport. These larger blocks are likely in the short to medium term to attract major distribution centres in large format buildings, as has occurred elsewhere across Western Sydney. As these uses are prone to give way over time to more land and job intensive uses, it is nonetheless critical to create a broad and connected primary street system, that over time can be augmented by further public connections.

Currently the major creek systems across the area have been harnessed with agricultural dams. These dams are likely to be heavily modified or replaced by a chain of ponds or other innovative water management and treatment systems, all set within generous new parklands that are key to the Western Parkland City vision. Rather than watercourses being left over spaces tucked away behind sheds as is business as usual in many industrial estates, here in the Northern Gateway the parklands will be bounded by public streets, with ecological, landscape and recreational benefits available to all.

Annotations

1. Open space incorporating Sydney Water Basins and riparian lands
2. Existing woodland to be incorporated into private open space within lots. This can make up the required percentage of open space.
3. Potential playground and associated facilities
4. District indoor sports centre
5. Local centre with mix of uses apart from residential.



Oxford Milton - Park Perkins Will

Swiss Research Headquarters - Hadi Teherani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PLANTING STRATEGY

Successful delivery of the landscape and planting vision is paramount to the realisation of the Western Parkland City.

Design Intent

Existing vegetation on site is a remnant of the broader Cumberland Plain vegetation that occupied the region pre-European settlement.

The overarching planting strategy aspiration is to preserve, restore and build upon the Cumberland Plain Woodland and grassland character, that is typical for this place.

The landscape planting strategy for the project will draw upon existing remnant vegetation communities, their pattern and characteristics.

The existing landscape character of the site, its topography, its hydrology and its geomorphology will guide the proposed planting strategy.

Remnant vegetation communities inform the planting palette

Planting palette for the riparian zones of the creek corridors and the associated floodplains will be informed by planting found within the Alluvial Woodland communities of Wianamatta-South Creek, Thompsons Creek and Badgerys Creek corridors.

Following vegetation communities are currently present within the alluvial zones - River-flat Eucalypt Forest, Swamp Oak Floodplain Forest.

As the floodplains transition to the hillside, the alluvial riparian woodland gently transition to grassy open woodland and grassland (Shale Plains Woodland) and grassy open forest (Shale Transition Forest) and Castlereagh Ironbark Forest; remnants of these vegetation types are fount within Badgerys Creek precinct. Closer to the ridgelines, Cumberland Plain Woodland is the predominant remnant planting community.

The vegetation character of scattered trees with open canopy, ground cover dominated by grasses and herbs, sometimes with layers of shrubs and/ or small trees - this will inform the planting palette for the precinct.

Protecting, enhancing and restoring existing vegetation communities

Existing native vegetation has been incorporated in the open space framework where possible and will be protected, enhanced and further reinforced through the connected landscape system.

Within the framework, native Cumberland Plain Woodland and grassland vegetation community will be restored.

Riparian corridors of tributary creeks within the open space will be rehabilitated and revegetated with appropriate riparian species.

Diversity and planting quantity

Maximising planting palette diversity is a key landscape outcome for the realisation of the Western Parkland City.

Planting diversity and quantity within alluvial zones of the key creeks will be maximised to restore the health of the creeks, increase biodiversity and strengthen resilience of the Blue-Green system.

Streetscape

Streetscape is an integral component of the overall open space framework and significantly contributes to the biodiversity and Blue-Green system within the urban fabric.

The aspiration is to create a rich, diverse and multi layered streetscape planting, that will draw upon the native Cumberland Plain species, their pattern and characteristics.

The planting palette will be a mix of native and non native species, that are appropriate for the climate of Western Sydney and urban streetscape conditions and contribute to the planting palette richness.

Planting within wildlife buffer

Wildlife strike is a significant risk. Mitigations to be implemented include selection of plant species to minimise wildlife attraction. Refer to

the Western Sydney Aerotropolis Draft Wildlife Management Assessment Report prepared by Avisure.

Large and tall trees - the key species of Cumberland Plain - set the structure. The spacing and species selection of the street trees planting is inspired by the Cumberland Plain scattered pattern and therefore it is proposed to be alternating, intentionally planted in a non-boulevard manner.

The smaller trees, that form the lower canopy layer, provide the continuous shade for pedestrians. These trees will be a combination of native and exotic species, that are appropriate for the climate and conditions of Western Sydney.

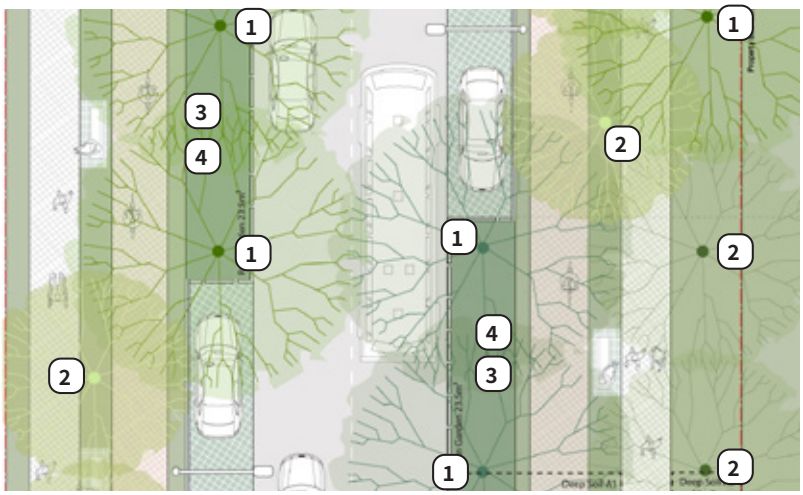
The rich and diverse groundcover planting is built upon native grass species, herbs and low shrub layer. This is complemented by non native species to provide all year interest. Native trees, shrubs and plants from the riparian corridors form the core planting palette for the raingardens and bioretentions.

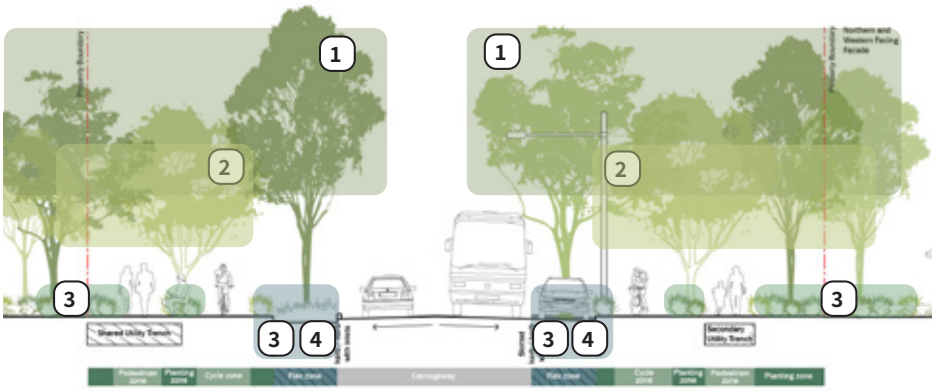
Sustainability and Resilience

Planting strategy is developed according to water sensitive urban design (WSUD), passive watering and species with low water requirements are proposed.

Annotations

1. Large and tall trees set the structure
2. Smaller trees form the lower canopy layer and provide continuous shade for pedestrians.
3. Ground cover planting rich in diversity integral part of Blue -Green system
4. Water Sensitive Urban Design embedded in the street profile






Spotted Gum


Rough-barked apple


Forest red gum


Textured foliage (Casuriana)


Textured bark (Paperback)


Seasonal interest (Narrow-leaved paperbark


Grasses (Kangaroo Grass)


Rushes (Marsh club rush)

TRANSPORT INFRASTRUCTURE FRAMEWORK

Movement is fundamental to the economy of the Aerotropolis and facilitating its intended jobs growth. An integrated network across all mode types is to be provided, with a focus on sustainable transport options.

Campbell Section 5, Canberra - Hill Thalis with Jane Irwin Landscape Architecture + Cardno

Constitution Avenue, Canberra - Hill Thalis with Jane Irwin Landscape Architecture and SMEC

MOVEMENT AND PLACE

with Aecom

It is important to note that there are multiple criteria; functional, spatial and environmental, that apply to all streets in the Aerotropolis.

Movement and place is an additional criteria, however it does not take precedence over other considerations.

The objective of Movement and Place is to achieve roads and streets that:

- Contribute to the network of public space within a location, where people can live healthy, productive lives, meet each other, interact, and go about their daily activities.
- Are enhanced by transport and have the appropriate space allocation to move people and goods safely and efficiently and connect places together. Balancing movement and place recognises that trade-offs may be required to achieve a best fit for the objectives

Classification into four street environments, as identified by the GANSW Movement and Place Strategy, provides an understanding of the function and form of a road corridor, where movement and place interact.

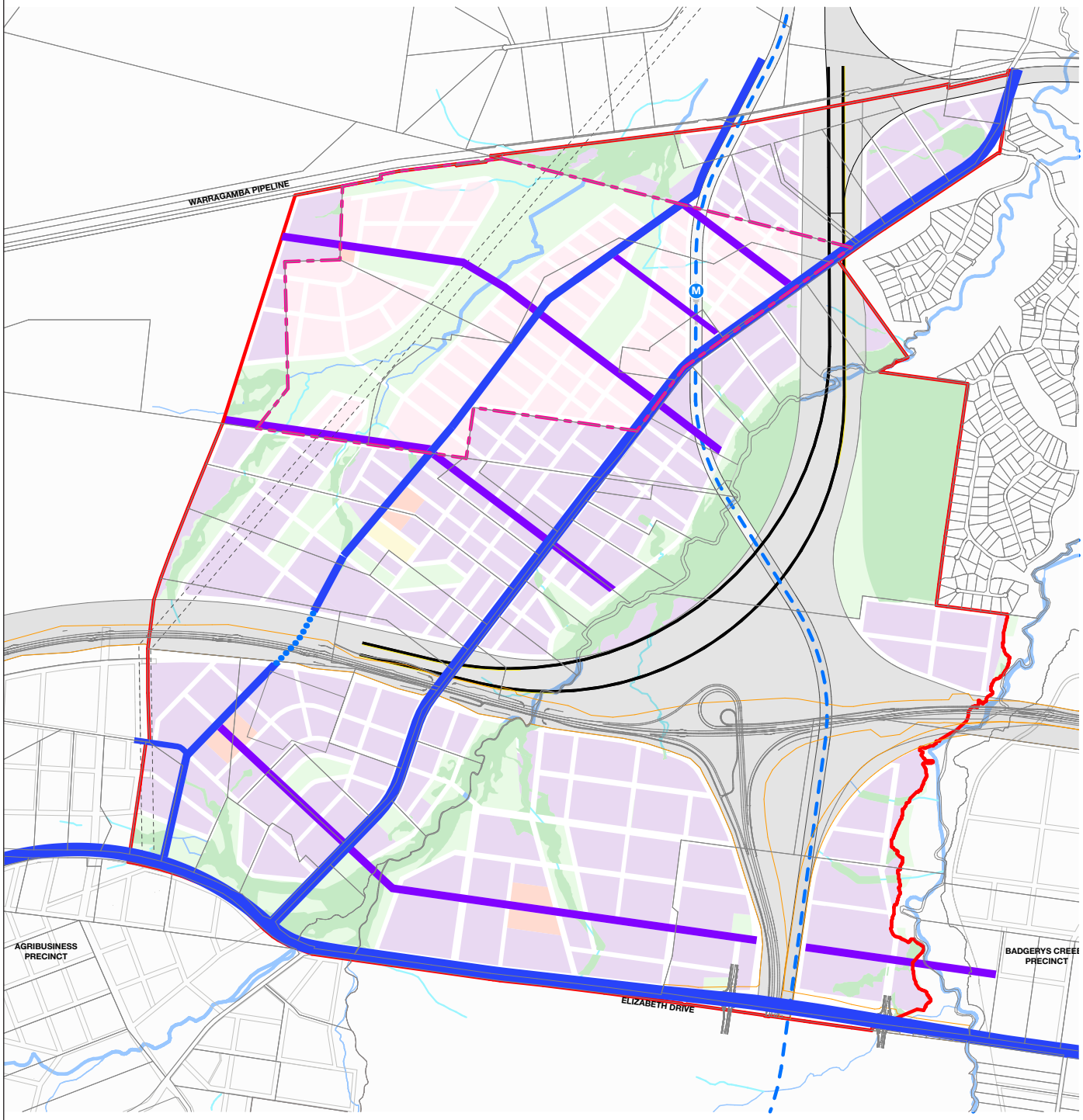
An assessment and definition of the roads and streets within the precincts have been undertaken using the Movement and Place framework, based on the proposed transport plan and land use plan for the Aerotropolis Core, Northern Gateway and Agribusiness precincts.

The Government Architect's Practitioner's Guide to Movement and Place has been referenced for this assessment.

For this stage of the project, an initial classification of the roads and streets within the precincts has been undertaken. This is likely to evolve as key issues and opportunities present for further investigation during the subsequent master planning stages or in the preparation and assessment of detailed development proposals.

The assessment focused on the classification of the Main Roads and Main Streets and Local Streets within WSA. Motorways sit within Main Roads, however as they do not have activated land use adjacent to them, they have been denoted by grey lines for the purpose of this analysis. In addition, Local Streets are not highlighted on the maps as these make up all the streets not otherwise marked.

- Civic Space has been identified in the Specialised Centre, around the metro station.
- Local Streets provide for local access both outside of centres and within centres.
- Main Streets traverse through areas with greater land use intensity, such as the metro station and mixed use areas.
- Main Roads provide for the strategic sub-regional, regional or metropolitan movement of people and freight within, and between, the precincts, and major land uses. These are formed of 40-metre-wide sub-arterial roads, 60-metre-wide arterial roads and motorways.
- Notwithstanding the above classifications, it is envisaged that all roads and streets within the Northern Gateway Precinct will be well planted with connected shaded footpaths and a web of cycleways.



- Main Street *
- Main Road *
- Indicative Street Network
- Blue & Green Infrastructure Network
- Specialised Centre with mixed use Note any changes to approved residential yield subject to masterplanning process
- Centre (non-residential)
- Education (Location indicative)
- Enterprise
- Precinct Boundary
- Sydney Science Park Boundary
- Cadastre/Lot Boundary
- Metro Station
- Metro centreline
- Outer Sydney Orbital/Freight Rail
- M12 Corridor

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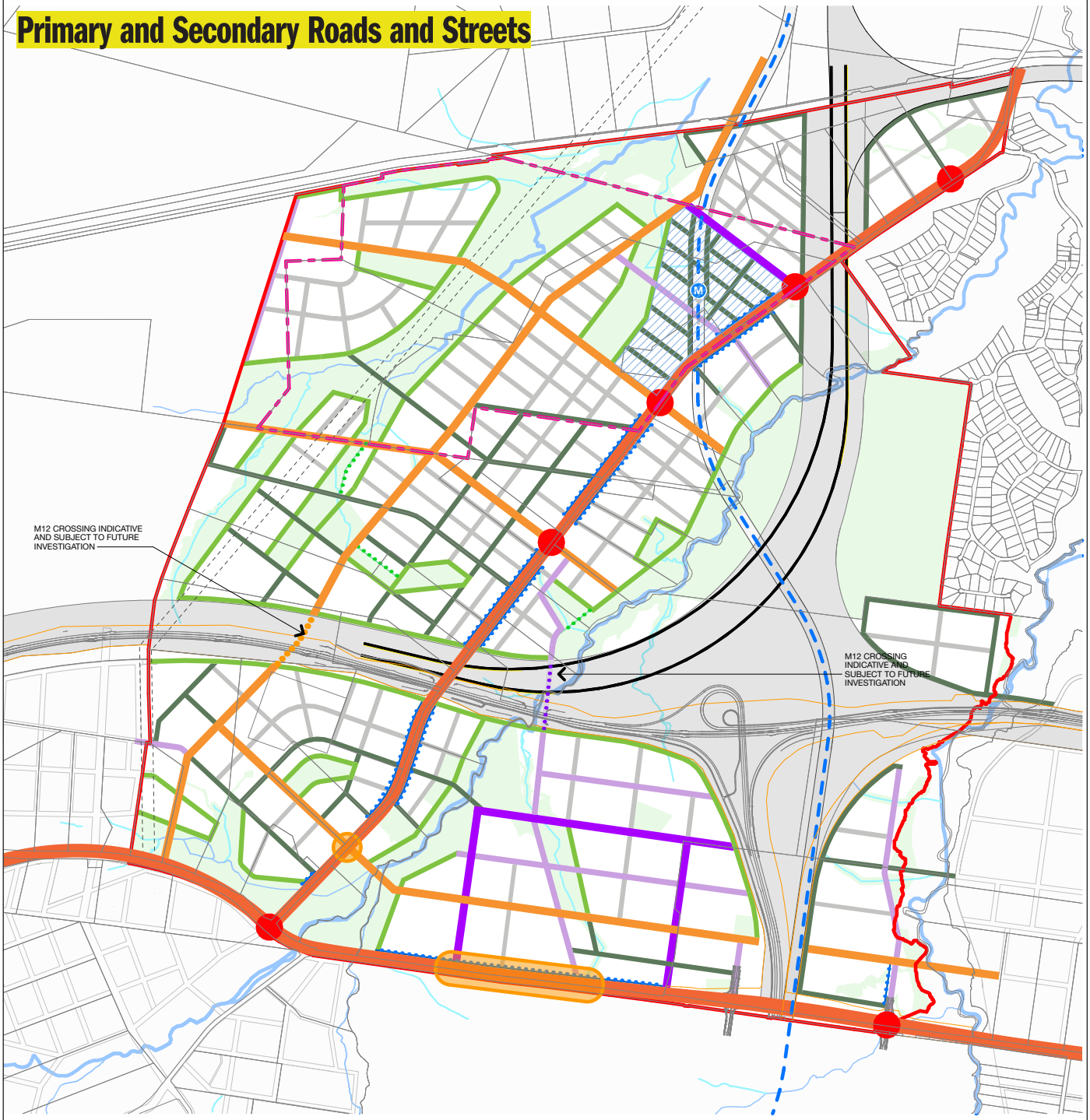
Primary and Secondary Roads and Streets



- Primary Arterial Road 60m
- Sub-Arterial Road 40m
- Local Collector - Green Blvd 40m
- Local Collector 30m
- Local Collector 25m
- Park Edge Street 25m
- Service Road 9m
- Park Edge Active Park 7m
- Local Road
- M12 crossing indicative and subject to future investigation
- Blue & Green Infrastructure Network
- Planned signalised intersection
- Potential signalised intersection subject to future investigation

Primary Roads and Streets
All roads identified on this plan with colour are Primary Roads and Streets and are in a location integral to the urban form and to the connectivity of the structure plan.

Secondary Roads and Streets
All roads identified on this plan (not coloured) are Secondary Roads and Streets . These are roads or streets at a more local scale that should be designed to meet the principles of the Planning Report and connect into the Primary Roads and Streets. Confirmation of location, type and connectivity at application stage.

Streets within hatch area cannot be altered without concurrence from Sydney Metro

- Precinct Boundary
- Sydney Science Park Boundary
- Cadastre/Lot Boundary
- Metro Station
- Metro centreline
- Outer Sydney Orbital/Freight Rail
- M12 Corridor

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Major Arterial and Sub Arterial Roads

- Arterial 60m
- Sub-Arterial Road 40m
- M12 crossing indicative and subject to future investigation
- Indicative development blocks
- Blue & Green Infrastructure Network
- Planned signalised intersection
- Potential signalised intersection subject to future investigation

- Precinct Boundary
- Sydney Science Park Boundary
- Cadastre/Lot Boundary
- Metro Station
- Metro centreline
- Outer Sydney Orbital/Freight Rail
- M12 Corridor

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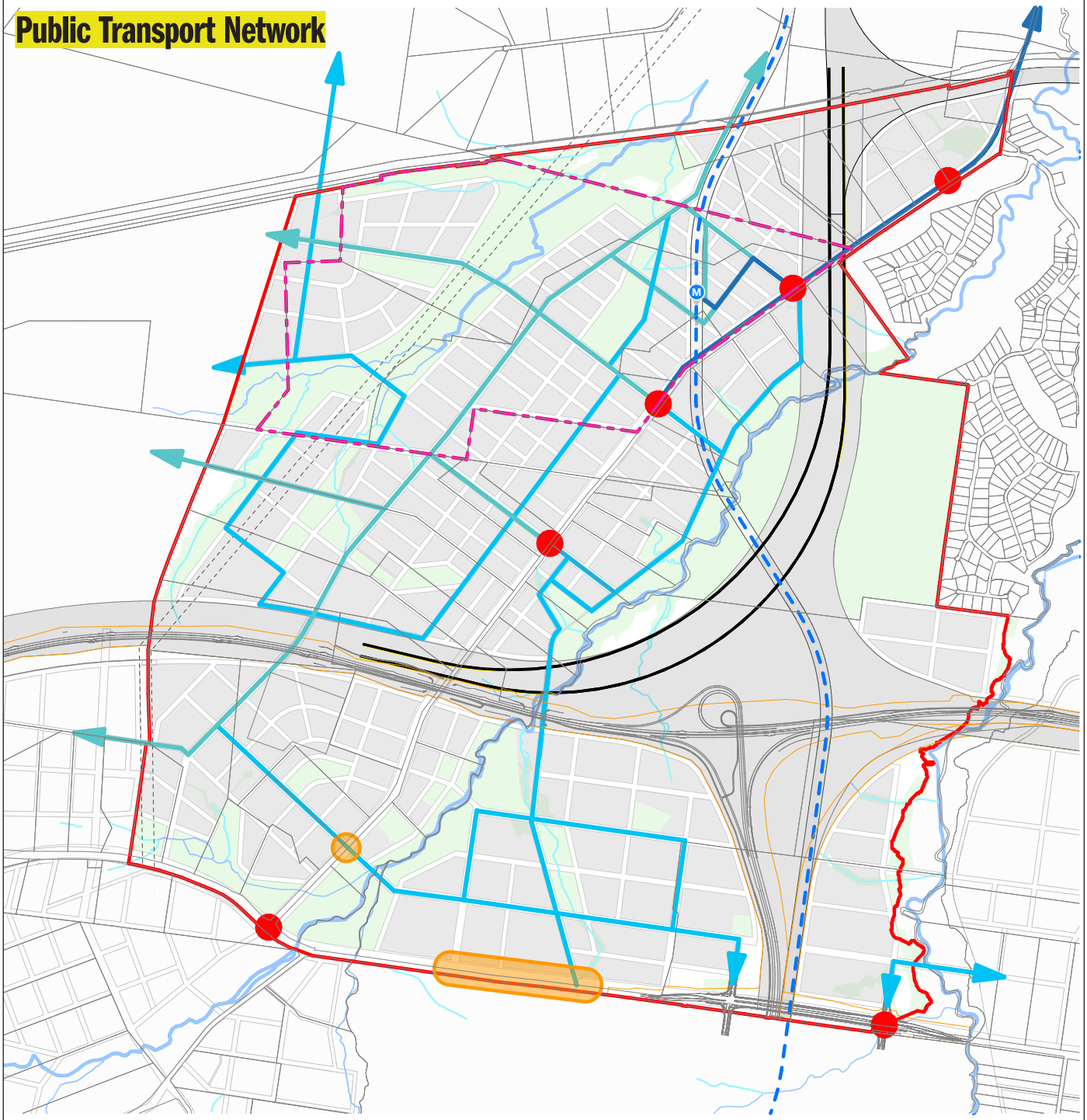
Public Transport Network



- Metro Line
- Rapid Bus Route (2026)
- Rapid Bus Route Urban Design Team Proposed
- Frequent Bus Route
- Local Bus capable roads
- Planned signalised intersection
- Potential signalised intersection subject to future investigation
- Precinct Boundary
- Sydney Science Park Boundary
- Cadastre/Lot Boundary
- Metro Station
- Metro centreline
- Outer Sydney Orbital/Freight Rail
- M12 Corridor

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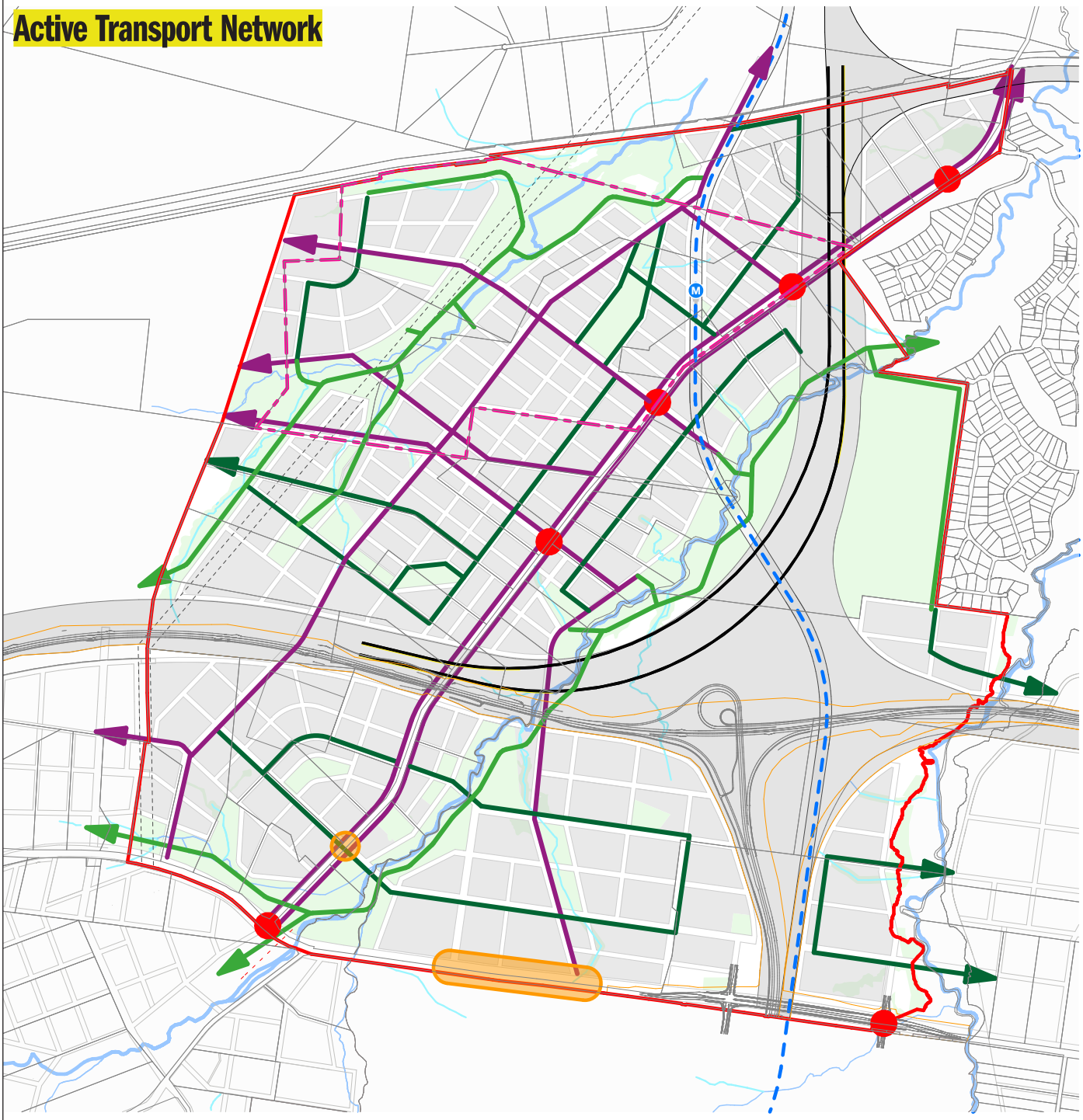
Active Transport Network



Regional on-street separated cycleway
Regional in-park separated cycleway
Local on-street separated cycleway
Local in-park separated cycleway

Planned signalised intersection
Potential signalised intersection subject to future investigation

Precinct Boundary
Sydney Science Park Boundary
Cadastre/Lot Boundary
Metro Station
Metro centreline
Outer Sydney Orbital/Freight Rail
M12 Corridor

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STREET TYPOLOGIES

It is envisaged that all roads and streets within the Northern Gateway Precinct will be well planted, overhanging tree canopies, connected shaded footpaths and a web of cycleways.

The street typologies in the Northern Gateway are based on the street types outlined in the Western Sydney Street Design Guidelines (WSSDG). The broader street reservations that constitute the major urban framework will give structure, legibility and flexibility to the layout, and establish a character intrinsic to the Western Parkland City envisaged by the Greater Sydney Commission.

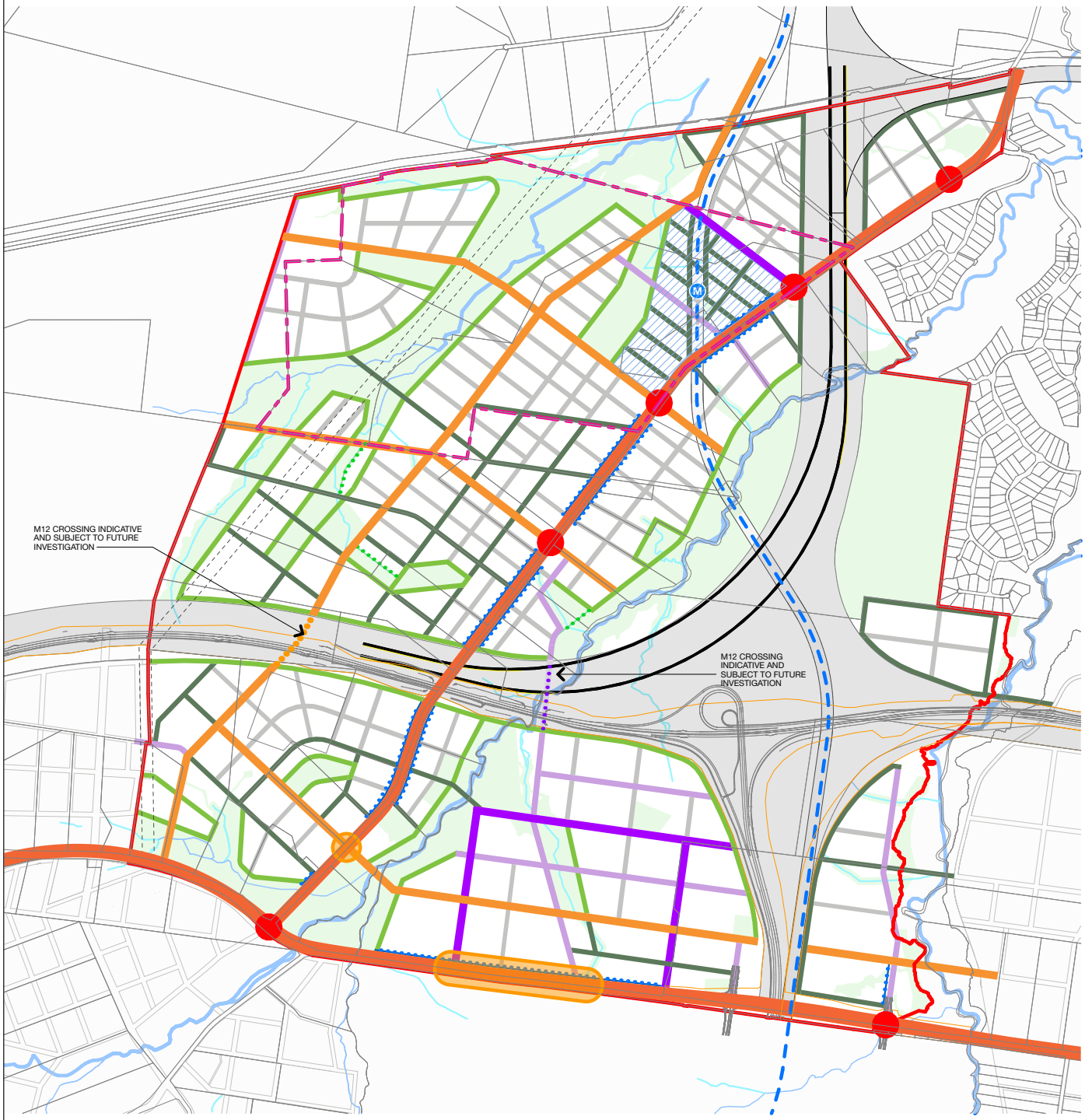
A number of the street reservation widths have been increased beyond those set out in the WSSDG in order to achieve objectives of a landscape-led approach. Specifically the streets' role in realising these objectives include;

- Playing the primary role in achieving the tree canopy target of 40%, enabling maintenance and renewal over the life of the trees;

- Protecting undisturbed soil profiles across the Northern Gateway, with the streets connected as system to the hill top parks and creek corridors, allowing better water infiltration, tree growth and ecological outcomes.

In all cases the street cross sections maintain the functionality required by the WSSDG – designation, travel lane, flex zone, parking aisle, footpath and cycle path widths - as stipulated in the WSSDG, for that street type. The street sections reference each of the relevant the WSSDG street types.

The Precinct Plan



- Primary Arterial Road 60m
- Sub-Arterial Road 40m
- Local Collector - Green Blvd 40m
- Local Collector 30m
- Local Collector 25m
- Park Edge Street 25m
- Service Road 9m
- Park Edge Active Park 7m
- Local Road
- M12 crossing indicative and subject to future investigation
- Blue & Green Infrastructure Network

- Planned signalised intersection
- Potential signalised intersection subject to future investigation

Streets within hatch area cannot be altered without concurrence from Sydney Metro

- Precinct Boundary
- Sydney Science Park Boundary
- Cadastre/Lot Boundary
- Metro Station
- Metro centreline
- Outer Sydney Orbital/Freight Rail
- M12 Corridor

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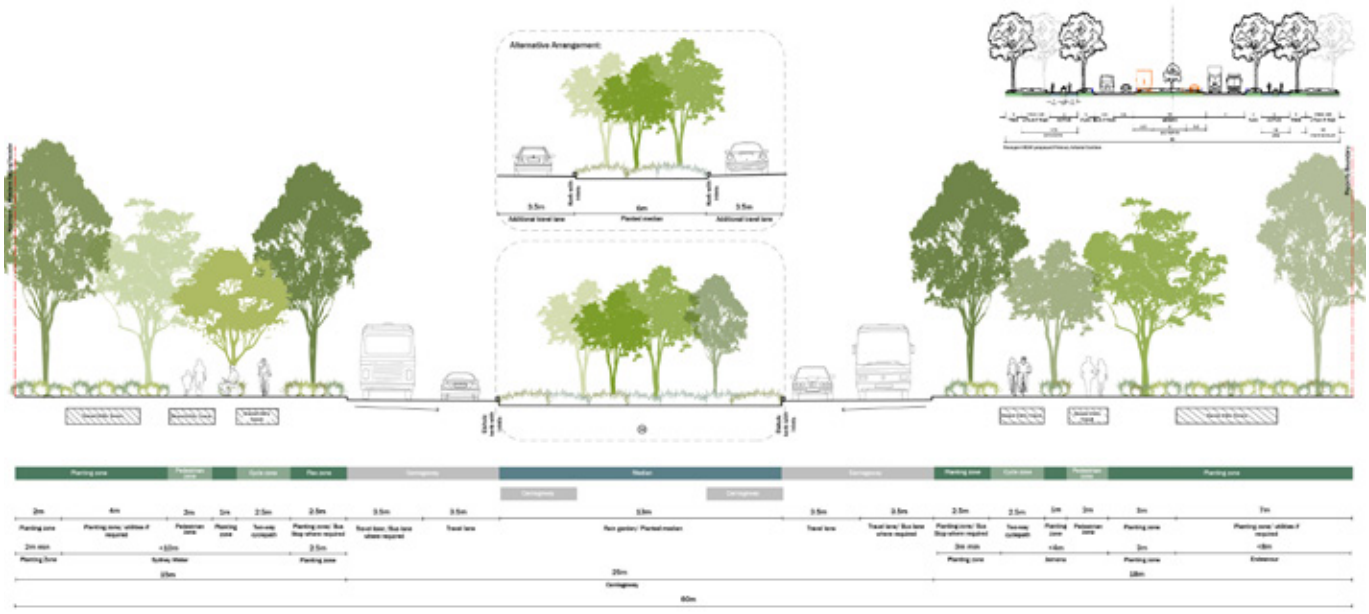
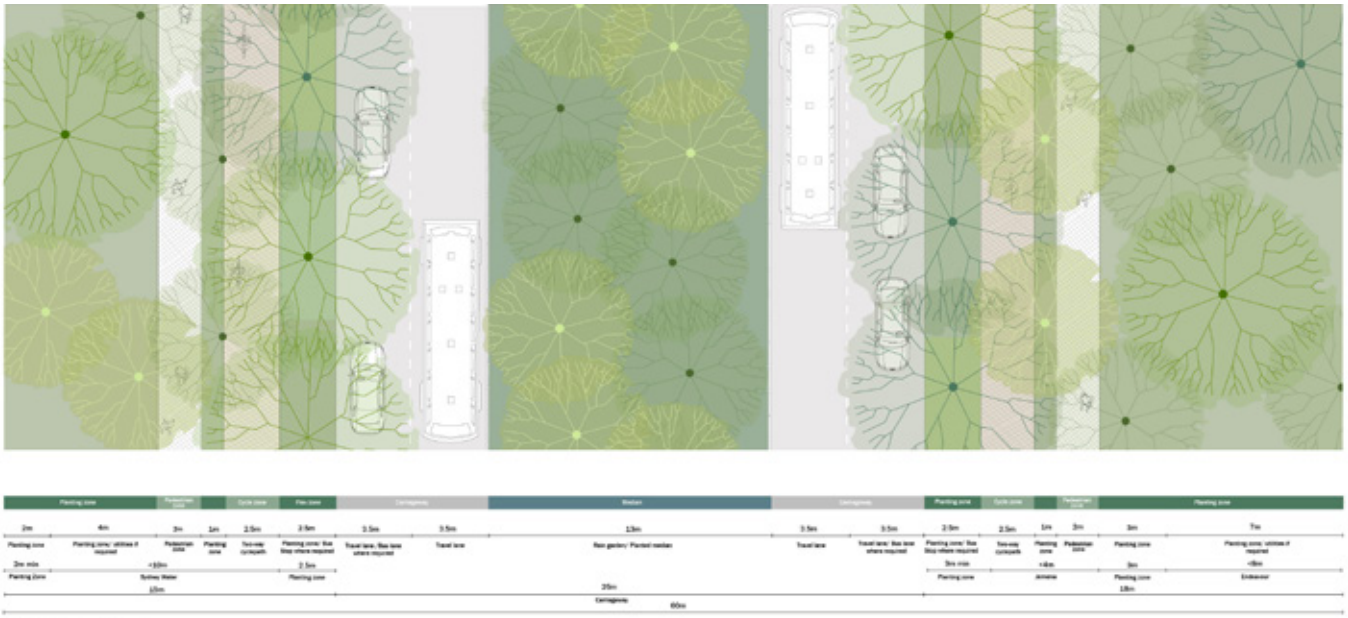
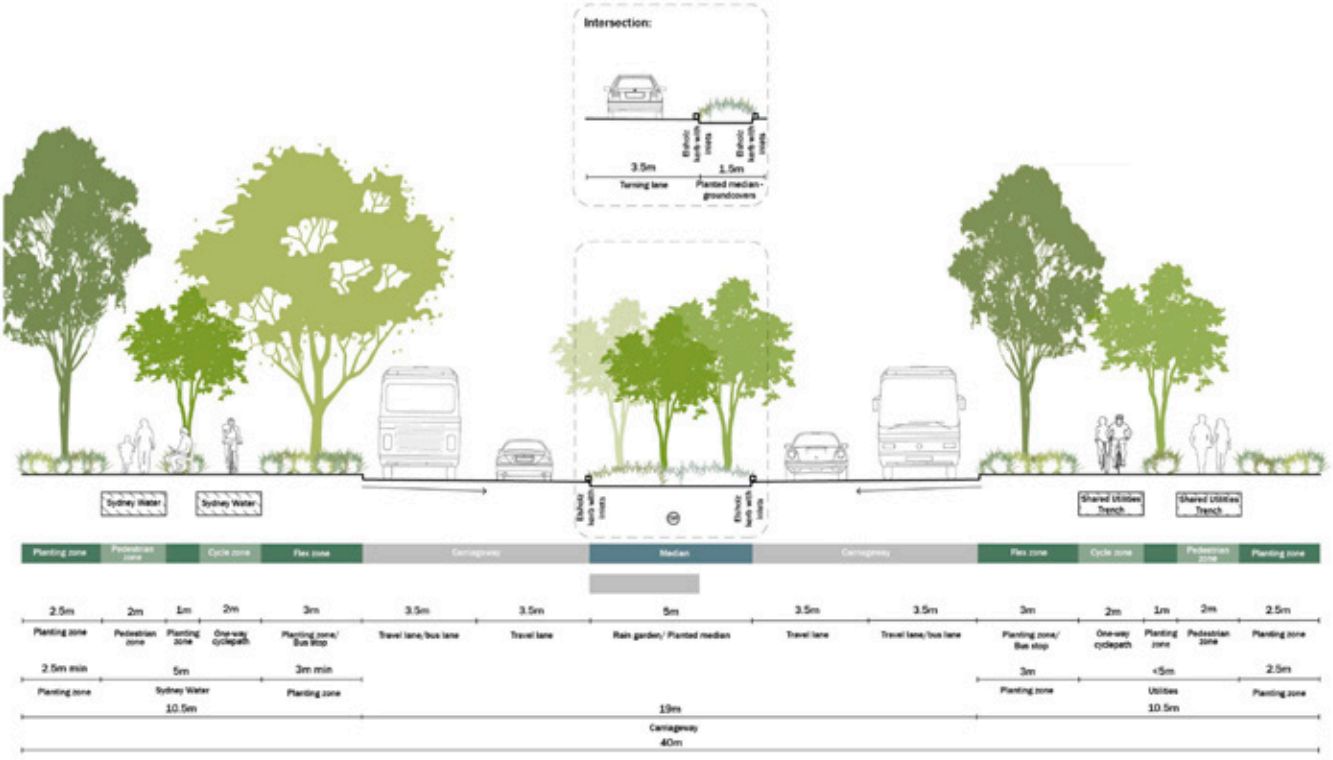
60 metre Arterial Corridor with freight functionality

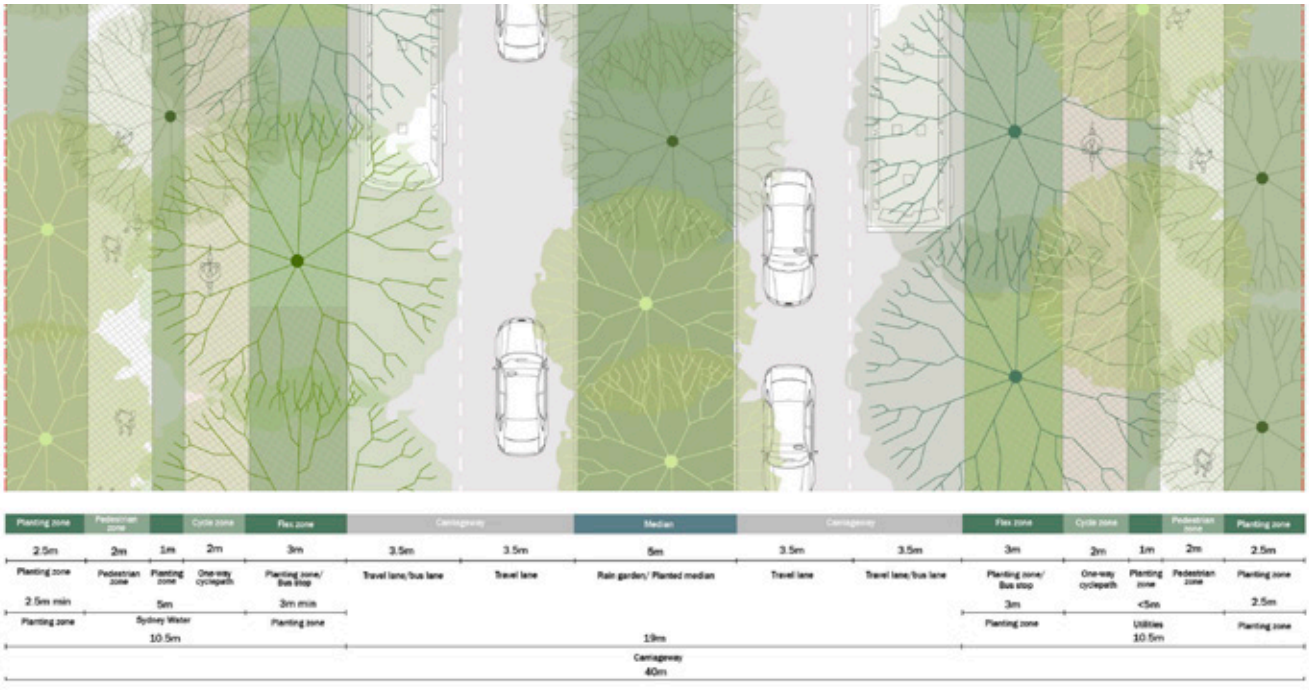


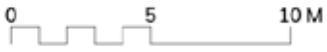


Primary Arterial (60m)

40 metre Sub-Arterial Road Kerbside Bus Lane







Local Collector - 30 metre collector with sloped median and bike lanes

- Sloped median on steeper streets to reduce lower embankment within properties and preserve B Horizon

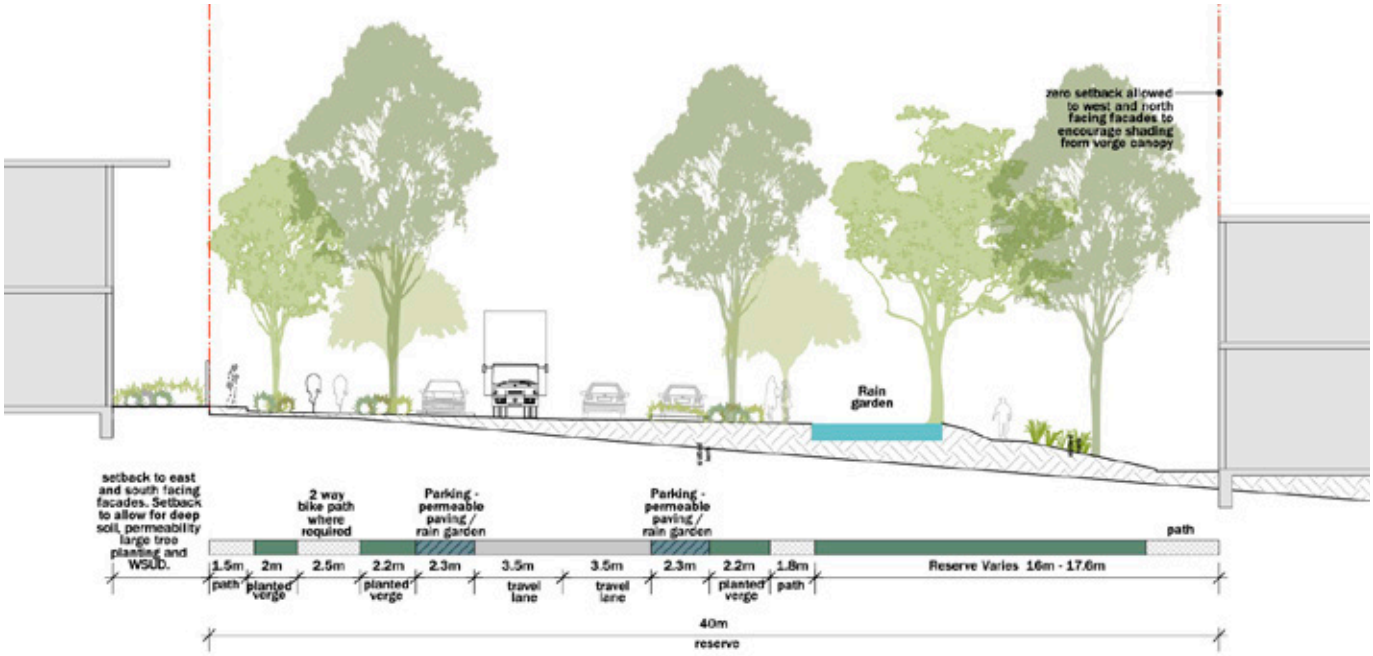
0 5 10 M

Local Collector - 30 metre collector with median and bike lanes

- Sloped median on steeper streets to reduce lower embankment within properties and preserve B Horizon

0 5 10 M

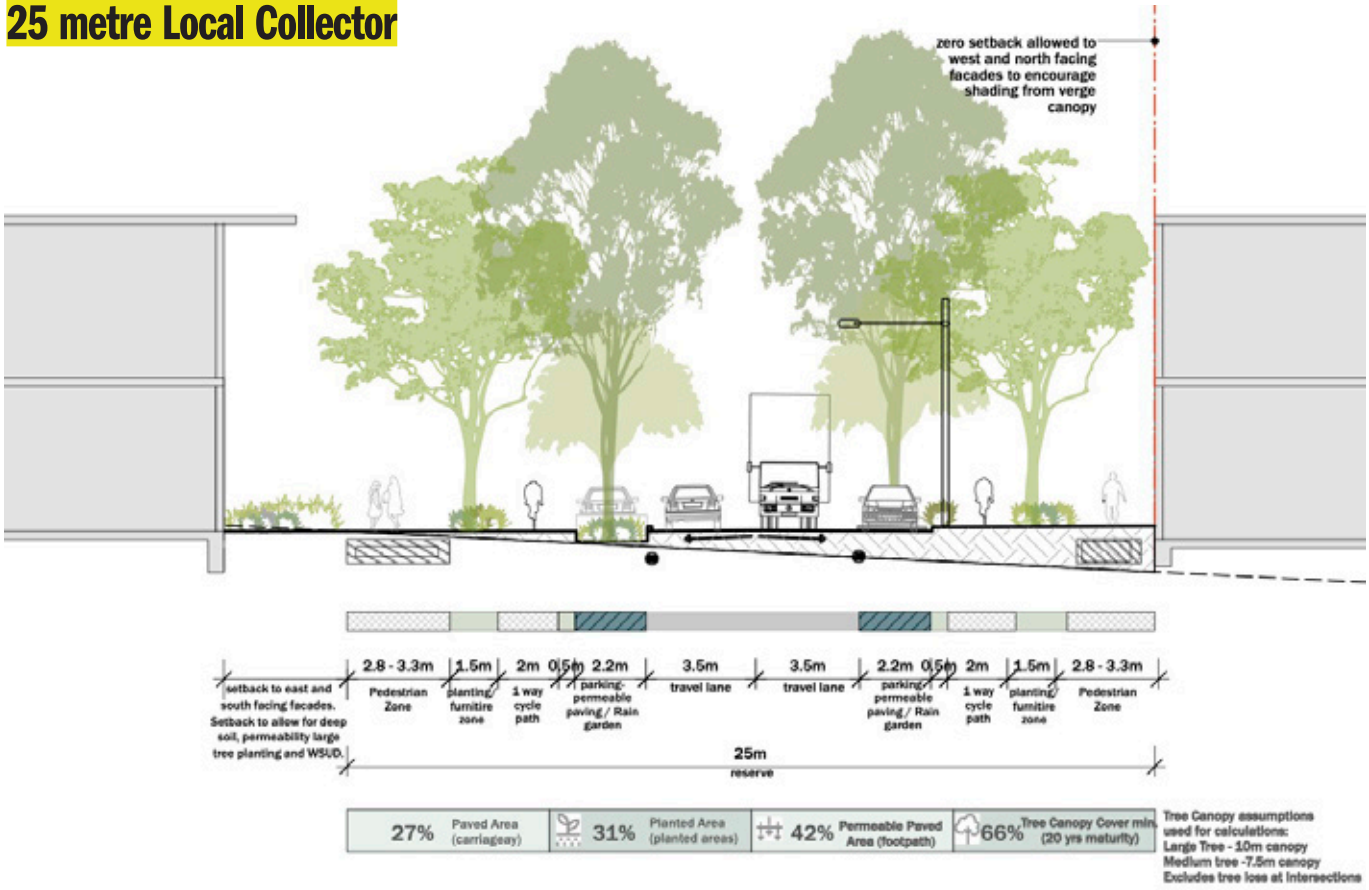
40 metre Local Collector

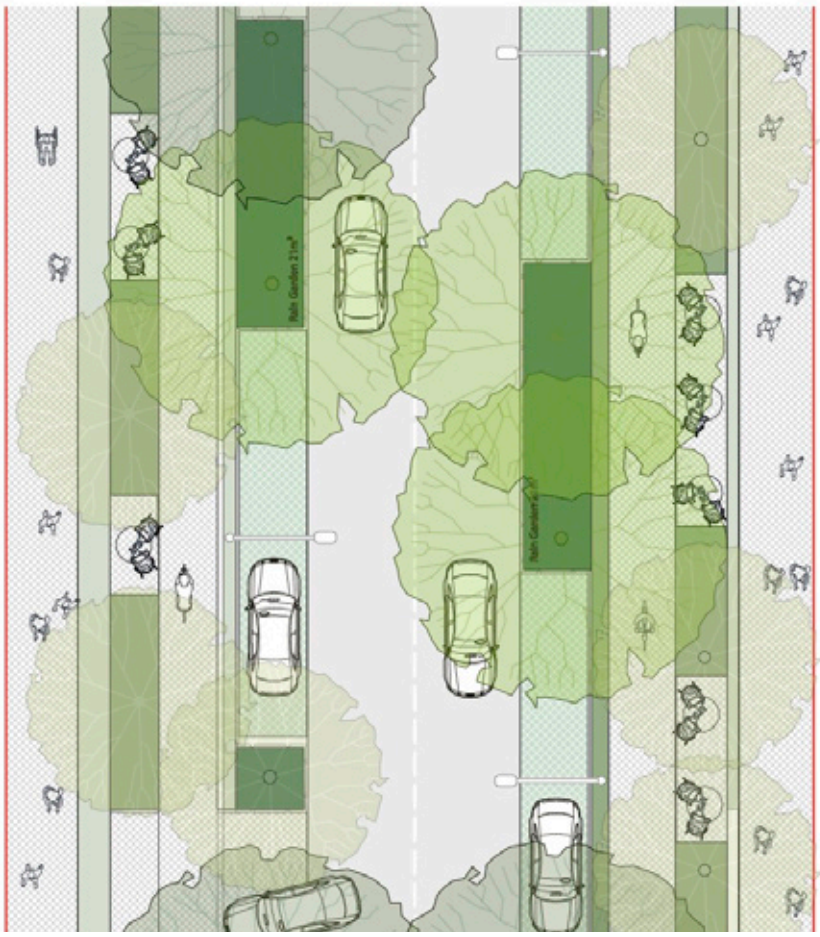


Tree Canopy Cover min. (20 yrs maturity)	76%	Permeable Paved Area (footpath)	34.4%	Planted Area (planted areas)	48.1%	Paved Area (carriageay)	17.5%

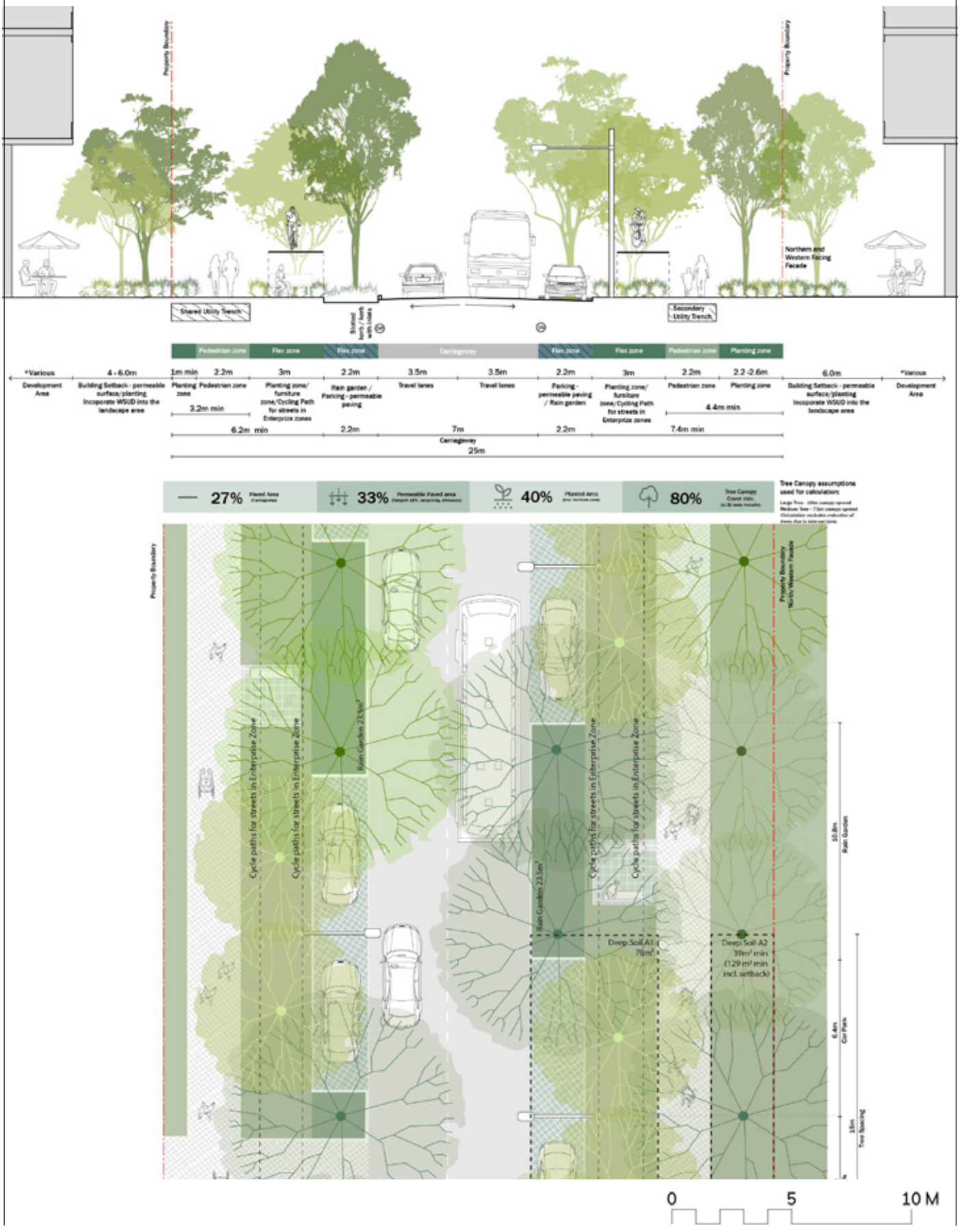
M10 5 0

25 metre Local Collector

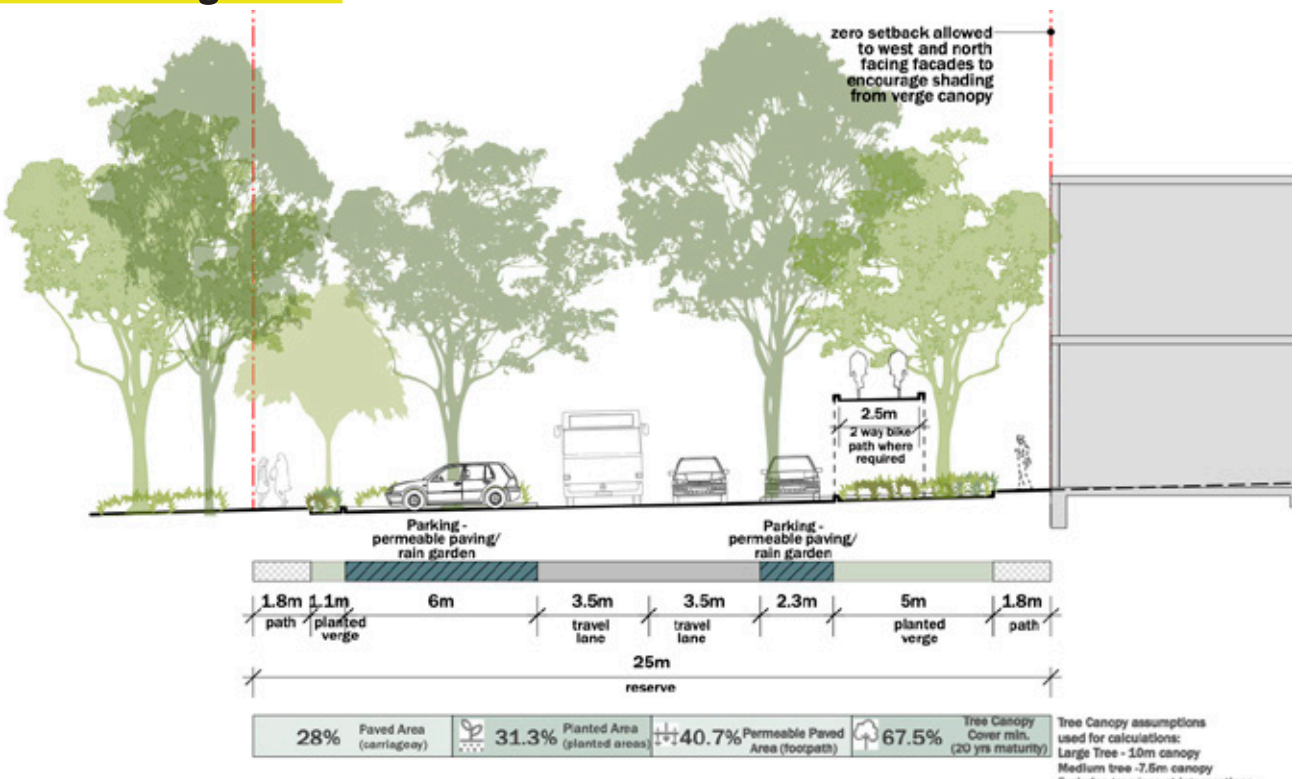


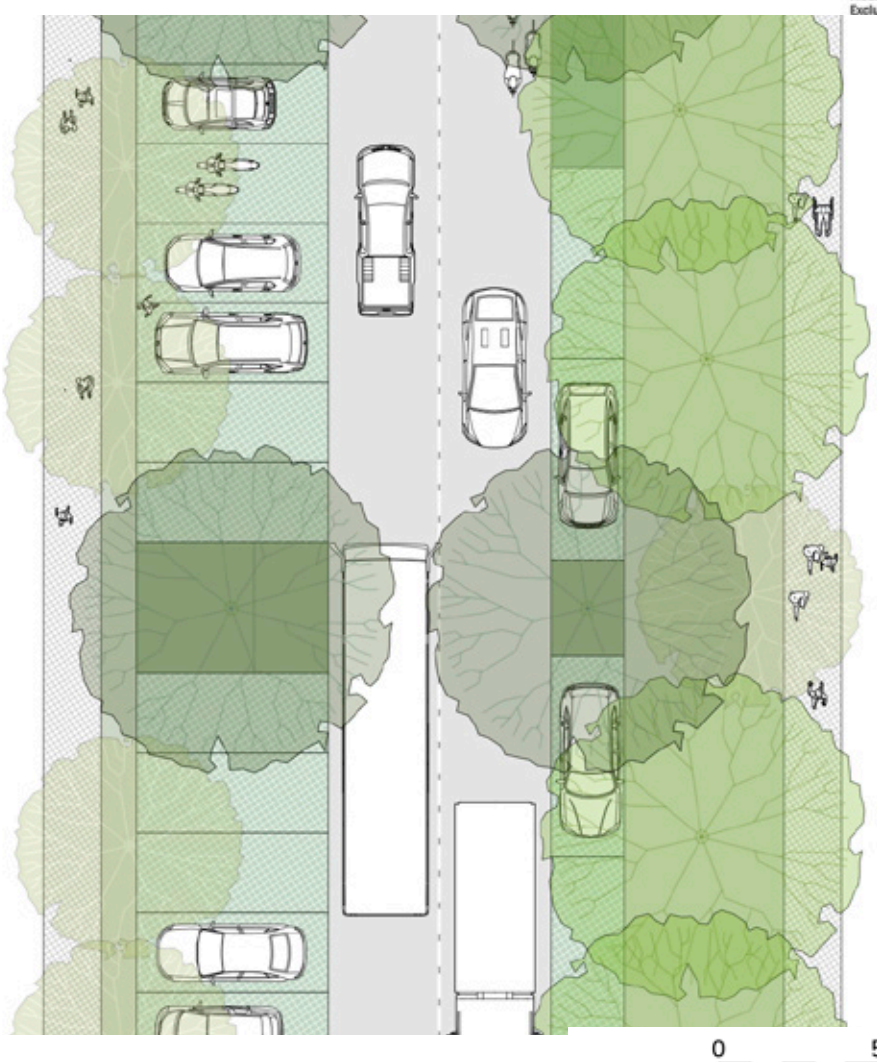


25 metre Local Road-For Mixed Use and Enterprise Zones

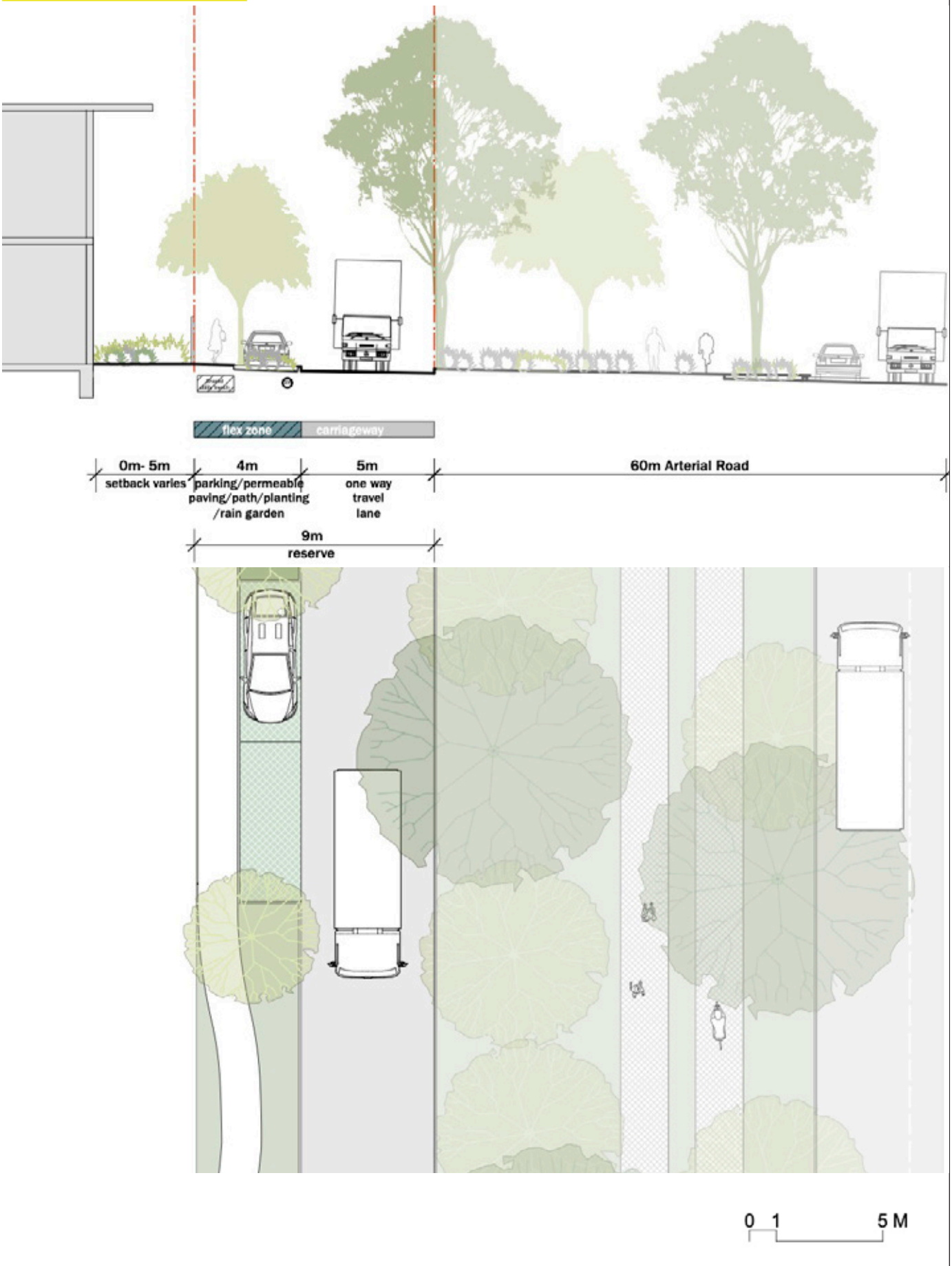


25 metre Park Edge Street

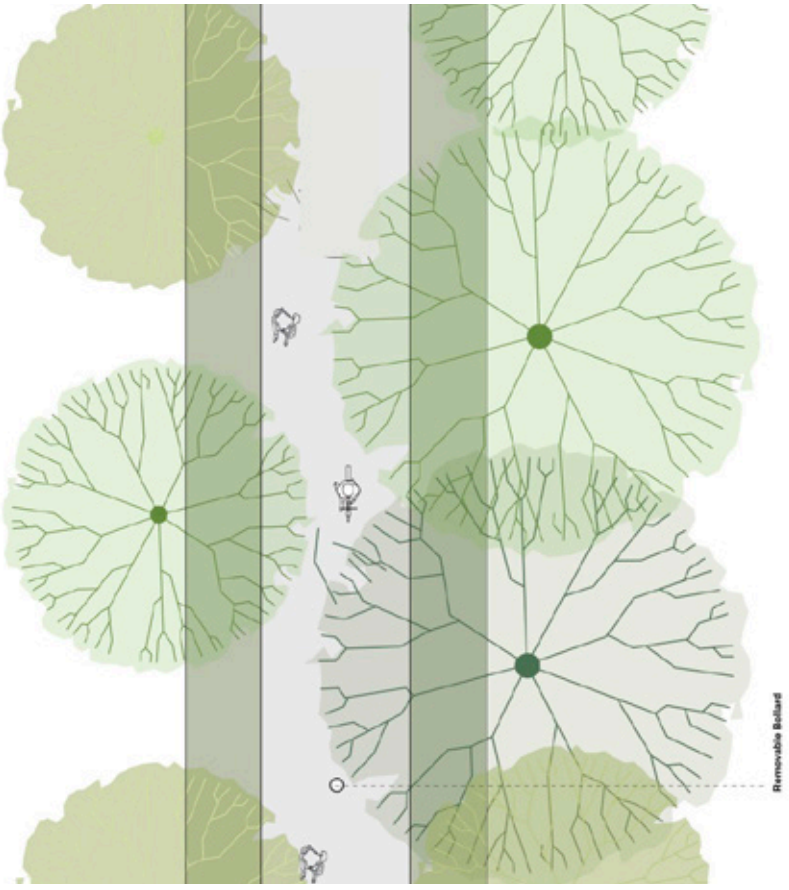


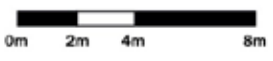


9 metre Service Street

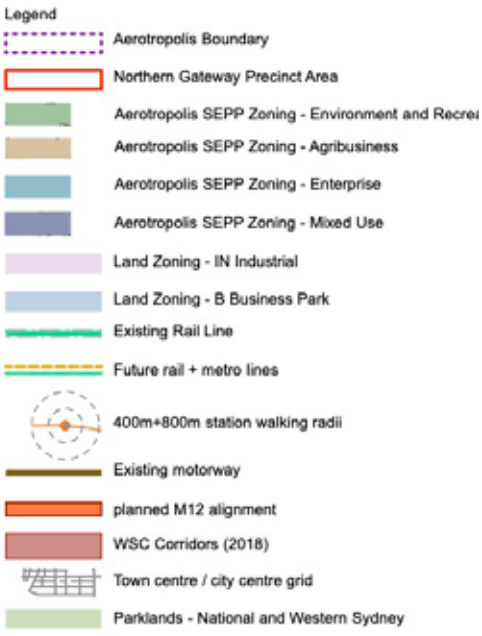


7 metre Park Edge Active Path

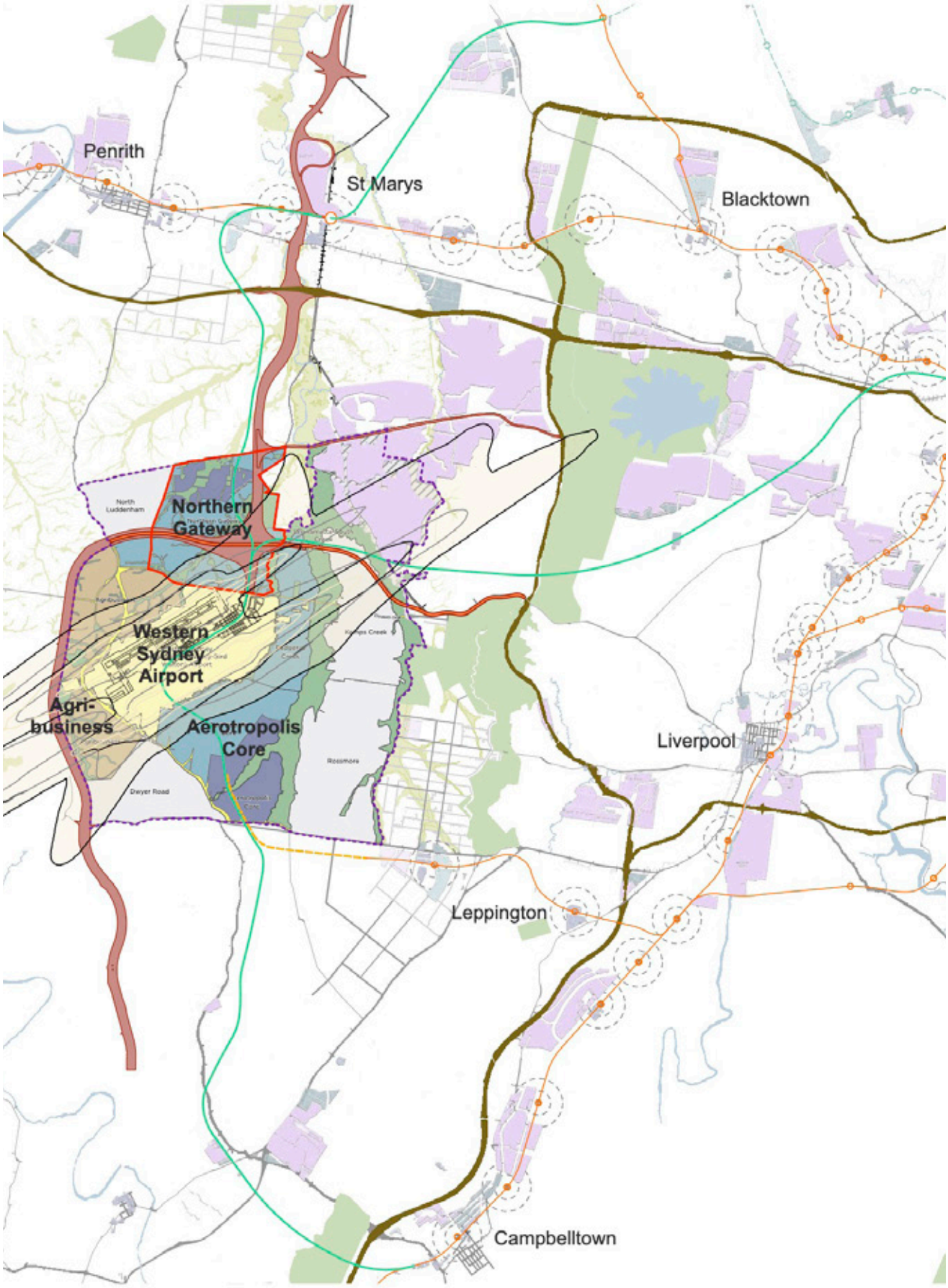




LAND USE AND URBAN FORM



Land use across the Northern Gateway Precinct will capitalise on the opportunities provided by the airport and proposed connections to wider Sydney. An integrated parkland city will emerge, with a focus on employment and mixed use activity.



Land use map within Aerotropolis and Greater Western Sydney

PRECINCT LAND USES

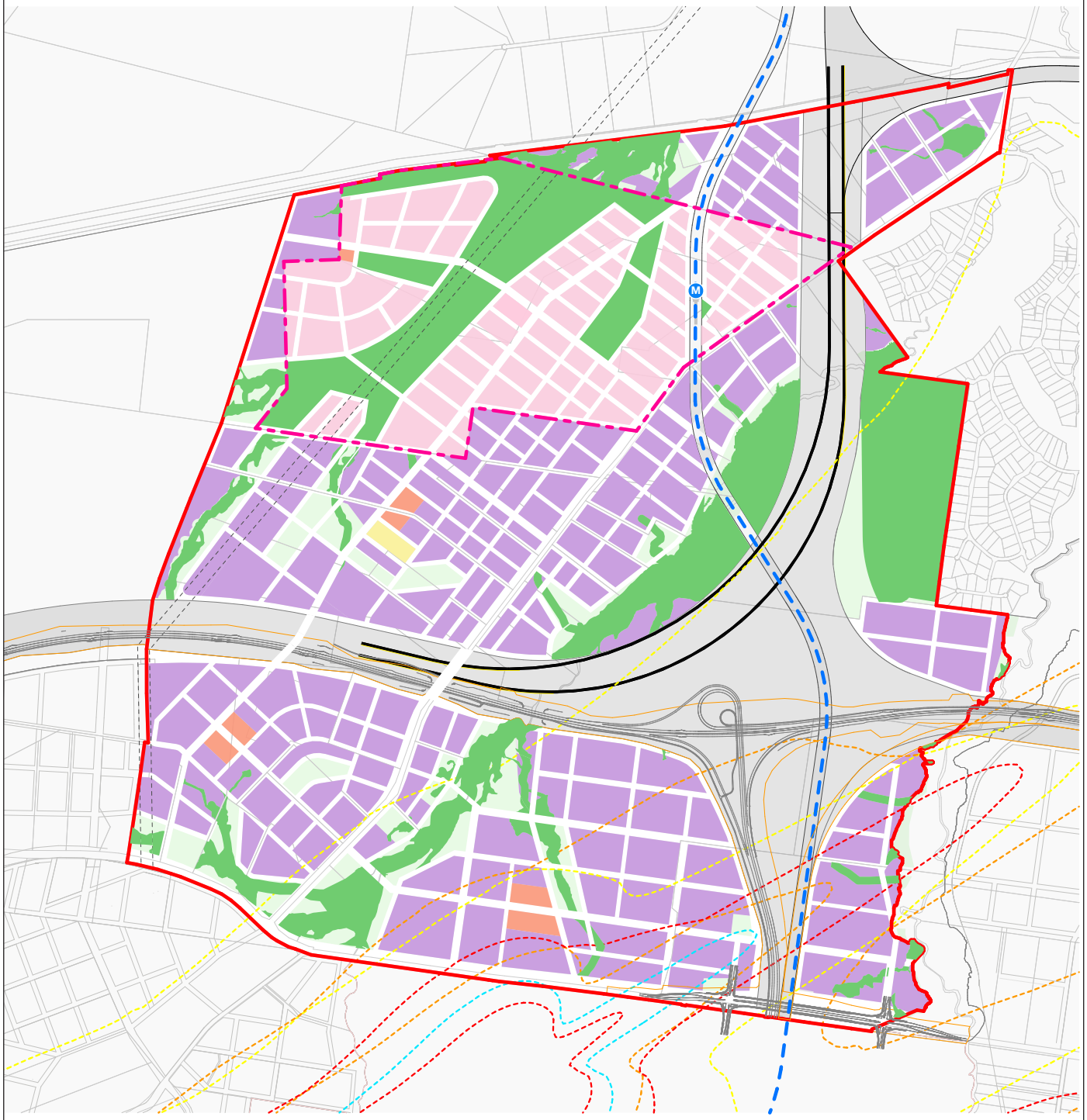
The land use zoning is set by the specific Western Sydney Aerotropolis State Environmental Planning Policy 2020 (SEPP) and relates to the urban structure and transport hierarchy. The highest densities and greatest mix of uses will be concentrated in the Specialised Centre around the metro station. This area will also be very well served by buses and connected with the extensive cycleway network, allowing a lively urban place to rapidly develop as a major new centre for Western Sydney.

Around the Specialised Centre a mix of uses are enabled by the zoning. These areas are supported by a generous and connected street system, forming tight urban blocks. Away from the Specialised Centre, the blocks become larger and the prescribed uses encourage major warehousing, distribution and manufacturing activities. These will inevitably be supported by a range of secondary and service uses.

A number of smaller local centres distributed across the precinct will provide diversity and some convenience retail uses. These centres will be non-residential but will have the potential to become a focus for the community as it develops over time. Their location is in relation to street hierarchy, bus connections and interface with parklands. These local centres are also distributed to provide local choices for those who want to walk and cycle, in so doing reducing reliance on car use for some trips.

Given the precinct's location to the airport, there are constraints associated with noise and building height limitations associated with the OLS. Parts of this precinct are in ANEF contours 20 or greater which will limit the types of land use within the southern portion of the site.

The Precinct Plan



Mixed Use Specialised Centre
Including education, employment generating uses, health and science.
Note any changes to approved residential yield subject to masterplanning process

Local Centre
(residential uses within Sydney Science Park only)

Special (public and community)

Education (Location indicative)

Enterprise

ENZ Zoning in precinct development lots

Blue & Green Infrastructure Network

ANEC 35 Contour

ANEC 30 Contour

ANEC 25 Contour

ANEC 20 Contour

Precinct Boundary

Sydney Science Park Boundary

Cadastre/Lot Boundary

Metro Station

Metro centreline

Outer Sydney Orbital/Freight Rail

M12 Corridor

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BUILT FORM

KEY BUILT FORM PRINCIPLES

1. Height is greatest within the Specialised Centre Mixed Use area, where the open spaces and Sydney Metro Station offer amenity and connectivity benefits.
2. Buildings are designed to address streets and open space.
3. Buildings are designed consistent with passive cooling principles, maximising the potential for cross ventilation and minimising solar heat gain.
4. Building type and scale responds to its intended use and topography.
5. Buildings and associated construction methodologies are designed to maintain adequate clearance for air navigational activity over and around the Aerotropolis.
6. Within identified centres, buildings present to adjacent roads and open space to create people focused and place based outcomes.
7. Low density dwellings outside the 1.2km radius from the Metro, within SSP lands. The majority of dwelling types will include houses, terraces, manor houses and semi-detached housing with a density of 15-20 dwelling/Ha and 'Missing Middle' terraces and walk up apartments with a density of 20-30 dwellings/Ha just within the 1.2km Metro catchment radius.

Within the Specialised Centre:

- Provide positive address and architectural presence to street frontages.
- Provide along public space frontages, point towers with excellent amenity.
- Allow the maximum gross footprint for any footprint above 27m, is 600m².
- Allow towers to come directly to ground, without podium setbacks, where wind and microclimate impacts are mediated.
- Allocate major corner sites that front open space and major streets for buildings of a civic nature such as district libraries, community centres, indoor sports facilities, clubs and the like.
- Design all buildings to be of high architectural quality.

Within the Mixed Use Zone:

- Provide street wall building types to street frontages with appropriate scale and articulation
- Permit zero setback on major streets
- Provide point towers with excellent amenity at dominant corners and frontages.
- Allow opportunities away from the major streets, for increased setbacks for residential towers so as to have generous ground floor or podium landscaped courtyards.
- Design buildings of high quality that meet the requirements of the Apartment Design Guide (ADG) where applicable.

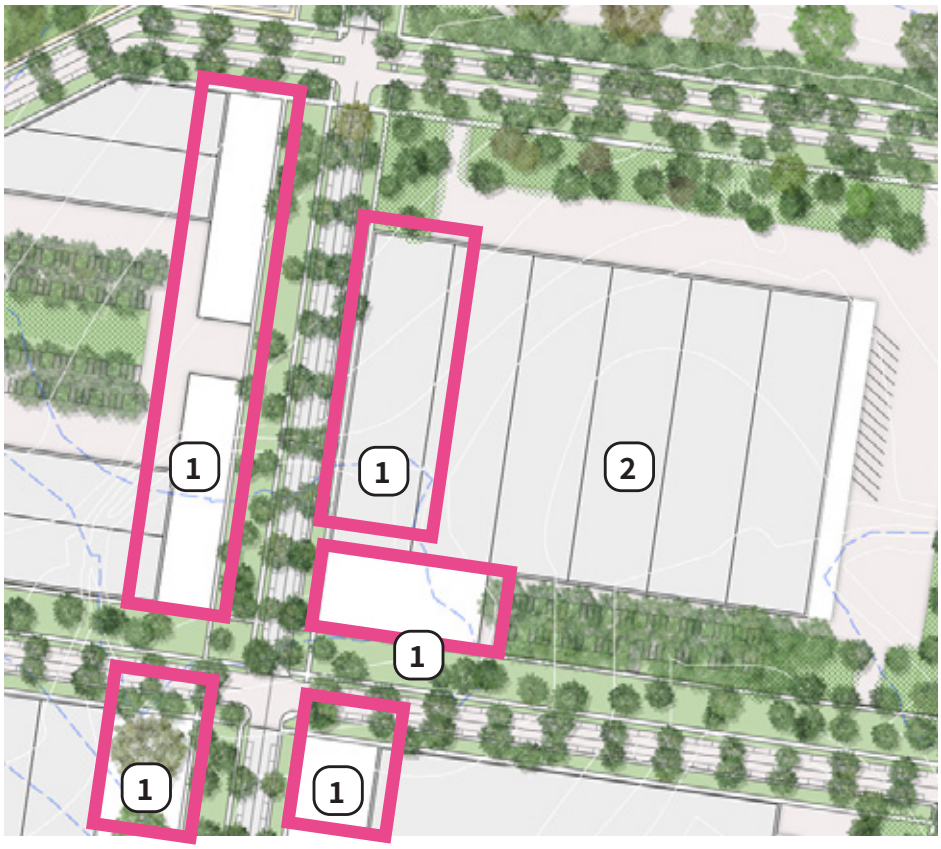
Within the Enterprise Zone:

- Notwithstanding the larger format of building footprints, buildings should address streets through clarity of entries, articulation and siting of active uses to street frontages, with levels consistent with the primary street address
- Level differences between buildings and any adjacent parkland / street should be minimised. Siting the smaller footprint associated ancillary uses of developments along these edges will minimise instance of level differences.
- Industrial and enterprise architecture will be of high quality and should promote sustainable design by integrating design elements such as solar collectors and battery storage, roof gardens, water reuse and the like
- All buildings and car parks should be carefully integrated with the landscape design.
- Minimise driveway crossings to streets, sharing driveways where possible.

Street wall and point tower built forms adress the main open spaces within the specialised centre

Prominent corner sites with civic buildings that adress the public

Industrial built form



Larger scale industrial block north of Elizabeth Dr

Activate frontages of industrial building by situating ancillary uses such as office or showrooms and the like along major street or park frontages and corners of intersections

1 Activate frontages of industrial building by placing ancillary uses such as office or showrooms and the like. Larger operations can be placed behind.

2 Larger scale component of industrial building located behind street front component, can be more flexible in section to minimise cut and fill

The Roofscape as Resource

- The roofscapes within the Northern Gateway precinct should be utilised to harvest rainwater, produce solar power or green roofs.
- Water harvested can be re-used within the Northern Gateway in a closed or open system depending on scale.
- Energy produced can be used on site or linked to the broader energy network to support the Aerotropolis and Greater Sydney.

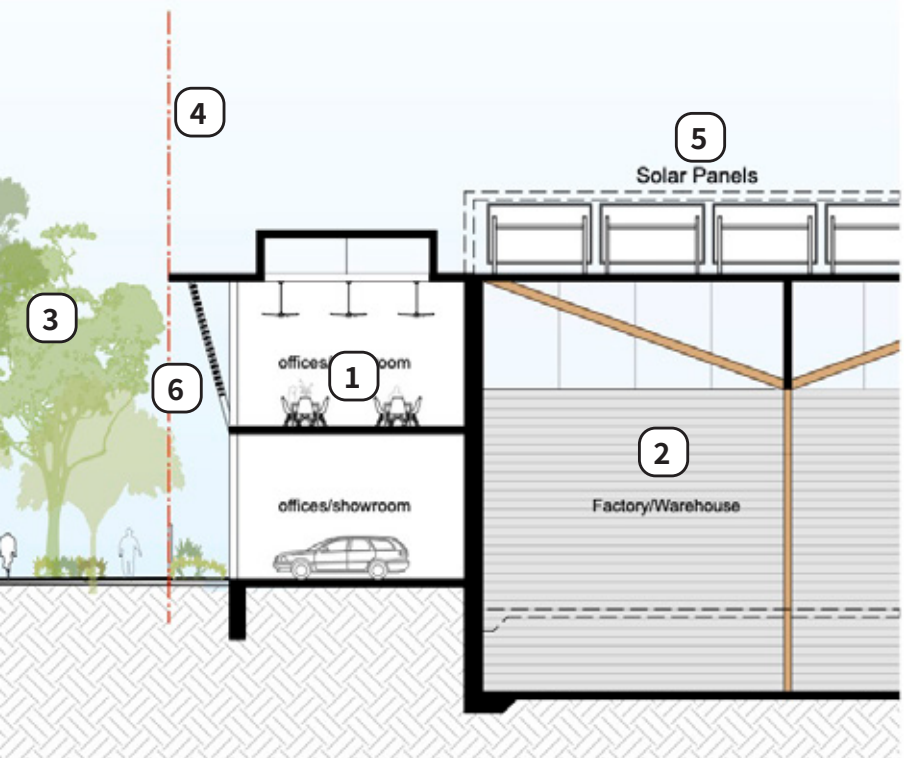
HKA Architekten

Hadi Tehrani

DLW- Architectes

Approach Design

Examples of high quality industrial and commercial buildings



1. Activate frontages of industrial building by placing ancillary uses such as office or showrooms and the like. Larger operations can be placed behind.
2. Larger scale component of industrial building located behind street front component, can be more flexible in section to minimise cut and fill
3. Larger trees for shading buildings. Mitigates urban heat effect.
4. West and North façades can have zero setback in order to maximise tree canopy in public space such as road reserves or street parks.
5. Roofscapes expressive of active sustainable design initiatives such as used to harvest water and energy production.
6. Expressed architectural character on facades through the use of passive environmental design elements such as screens and awning structures.

YIELD - MIXED USE ZONE

The Mixed Use Zone will become a vibrant centre, as it concentrated around the new metro station. The extensive parklands provide the perfect opportunity to embrace the principle of higher densities with the highest amenity, as the most intense forms of development are concentrated along the new parkland corridors that are an integral part of the Blue-Green Grid. These green corridors will become emblematic of the emerging Western Parkland City, as envisaged by the Greater Sydney Commission.

The Mixed Use areas are characterised by a higher connective street grid. In order to relieve the density, major east-west streets are all open ended, affording vistas to the landscaped creek corridors, and westward to the mountains beyond. It is important that these streets are heavily planted to provide pedestrians and cyclists with adequate shade to mitigate against urban heat island effects.

The Mixed Use Zone will in time be well served by a range of bus services, while the Green Grid and shaded street network offer significant opportunities for cycle connections and recreational opportunities.

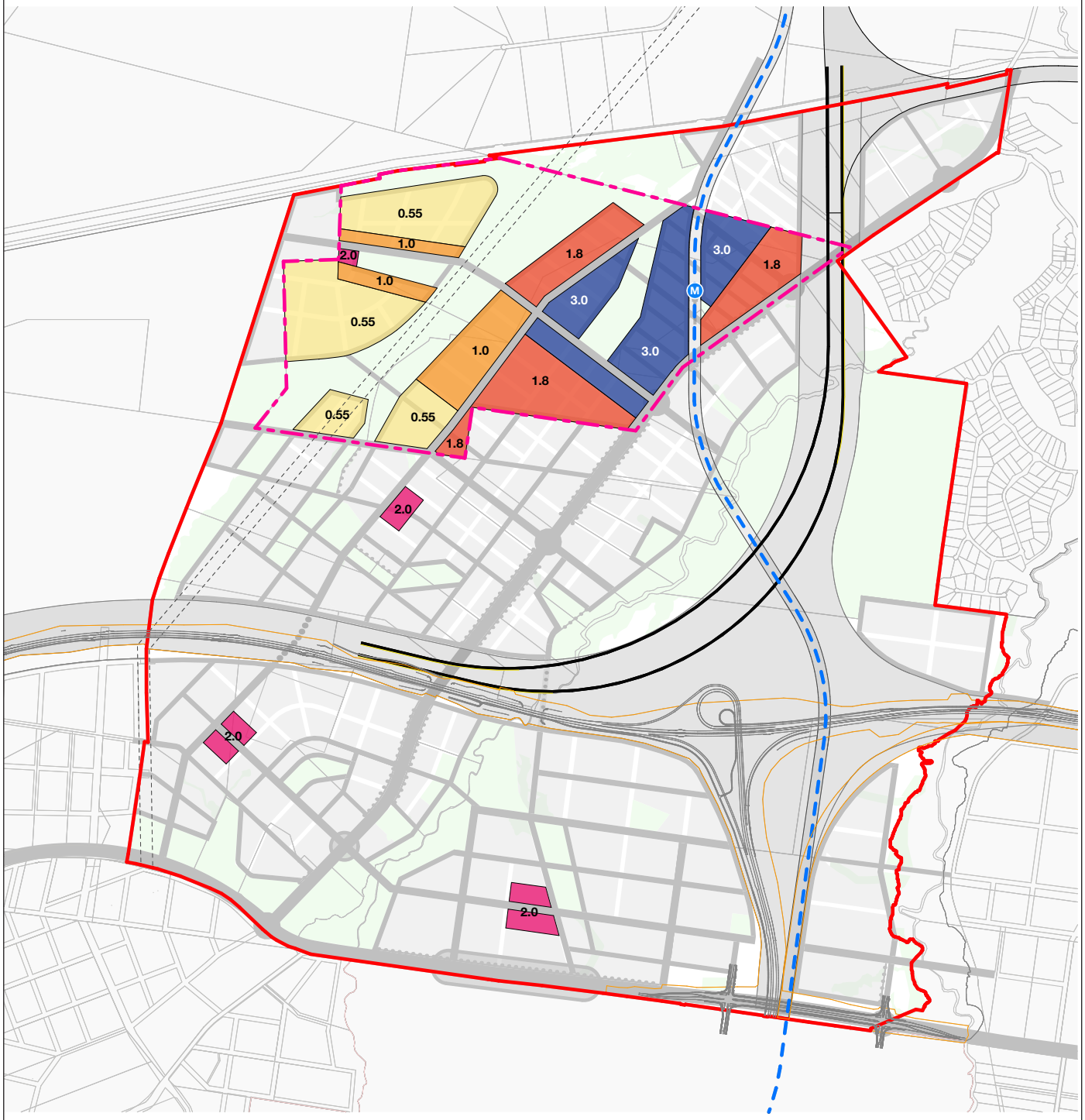
The major streets in the Mixed Use Zone will develop a mix of uses with active frontages. Employment and residential uses will be supplemented by public, community and specialist centres.

There is a 3400 dwelling cap within the SSP site. The area immediately within the town centre will have FSR values ranging from 1.8:1 to 3:1

Areas outside the 1.2km radius of the Luddenham Road Metro station will have lower FSR values ranging from 0.55:1 for single dwellings or dual occupancy type developments, increasing to 1:1 for those areas fronting open space areas .

A small area outside the 1.2km radius has a 2.0:1 FSR to allow for higher density within a local centre.

The Precinct Plan



HEIGHT FRAMEWORK

In the Northern Gateway Precinct, the highest buildings are concentrated in and around areas of high amenity in the Specialised Centre and mixed use areas. These areas will have ready access to the Metro station, local and regional bus services and the generous parklands that thread through this major new centre for Western Sydney.

Within these areas, the dominant building heights will be a combination of 27 and 45m metres, which is predominantly in the form of a perimeter block street wall type. The street wall, made up of generally contiguous building frontages, will define the space of the streets and encourage footpath level activation in the core. These perimeter block building forms can readily accommodate large footprint office and commercial uses, or be adapted to mixed use and residential accommodation.

The street wall type will be punctuated by 45 metre high point towers framing the expansive open space and major public frontages which enjoy excellent amenity.

The maximum gross footprint for any building above 27metres in height is 600m² (inclusive of all balconies, perimeter walls, plant and enclosed floor area). The small footprint towers will create slender profiles on the skyline, casting smaller, fast moving shadows across the public domain. The compact footprint tower forms will also have excellent internal amenity, maximising sun, daylight and natural ventilation, outlook and amenity to allow superior performance in relation to SEPP 65 and the Apartment Design Guide.

The predominant 27m building height within the mixed-use area, reduces to 24 metres away from park frontages and further from the core.

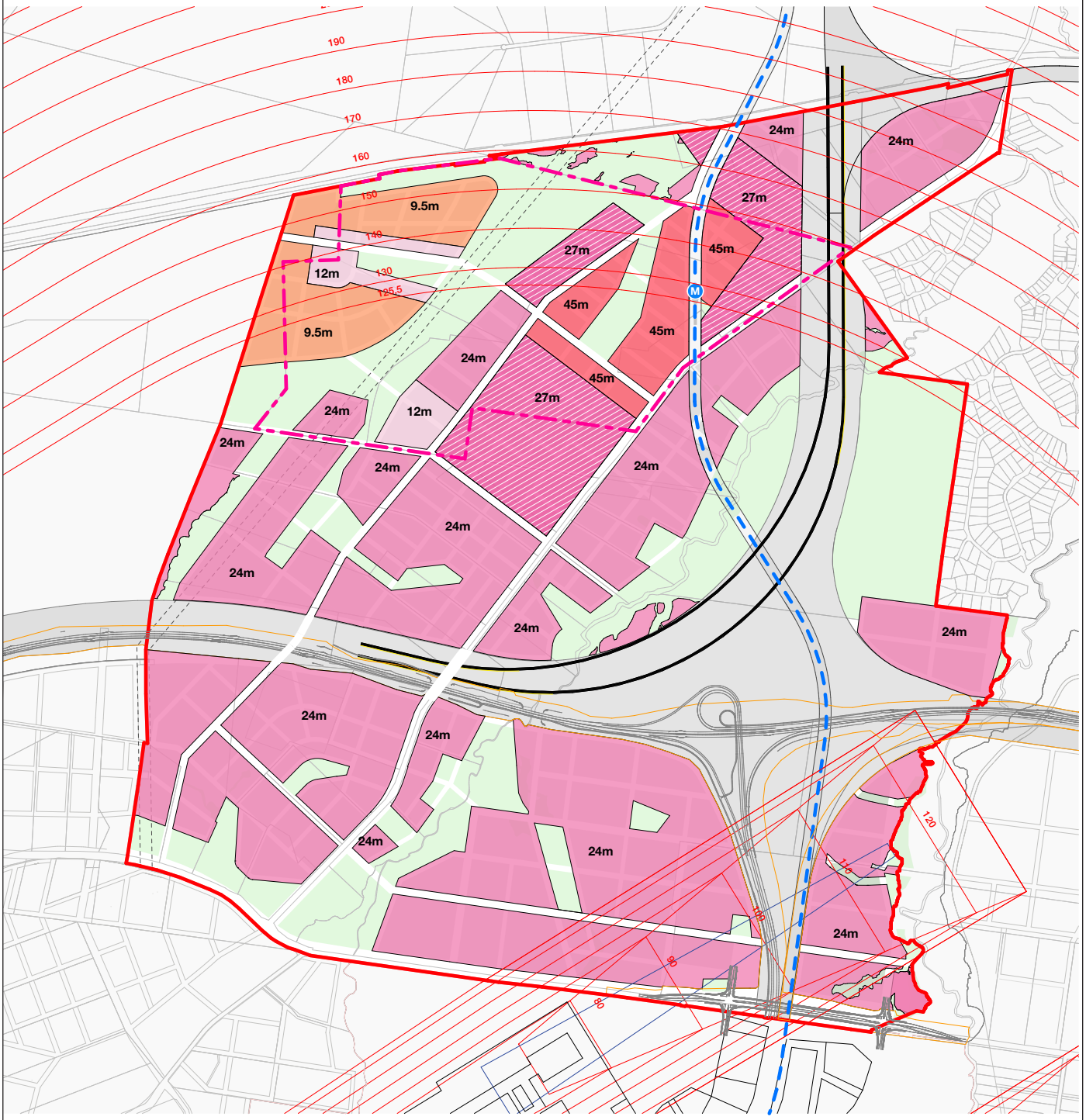
Within the SSP, the building heights are reduced further outside the 1.2km Metro catchment, catering for the lower density dwellings. Buildings will whave a height limit of 8.5m for the lowest density dwellings. Blocks fronting the open spaces increase in height to 12.5m taking advantage opf the amenity.

Flexible employment enterprise areas are predominately 16 metres in height, with a maximum 24 metres to allow for roof projections, roof pitch, structure, accessible green roof, access to solar panels, other plant and the like.

OLS Constraints

The height map includes an overlay of the OLS contours. In some instances the OLS contours will sit below the indicated heights and supersede them. Intrusions would require referral and approval.

The Precinct Plan



- 9.5m
- 12m
- 24m
- 27m
- 45m

- OLS Conical Contour
- Indicative development blocks
- Blue & Green Infrastructure Network

- Precinct Boundary
- Sydney Science Park Boundary
- Cadastre/Lot Boundary
- Metro Station
- Metro centreline
- Outer Sydney Orbital/Freight Rail
- M12 Corridor

Note: Development within sites affected by the OLS contours and the Public Safety Area Cone may require referral and approval.

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SOCIAL INFRASTRUCTURE FRAMEWORK

PRINCIPLES

1. Co-location with open space

→ School - sport & recreation facility - open space where topography permits.
→ Libraries, social & cultural institutions - park frontage

2. Co-location of complementing institutions & services

→ Libraries, social and cultural institutions
→ Local centres & active recreation in Enterprise Zone
→ Open space + active recreation in Enterprise Zone

3. Location and distribution throughout the precincts to ensure good accessibility to both workers and residents

→ Good public and active transport accessibility
→ Proximity to interconnected open space facilitates and encourages active transport

1. Sport and recreational facilities

Due to the steep topography and importance of retaining the natural hill tops, outdoor playing fields are difficult to be co-located with educational facilities. Education facilities and the playing field will have good accessibility to public transport e.g. Metro and transport routes.

Multi-purpose sport courts are distributed throughout the precinct to ensure workers and residents have access to active recreation within their local area. Some are co-located with educational facilities and in Enterprise zones, these are located in open spaces.

Indoor sport venues are located in specialised or local centres, oriented towards open space and with good accessibility to public transport - Metro and local transport route.

All sport & recreation facilities have good accessibility by public and active transport.

2. Educational facilities

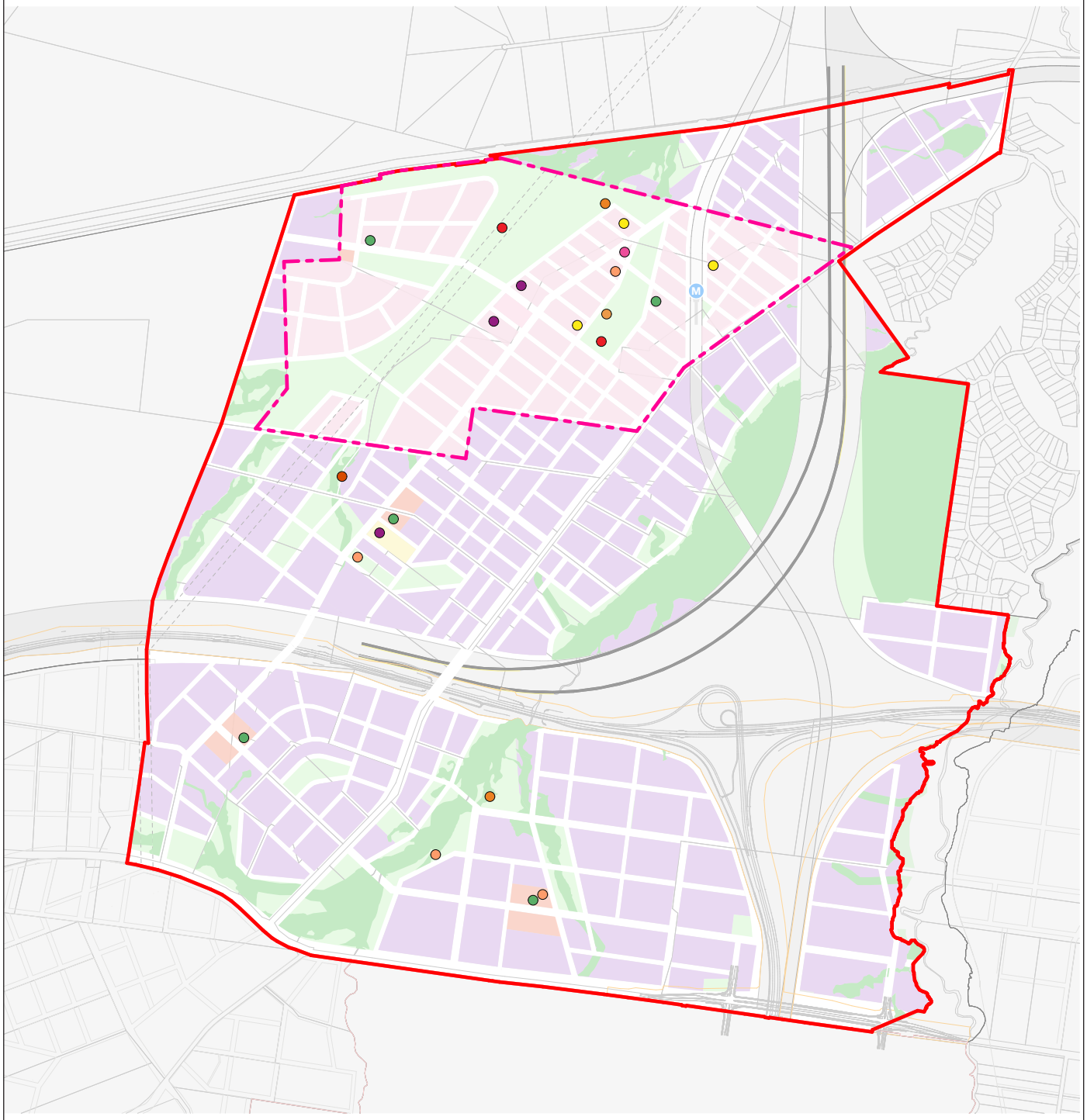
Educational facilities are oriented towards open space. Hilltop and riparian parks and have good access to public transport e.g. Metro station or local bus transport.

3. Social and cultural infrastructure

Libraries, community centres and cultural institutions are the core of the community life - for residents, workers and visitors alike. Prominent situations with park frontage within the Specialised Centre or co-located with community facilities and with great public and active transport accessibility.

4. Civic Spaces

Civic spaces should be considered in the Specialised Centre especially around the Metro station. These should be co-located with a range of community facilities.



- Regional playground
- Outdoor sports fields
- Child care centre (suggested location only)
- District / Local library
- District / Local community place
- Education (schools / tertiary education)
- District youth recreation area
- District Indoor Sports

NOTE: Notional infrastructure and locations only

- Precinct Boundary
- Sydney Science Park Boundary
- Cadastre/Lot Boundary
- Metro Station
- Metro centreline
- Outer Sydney Orbital/Freight Rail
- M12 Corridor

Note: Cultural and community infrastructure - notional location only. To be determined in consultation with local community.

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0m 250 500 750 1000 1250