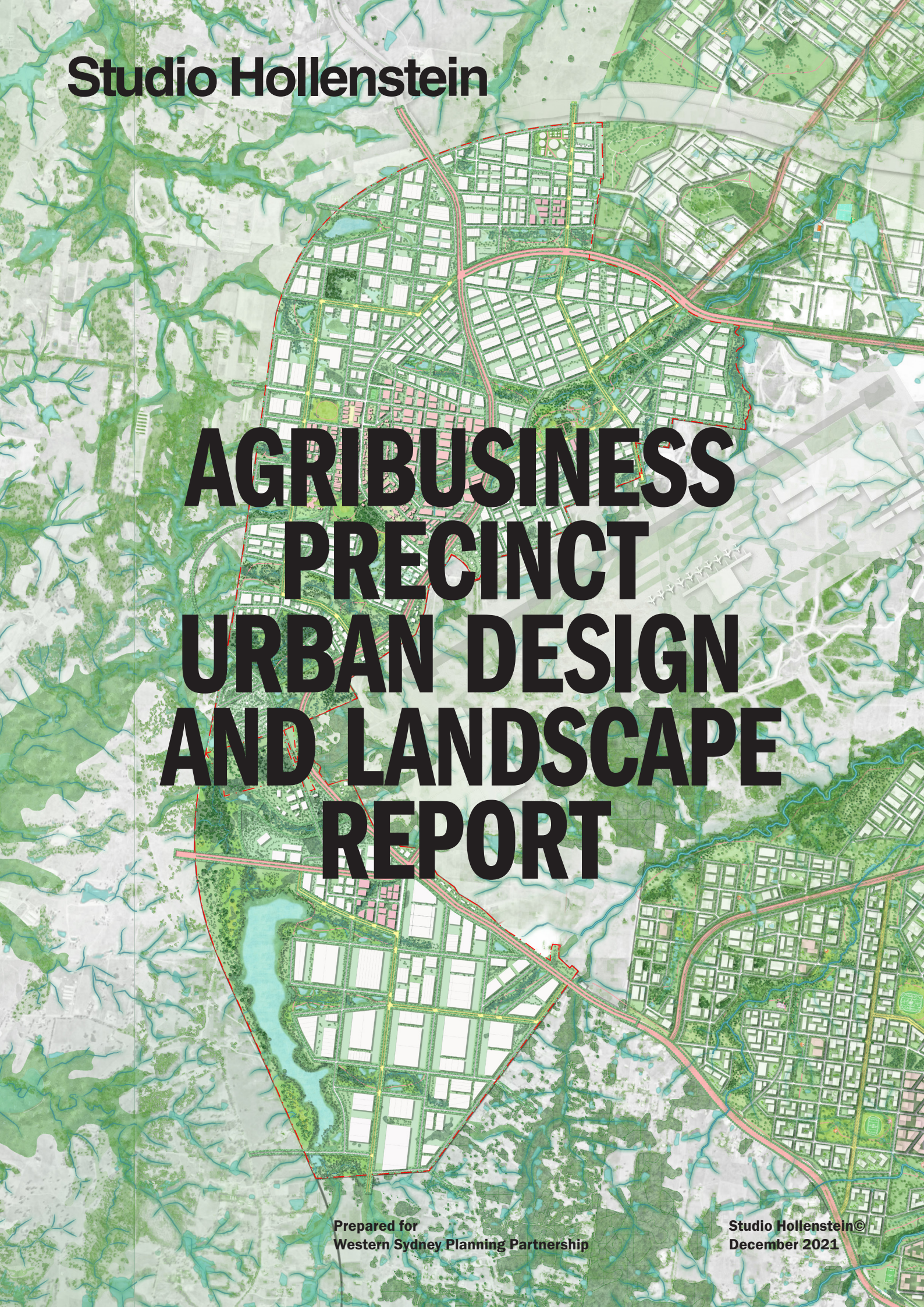
Studio Hollenstein

AGRIBUSINESS PRECINCT URBAN DESIGN AND LANDSCAPE REPORT



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Western Sydney Planning Partnership

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This report has been prepared for:

WESTERN SYDNEY PLANNING PARTNERSHIP

NSW GOVERNMENT

Agribusiness Urban Design and Landscape Report

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This report is Part 5 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.

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PART 5: THE AGRIBUSINESS URBAN DESIGN FRAMEWORK

The Agribusiness urban design framework will create a world-class agribusiness precinct that will support the production and value-adding of sustainable, high quality fresh produce and pre-prepared consumer foods.

Illustrative view of climate responsive Agribusiness development along Adams Road

URBAN DESIGN FRAMEWORK

The Agribusiness Urban Design Framework Plan will create a world-class agribusiness precinct that will support the production and value-adding of sustainable, high quality fresh produce and pre-prepared consumer foods whilst achieving ongoing conservation outcomes in a manner that reflects the enduring spirit of Country. The embedded spiritual connection to land will persist through the weaving of modern and traditional practises and techniques of harvesting the land.

The Agribusiness precinct draws upon the agricultural and horticultural history of the area, continuing to provide food security and supplying Sydney and export markets.

The Agribusiness Urban Design Framework Plan is structured in response to its unique topography, the predominant north south ridgeline traced by the Old Northern Road and shadowed by the Northern Road with creek-lines originating at the head of the broad valleys that form Cosgroves Creek and Badgery's Creek to the east, and duncans Creek and the Mulgoa Valley to the west.

Luddenham Village sits high on the ridgeline, at the core of the Precinct, and acts as an Agribusiness village that is connected to local, district and regional centres by transportation and parkland networks. New parkland will increase the amenity of the village and support its growth.

The Agribusiness precinct is anticipated to accommodate up to 5,400 jobs by 2036, resourcing this from within the aerotropolis and adjoining local government areas.

Annotations

1. Growth within and around Luddenham Village is structured to enhance and protect the character and history of the village. As one of the few existing centres within the Aerotropolis, Luddenham village will play a key role in supporting the growth of the broader Aerotropolis as well as the Agribusiness Precinct. The village is identified as a key site within the Urban Design Framework Plan.

2. A new Agribusiness Park (Agri-Park) is located on the southern end of Luddenham Village and preserves and frames landscaped views from the Luddenham Village ridgeline (songline) to the west, through Duncans Creek valley towards the Blue Mountains. The park connects to St James Anglican Church grounds and Sales Park to the north, and extends down into Duncans Creek tributaries to the south. Luddenham Village and the Agri-Park will form part of a regional tourism network.

3. Cosgroves Creek Park is a parkland network framed along Cosgroves Creek with active transport links, playing fields, running and cycling tracks that extends from the Luddenham Village ridgeline, across The Northern Road across Elizabeth Drive to the Northern Gateway Precinct. The park is located to preserve and enhance landscaped view corridors from the songline of the Luddenham Village ridgeline along Cosgrove Creek and towards the city beyond.

4. Duncans Creek reservoir is rehabilitated, using waterway rehabilitation techniques, into a generous lake for active and passive recreation for workers, visitors and residents of the broader Aerotropolis. The reservoir will incorporate details to mitigate wildlife attraction and waterway functionality. A continuous pathway around its perimeter will provide an almost 5km long track similar in nature to the Bay Run in Iron Cove. A series of stormwater focused open spaces extend like fingers into the adjacent development zone, providing stormwater infrastructure whilst also providing landscape amenity and public access.

5. The Old Northern Road is transformed into a green boulevard through Luddenham Village, celebrating the landscape character of this walk-able scaled local centre. The character of the The Old Northern Road will evolve into a 'main street' lined with retail, hospitality and commercial offerings. Generous public domain improvements will include new planting, pedestrian footpaths, seating, lighting, cycle paths, street parking, public art and heritage interpretation.

6. Historic elements within Luddenham Village will be revitalised to better suit the needs of the existing and emerging community and visitors. For example, the historic Luddenham Showground continues to support Luddenham Village and the broader Agribusiness Precinct as a centre of community activity. Its sensitive renewal will ensure it can support both the existing and emerging community.

7. A coordinated enterprise development, north of Elizabeth Drive with associated parkland and strong connectivity to the rest of the Agribusiness Precinct, the Northern Gateway and North Luddenham across the M12.

8. Sydney Water Reservoir site located towards the top of the ridgeline within the enterprise development zone provides essential water infrastructure.

9. Areas of sensitive ecology form part of a conservation area as part of the Cumberland Plain Conservation Plan.

10. A parallel Northern Road connects across the Agribusiness precinct from Anton Road north across Cosgroves Creek and Elizabeth Drive. Adams Road also extends from east to west, connecting the precinct to Luddenham Road.

11. Neighbourhood hubs are located along creek parkland edges and act as a centre for employment activity.

12. A local employment centre develops adjacent to the airport along the Northern Road with amenity and outlook over Duncans Creek reservoir and adjacent open space.

13. A large employment precinct develops adjacent to the airport. The street layout is developed to facilitate large format land uses clearly framed by parkland.

14. Intensive Food production is supported on the large and relatively flat land holdings in the northern area of the Precinct that harness the connectivity provided by the proximity of the M12 and airport.

15. The planned Outer Sydney Orbital (OSO) corridor will consider critical landscape, active and vehicular crossings along its length. It's vertical alignment and design should be responsive to the need to preserve strategic sight lines, landscape and habitat connections from the Agribusiness precinct towards the west and the Blue Mountains.

16. The Hubertus Club, as a registered club, is maintained to support the local community and future development within the precinct.

17. Potential connection to the future Outer Sydney Orbital will maximise connectivity between the precinct, the airport, greater Sydney and NSW.

The Northern Road
Luddenham Road
Mulgoa Valley
Park Road
Elizabeth Drive
Cosgroves Creek
Duncans Creek
The Northern Road
Badgerys Creek
Duncans Creek Reservoir
8
7
11
14
15
10
3
16
6
1
5
3
11
2
2
9
9
9
17
12
4
13
Scale 1:40,000 @ A4
0m
500m
1000m
2000m

View looking east over the Agribusiness Precinct

Part 5

OPPORTUNITIES AND CHALLENGES

The key opportunities and challenges to address in Urban Design Framework Plan

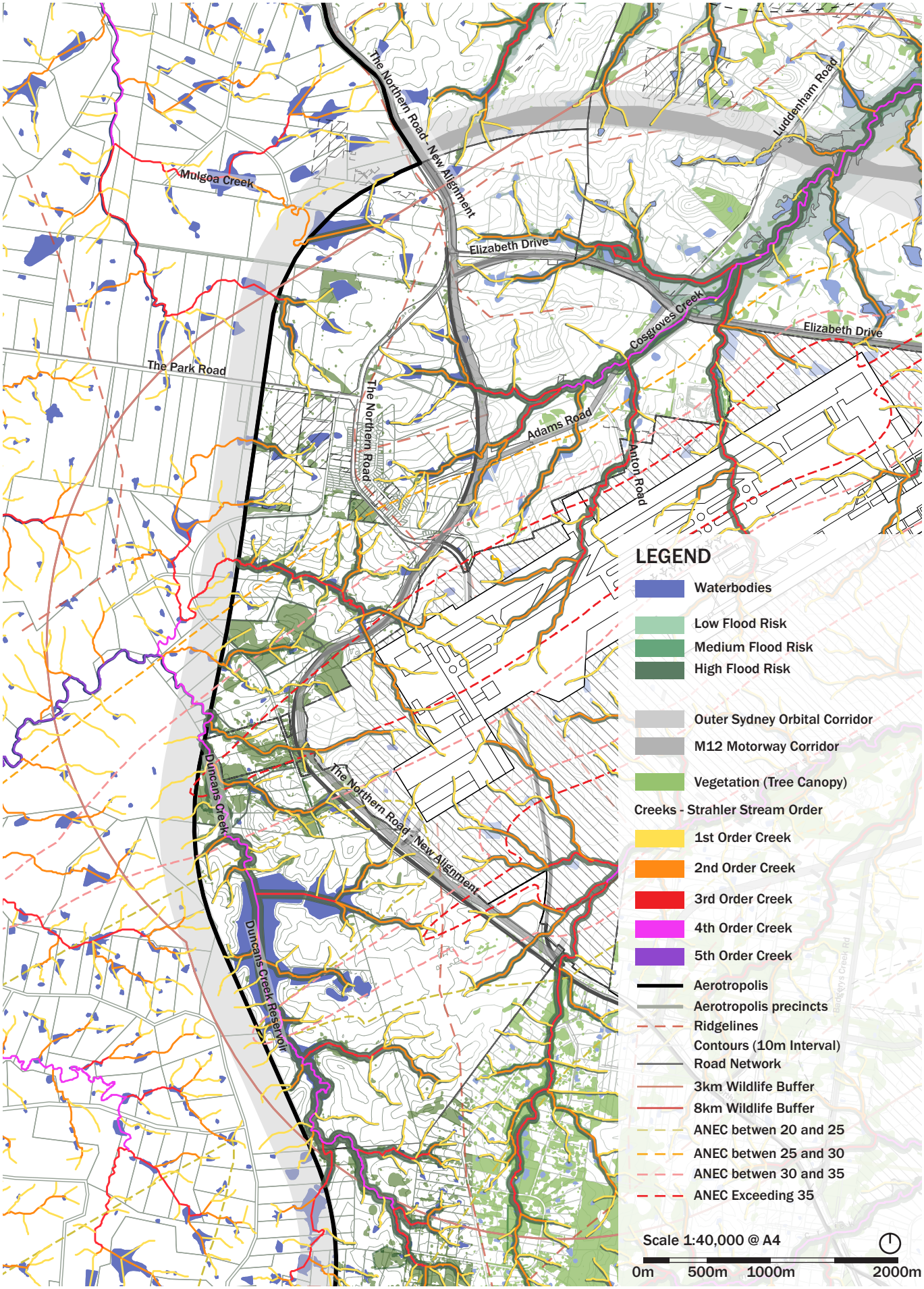
Opportunities

- Recognise and embrace the precinct's rich cultural history and honour the enduring spirit of Country and ancestral connection to land
- Leverage the accessibility and catalyst opportunities provided by the connections to the new international Airport
- Utilise the prominent ridgelines and creek network to establish the structuring elements of the Urban Design Framework Plan
- Connected open space network can function as an active transport, recreation, environmental and habitat network
- Retain and enhance existing vegetation that has biodiversity values
- Respect and conserve heritage items, around Luddenham Village and the greater Agribusiness precinct
- Celebrate the heritage and agricultural history of Luddenham Village
- Transform the old Northern Road into a walkable 'main street' lined with cultural, retail and hospitality offerings
- Retain and enhance key landscaped vistas from ridgelines
- Provide active transport crossings of the creeks
- Reinforce the landscape character of the precinct by utilising landscape and tree canopy to screen built form
- Transform Duncans Creek Reservoir into a public recreation asset
- Leverage access opportunities along Elizabeth Drive connecting to the M12 and Greater Sydney
- Opportunity to use the roofscape for water capture and use
- Utilise large scale roofscape for precinct scale solar power
- Harness the potential of waste to energy at precinct and Aerotropolis wide scale
- Improve food security by producing food for the Greater Sydney Area
- Integrate sustainable energy, waste and water as well as circular economy design principles into development and operations.
- To utilise green infrastructure throughout the precinct and along arterial roads to buffer the precinct and Aerotropolis from hot prevailing westerly winds
- Potential freight rail access to the Agribusiness Precinct
- To build resilience for communities and place over the long term
- Leverage food production opportunities in the precinct and import/export opportunities from the wider Metropolitan Rural Area and Regional NSW to the world

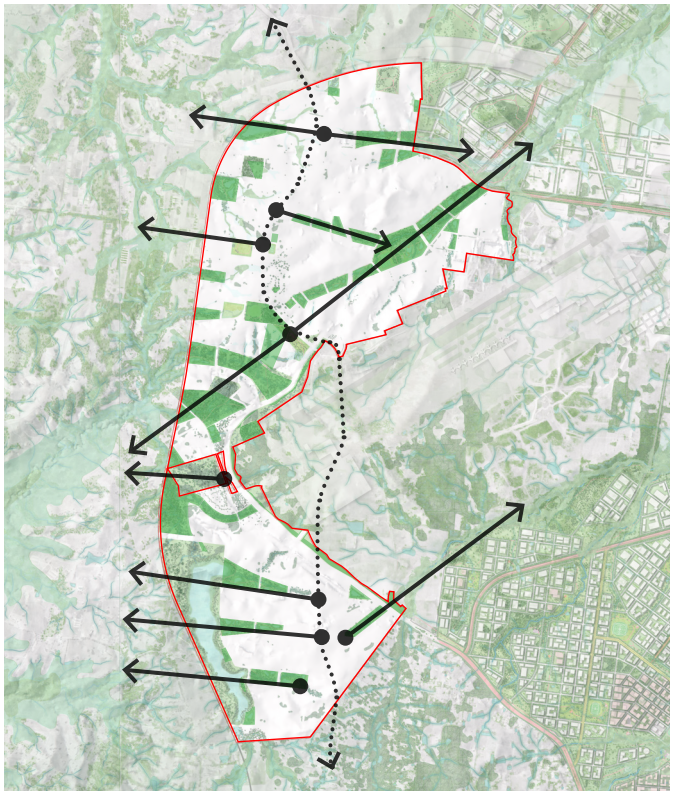
Challenges

- Safeguarding airport operations including limitations on vegetation and open water bodies to limit wildlife attraction.
- Ensuring long term viability and sustainability of Luddenham Village
- Topography limits possible locations of large format land uses
- Land uses will need to be scaled to suit site topography and minimise earthworks.
- Future noise and public safety areas resulting from the airport impose land use limitations
- Building heights will need to conform to OLS limitations
- Limitations on the number of intersections along arterial roads
- Trees pose bushfire connectivity issue unless managed
- Existing ownership and lot arrangements
- Maintaining ecological, physical and visual connections across the potential future alignment of the Outer Sydney Orbital (OSO)
- Development sequencing to ensure appropriate servicing and management of conflicting land uses / adjacencies.
- Existing utility service provision is limited. Large Portions of the precinct are unserviced
- Heat including prevailing winds from the west
- Presence of River-Flat Eucalypt Forest along Cosgroves Creek and riparian corridors. River-Flat Eucalypt Forest is listed as an Endangered Ecological Community under the *Biodiversity Conservation Act 2016 (NSW)*
- Development that affects riparian corridors must avoid, minimise, mitigate and offset impacts to biodiversity as prescribed in the Draft Cumberland Plain Conservation Plan (CPCP).
- The recent Northern Road bypass and prohibition on noise sensitive uses within the Australian Noise Exposure Concept (ANEC) 20 and above contours threatens the viability of the Luddenham Village

The Urban Design Framework Plan

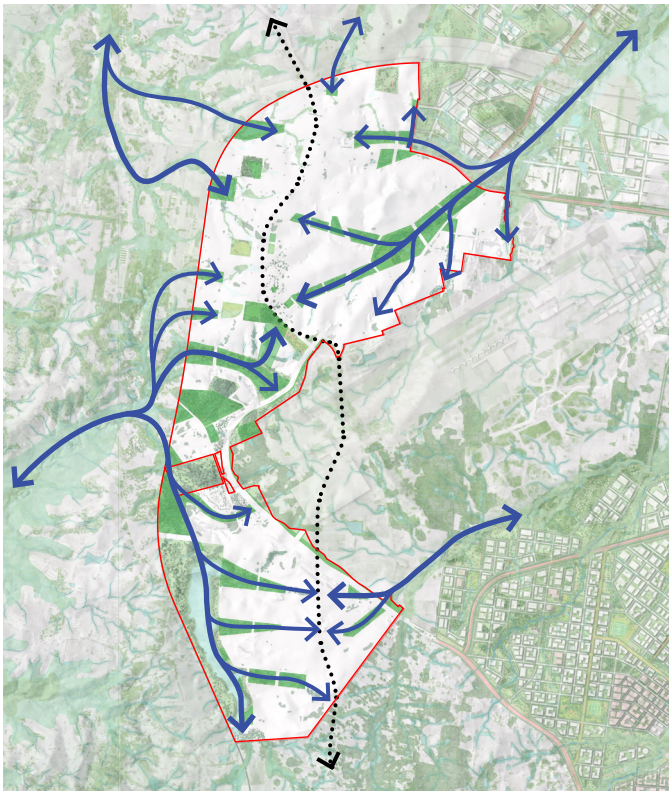


THE KEY PRINCIPLES AND STRUCTURE



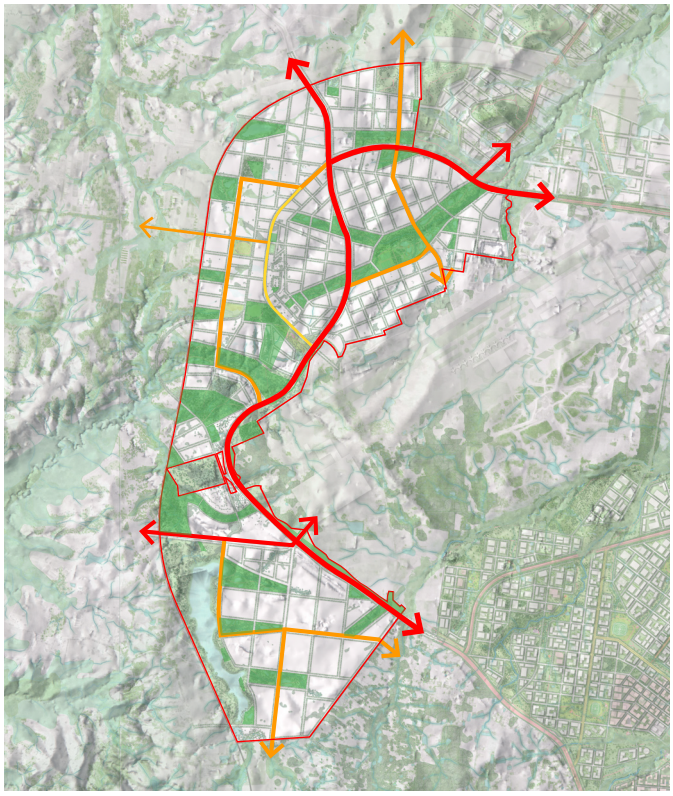
Views across Country

- Establish the prominent north-south ridgeline (songlines) as the primary structuring element.
- Preserve landscaped views through the precinct to landscape landmarks such as the Cosgroves Creek, Mulgoa Valley, Badgery's Creek and the Blue Mountains beyond.
- Preserve views across Country that span from immediate contextual elements to the broader landscape and wide open sky.



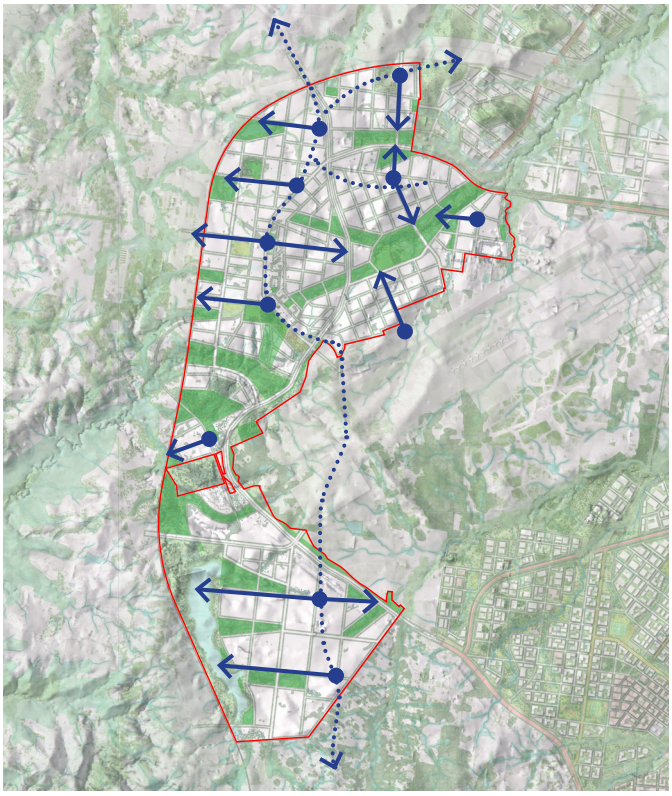
Ridge to Creek / River

- Create a new connected parkland that extends from the precincts prominent ridgeline, which includes Luddenham Village, down to Cosgroves Creek and the Wianamatta to the east, the Nepean River to the west
- The parkland network combines both blue and Green grids.
- The parkland network will connect to existing parkland, such as Sales Park.
- As a structuring element within the Urban Design Framework Plan, the parkland will have a clear and legible form that is framed and accessed by public streets.



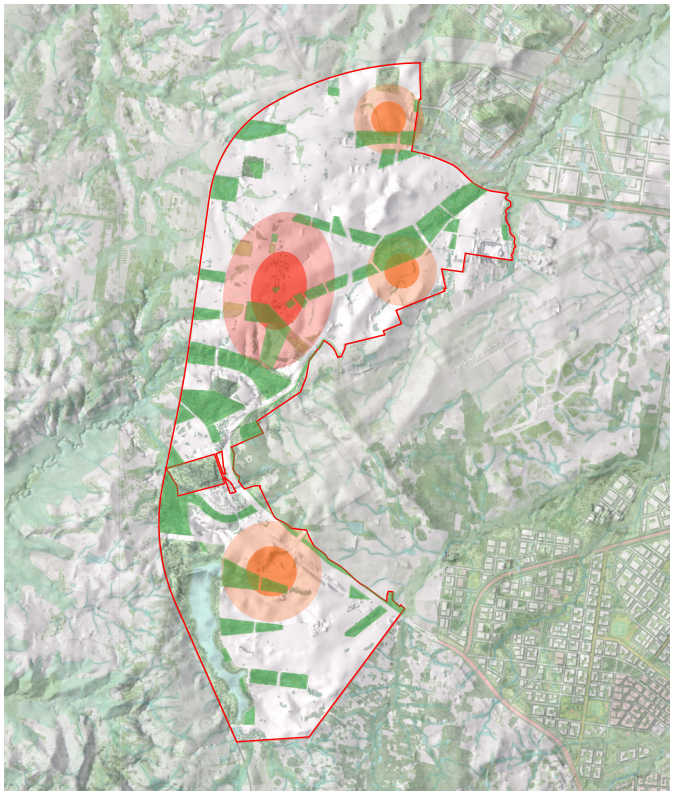
Connectivity

- The realigned Northern Road forms the primary north-south connector and ensures freight connectivity between the precinct, the airport airside cargo terminal and broader Sydney through the M12.
- Connection to the future Outer Sydney Orbital is located in close proximity to the WSIA freight terminal
- Public Transport (bus) equitably distributed throughout the precinct
- Active Transport networks provide connectivity throughout the street and parkland network
- Freight movements are minimised through Luddenham Local Centre.



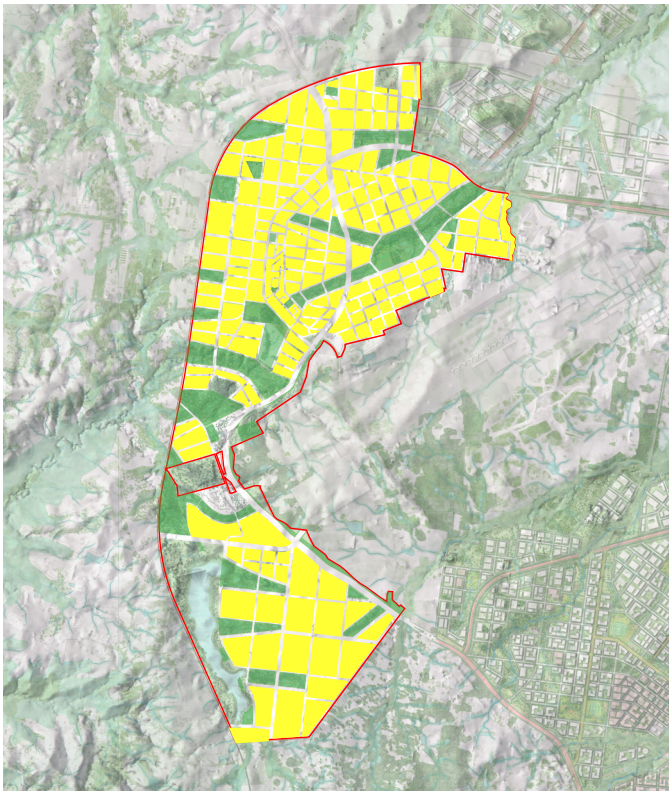
Streets to Creeks

- The connected street network has its pattern aligned with views to landscape. This approach generally means that streets run from ridgelines to creek lines.
- This approach will enhance the visibility of the landscape within the precinct along with ensuring a permeable, connected precinct.
- The street pattern allows for a variety of differently scaled land uses whilst strategically responding to topography, walkability and connectivity.



Hierarchy of Centres

- Celebrate the history of Luddenham village as a centre of rural industry by framing it with agricultural industry and connected it to parkland networks of Cosgroves Creek, Duncans Creek and the Mulgoa Valley.
- The agricultural history, heritage and character of Luddenham Village will be celebrated and be a destination in its own right close to fresh food markets.
- A new local centre is formed to support the employment area that forms south of the airport cargo terminal alongside Duncans Creek
- Neighbourhood hubs are located adjacent to public domain and public transport routes adjacent to Cosgroves Creek.



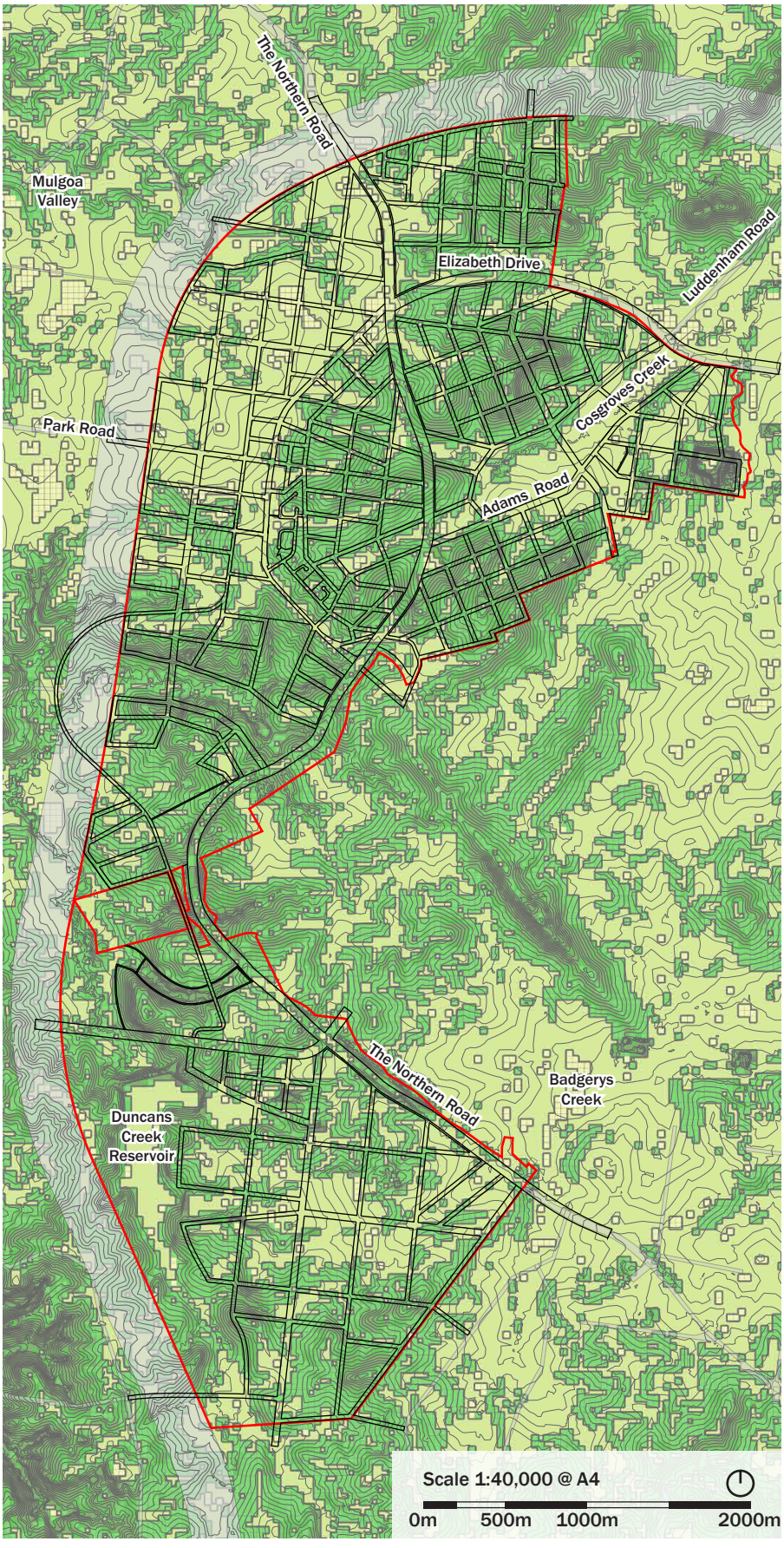
The Roofscape as Resource

- The roofscapes within the Agribusiness precinct should be utilised to harvest rainwater, produce solar power or green roofs.
- Cooling Canopies, with integrated solar panels and rainwater capture, will shade built form, hard stand and private open space within development sites
- Water harvested can be re-used within the agribusiness 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.
- The scale of the built form within the precinct means it provides an unprecedented opportunity to integrate precinct wide solar farming in a manner which can support local and national sustainability objectives

Street Framework

The street layout of the Agribusiness precinct has been developed to respond to the following requirements:

- → Creeks and ridgelines are the primary structuring element of the street framework.
- → Street framework adjusts orientation and scale to suit local topography within the creek network and ridgelines
- → Street framework is flexible to accommodate very large rectangular footprint buildings without compromising connectivity and walkable neighbourhoods
- → Streets are aligned to maximise the visibility of long vistas and local landscape
- → Streets align across arterial and sub-arterial roads to future proof potential future intersections and connectivity
- → Edge streets define and provide access to riparian zones and open space
- → Alignment of street network with existing cadastre, where possible, to improve delivery outcomes and minimise impacts on existing landowners



LEGEND

- 1-5
- 6-10
- 11-20
- 21-100
- More than 100
- 2m contours
- Street layout (all typologies)

EXISTING CHARACTER

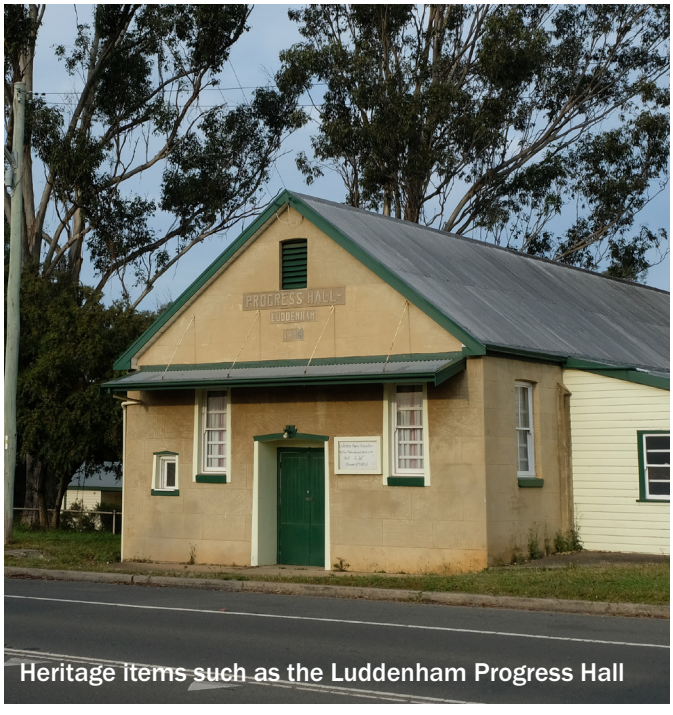
Located between the watershed of the Nepean River to the west and the Wianamatta Creek and proposed airport to the east, the Agribusiness Precinct spans the ridgeline on which the Northern Road is situated, this road historically linking Penrith and Campbelltown.

Luddenham, positioned on the Northern Road is a village that provides service facilities to the surrounding agricultural lands.

Luddenham Village is distinguished by its low built form and scale and features a selection of heritage listed buildings including St James Anglican Church and the Luddenham Showground. The village is set within an agricultural setting of open pasture and groups of native trees with significant views to the Blue Mountains to the west and wooded ridgelines and surrounding landscape including Cosgroves Creek to the east. These views, from the highest ridgeline within the Aerotropolis, significantly inform your impression of place and its relationship to context.

The fluvial nature of the landscape is highlighted by the drainage and creek lines that are identified by a series of dams and water bodies. These water bodies serve as reservoirs for the small scale agricultural and horticultural activities of the area.

Duncan's Creek reservoir to the south is the largest and has been known to be used for recreational activities. To the east, the landscape character is open grassland with minor groups of trees located in irregular patterns across the landscape. To the west of the ridgeline, the valleys are characterised by remnant woodlands and are more incised than those valleys to the east. Overall, the undulating topography, open pasture and groupings of remnant woodlands provide traditional aesthetic pastoral values associated with the Cumberland Plain.



Heritage items such as the Luddenham Progress Hall

St James Anglican Church Cemetery

A watery landscape, Broad landscape views from ridgelines and chains of ponds along creek lines

The Old Northern Road as it runs through Luddenham Village

Agricultural land use in and around the precinct.

Presence of the Blue Mountains on the western horizon

A HISTORY OF HARVESTING

The history of harvesting in the precinct is celebrated within the Agri-Park, through Aboriginal planting themes and indigenous land management, and continues within new intensive agriculture enterprises throughout the precinct.

A HISTORY OF HARVESTING

The lands within the Agribusiness precinct have a legacy of agricultural land use. The seasonal and cyclical harvesting of land has supported and nourished the community throughout history, bridging Indigenous and European cultures and connecting the precincts future with its past.

The history of harvesting acknowledges the importance of the stewardship of the land over millenia. Acknowledging this history and its relationship to the future of the precinct could provide opportunities to connecting with Country through cultural, educational, research, tourism, commercial activities and programs.

At the heart of the precinct is Luddenham Village, with strong visual and social evidence of its connections from colonial times. The heritage of the land use and management practices of the Cumberland Plain are reflected in the landscape character of the Agri-business Precinct and strongly represented around the Luddenham Village.

The Agribusiness will value the heritage and history of the land and realise the potential of the resources of soil, sun and water that are at the core of land management practises.

Sun and rain falling onto roofspace will be harvested in the form of solar power or solar heating. Rain water will be collected or directed off roofs and hard surfaces into storage or WSUD features. The solar power will supplement the demand on grid energy supply, while rain water collected would be used in the form of irrigation or infiltration to sustain the landscaped areas and to mitigate and stabilise creek water flows.

The mitigation and stabilisation of water flows will assist in the retention of soil by reducing the erosive effects on creeklines and banks. Re-vegetation and rehabilitation across the precinct will assist in further protecting and enhancing the soils of the Agribusiness.

The parkland within the Agribusiness precinct will reflect a diverse range of landscape and physically connect the Agribusiness precinct to the modern and historical land usage. The parkland is to integrate Indigenous planting and management techniques, re-establishing the heritage and history of the place.

An opportunity exists to Connect to Country through Aboriginal planting themes that will be consistent with Indigenous use of the land, and include plants that are integral to Aboriginal life and culture. This will be especially evident in planting to the Agripark, APZ 's and riparian corridors and areas of Aboriginal heritage sensitivity.

The plantings within the precinct can be harvested as a seed bank for future stages of development within the Aerotropolis.

The Agribusiness will reinterpret the traditional agricultural practises with industry leading, best practise in crop production, preparation and storage facilities that will also sustain the replenish the natural systems within land in which the Agribusiness sits.

Agribusiness Hubs

Development within the Agribusiness Precinct will include uses that will benefit from opportunities for national and international trade. These uses may include:

Integrated Logistics Hub

Will deliver a multi-modal supply chain solution. Its superior land-side to air-side linkages will provide safe, secure and seamless connectivity to domestic and international markets for inbound and outbound freight. With digitally enhanced systems, processes and platforms it will enable rapid distribution of high-value products.

Integrated Intensive Production Hub

Support the production and value-adding of sustainable, high-quality fresh produce and pre-prepared consumer foods, bringing opportunities to existing and new businesses, markets and products. Enabling revolutionary urban agricultural solutions, it will accommodate large scale high-tech glasshouse operations and smaller scale vertical farming operations.

Food and Pharma Hub

Help deliver a major fresh food distribution point and create a collaborative, high value-added and integrated sector that helps meet the growing demand and changing consumer preferences in high growth sectors such as nutraceuticals, complementary medicines, value-added foods and pre-prepared meals.

Australian Centre of Excellence in Food Innovation

An industry-led powerhouse in food science, tech, engineering and math, unifying students, academics, entrepreneurs, industry experts and government. It will foster and accelerate research and production and create rewarding career opportunities

THE BLUE-GREEN INFRASTRUCTURE FRAMEWORK

The Blue-Green Infrastructure Framework is a series of integrated natural networks that penetrate into and through the urban form. The Green and Blue Infrastructure aims to: mitigate the urban heat effect, promote biodiversity, improve waterway health, promote active and passive use of open space, reduce stormwater runoff, endorse tree canopy cover targets, create a more resilient landscape and urban form, reduce soil salinity and improve amenity for residents, workers and the whole community. The framework will be responsive to the need to safeguard airport operations by limiting wildlife attraction. The framework includes conservation corridors of remnant Cumberland Plain and River-Flat Eucalypt Forest preserved in conditions as close to original as possible.

View along Cosgroves Creek Parkland towards Luddenham Village and beyond

PUBLIC DOMAIN PLAN

The Public Domain within the Agribusiness Precinct will, by creating a range of memorable and high-quality spaces, connect the urban form to Country, in a manner that respects the natural processes and rehabilitates the land. By these processes, it will meet the needs of an evolving and liveable city.

PROVIDE OPPORTUNITY TO CONNECT TO COUNTRY

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

REPAIR AND PROTECT CREEKS AND WATERBODIES

- Preserve and improve creeks, dams, floodplains and mitigate stormwater issues
- Public space integrated with riparian areas and water bodies
- Water sensitive urban design principles integrated into urban design
- Preserve and enhance creek corridors
- Connect creek corridors to ridges and hilltops
- APZ areas to integrate Aboriginal planting themes and management practices

REPAIR AND PROTECT THE CUMBERLAND PLAIN

- Celebrates and enhances the existing landscape characteristics
- Promotes an urban tree canopy that builds towards achieving 40% canopy cover across the precinct
- Provide shade and amenity through tree planting
- Generous public domain to streets, parks, and riparian corridors
- Diffuse reflection of solar radiation

PROTECT AND NURTURE THE SOIL

- Carefully manage cut & fill
- Make contiguous areas of soil & natural ground
- Use permeable surfaces
- Preserves soil and provide maximum opportunity for soil biota and water retention by minimising pavements
- Reduce areas and concentration of soil salinity

CELEBRATE THE TOPOGRAPHY

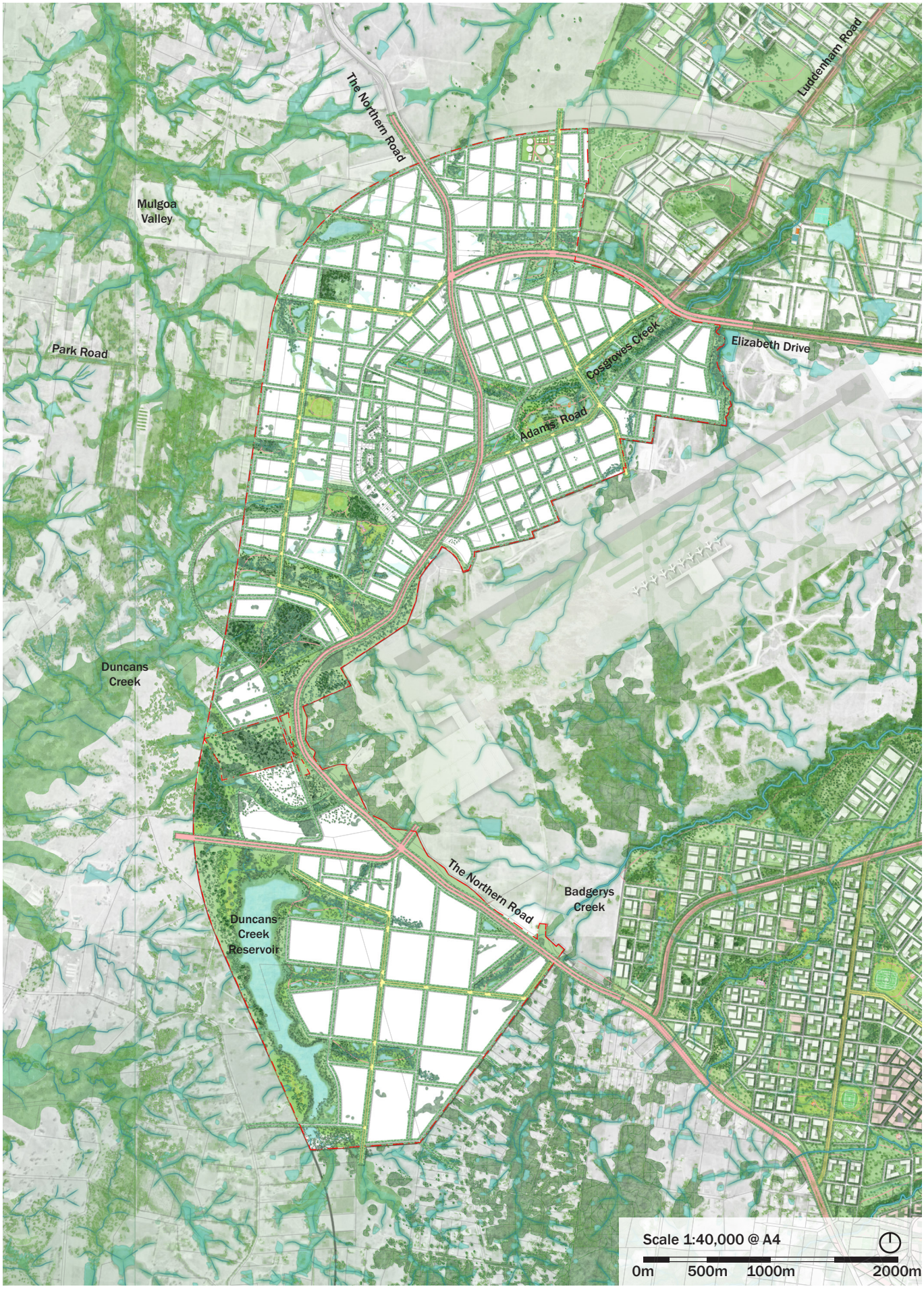
- Accentuate the natural topographic features
- Enhance existing topography by careful placement of roads and open space
- Retain the form of the existing characteristic undulating topography by considered cut and fill

LAYOUT AND STREETS

- Streets should provide orientation, address and a clear and legible hierarchy
- The needs of servicing and practical movement are to be accommodated within the street framework.
- Streets are to provide clear wayfinding through appropriate design for pedestrians, cyclists and vehicles
- Provide shade and mitigate the urban heat effect

HISTORY OF HARVESTING

- Provides opportunities for connection to Country
- Protects views across Country from the ridgeline at Luddenham Village towards the Blue Mountains and The Cosgroves Creek Valley to the Western Sydney Parklands
- Assists in interpretation of the existing landscape
- Facilitates a further understanding of contemporary land use practices
- Celebrates and interprets Aboriginal planting themes and indigenous management of the land
- Provides educational and tourist opportunities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Duncans Creek Reservoir
Scale 1:40,000 @ A4
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1000m
2000m

OPEN SPACE TYPOLOGY

The existing creeklines within the Agribusiness are fine tributaries stringing through the slopes from the ridgelines eventually connecting to form tributaries to the main creeklines in the valleys. The creeklines are used as a spine to form a series of connecting parks that link the landscape through the urban form. These parklands will integrate the Blue and Green Grid maintaining the biodiversity, improving the water quality in the precinct and connecting the urban form with nature.

The open space framework across the aerotropolis is comprised of local, district and regional parks. Within the Agribusiness Precinct, there are District and Local parks. These parks string through the precinct following the creeklines from the ridgelines to, and through the valleys.
The creeklines are used to connect the three park types in the Aerotropolis.
The creeklines and parklands, link the landscape through the urban form, integrating the urban form into the Blue and Green Grid.
The character of the parklands is diverse, but the primary function within the Blue Green Grid of all parklands is to maintain biodiversity whilst improving the water quality in the precinct and connecting the urban form with nature.
Within the Agribusiness, there are Local and District Parks with differing landscape responses and character.

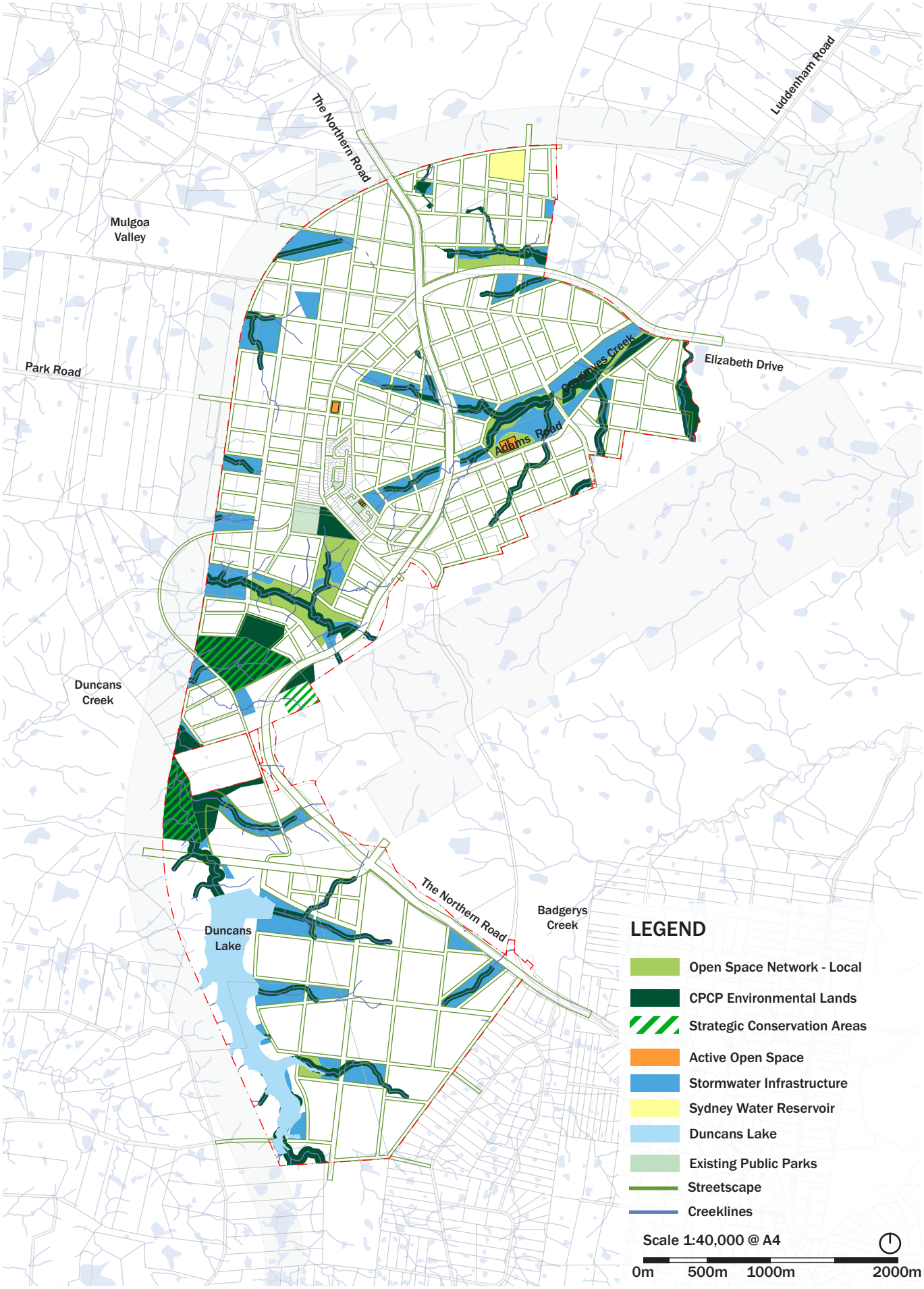
District Parks
- → Easily accessible by active transport and public transport and are generally within 2km. The Parks provide district level social and recreational infrastructure.
- → Waterways of Strahler Order 2 and higher will be maintained in a natural state, including the maintenance and restoration 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 the waterway to enable natural processes and functionality.
- → Parks have sufficient width to allow for vegetated riparian corridor, pockets of passive and active recreation of local character, cycle and pedestrian connectivity .
- → Infrastructure, facilities and pathways, located outside the 1% AEP flood zone where possible.
- → Community amenities, passive and active recreation and active transport links, playgrounds, fitness nodes Physical connection of parklands
- → Open space to accommodate Sydney Water assets such as storage basins and Biofilters integrated into parklands
- → Urban Cooling
- → APZ landscape zone to provide Aboriginal planting themes and managed land. APZ as determined by bushfire report.
- → Open space established around connections to areas with remnant vegetation and managed with primary focus on environmental protection
- → Strong visual connections through urban form and at terminating streets to parkland
- → Biological and Biodiversity connections and corridors

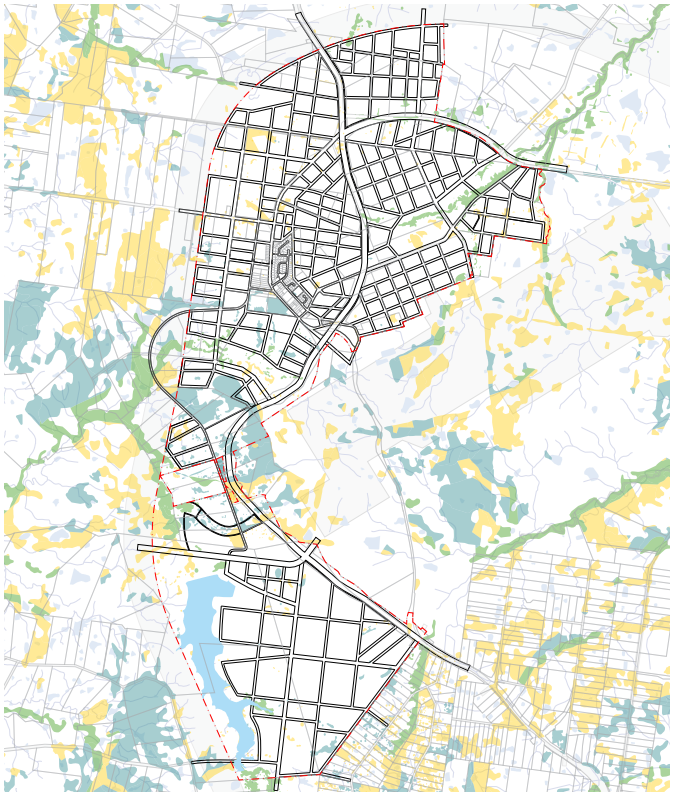
Local Parks
- → Open space servicing local area within 400m of the park.
- → Strahler Order 2 and higher will be maintained in a rehabilitated state that supports habitat, biodiversity, riparian, waterway and natural processes and functionality.
- → Active transport links. Pathways and cycleways are aligned with existing streetlights where possible to minimise extra lighting
- → Sydney Water assets such as storage basins and Biofilters integrated into parklands
- → Strong visual connections through urban form and at terminating streets to parkland
- → Neighbourhood meeting place
- → Passive recreation
- → Urban cooling
- → Open space to accommodate water retention capacity

Streetscape
- → Integral component of the overall open space framework
- → Continuous tree and ground cover planting rich in diversity allows for wildlife to migrate through the urban fabric
- → Layered Tree canopy provides shade, cooling and helps mitigate urban heat
- → Provides infiltration and recycled/captured water reuse opportunities

Cumberland Plain Conservation Plan
- → Conservation areas of sensitive ecologies.
- → Remnant Cumberland Plain retained and conserved in original or unmodified condition
- → Incorporates a range of landforms and environments of the Cumberland Plain with consideration of curtilage, view lines and amenity
- → Provides the experience of what the Cumberland Plain as it was

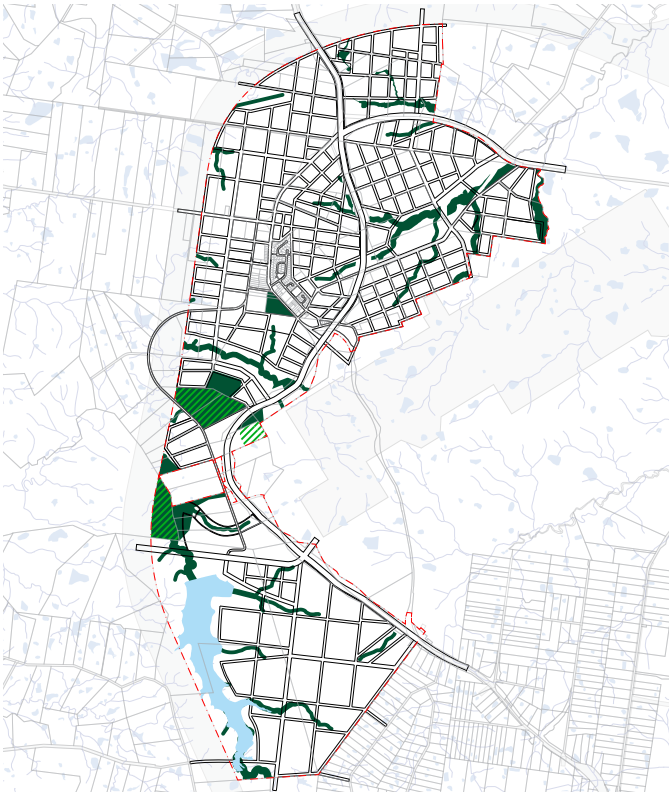
The Urban Design Framework Plan





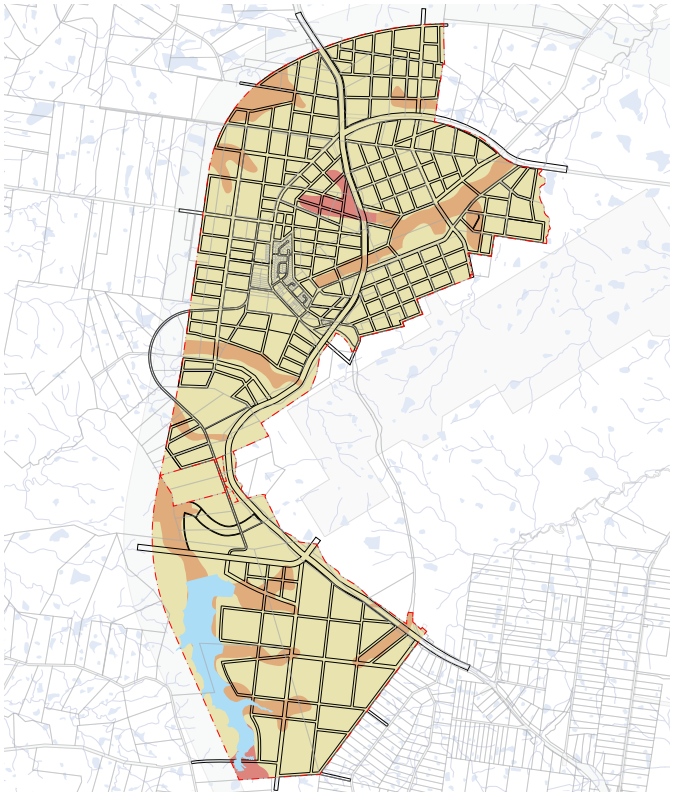
Existing Vegetation Communities

- Cumberland Plain - Shale Plains Woodland
- Cumberland Plain - Shale Hills Woodland
- Sydney Coastal River-flat Forest - Alluvial Woodland



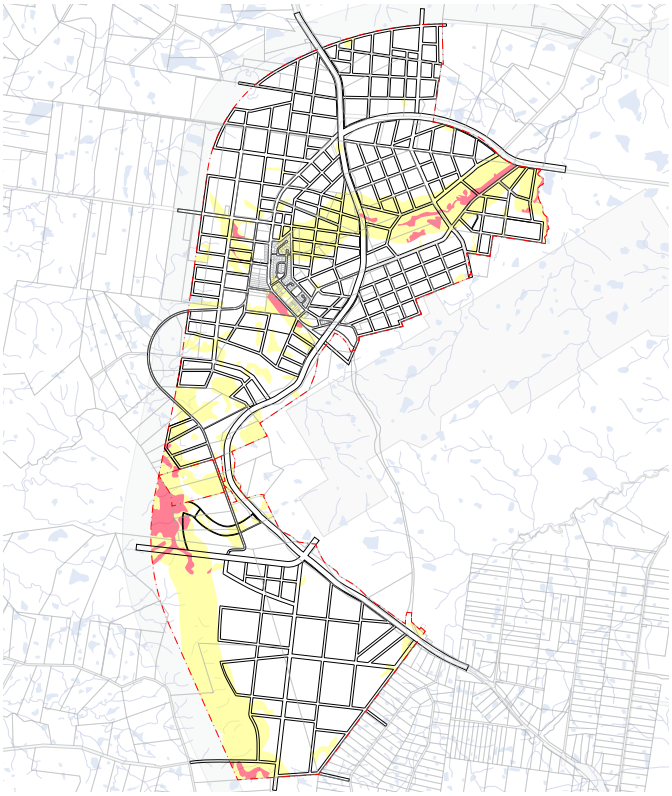
Strategic Conservation Areas and Environmental Lands

- Strategic Conservation Areas
- CPCP Environmental Lands



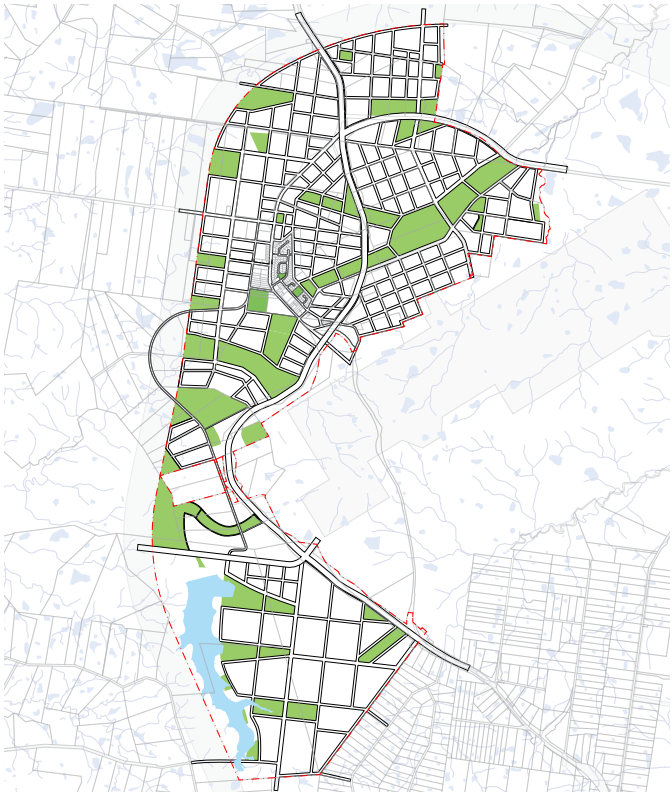
Salinity Potential

- Known Salinity
- Salinity Potential - High
- Salinity Potential - Moderate



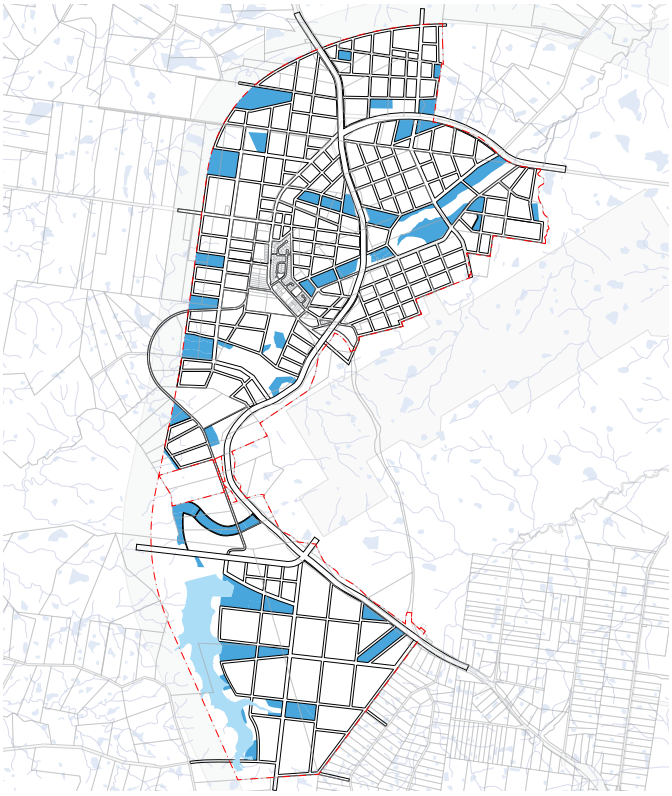
Aboriginal Heritage Sensitivity Mapping

- High Sensitivity
- Medium Sensitivity



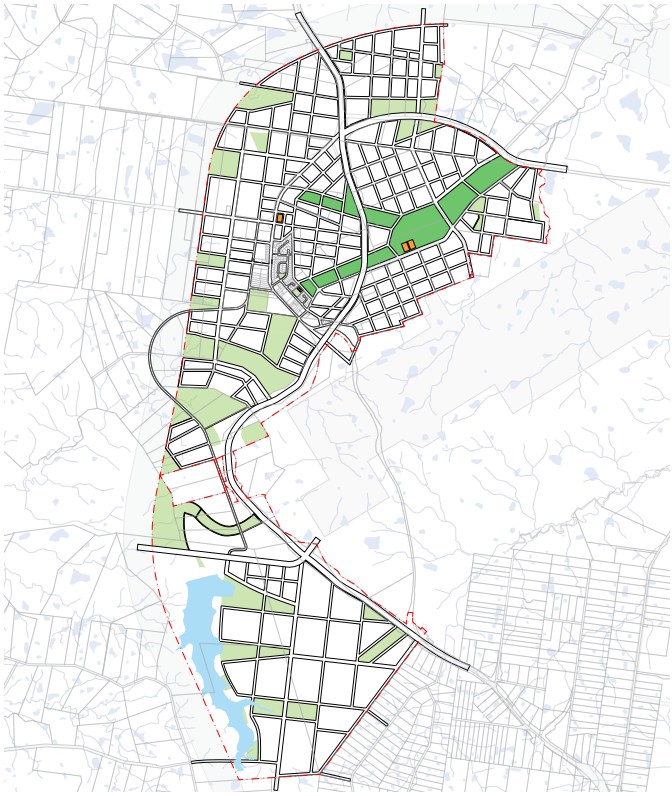
Parkland within the Agribusness Precinct

Open Space Network



Stormwater Infrastructure

Stormwater Infrastructure



Open Space Network

Active Open Space
District Park
Open Space Network - Local

Planting Strategy

Predominantly Shale Plains Planting
Predominantly Shale Hills Planting
Vegetated Riparian Planting
CPCP Planting
Dedicated APZ Planting and Management
Wetland planting in Stormwater Lands

Part 5

CULTURAL LANDSCAPES AND HERITAGE

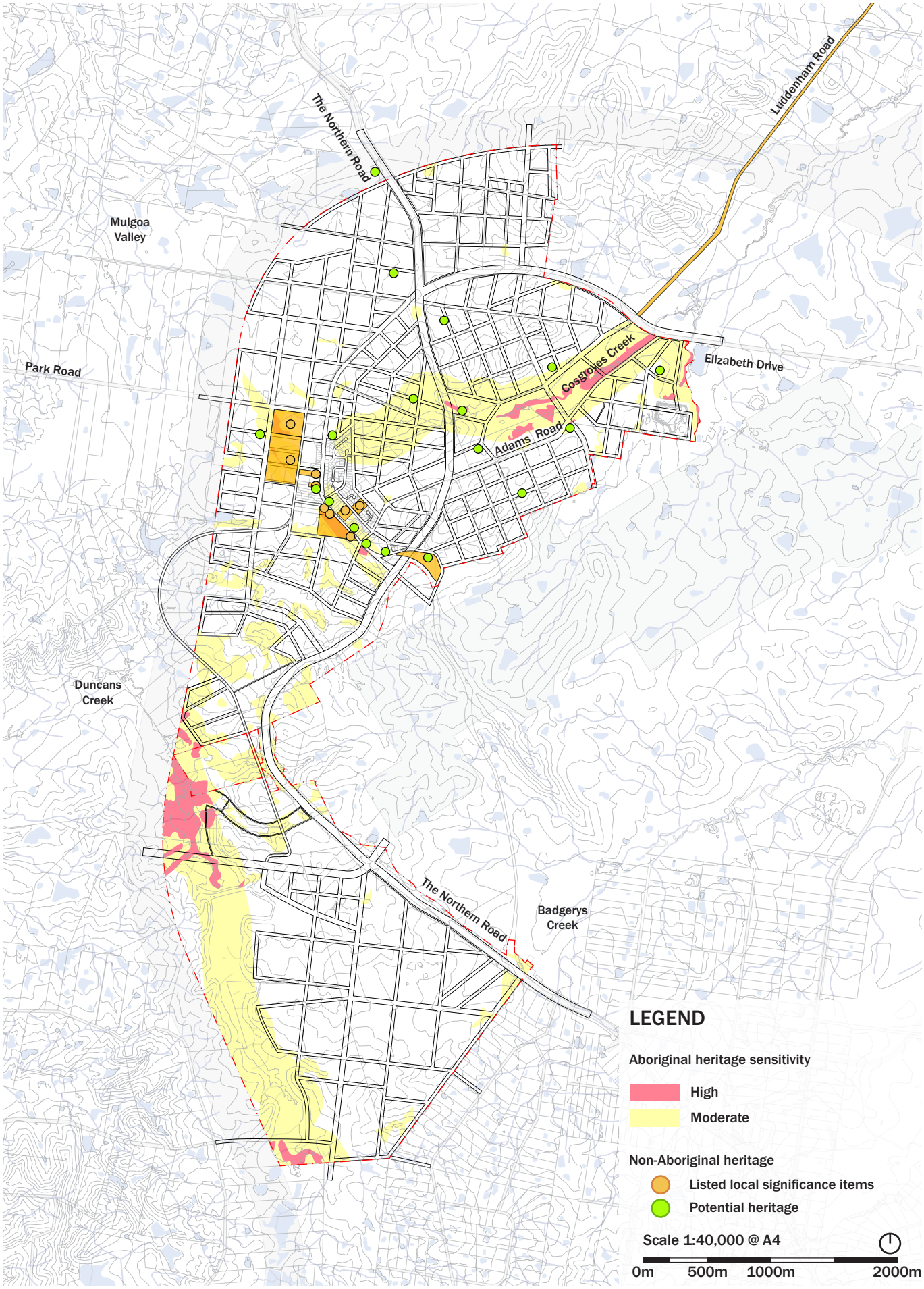
The existing Country remains incredibly significant in Indigenous Culture and heritage significance. Many existing sites have been documented across the Agribusiness precinct and Luddenham Village - and it is likely many others are unmapped. Country being core to Culture - water, creeks, ridgetops, existing vegetation and the like are associated with the sites of significance.

The Agribusiness Precinct contains the highest concentration of non-Aboriginal heritage items in the Aerotropolis. Most of the non-Aboriginal heritage items are included in or around Luddenham Village and connected with the early pastoral settlement of the village. Some of these items include Luddenham Progress Hall, St James Anglican Church and Cemetery and the Luddenham Public School amongst others.

There are also significant places of Aboriginal cultural heritage significance with several Aboriginal artefacts and potential archaeological deposits identified, particularly within the north of the precinct and around riparian areas. Similar to other precincts, areas of moderate and high Aboriginal heritage sensitivity have been identified along the creek lines and riparian areas. Furthermore, the Urban Design Framework Plan has identified several potential conservation corridors which contain Aboriginal heritage values. These potential corridors have been incorporated into the broader open space network and encompass landforms of ridgeline, spur, hillslope, creek flats, creekline and views.

St James Anglican Church and cemetery located at the top of the rise on The Northern Road at the southern end of Luddenham Village.

Photography by Extent Heritage, 2020


The Northern Road
Luddenham Road
Mulgoa Valley
Park Road
Cosgroves Creek
Elizabeth Drive
Adams Road
Duncans Creek
The Northern Road
Badgerys Creek
LEGEND
Aboriginal heritage sensitivity
High
Moderate
Non-Aboriginal heritage
Listed local significance items
Potential heritage
Scale 1:40,000 @ A4
0m
500m
1000m
2000m

SCENIC VALUES

The following is a record of the existing significant scenic and heritage view corridors and sight lines from within the Agribusiness precinct. Significant Indigenous sightlines have been considered from the cultural and historic studies. Items such as scarred trees noted in these documents are not visible from the site and noted gathering places or where artefacts have been found, are not identifiable. A more detailed walking of Country with elders who have deep knowledge of the land and the story of Country is required to clearly observe and document where these occur. It is likely that the points at which the land can be observed from the ridgelines is similar to that noted in this document.

The scenic values of the Agribusiness Precinct recognise the existing undulating topography that characterises the place and the relationship of the Precinct to its broader setting.

Opportunities are gained from the dominant north-south ridgeline that runs through the centre of the precinct generating opportunities for views over and through the precinct. The views are enhanced by the retention of the creek systems and their immediate surroundings, the open space structure and incorporation of existing features including Duncans Creek Reservoir and the pastoral landscape setting of native trees and grazing land associated with Luddenham Village The retention of these areas and sites facilitate an appreciation of place while incorporating the evolving landuse and urban form that is proposed.

The existing relationship of landscape is reinforced by the identification of these key views that strengthen and underlie the landscape values of precinct.

The scenic values of the precinct are found along the ridgelines, reinforcing the existing values of a fluvial landscape with its characteristic stream systems, undulating landform and remnant woodland. This, combined with views to the broader setting of the Blue Mountains to the west and the undulating form of the Cumberland Plain to the east facilitate opportunities for the appreciation of the overall context and scenic values of the precinct. The following structuring landscape view lines have been identified:

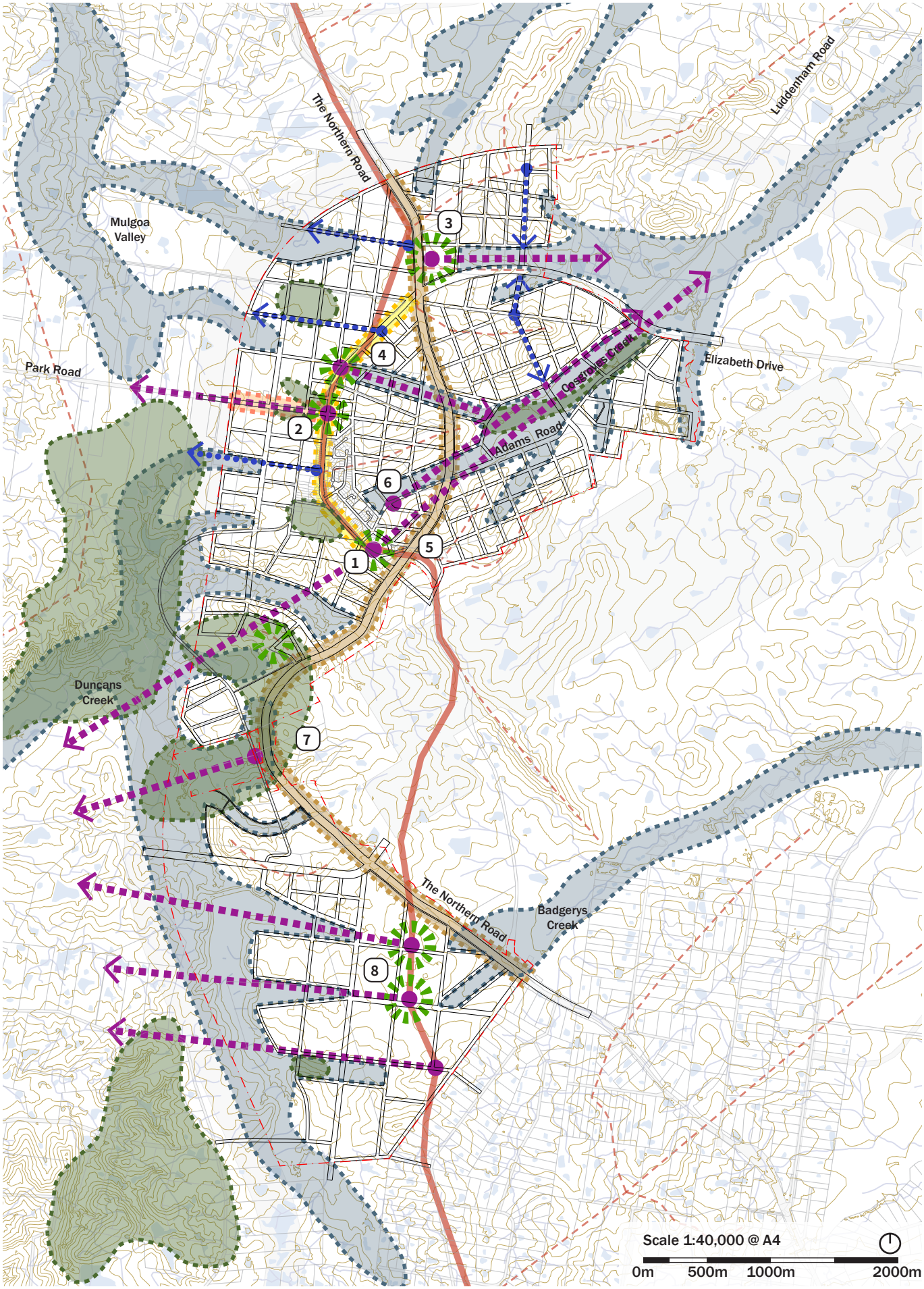
1. **Long views south west from the predominant north south ridgeline along the old Northern Road.**
2. **Park Road west views to Blue Mountains**
3. **View along Cosgroves Creek tributary and towards Cosgrove Creek and Sugarloaf Ridge**
4. **Valley view to east through a branch of Cosgroves Creeks, from the Northern Road**
5. **View from the old Northern Road ridgeline, down the Cosgroves Creek valley**
6. **Valley view adjacent Adams Road to the north east along a southern branch of Cosgroves Creek**
7. **View to west over pastoral and Cumberland Plain Woodland from Willowdene Avenue**
8. **Set of 3 views from the predominant north-south ridgeline along creek lines towards Duncans Creek with the Blue Mountains beyond**

The above views are described in further detail in the following pages.

LEGEND

- Predominant north-south ridgeline
- Landform - subtly undulating
- Filigree of creeks and dams
- Creek riparian corridor with associated vegetation framing long views
- Existing remnant vegetation - framing long views
- The realigned Northern Road - major arterial road with adjacent planting buffer
- The old Northern Road with 'Green Boulevard' landscape marking the ridgeline
- Gateway landscape along Park Road arrival
- Parkland on ridgetops or local high points
- Views from streets towards the creeks and broader and landscape setting
- Significant structuring views from ridgelines to and along creeklines and valleys.

The Urban Design Framework Plan



1. Long views south west from the predominant north south ridgeline along the old Northern Road.

- Connecting Country - connecting ridgeline to creekline and the Blue Mountains beyond.
- Significant heritage and scenic views
- Sightlines connect Luddenham Heritage buildings with colonial pastoral countryside
- Views across St James Anglican Church Cemetery from the Northern Road (Exisitng Alignment) to south west, across pastoral paddocks and the heritage Lawson's Inn site, to the layered tree lines in creek gulleys. Blue Mountains are visible on the horizon
- Backdrop of native canopy trees behind the church frames the view of the church frontage and directs the eye to more distant view

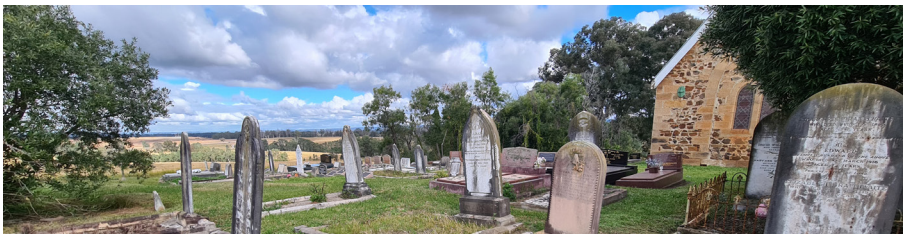


Image sourced from Extent Heritage, 2020

2. Park Rd to West of Luddenham Showground to Wallacia

- Siginificant views that define the transition into rural Country west of the ridgeline at Luddenham
- Blue mountains highly visible just above the horizon line.
- Journey through the transition into vast open rural space significant.
- Creekline valley's defined by trees adjacent tracing creeks

3. Valley view to east through north branch of Cosgroves Creek, North of Elizabeth Drive

- Significant views through to Sugarloaf Ridge across Cosgroves and South Creek valleys
- View through creek valley to broader views.
- View line includes significant Cumberland Plain vegetation
- Ridges of creek valley contain and focus views towards Sugar Loaf Ridge

4. Valley view to east through a branch of Cosgroves Creek, from the Northern Road

- Long views through to Sugarloaf Ridge over dams with regrowth indigenous trees in foreground
- Long Ridges restrict broader views and scale of Sugarloaf Ridge

5. Valley view to east through southern tributary of Cosgroves Creek,

- Scenic view of chain of dams through creek valley. District valley views beyond
- Realigned Northern Road prominent intersecting longer sightlines to extended valley view and ridges

6. Adams Road - Cosgroves Creek Valley East of Luddenham Village

- Minor scenic views confined to valley
- Rural views through pastoral valley and chain of dams

7. View to west over pastoral and Cumberland Plain Woodland from Willowdene Avenue near future underpass of Outer Sydney Orbital.

- Enclosed pastoral view to significant stand of Cumberland Plain Woodland along Creekline
- Link of pastoral scene to Cumberland plain woodland

8. Set of 3 views from the predominant north-south ridgeline along creek lines towards Duncans Creek with the Blue Mountains beyond

- Enclosed pastoral view to significant stand of Cumberland Plain Woodland along creekline
- Link of pastoral scene to Cumberland Plain Woodland

Image sourced from https://www.lpcmilk.com/gallery/

DUNCANS LAKE LOCAL PARK

The existing Duncans Creek Reservoir is distinguished by an existing large and substantial waterbody that forms a ready asset for the establishment of an aquatic focused recreation park.

The Duncans Creek Reservoir connects the rehabilitated Blue and Green grid with the remnant Green and blue grid that exists beyond the outflow of the reservoir into Duncans Lake. This creates opportunities to enhance the landscape and connections within the business related lands along the tributary creeks through the use of biofiltration and storm water basins.

This strategy facilitates the use of the open space through the provision of walking tracks, bike trails and the like providing vital multi functional open space adjacent to the business lands.

Through the rehabilitation and remediation measures of the Duncans Lake and its tributary creeks, unique parkland feature is realised facilitating a positive interaction with the reservoir creating the following opportunities:

- → Water activity and access
- → Active sport and recreation
- → Biofiltration and lake rehabilitation to improve water quality
- → Elevated platforms, look outs and boardwalks for walking and cycling.
- → Landscape that is responsive to the wildlife management requirements of the airport

Annotations

1. Water sport launching off points
2. Shared paths and cycleways
3. BBQ & sheltered zones
4. Playing courts & children play areas
5. Sports field & open recreational areas
6. Water detention and rehabilitation zones

Legend

- Sportfields
- Active recreation, areas with recreation focus, park amenities
- Water launching-off point
- Cyclepath, walking trails
- Recreation nodes, exercise stations, playgrounds - local
- Creek & associated riparian corridor
- Existing tree vegetation

The Urban Design Framework Plan

View east across Duncans Creek and Reservoir Parkland with agribusiness development beyond

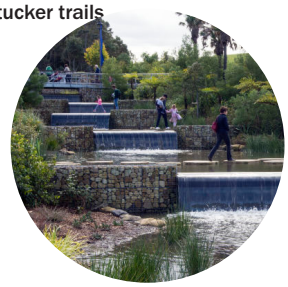
Section through Duncans Lake Parkland

Integrated raingardens as part of streetscape

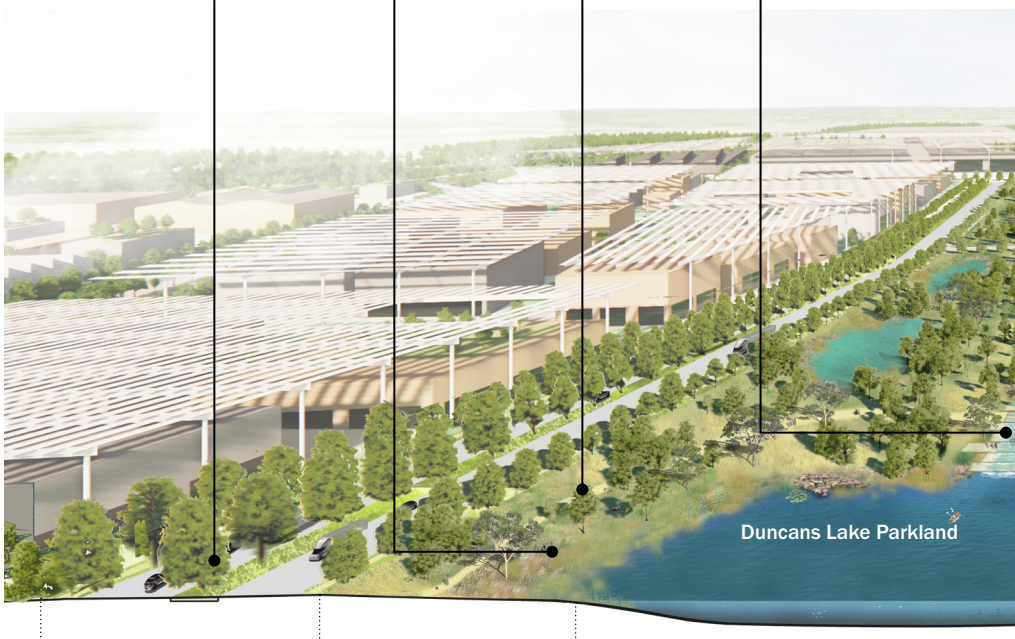
Restore native habitats to enhance biodiversity with integrated bush-tucker trails

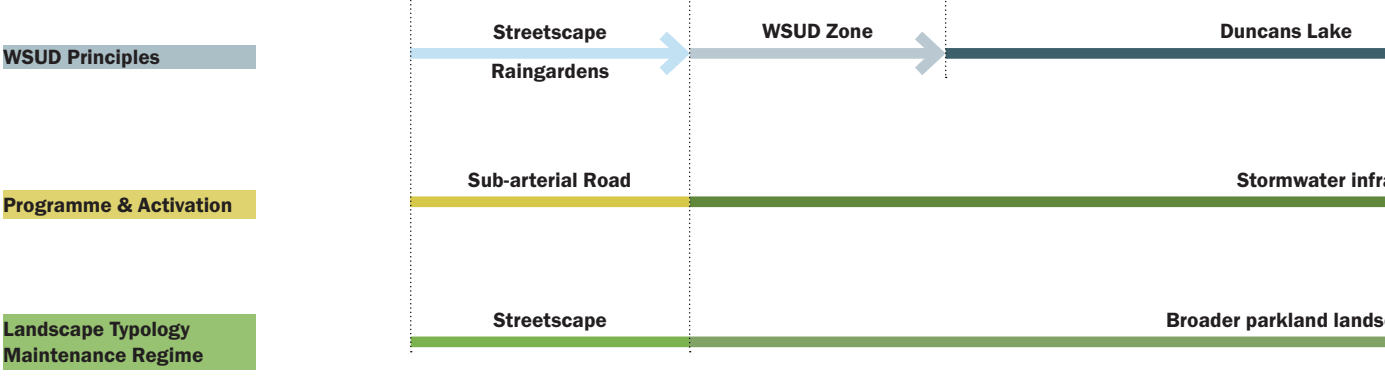
Safeguard existing ecological zones along the lake, and create enhanced linkage for cycling and walking

Design with landforms to minimise cut and fill, enhance view corridors and safeguard existing native vegetation



Tiered water feature in creek acts as a play element at water's edge





Linking habitats and utilise linear parklands along creeks to strengthen biodiversity

Activated landscape edges

Creek crossing

Integrate WSUD with boardwalks and stepping stones as innovative recreation spaces

Future agribusiness opportunities integrated with WSUD and sustainable building systems

WSUD Zone

Stormwater Basin

Streetscape

Rainwater capture and biofiltration

astructure with passive recreation

Park Edge Street

Active built form edge

cape with areas of intensive maintenance

Streetscape

Agribusiness

LUDDENHAM VILLAGE AGRIBUSINESS LOCAL PARK

The Luddenham Agri-park, located to the south of the village of Luddenham is afforded iconic views west, towards the Blue Mountains, and provides opportunities for active recreation and incorporating blue and green ecological values within the setting of a pastoral landscape that is characteristic of the Cumberland Plain.

The landscape character of open pasture and remnant native woodland provides a natural setting for the recognition and celebration of the ecological and cultural layering of the place while providing opportunities to preserve and frame landscaped views across Country from and to Luddenham and the Blue Mountains. This approach to views is mirrored to the east within Cosgroves Creek Parkland. The landscape character is distinguished by the open grass lands, canopy native trees and fluvial qualities of the creek systems that flow through the parkland. Clear sight lines and ready pedestrian and vehicular access to these parkland create opportunities for the use and enjoyment of the warmth of nature.

This parkland acts as the cultural tie that links both past and future uses of the land through:

- → Opportunities to connect to Country
- → Food research and food production
- → Indigenous knowledge of land management
- → Indigenous land management
- → Aboriginal planting themes
- → Natural and cultural heritage
- → Opportunities for heritage interpretation and cultural practice
- → Limitations on wildlife attraction

Annotations

1. Creek-line riparian revegetated zone
2. Strategic Conservation area
3. Shared paths and cycleways
4. Rest and rehabilitation stops
5. Natural play parks
6. Water detention and rehabilitation zones
7. Bridge over the creek

Legend

- Land dedicated to Aboriginal Planting Themes
- Shade facilities and rest stops
- Cyclepaths, walking trails
- Recreation nodes, exercise stations, playgrounds - local
- Creek & associated riparian corridor and stormwater infrastructure
- Existing tree vegetation

Campbell Street
The Northern Road - Existing Alignment
The Northern Road - New Alignment
Willowdene Avenue
1
2
3
4
5
6
7
Scale 1:10,000 @ A4
0m
100m
200m
300m
500m

View south west across the Agri-Park from the ridgeline at Luddenham Village towards the Blue Mountains

Section through Luddenham Agri-Parkland

Design with landforms to minimise cut and fill, enhance view corridors and safeguard existing native vegetation

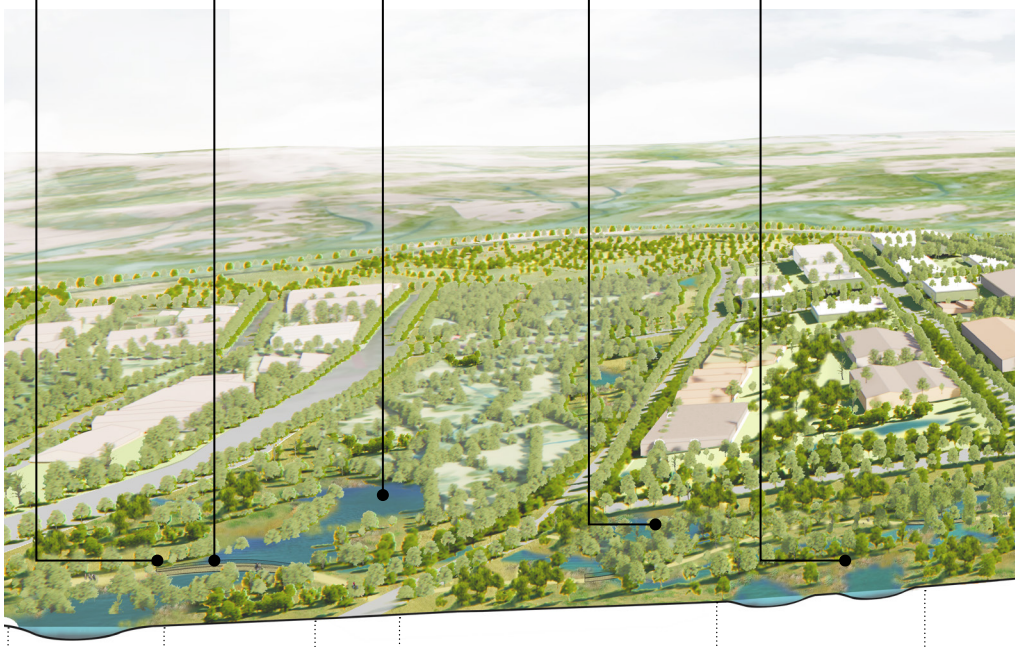
Flood detention storage and embankments intergrated around WSUD elements

Shallow marsh wetlands with internal ridges to maximise flow

Safeguard existing ecological zones along the creek, and create enhanced linkage for cycling and walking

Retain high environmental value dams and associated native wetland planting and woodlands

Bush-tucker trails as part of the parks



	High Ecological Value Dam	Adjacent Stormwater land	Streetscape	Adjacent Stormwater land	WSUD Basin	30m Rip Zon
WSUD Principles						
Programme & Activation	Stormwater infrastructure with passive recreation		Park Edge Street	Stormwater infrastructure with passive recreation		
Landscape Typology Maintenance Regime	Natural vegetated riparian area appropriate maintenance regime		Streetscape	Natural vegetated riparian area appropriate maintenance regime		Aboriginal Them

St. James Anglican Church

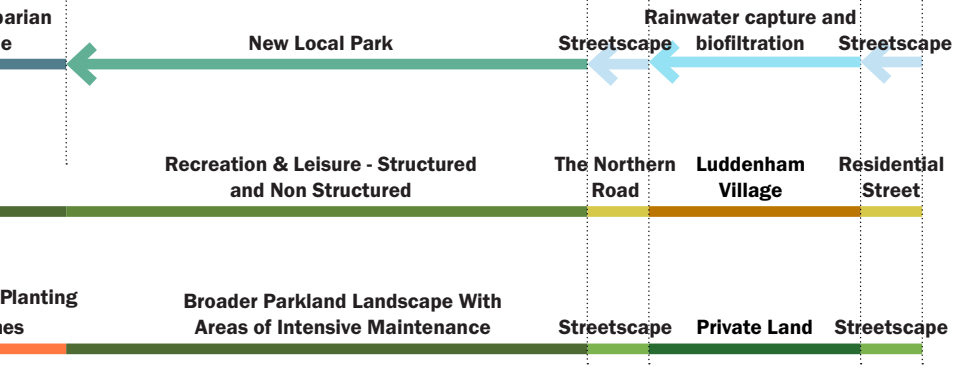
Opportunity to teach sustainable water and landscape management within local schools

Wimington Reserve upgrade with additional netball courts

Viewing platform to look towards the Blue Mountains

Luddenham Progress Hall

The Old Northern Road as it runs through Luddenham Village



COSGROVES CREEK DISTRICT PARK

The Cosgroves Creek Parkland is bound by a vibrant working community located to the north and south of the open valley parkland that is centered on Cosgroves Creek. The creek is currently identified by dense stands of She oaks set in open pasture. This landscape forms the foundation of this parkland and as the basis for the extension of the blue and green grid across the precinct and the incorporation of Aboriginal land management practices.

The Cosgroves Creek Park covers a broad topographic range, moving from ridgeline to valley floor through a string of man made water bodies that improve water quality and mitigate fluctuations in stormwater flows. The creeklines and reshaped/rehabilitated water-bodies will be revegetated to reinforce the Blue-Green Grid through riparian re-vegetation. The urban park sits adjacent to the vegetated riparian corridor.

Along the linear sections of parkland passive recreation opportunities exist with urban parks that sit adjacent to the riparian parklands. Seating, picnic facilities, children's play and structures that engage with the water, are linked to the larger parkland areas where centralised sports-fields and facilities provide recreational opportunities for the new community and workforce.

Facilities provided in parkland:

- → Picnic shelter and seating incorporating one BBQ
- → Change rooms and Public toilets
- → Shade
- → Drinking fountain
- → Large kick about area
- → Lighting
- → Varied range of play equipment and play themes or all ages, and opportunities for kick around, free running activities and ball game
- → Kiosks
- → Sydney water assets, Water detention & rehabilitation

Annotations

1. Detention basin within parkland (indicative)
2. BBQ & sheltered zones
3. Playing courts & children play areas
4. Passive open space with provisions for dog parks
5. Employment centre
6. Active transport links through parkland

Legend

- Sportfields - district
- Active recreation, areas with recreation focus, park amenities
- Cyclepath, walking trails
- Recreation nodes, exercise stations, playgrounds - local
- Creek & associated riparian corridor
- Proposed parkland
- Water detention basins (indicative)

Elizabeth Drive
Luddenham Road
The Northern Road - New Alignment
Adams Road
Anton Road
Scale 1:10,000 @ A4
0m
100m
200m
300m
500m

View along Adams Road with Cosgroves Creek parkland on the left

Section through Cosgroves Creek Parkland

Integrated stormwater median as part of wider WSUD network

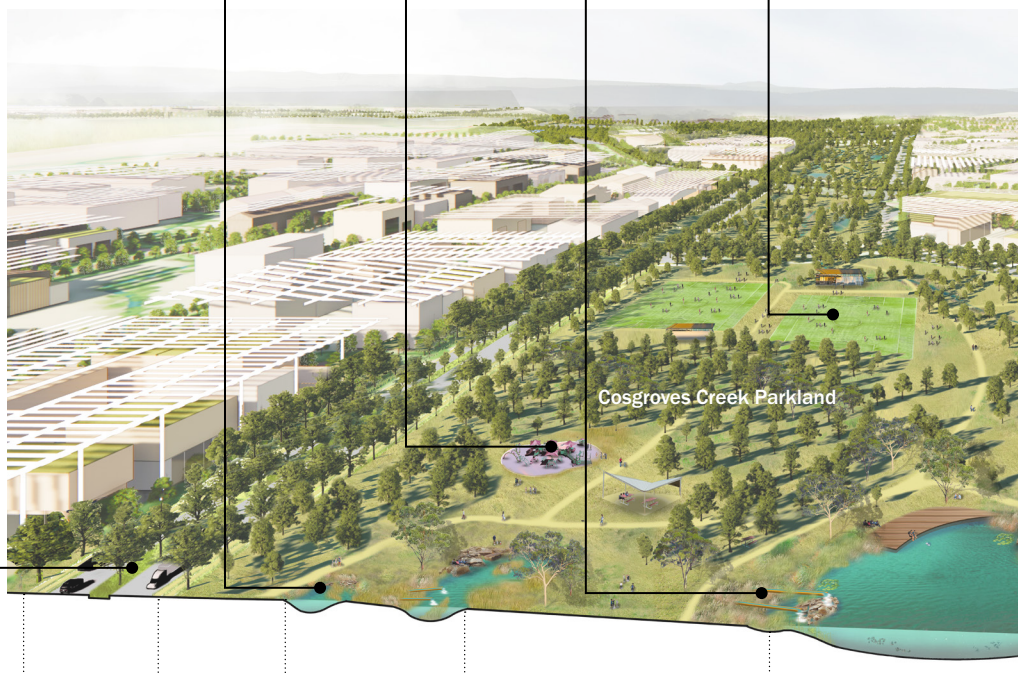
WSUD basins connected to existing blue grid to improve flows and water quality

Water piped downstream through feature interpretive channels integrated with open water basin

Design with landforms to minimise cut and fill, and safeguard existing native vegetation

High engagement playground with outdoor exercise facilities

New sports fields to support active recreation within employment lands



WSUD Principles	Streetscape	Adjacent stormwater lands	Stormwater basin	Adjacent stormwater lands	Stormwater bas
Programme & Activation	Sub-arterial Road	Stormwater infrastructure with passive recreation			
Landscape Typology Maintenance Regime	Streetscape	Broader parkland landscape with areas of intensive maintenance		Aboriginal planting themes	Broader parkland landscape wi intensive maintenanc

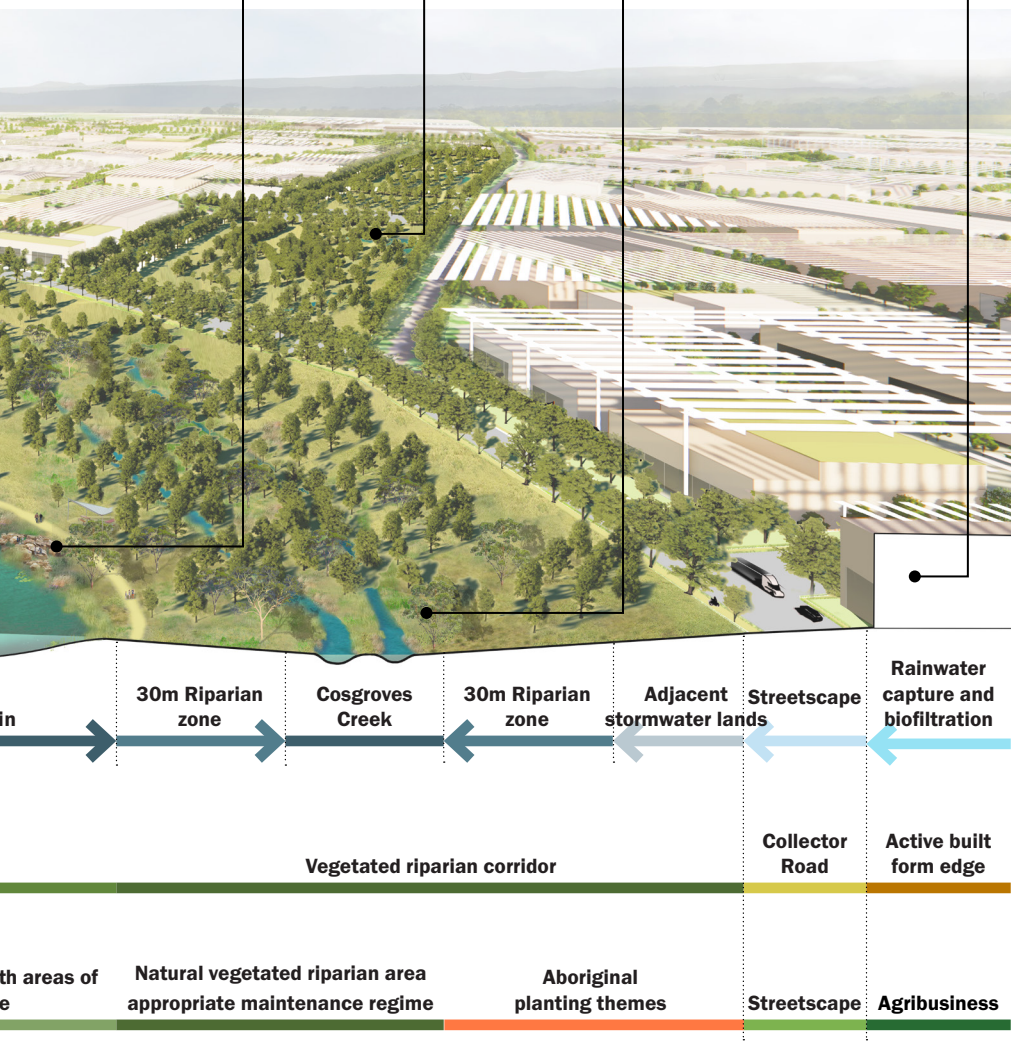
Linking habitats and utilise linear parklands along creeks to strengthen biodiversity

Dense grass planting with occasional shrub layer

Rock riffle & shallow marsh wetland to maximise flow

Opportunities for pedestrian movement as part of WSUD

Future agribusiness opportunities integrated with WSUD and sustainable building systems



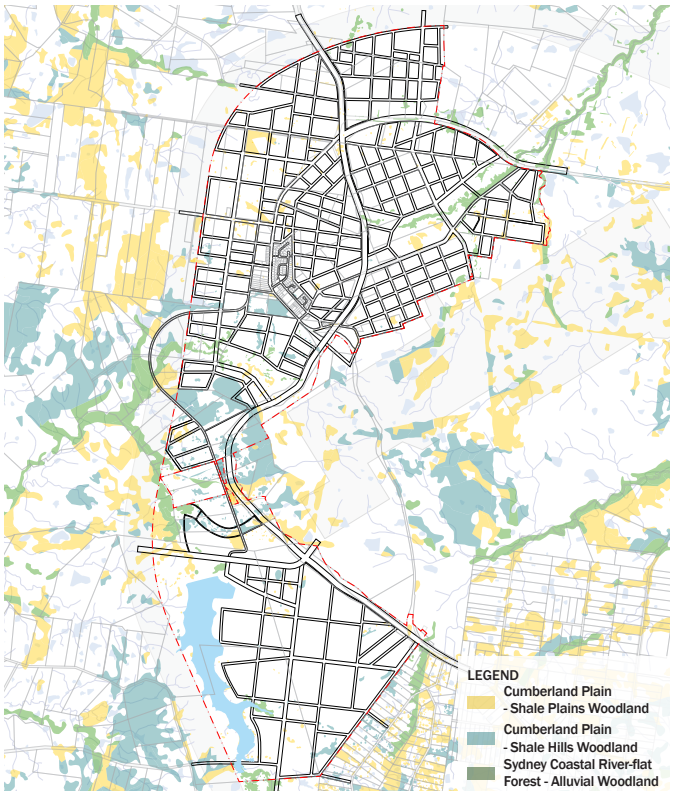
VEGETATION ANALYSIS AND OUTCOMES

A consideration of the existing vegetative character of the Agribusiness is integral to delivering a considered and site responsive planting framework. This includes an understating of local ecological communities, soil conditions, and culturally significant zones to deliver a rich planting strategy throughout the precinct that is in-line with the Draft CPCP.

Planting framework to Parkland and Development Lands

The vegetation of the precinct is inspired by the existing vegetation characteristics. This strategy is outlined in the following:

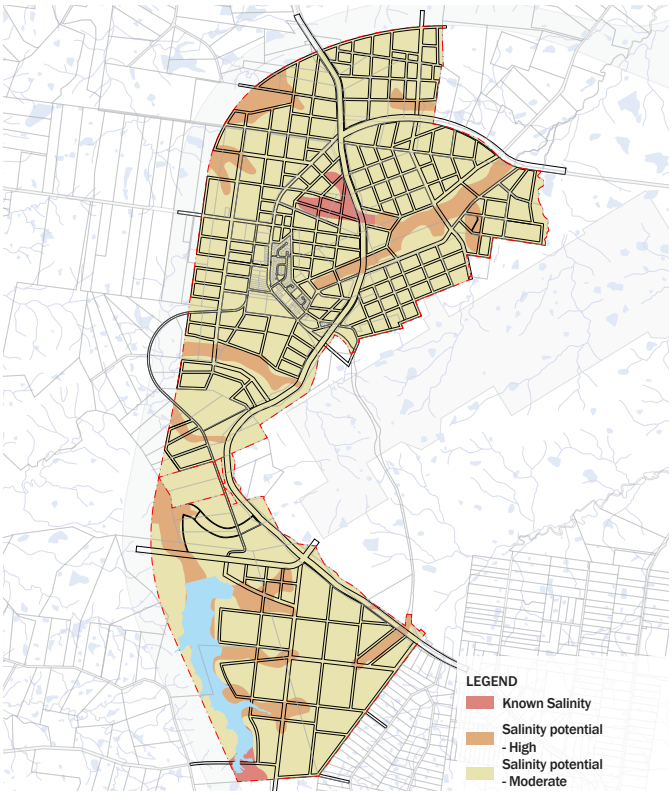
- → Shale Plains planting to areas with grades less than 10%
- → Shale Hills planting to areas with grades of 10% and higher
- → Riparian planting to areas over alluvial soil and creekline revegetated zones
- → Plantings to managed APZs informed by Aboriginal planting themes
- → Planting framework to be integrated with the strategies outlined in the CPCP
- → Native wetland planting to the edges of permanent water bodies
- → Flood tolerant tree planting in select areas around permanent water bodies
- → Flood tolerant native species at interface of flood zone



Existing Vegetation Communities

The existing vegetation characteristics of the Aerotropolis consist mainly of three communities. These are:

→ Cumberland Plain - Shale Plains woodland
→ Cumberland Plain - Shale Hills woodland
→ Sydney Coastal River-flat Forest - Alluvial woodland



Salinity Potential

The known and potential saline soils within the precinct are centred around creek orders of 2nd and higher. Planting to these areas to consider:

→ Tolerance to saline conditions
→ Saturated soils
→ Poor drainage

PLANTING STRATEGY

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

Design Intent

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

The overarching planting strategy aspiration is to

- → Preserve, restore and build upon the Cumberland Plain woodland and grassland character,
- → Preserve the Alluvial Woodland communities consistent with strategies in the Cumberland Plain Conservation Plan (CPCP).

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

The sites topography, hydrology, and geomorphology will guide the proposed planting strategy to:

- → Rehabilitate waterways, restore water quality, minimise and mitigate against any wildlife management concerns.
- → Be consistent with the recommendations of the bushfire risk assessment report and soil salinity potential.
- → Tree canopy in the public and private domain will provide shade, cooling and mitigation of the urban heat island effect.

Remnant vegetation communities inform the planting palette

The 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.

As the floodplains transition to the hillside, the alluvial riparian woodland gently transitions to grassy open woodland and grassland (Shale Plains Woodland) and grassy open forest (Shale Transition Forest) and/ or Castlereagh Ironbark Forest;

Remnants of these vegetation types are found within Badgerys Creek precinct. Closer to the ridgelines, Cumberland Plain Open Woodland is the predominant remnant planting community.

Woodland communities are to maintain the existing biodiversity and re-establish the connection between vegetation layers, plant communities and ecosystems. Within the framework, native Cumberland plain open woodland and grassland vegetation community, will be restored through:

- → Scattered canopy trees with grassy and herbaceous groundcover
- → Occasional understory of small trees shrub layer to maintain biodiversity
- → Protect, enhance and restore existing vegetation communities
- → Incorporate, protect and enhance existing vegetation in the open space framework where possible to enhanced and further reinforced the connected landscape system.

Riparian corridors of tributary creeks within the open space will be rehabilitated and revegetated with appropriate riparian species to form part of the Sydney Water Assets of stormwater storage areas and biofiltration. The Riparian corridors with APZ adjacent, for bushfire mitigation will have a reduced tree canopy and low shrub layers. The areas of soil salinity potential will utilise the species that exhibit salt tolerance and establish root systems that effectively reduce the water table.

Diversity and planting quantity

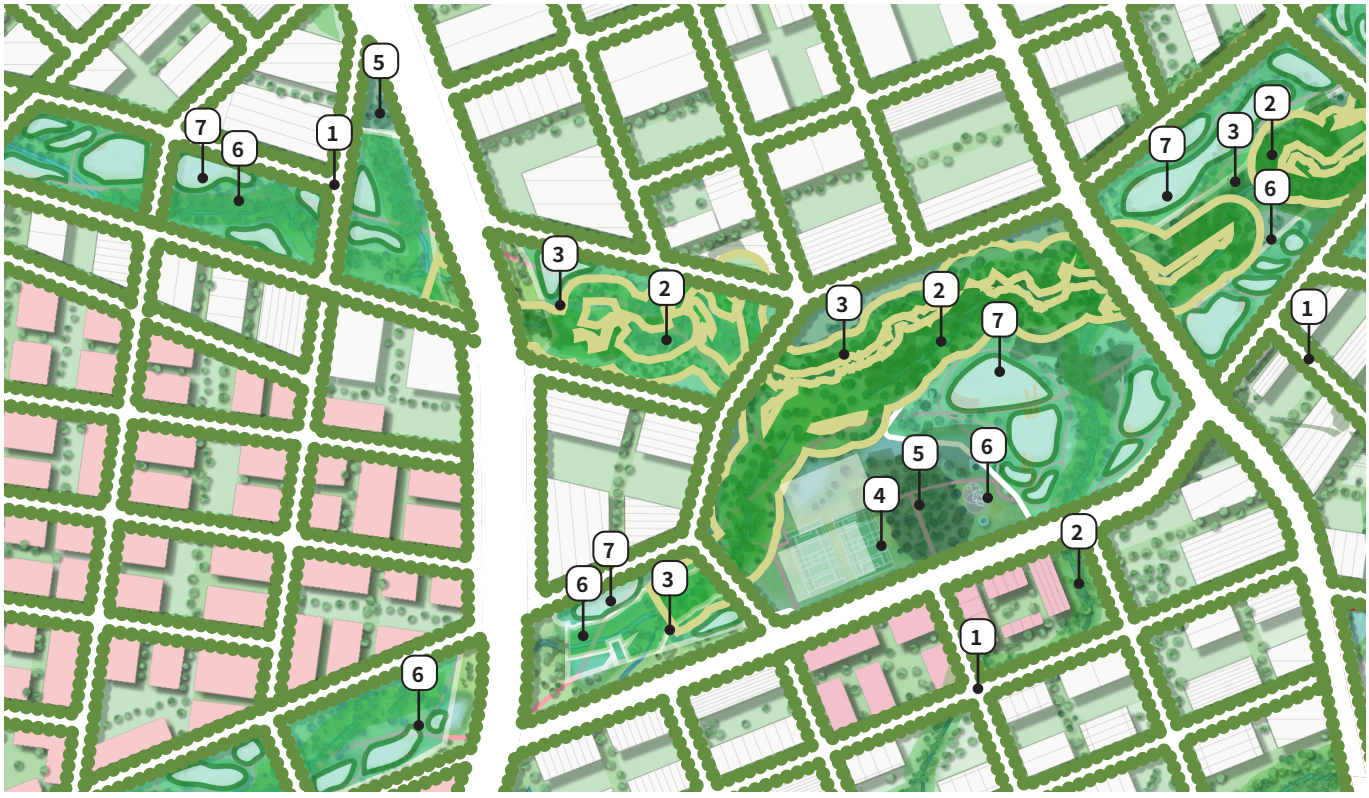
Maximising planting palette diversity is a key landscape outcome for the realisation of the Parkland City.

Planting diversity and quantity within alluvial zones of the key creeks will be maximised to

- → Restore the health of the creeks a
- → Reduce potential for soil salinity arising
- → Increase biodiversity and strengthen resilience of the Blue Green system.

Cumberland Plain Conservation Plan (CPCP) Lands

- → CPCP land will be retained and protected.
- → Weed species and other threats to the continuance of this remanent species will be implemented.



Aboriginal Planting Themes and Management

Aboriginal plantings are closely linked to cultural and historical uses of the land and its management. Planting to the Agripark, APZ and parklands will generally be consistent with these indigenous values of place.

Streetscape and Street Trees

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 and urban tree canopy, that will draw upon the native Cumberland Plain species, their pattern and characteristics, and non native species, that are appropriate for the climate of Western Sydney and urban streetscape conditions, contributing to the planting palette richness.

This will include:

- → Large and trees, key species of the Cumberland Plain
- → smaller trees to form the lower canopy layer
- → A combination of appropriate native & exotic species
- → A rich and diverse mix of native and exotic groundcover palette to provide seasonal interest
- → Riparian trees and layered planting to rain gardens & Sydney water assets

The spacing and species selection of the street trees planting is inspired by the Cumberland Plain scattered pattern, and intentionally planted in a non-boulevard manner that provide shade for pedestrians in summer and solar access in winter.

Sustainability and Resilience

Planting strategy is developed according to water sensitive urban design (WSUD):

Passive watering and species with low water requirements are proposed. Utilise passive irrigation to increase evapotranspiration. Provide adequate vegetation and tree canopy around buildings to shade and cooling.

Planting within wildlife buffer

Planting within the wildlife buffer zones to consider implications attracting bird/bats and risk of aircraft strike

Annotations

1. Water Sensitive Urban Design embedded in the street profile with large street trees and groundcover
2. Riparian revegetation & rehabilitation along creeklines and water bodies
3. Aboriginal planting themes and indigenous management zone
4. Parkland open space with Feature trees
5. Existing vegetation supplemented
6. Low grasses to broader stormwater basins
7. Wetland planting to waters edge

PLANTING CHARACTER

Predominantly shale plains planting

Grey box

Parramatta wattle

Wheeping grass

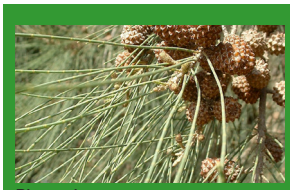
Predominantly shale hills planting

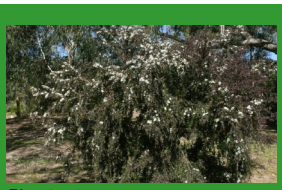
Forest red gum

Native Blackthorn

Grasses (Kangaroo Grass)

Vegetated riparian planting 3rd order creeks & greater


River oak


River tea tree

Tall sedge

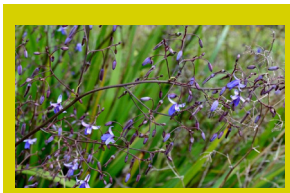
Cumberland Plain Conservation planting (CPCP)

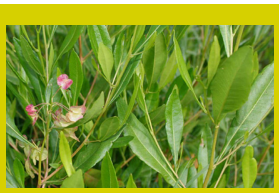
Spotted gum

Narrow-leaved ironbark

Common tussock

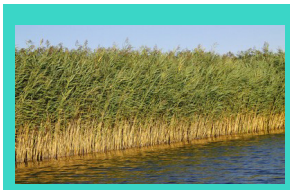
Dedicated APZ planting and management


Blue Flax lily


Hop bush

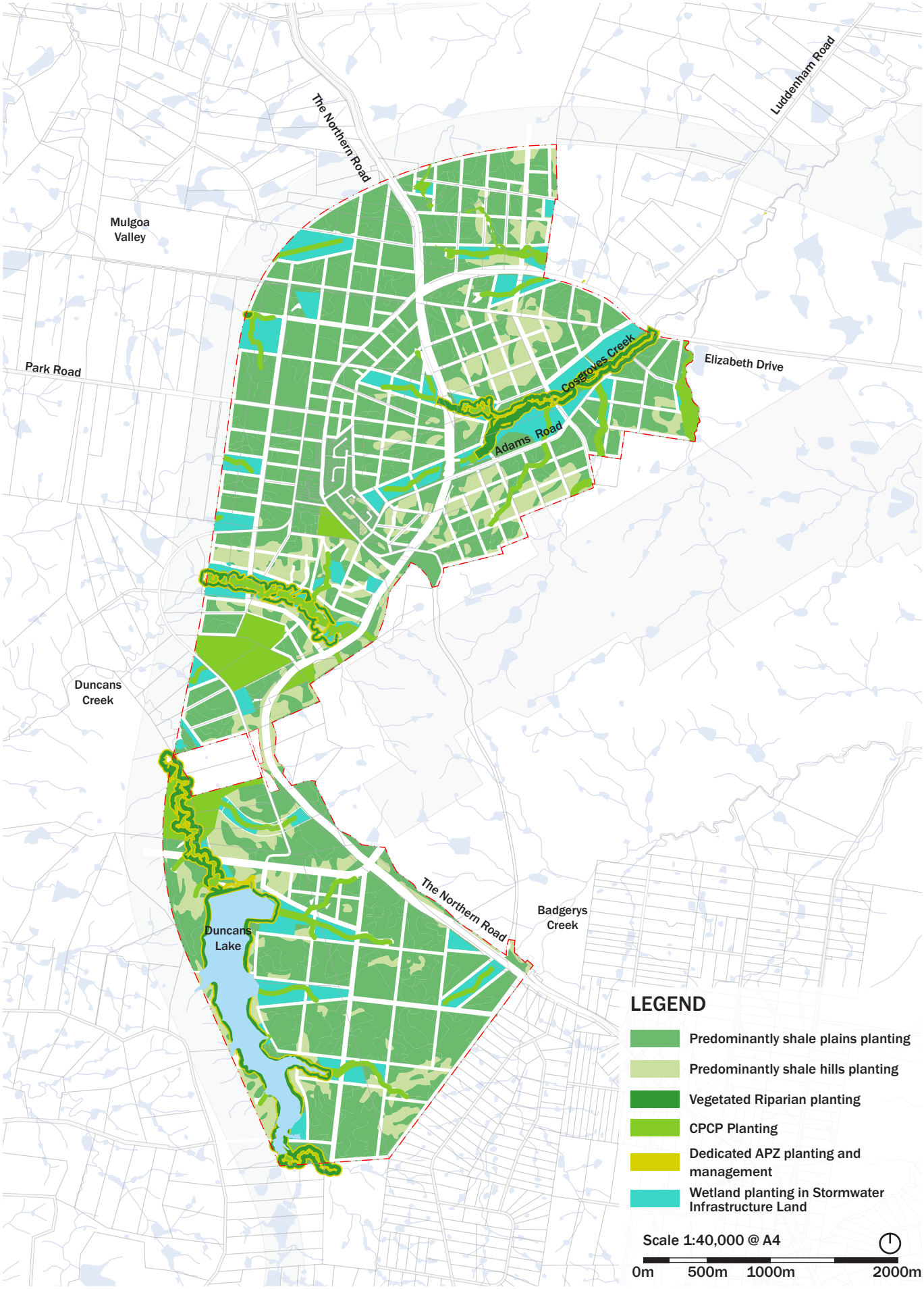
Spinehy headed mat rush

Wetlant planting in stormwater infrastructure land


Common reed

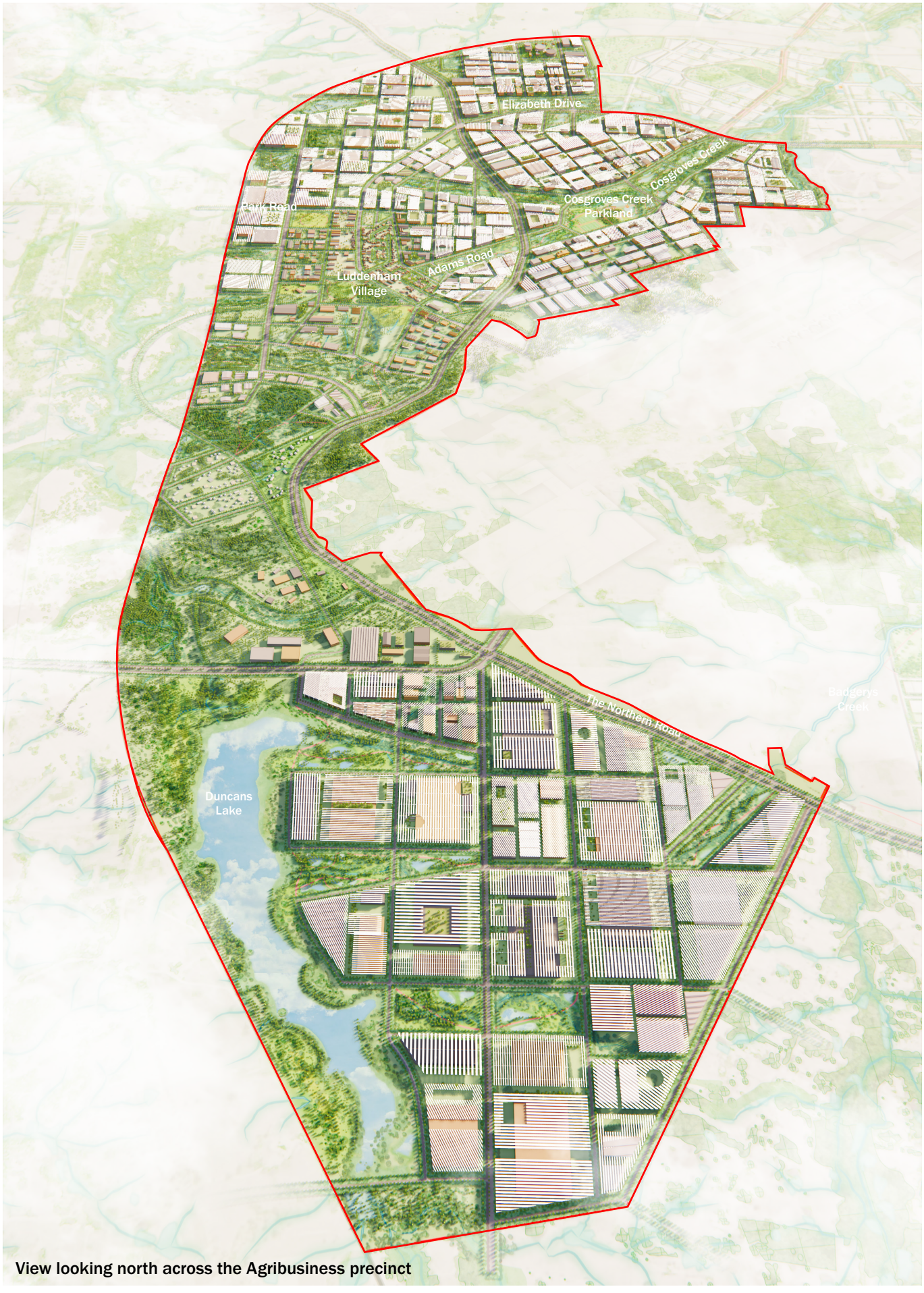
Knotted club-rush

Tall flat-sedge


The Northern Road
Luddenham Road
Mulgoa Valley
Park Road
Elizabeth Drive
Cosgroves Creek
Adams Road
Duncans Creek
The Northern Road
Duncans Lake
Badgerys Creek
LEGEND
Predominantly shale plains planting
Predominantly shale hills planting
Vegetated Riparian planting
CPCP Planting
Dedicated APZ planting and management
Wetland planting in Stormwater Infrastructure Land
Scale 1:40,000 @ A4
0m
500m
1000m
2000m

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.



View looking north across the Agribusiness precinct

MOVEMENT AND PLACE

By AECOM

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. Ensuring buildings and structures do not impede on the Obstacle Limitation Surface (OLS) associated with the airport
- 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 the four street environments 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 utilised for this assessment.

For this stage of the project, an initial classification of the roads and streets within the precincts hasbeen undertaken.

This is likely to evolve as key issues and opportunities present for further investigation during the subsequent master-planning stage.

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 Spaces have not been defined as detailed master-planning of centres is not yet known.

– Local Streets provide for local access both outside of centres and within centres.

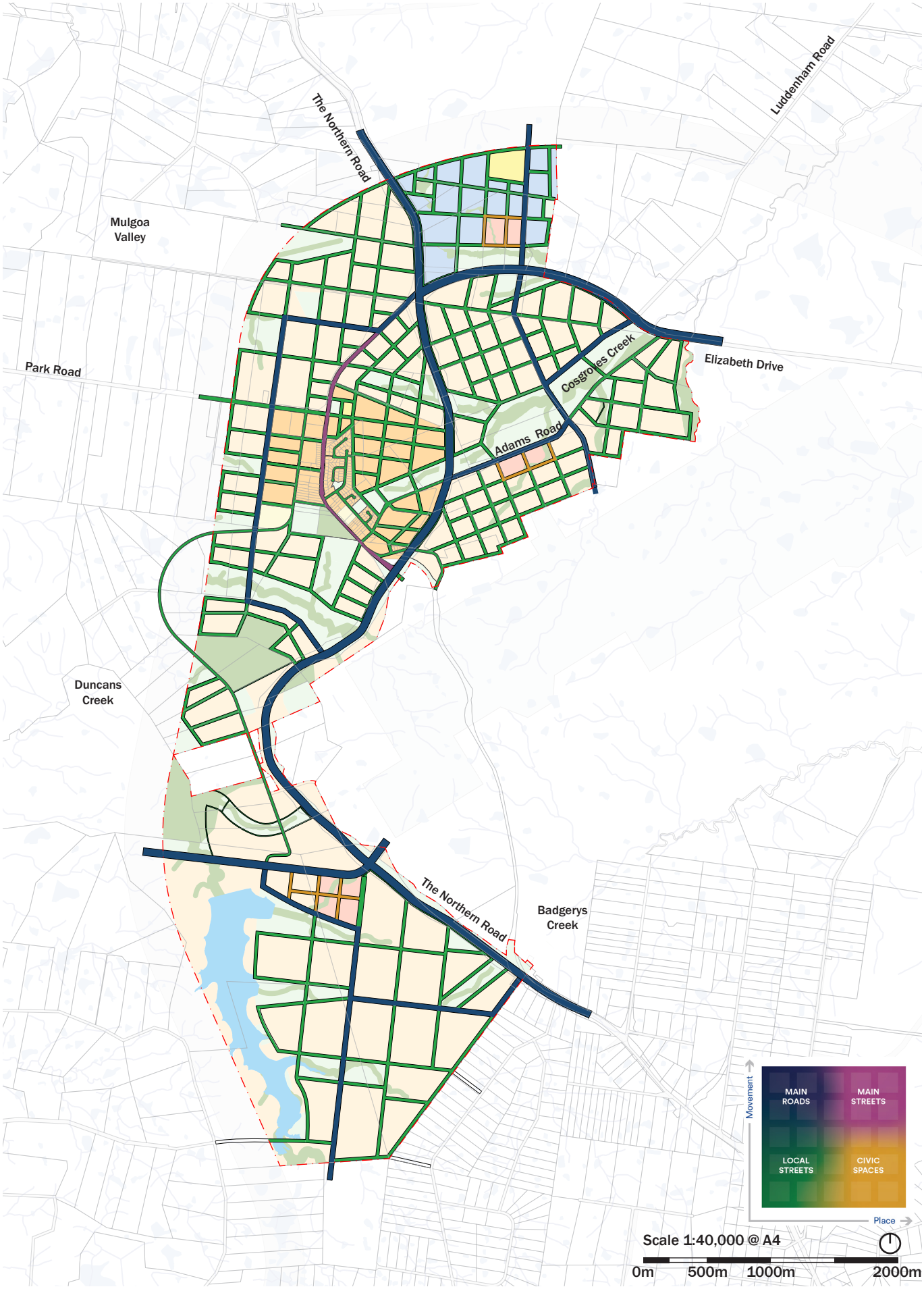
– Main Streets traverse through areas with greater land use intensity, at the core of the centres.

– 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.

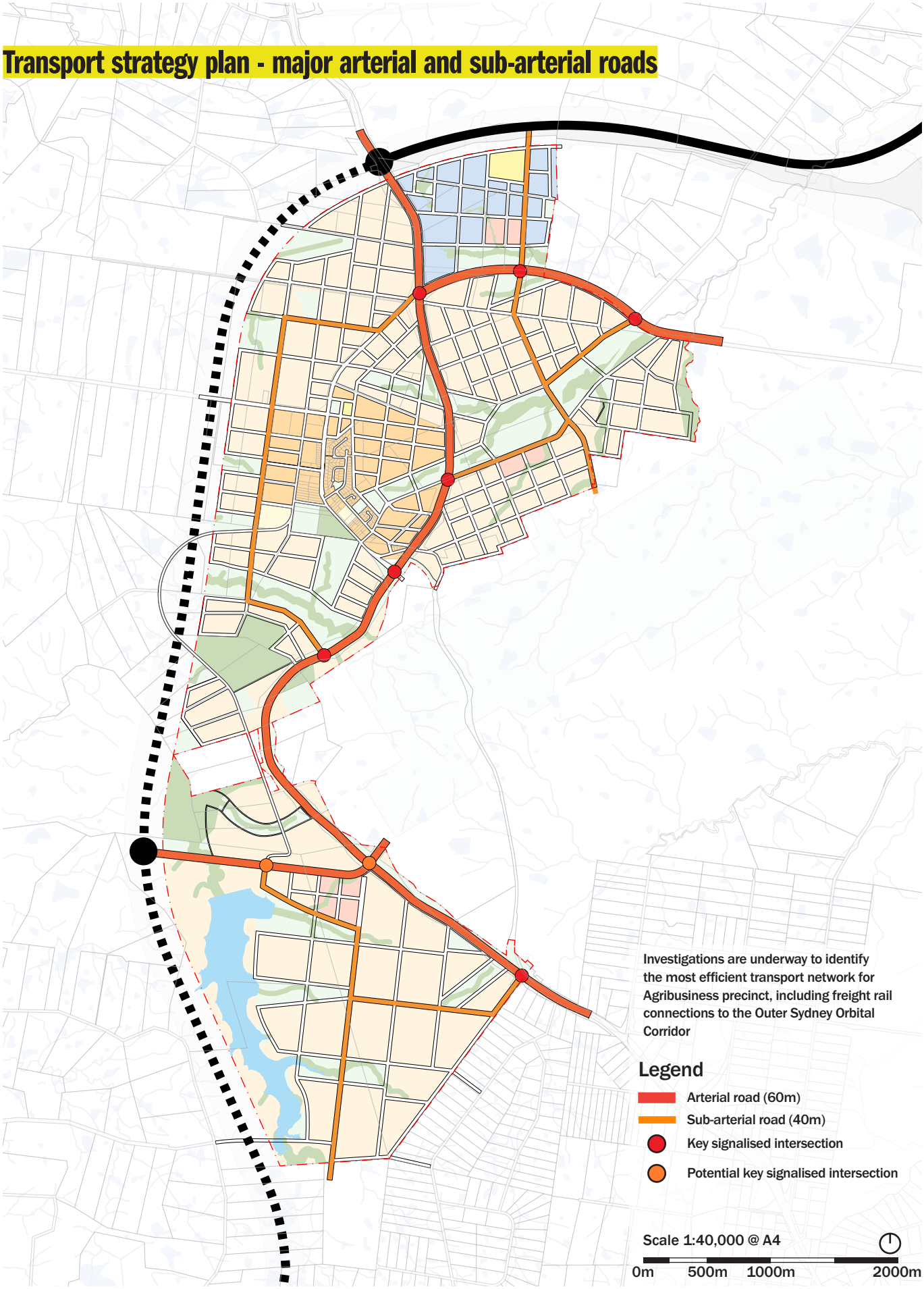
Legend

- Main Roads
- Main Streets
- Local Streets

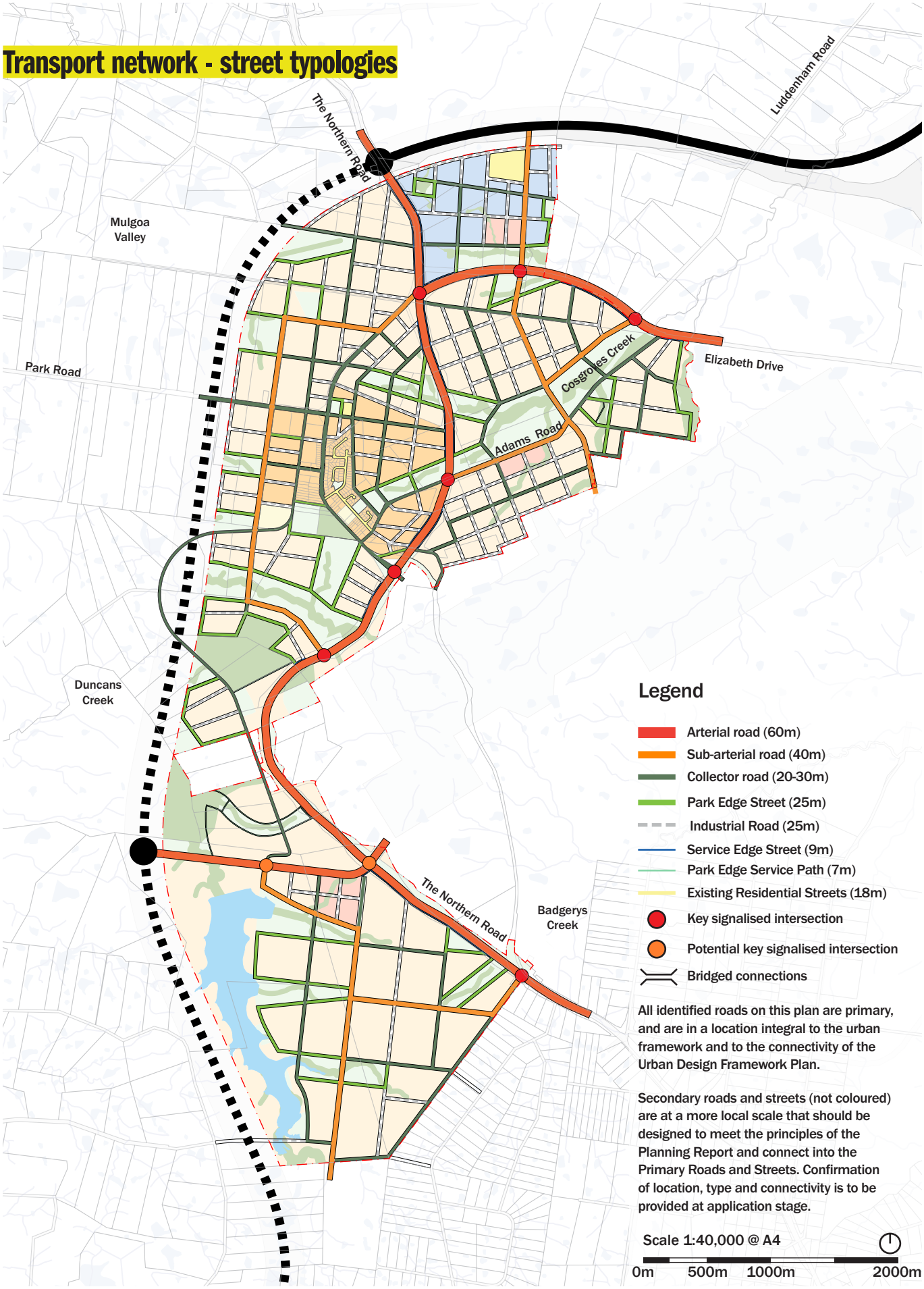
The Urban Design Framework Plan



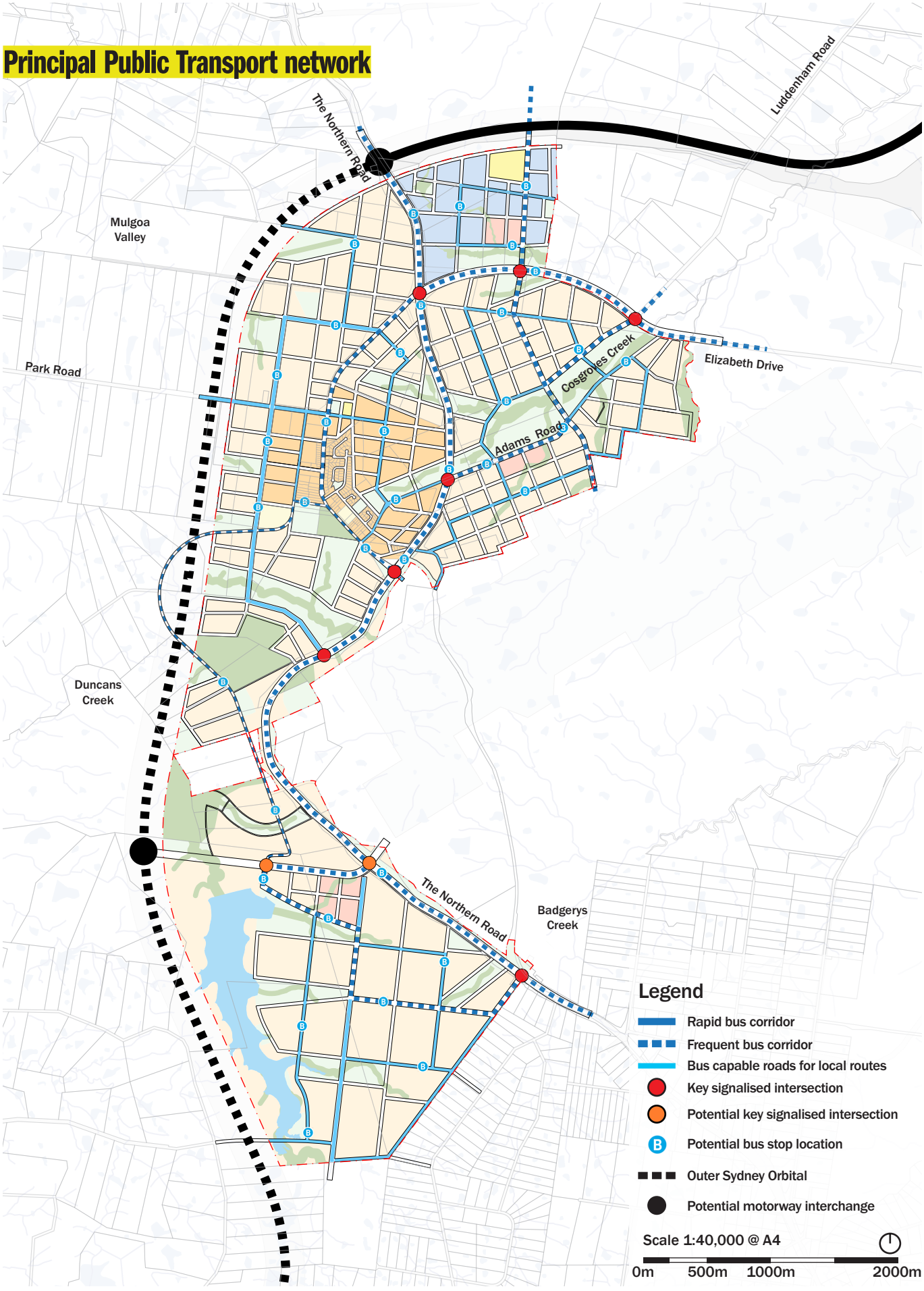
Transport strategy plan - major arterial and sub-arterial roads



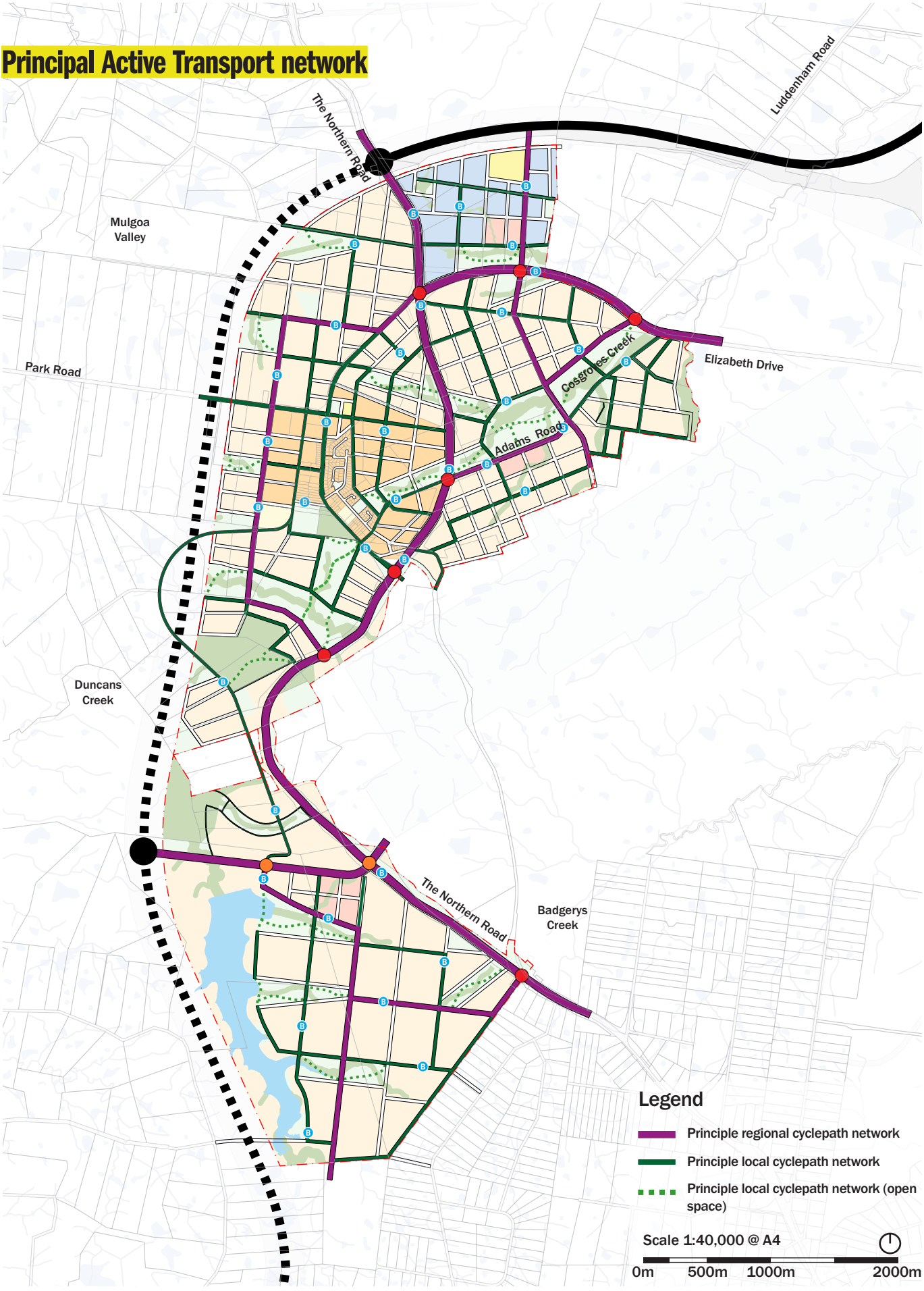
Transport network - street typologies



Principal Public Transport network



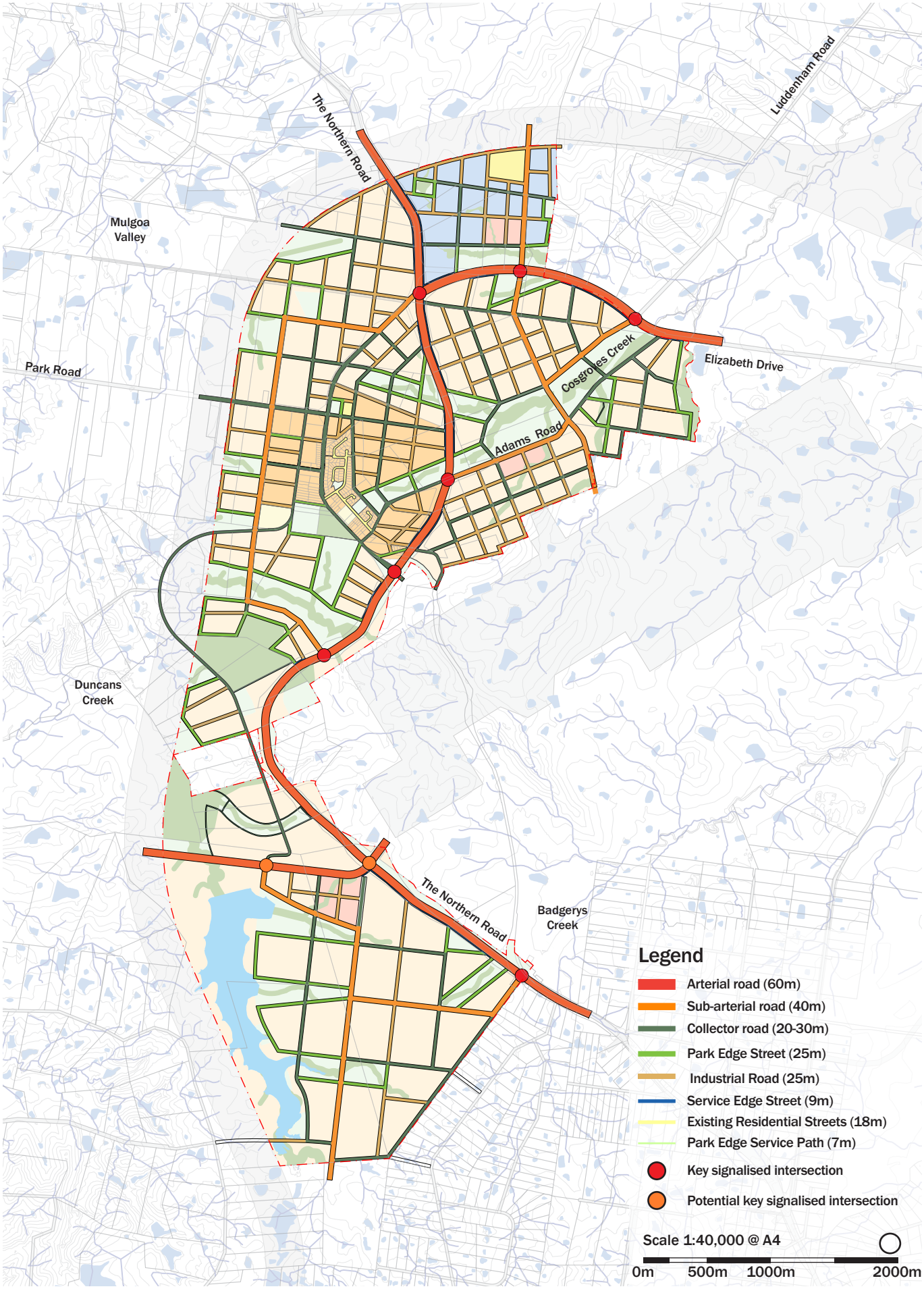
Principal Active Transport network



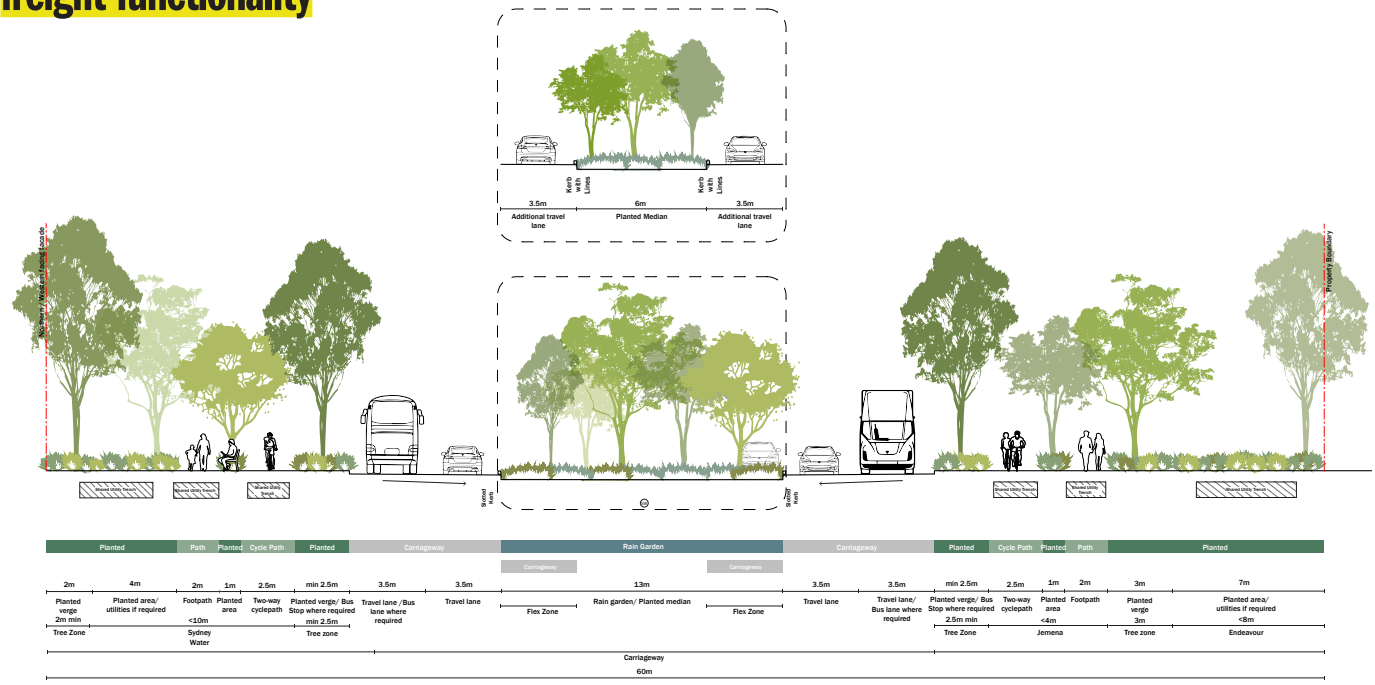
STREET TYPOLOGIES

The street types across the Agribusiness Precinct are founded on the Western Sydney Street Design Guidelines. These have been adapted to suit place based requirements.

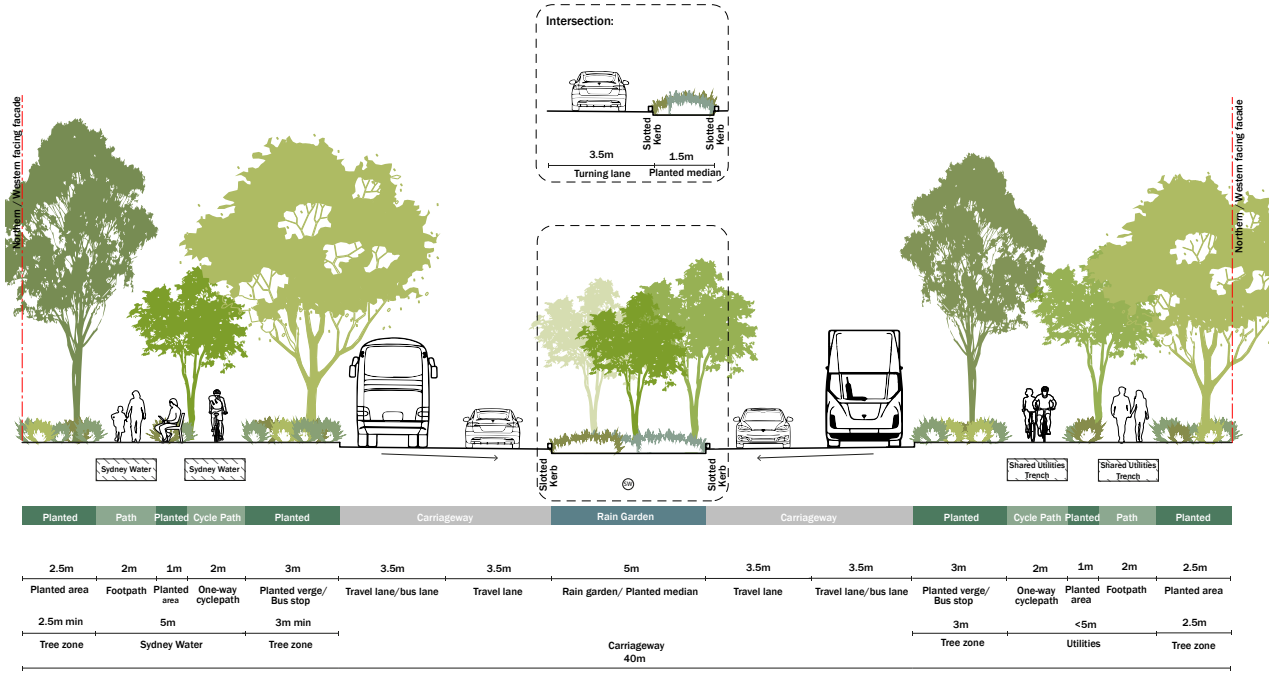
The Urban Design Framework Plan



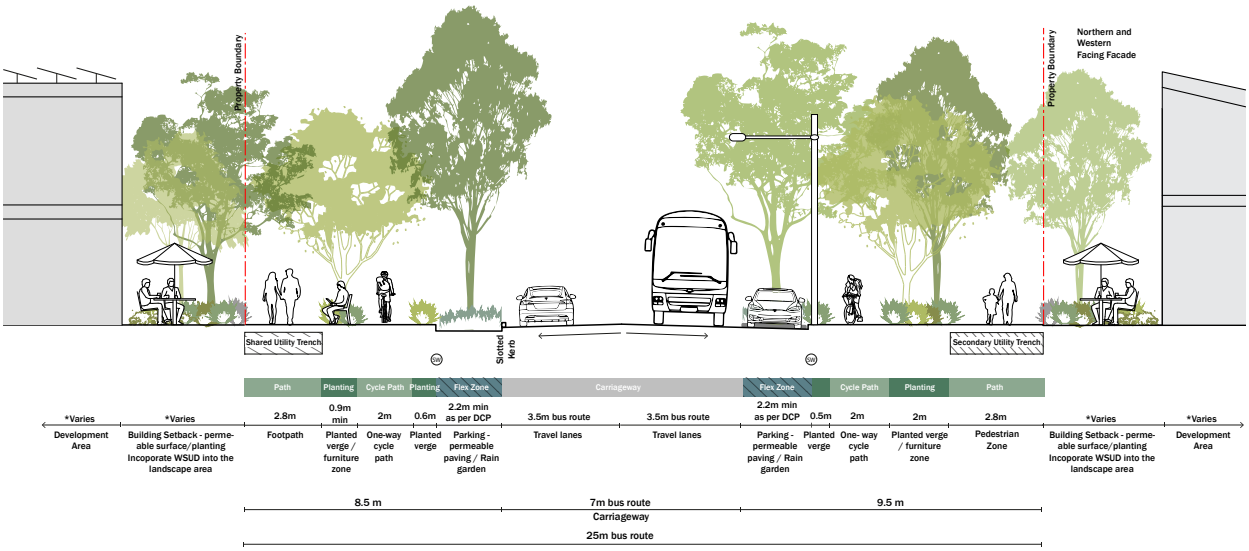
60 metre corridor with freight functionality

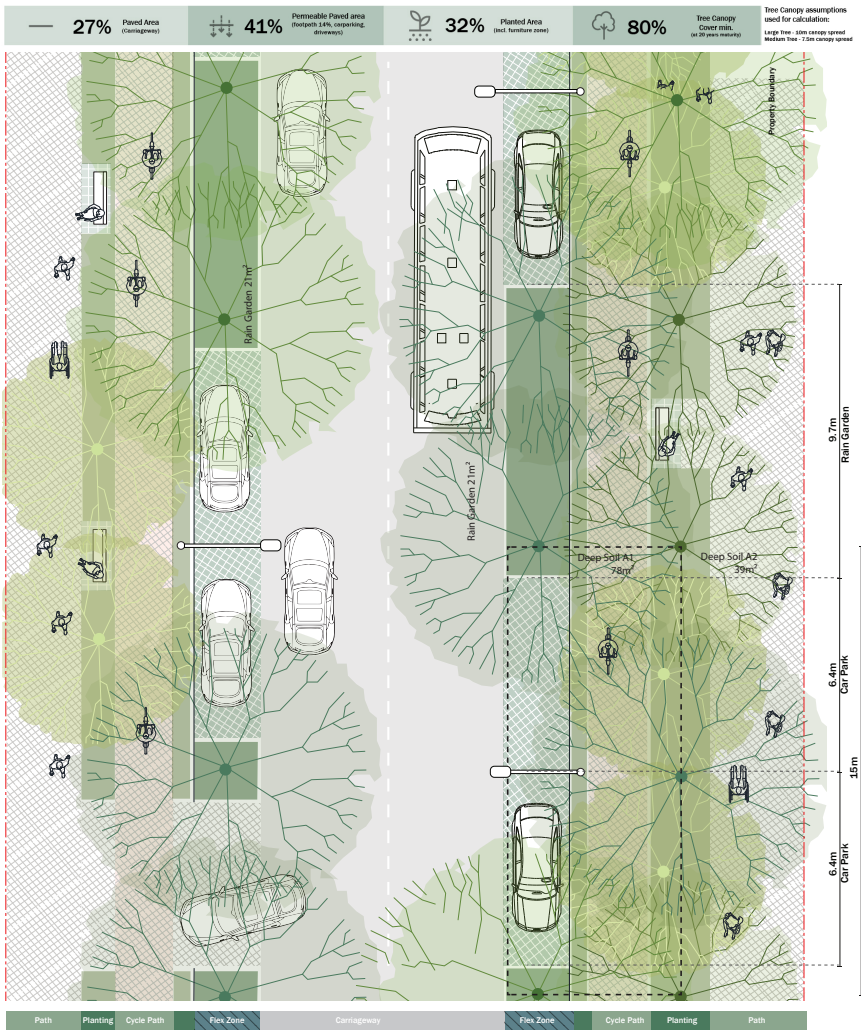


40 metre corridor with kerbside bus lane



25 metre Collector Road



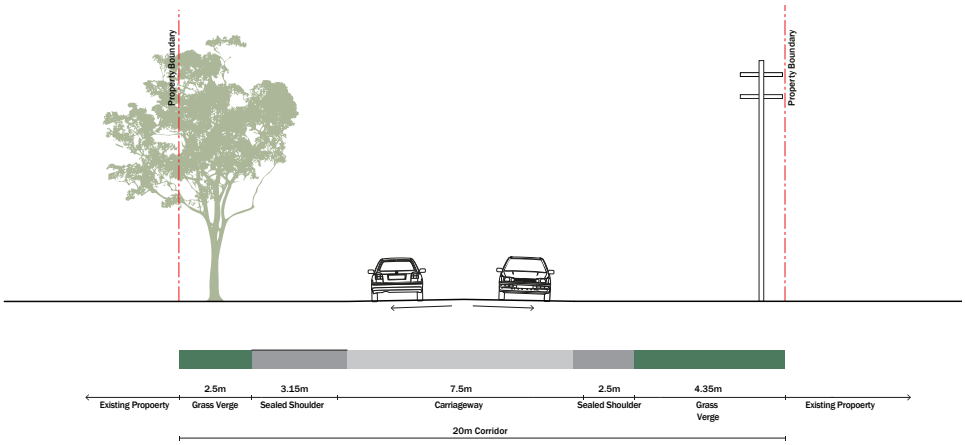


Scale

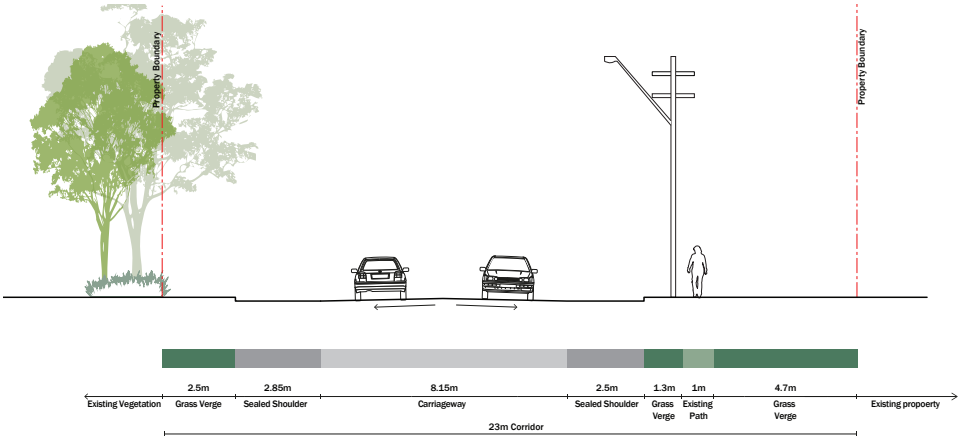
0m 2m 4m 8m

The Northern Road Existing Alignment

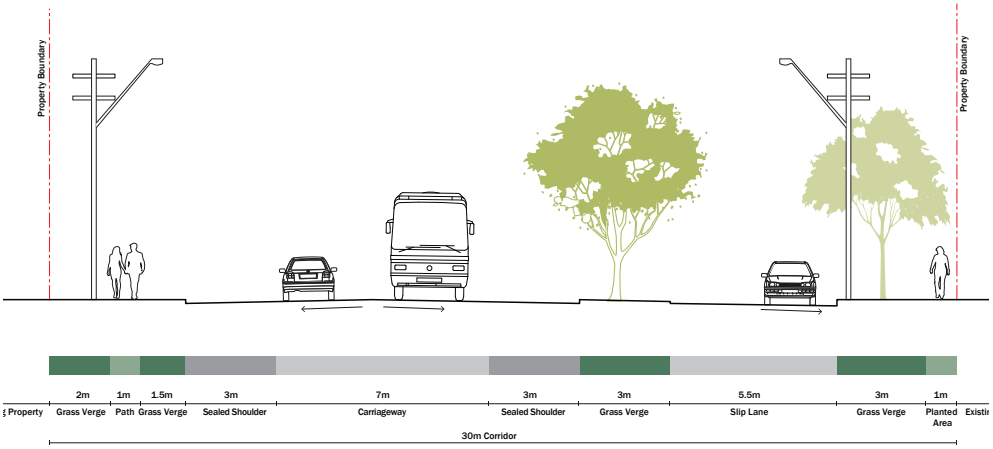
Existing conditions



Existing 20m corridor



Existing 23m corridor



Existing 30m corridor

Scale

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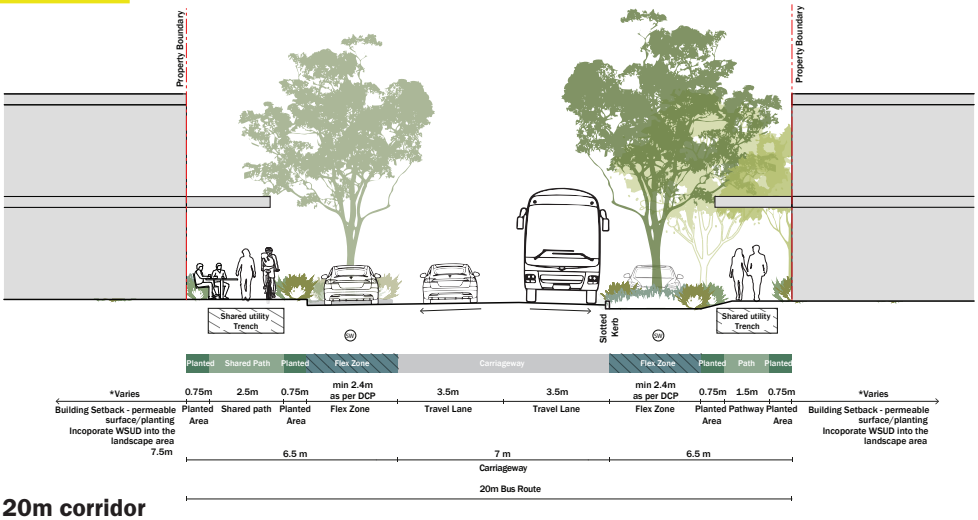
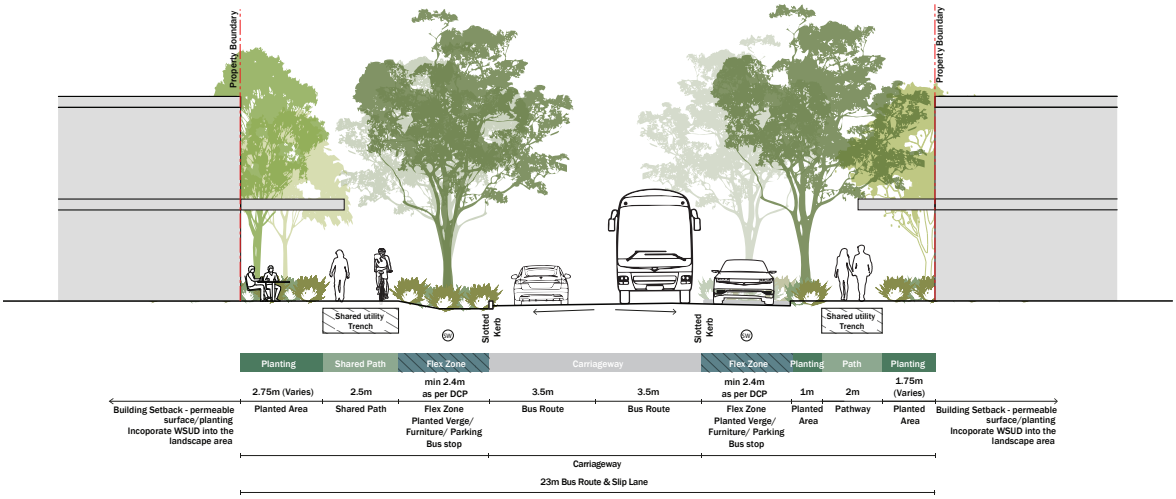
The Northern Road Existing Alignment

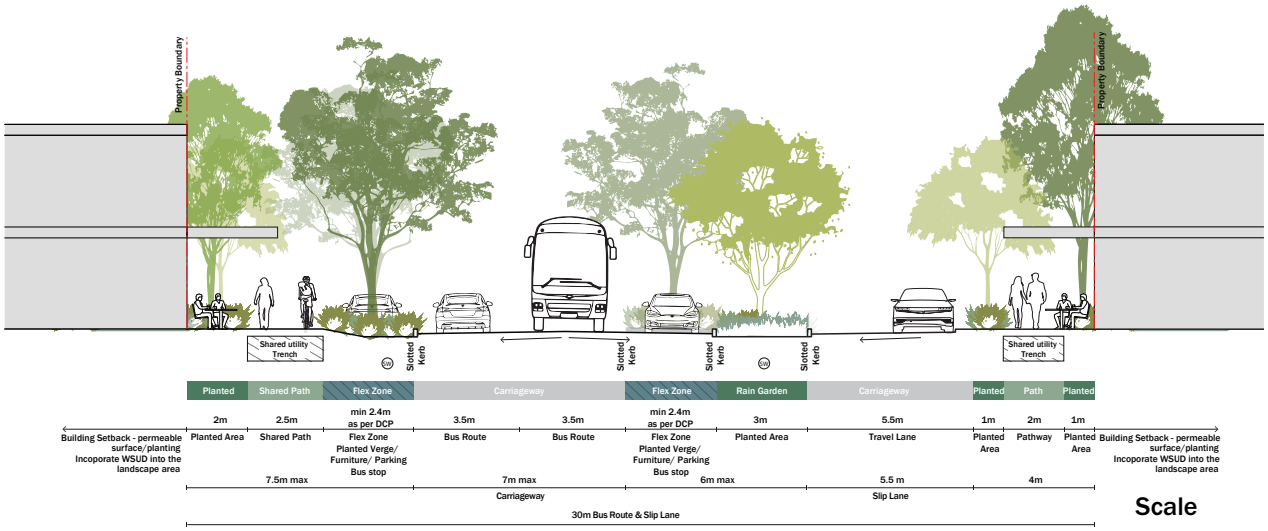
Proposed treatment



Proposed 20m corridor



Proposed 23m corridor



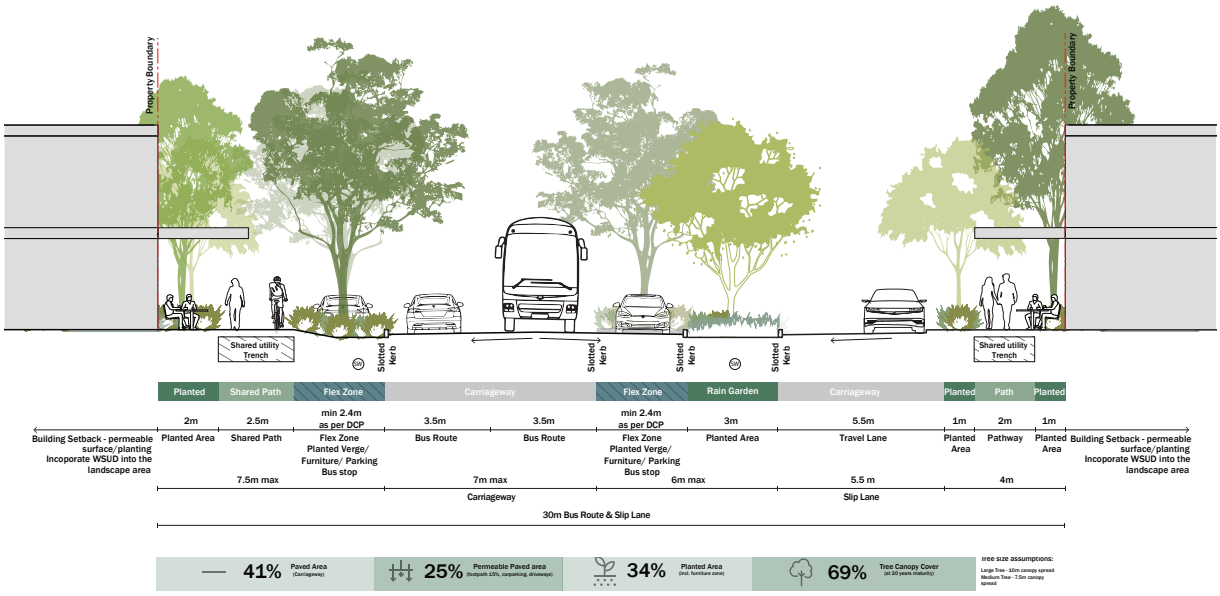
Proposed 30m corridor

Scale

0m 2m 4m 8m

30 metre The Northern Road Green Boulevard

(Existing Alignment)



Scale

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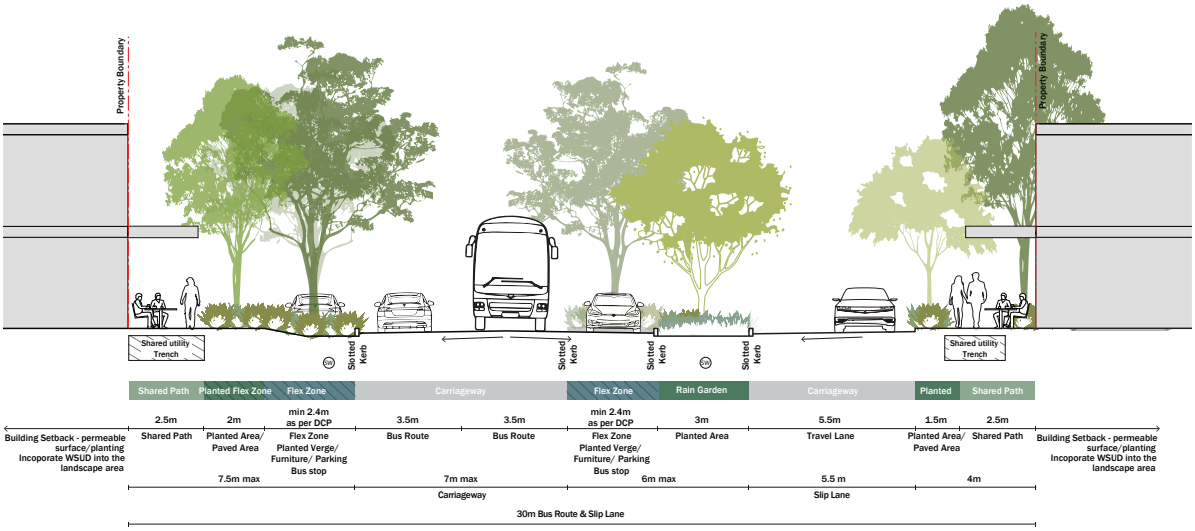
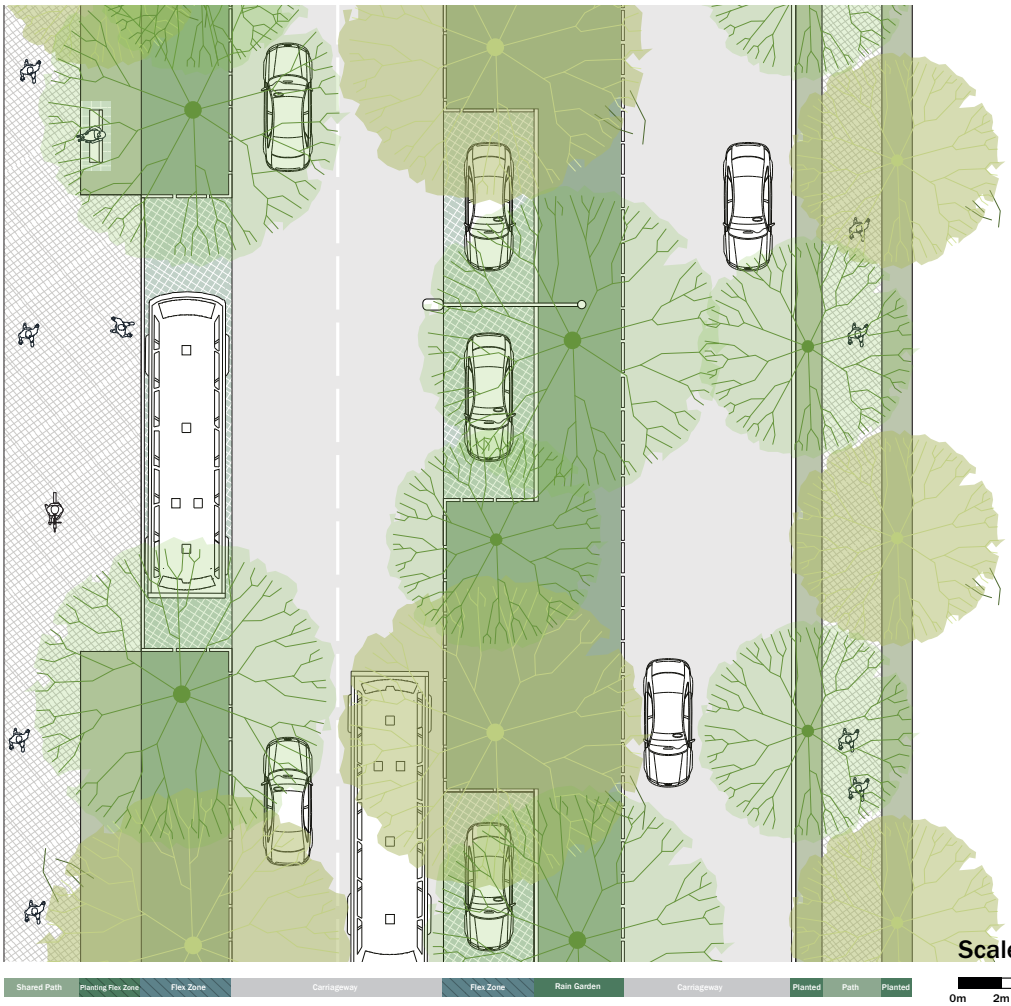
30 metre The Northern Road (Shop Front Edge) Green Boulevard (Existing Alignment)





Scale

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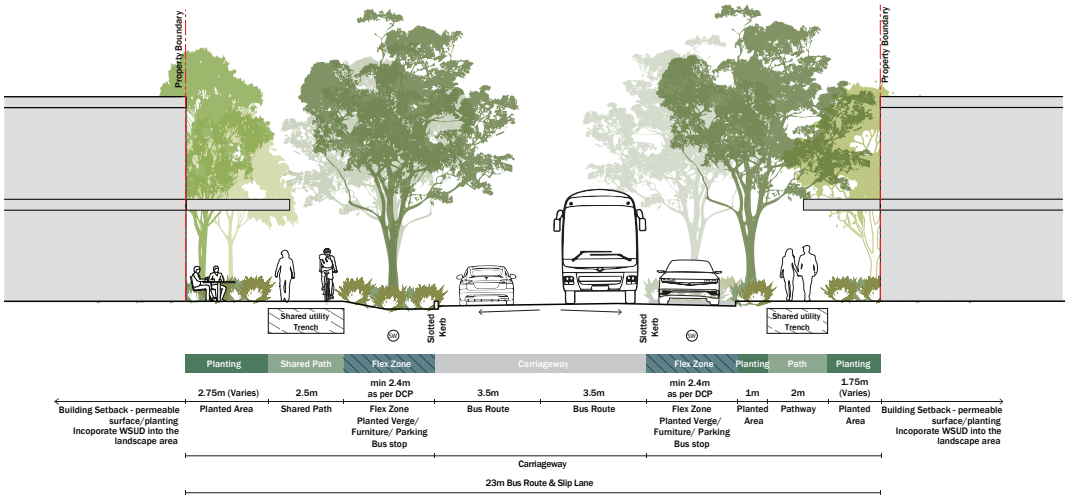
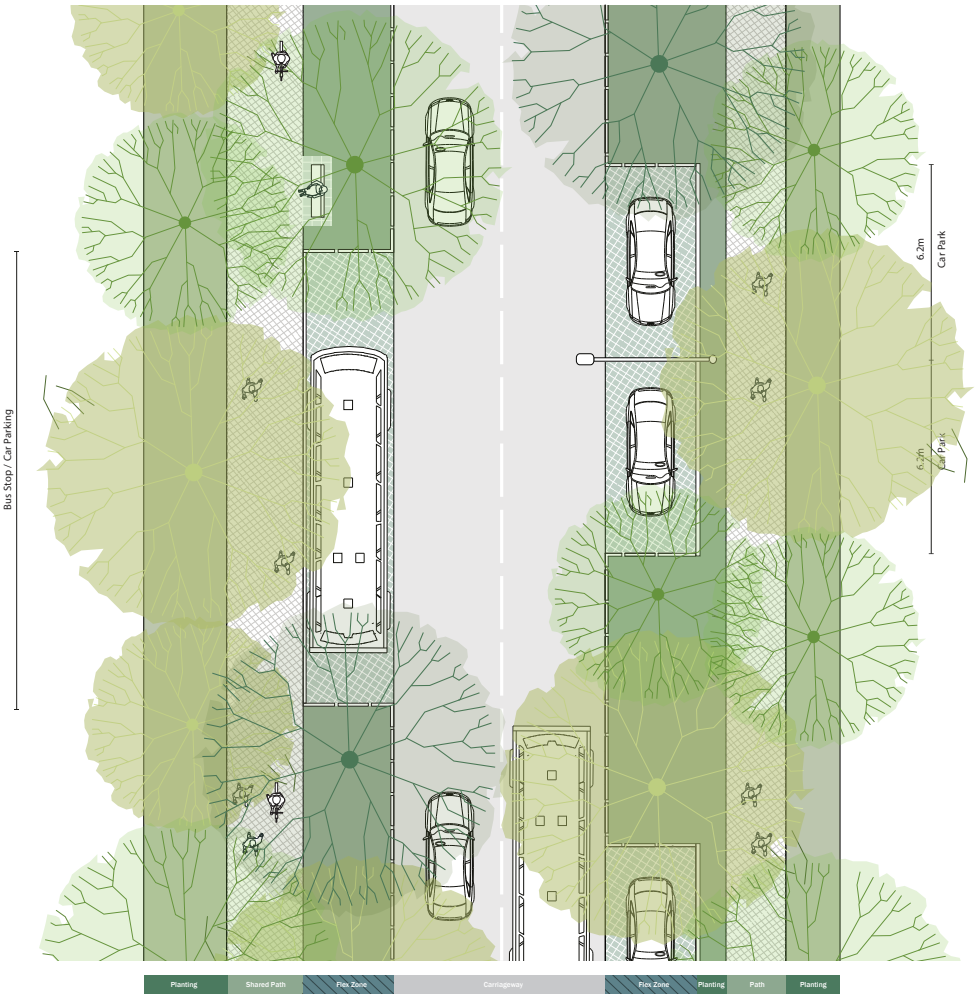
23 metre The Northern Road

(Existing Alignment) Section & Plan





Scale

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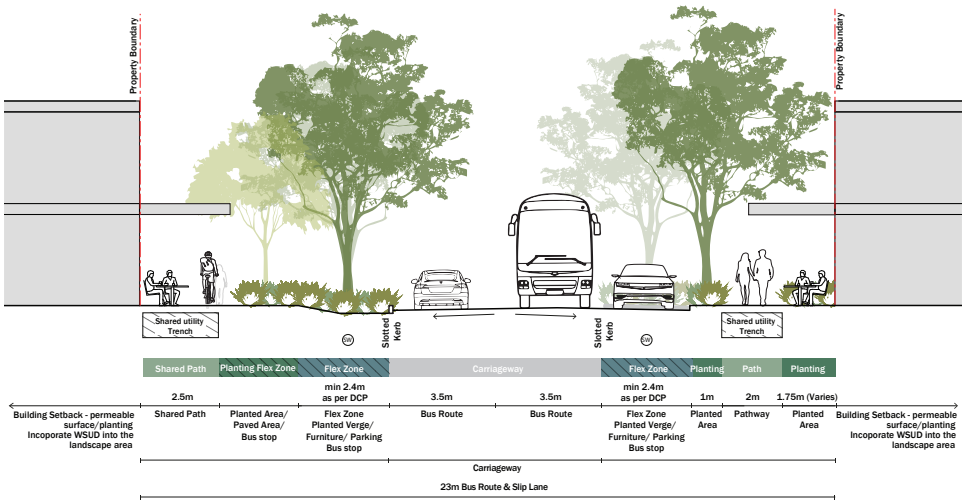
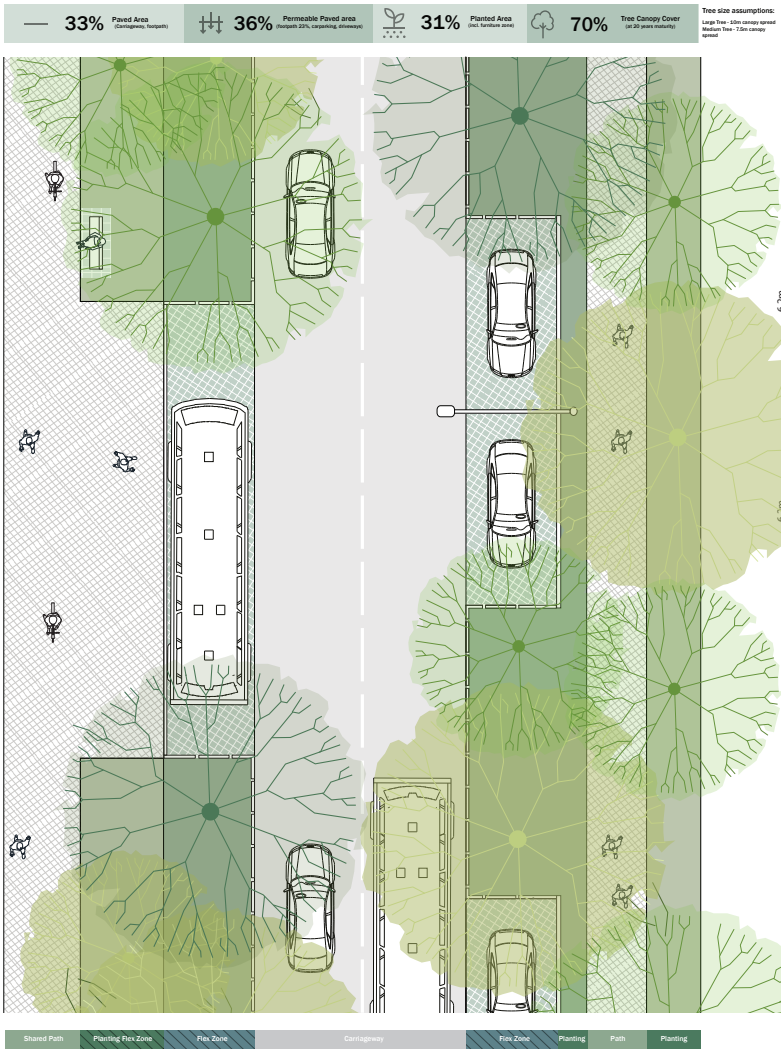
23 metre The Northern Road (Shop Front Edge)

(Existing Alignment)





Scale

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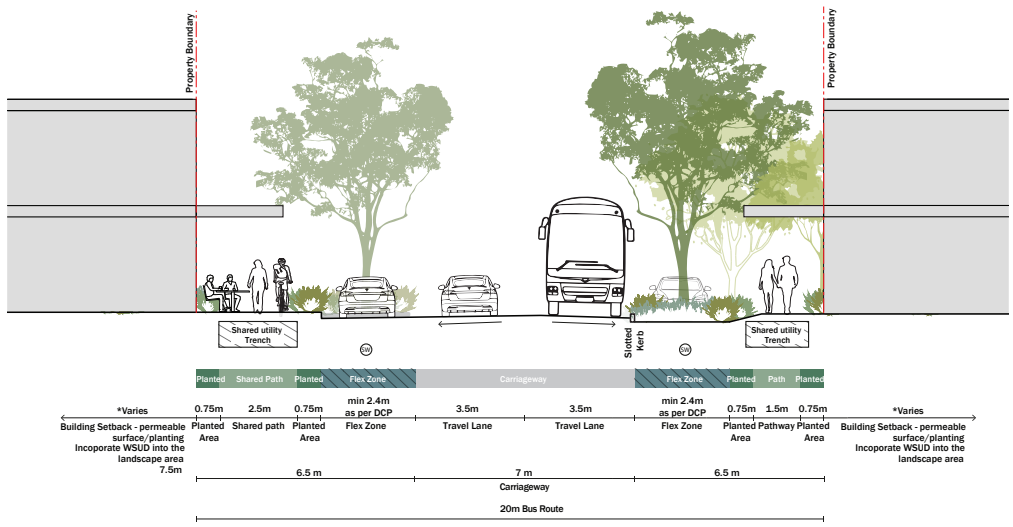
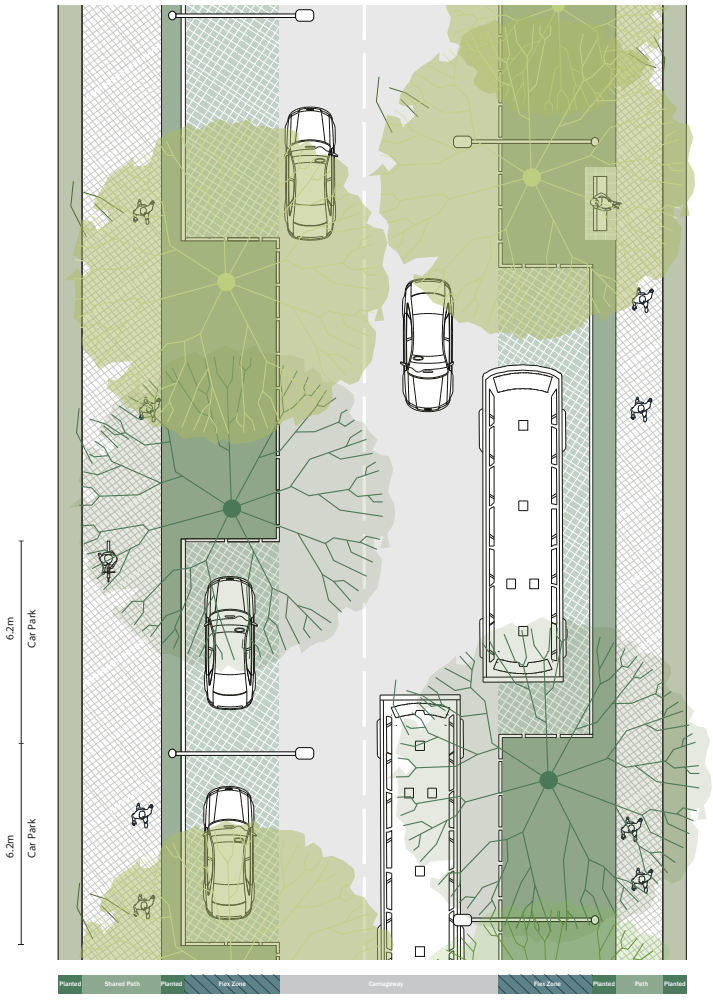
20 metre The Northern Road

(Existing Alignment) Section & Plan



Tree size assumptions:

Large Tree - 10m canopy spread
Medium Tree - 7.5m canopy spread

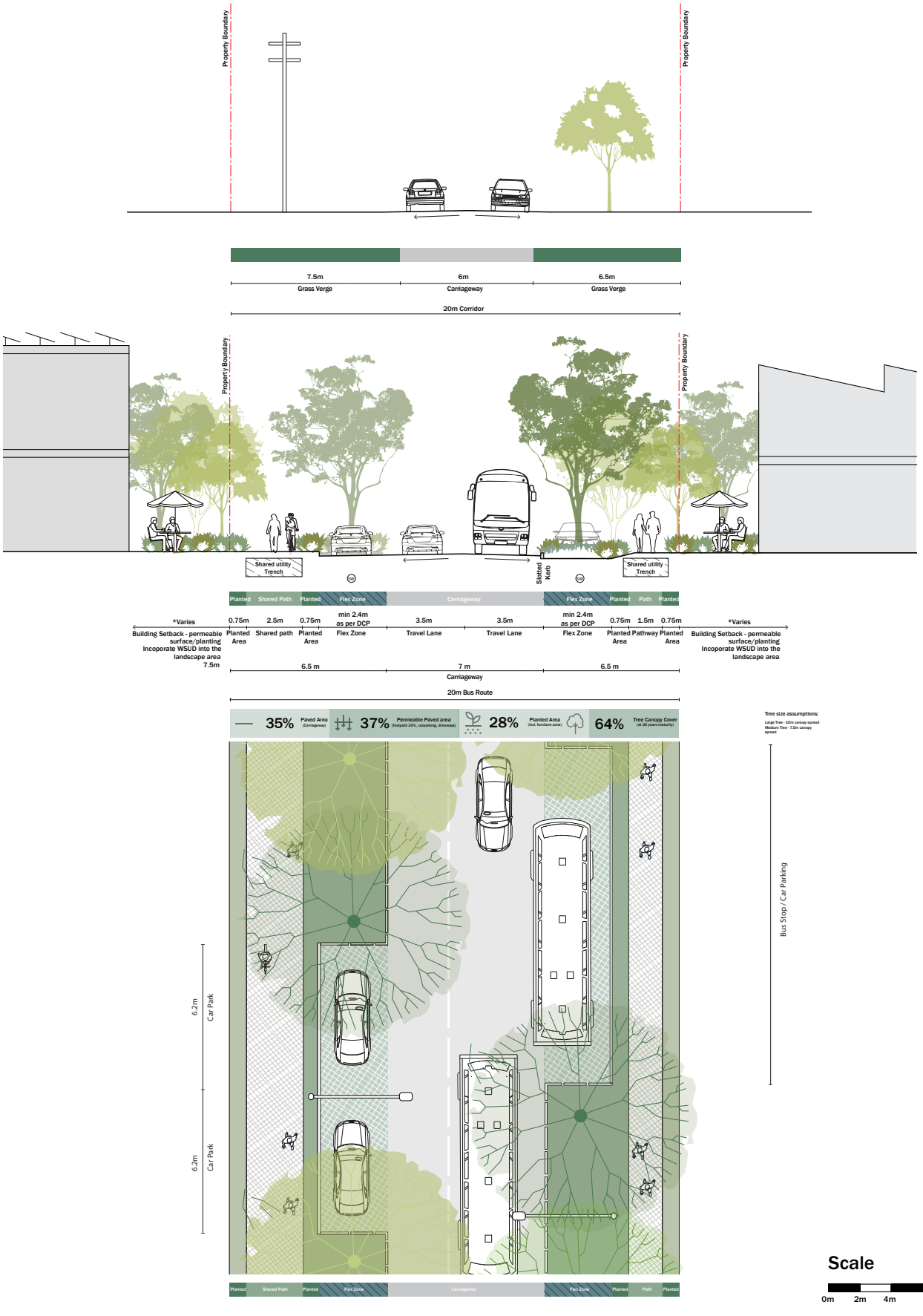


Scale

0m 2m 4m 8m

20 metre Road to Campbell Street, Willowdene Avenue,

Existing & Proposed treatment



Scale

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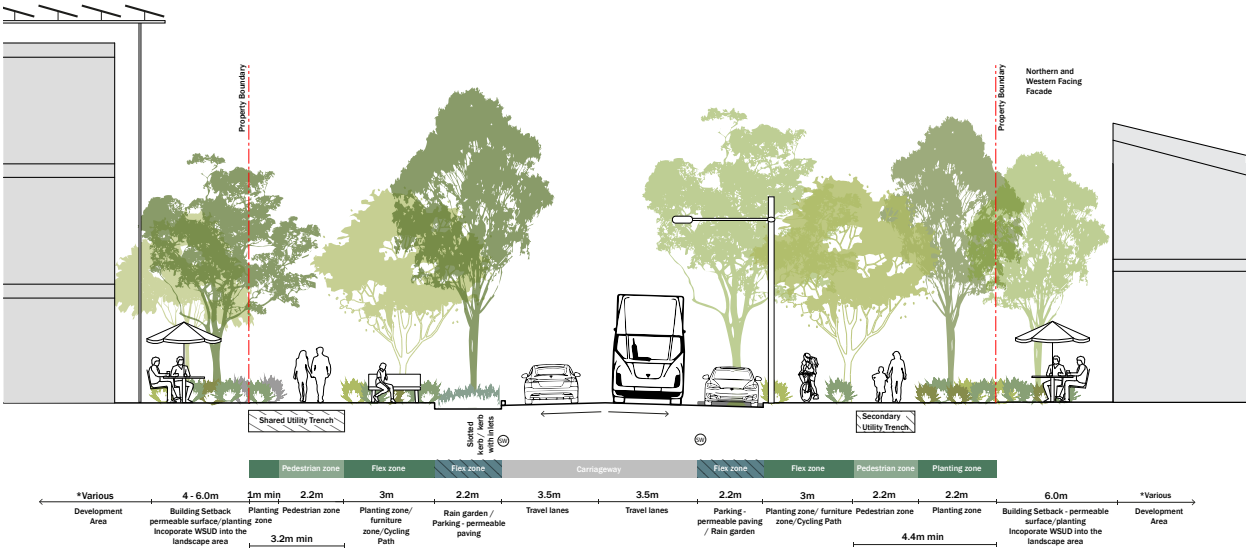
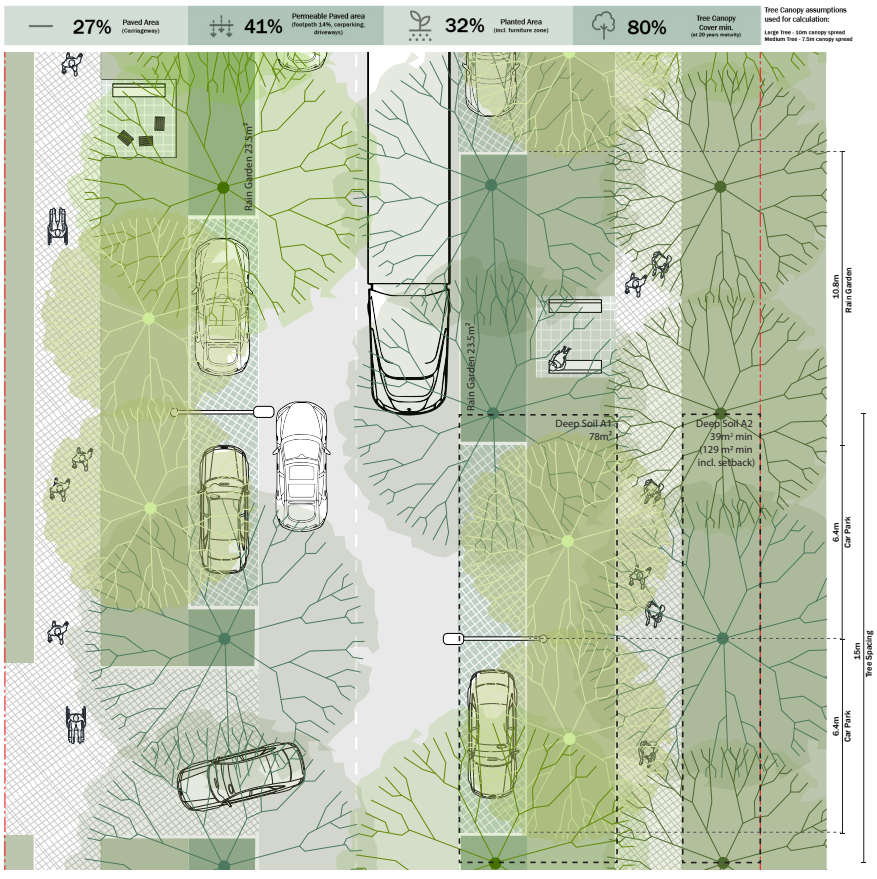
25 metre Local Industrial Street with bike lanes

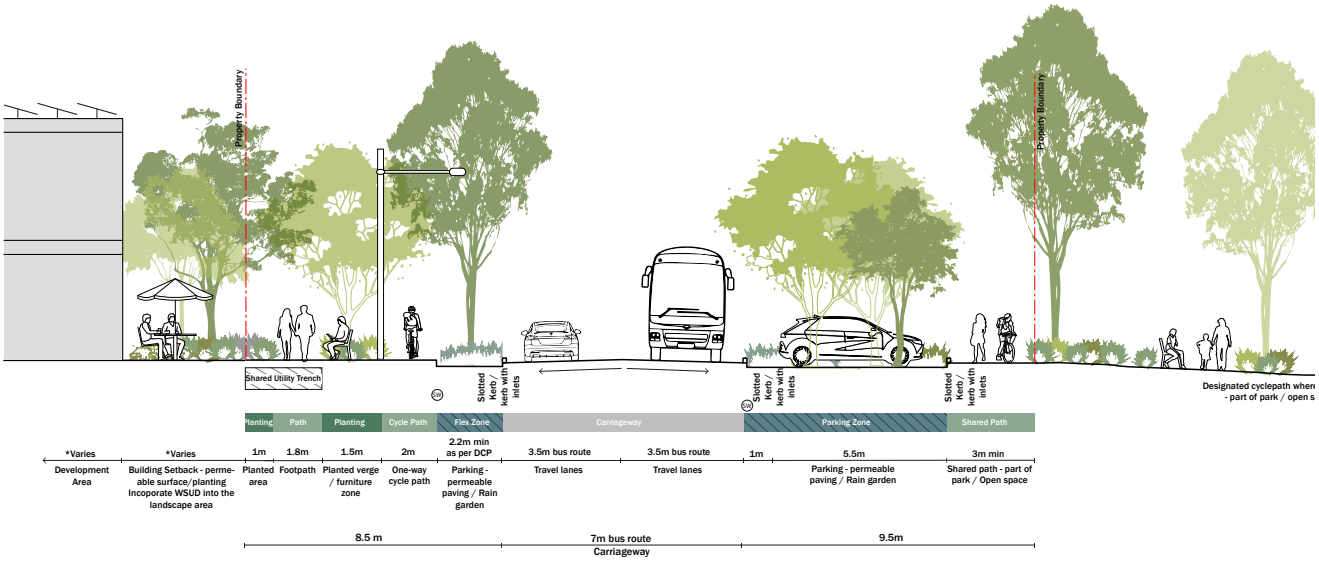


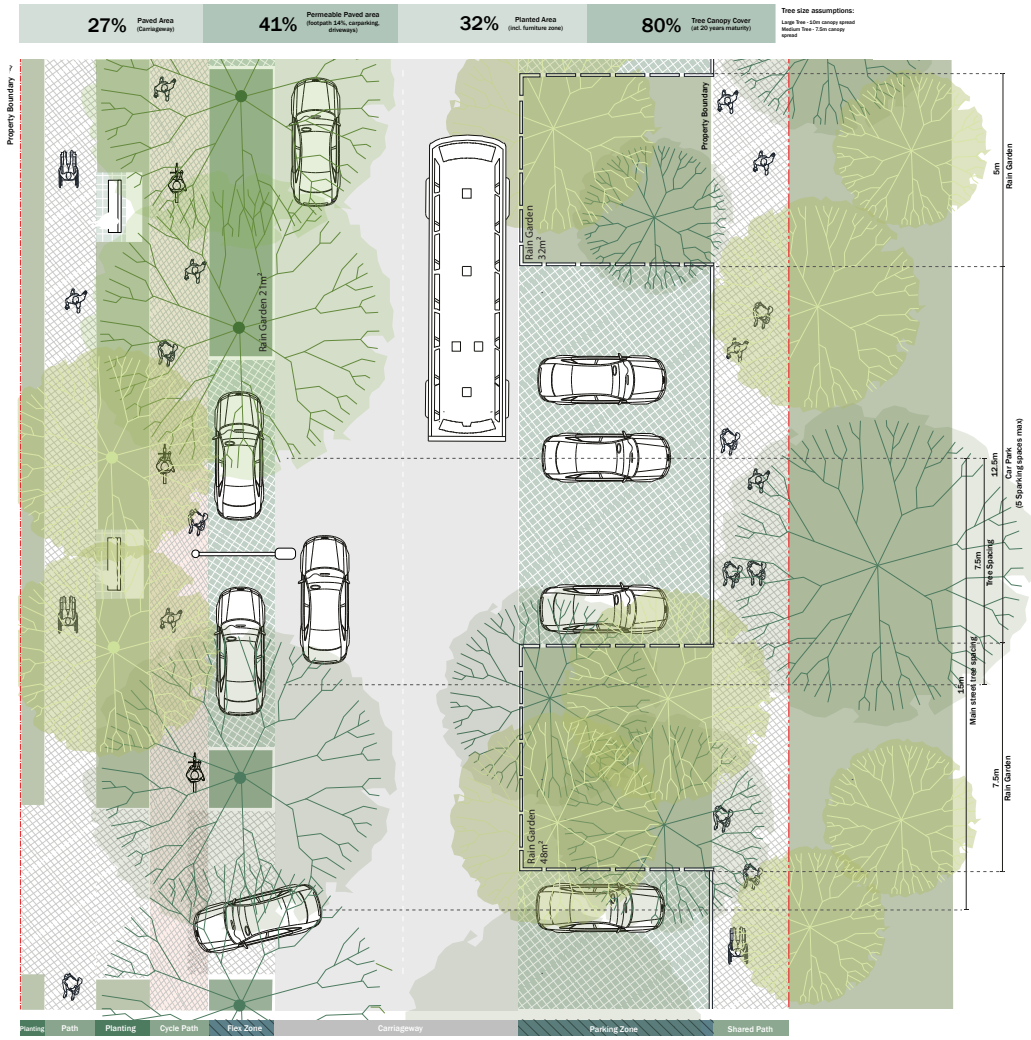


Scale

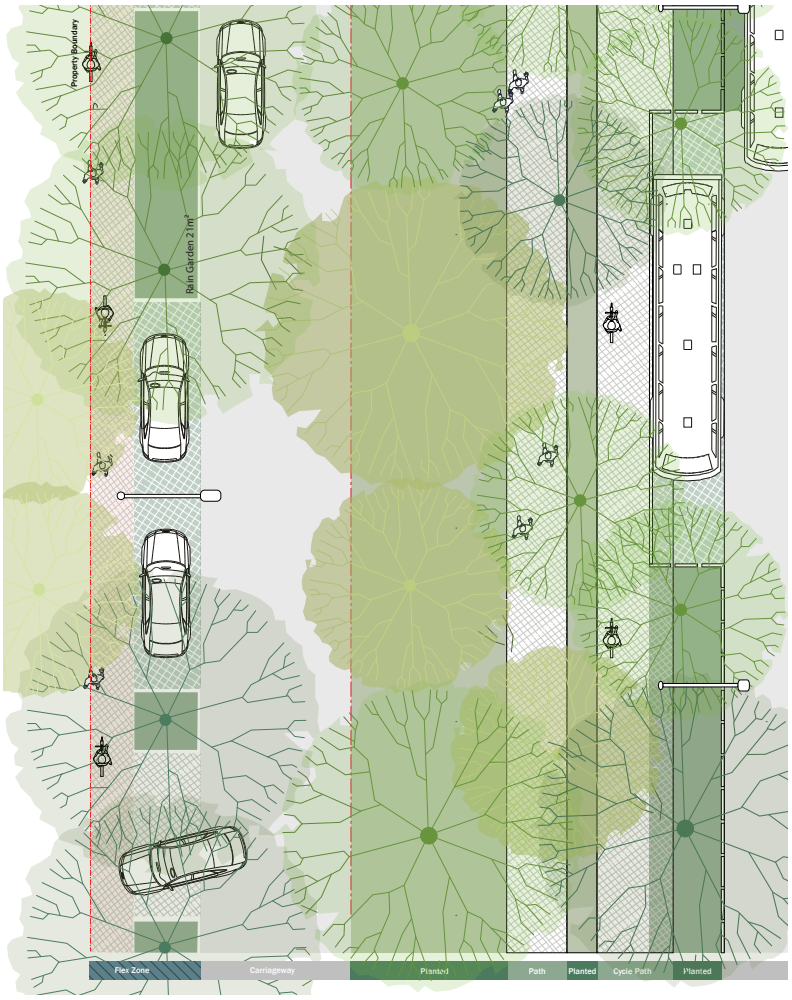
0m 2m 4m 8m

25 metre Park Edge Street





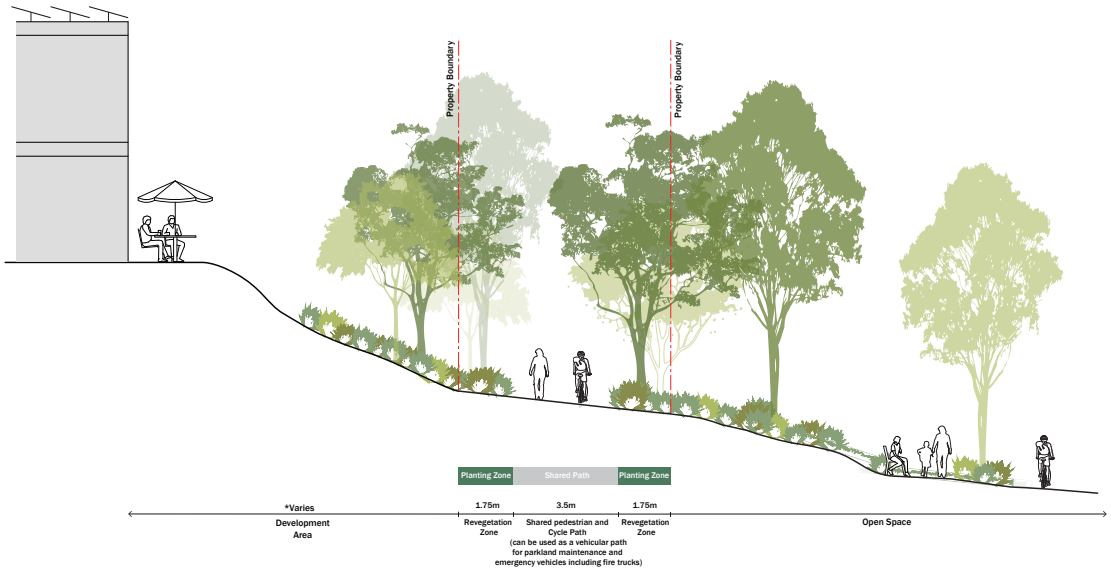
9 metre Service Edge Street

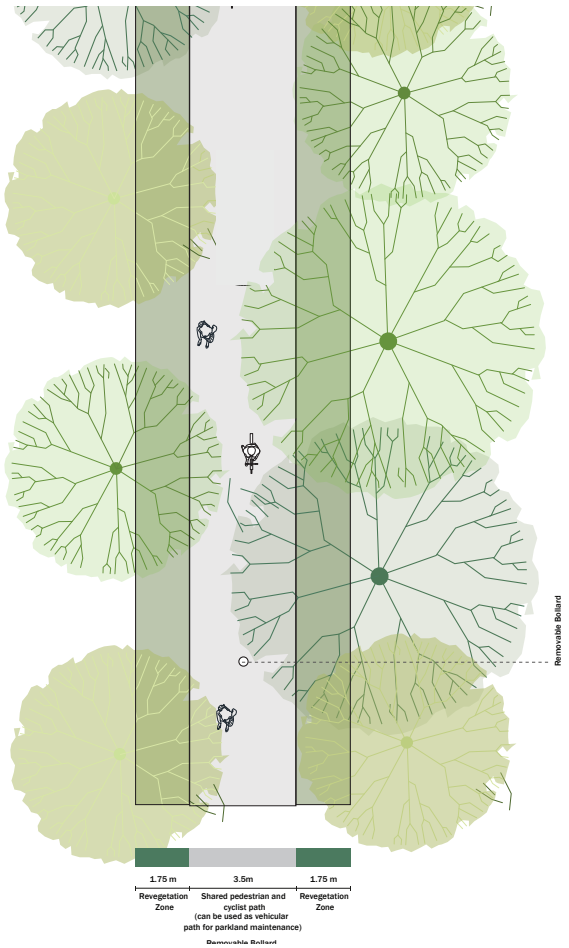


Scale

0m 2m 4m 8m

7 metre Park Edge Service Path

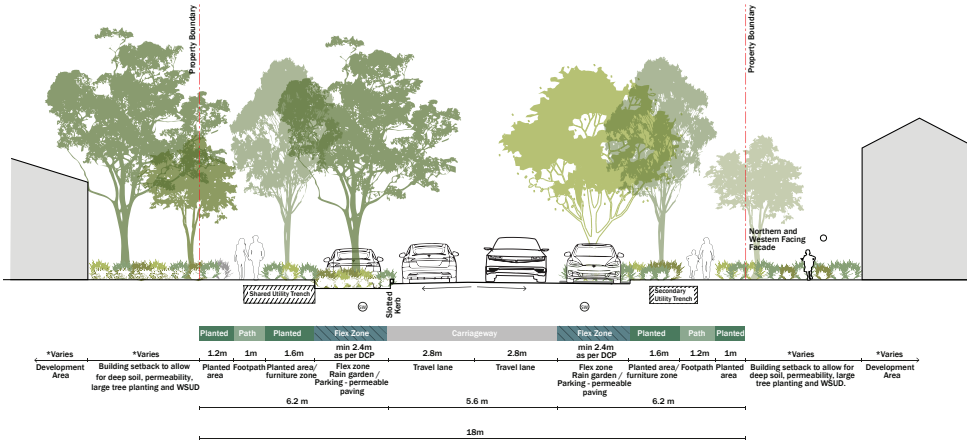


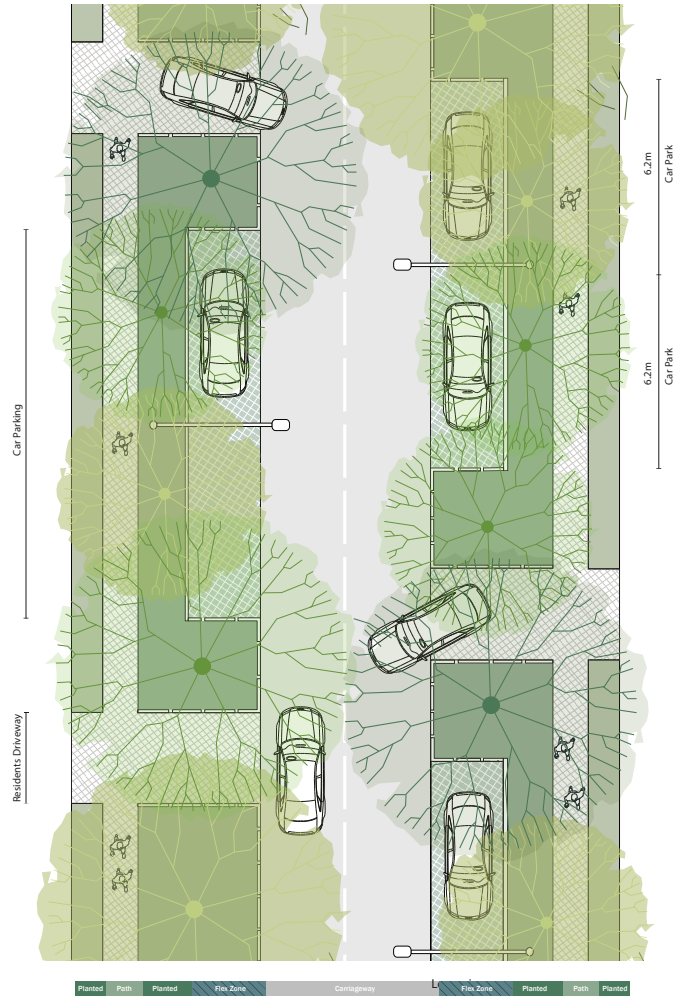


Scale

0m 2m 4m 8m

18 metre Residential Street (Existing within Luddenham Village)





Scale

0m 2m 4m 8m

View looking west towards Duncan Lake over the Northern Road

LAND USE AND URBAN FORM

Land use across the Agribusiness 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 activity.

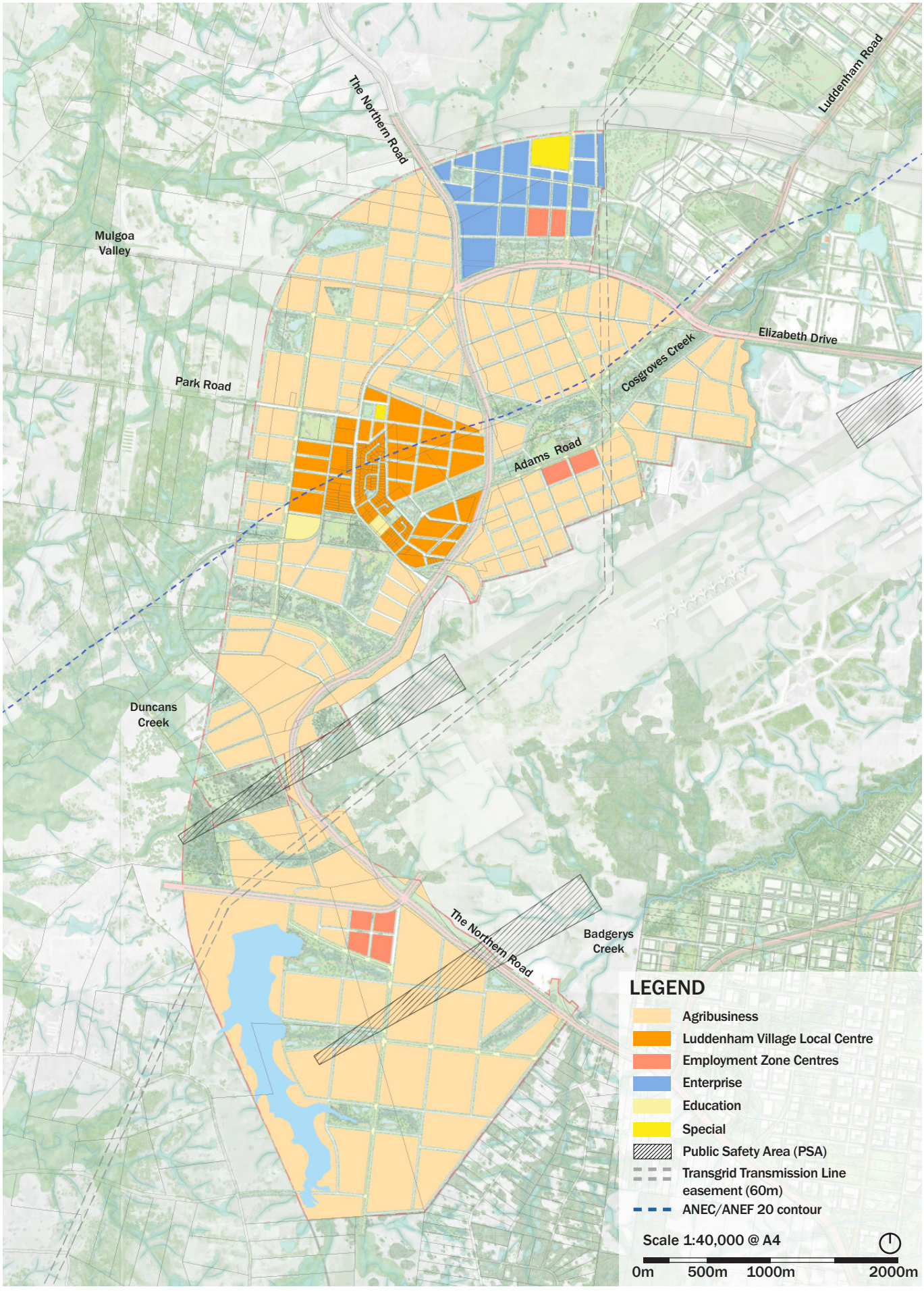
View looking south across the Agribusiness precinct

PRECINCT LAND USES

The Agribusiness Precinct will support approximately 5,400 jobs by 2036 with additional employment further into the future. The land use plan has been derived based on these targets and to also support an urban form that provides legibility, amenity and functionality.

- → Luddenham Village forms a compact Local Centre at the heart of the precinct, with appropriately scaled land uses that benefit from its walkable scale, landscape attributes and heritage character. It's land uses will transition over time from existing residential uses. The village is envisaged to have a larger footprint to function as a service centre and allow for additional permitted uses such as registered clubs and short-term accommodation.
- → A number of employment zone centres are provided across the precinct to support community amenity and diversity as it develops over time. Along with Luddenham Village, these will be very well served by buses and connected with the extensive cycleway network.
- → Agribusiness uses are anticipated throughout much of the precinct and will be oriented to benefit from the amenity of the open space and parkland network.
- → Flexible enterprise land uses are provided in the north of the precinct adjacent to the Northern Gateway to act as a transition between the predominant land uses in both precincts.
- → An Integrated Logistics Hub, Food and Pharma Hub, Integrated Intensive production Hub and an Australian Centre of Excellence in Food Innovation may be located within the precinct to benefit from the opportunities for national and international trade.
- → Tourism and cultural uses are anticipated in Luddenham Village as well as areas of ecological value and landscape amenity
- → Educational land use at Luddenham Public School and the Holy Family Catholic School will continue
- → Special uses for community infrastructure, such as a branch library and agile workspace, have been identified in Luddenham Village and located to benefit from adjacent open space
- → Open space is provided to be networked, multifunctional and consistent with the Blue-Green grid
- → Land uses will be responsive to requirements of heritage sites within the precinct.
- → Land uses are limited with regards to managing wildlife attraction (in the interest of safeguarding airport operations).
- → Land uses with noise sensitivities will be limited by ANEC contours.
- → Land uses within the Public Safety area need to be limited to ensure low densities of on site populations
- → Land within the Transgrid transmission line easements will need to conform with the relevant easement requirements.

The Urban Design Framework Plan



BUILT FORM

KEY BUILT FORM PRINCIPLES

1. Height and location of buildings is responsive to the strategic views across Country from the predominant north-south ridgeline through the precinct.
2. Height and scale of buildings responds to the intended function and typology.
3. Buildings are designed to address streets and open space.
4. Building type and scale responds to its intended use and topography.
5. Buildings present to arterial roads or associated service roads through clean built form and minimal visual clutter.
6. Buildings are designed consistent with passive cooling principles, maximising the potential for cross ventilation and minimising solar heat gain.
7. Buildings and associated construction methodologies are designed to maintain adequate clearance for air navigational activity over and around the Aerotropolis.
8. Site design enables setbacks to road edges for landscaping and water permeability to the soil.
9. Within identified centres, buildings present to adjacent roads and open space to create people focused and place based outcomes.
10. Loading docks and service bays are not oriented towards key street frontages and parkland.

Within the Agribusiness and Enterprise Zones:

– 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, green roofs, 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.

– Agribusiness built form to be responsive in scale and character where adjacent to the Luddenham Village Local Centre.

– The roofscapes within the Agribusiness precinct should be utilised to provide shade, harvest rainwater, produce solar power or green roofs.
– Water harvested can be re-used within the agribusiness 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.
– The scale of the built form within the precinct means it provides an unprecedented opportunity to integrate precinct wide solar farming in a manner which can support local and national sustainability objectives

Within Luddenham Village Local Centre:

– Provide positive address and architectural presence to street frontages, especially the old Northern Road

– Provide street wall building types to street frontages with appropriate scale and articulation.

– Permit zero setbacks on major streets to encourage active frontages.

– Allow opportunities away from the major streets for increased setbacks.

– Design all buildings to be of high architectural quality.

- Provide suitable curtilage, setback and built form scale in response to heritage items.

Architectural built form precedents, for the Agribusiness and enterprise zones, that illustrate the following objectives:

- → Sustainable design
- → Active interface between street and built form
- → Sustainable materials
- → Biophilic design approach
- → Green Roofs
- → Passive solar
- → Adaptability in use
- → High canopy cover
- → Integrated approach to landscape
- → Built form responds to airport controls and safety regulations

LUDDENHAM LOCAL CENTRE

Luddenham Village will be the historical and cultural heart of the Agribusiness Precinct. Luddenham Village will support the growth of the broader Aerotropolis as well as the Agribusiness Precinct. It is already home to several businesses, agricultural land and residences.

Luddenham Village is to emerge as a Tourist and Cultural hub for the Aerotropolis celebrating and being anchored by, its rich cultural heritage and elevated position in Western Sydney, whilst servicing employees within the Agribusiness precinct.

It will be a vibrant and sustainable community retaining its village character and celebrating its rich history, its vistas and views and its connection to country.

The village will become the focal point for new parklands that extend from its ridgetop location, east, along Cosgroves Creek and west along Duncans Creek.

The Village is to remain compact but will be a distinctive centre that protects and enhances it heritage sites. New and emerging technologies will be embraced alongside design excellence and appropriate development while maintaining the village's character, amenity and lifestyle.

The Old Northern Road will transform into an inviting and attractive spine through the village activated by shops and businesses, creating a highly pedestrianised and cycle-friendly environment.

Consultation with stakeholders and the community on the future plan for Luddenham Village highlighted key issues (such as aircraft noise and servicing) that will need to be resolved before a Luddenham Village Plan can be finalised. An interim plan for Luddenham Village has been developed which outlines those key issues and clarifies the next steps towards finalising a Luddenham Village Plan. Finalising a Luddenham Village Plan will be an iterative process and require further consultation with the community, councils and government agencies. The finalisation of a Luddenham Village Plan in the coming years will result in updates to the Agribusiness Precinct Plan.

Annotations

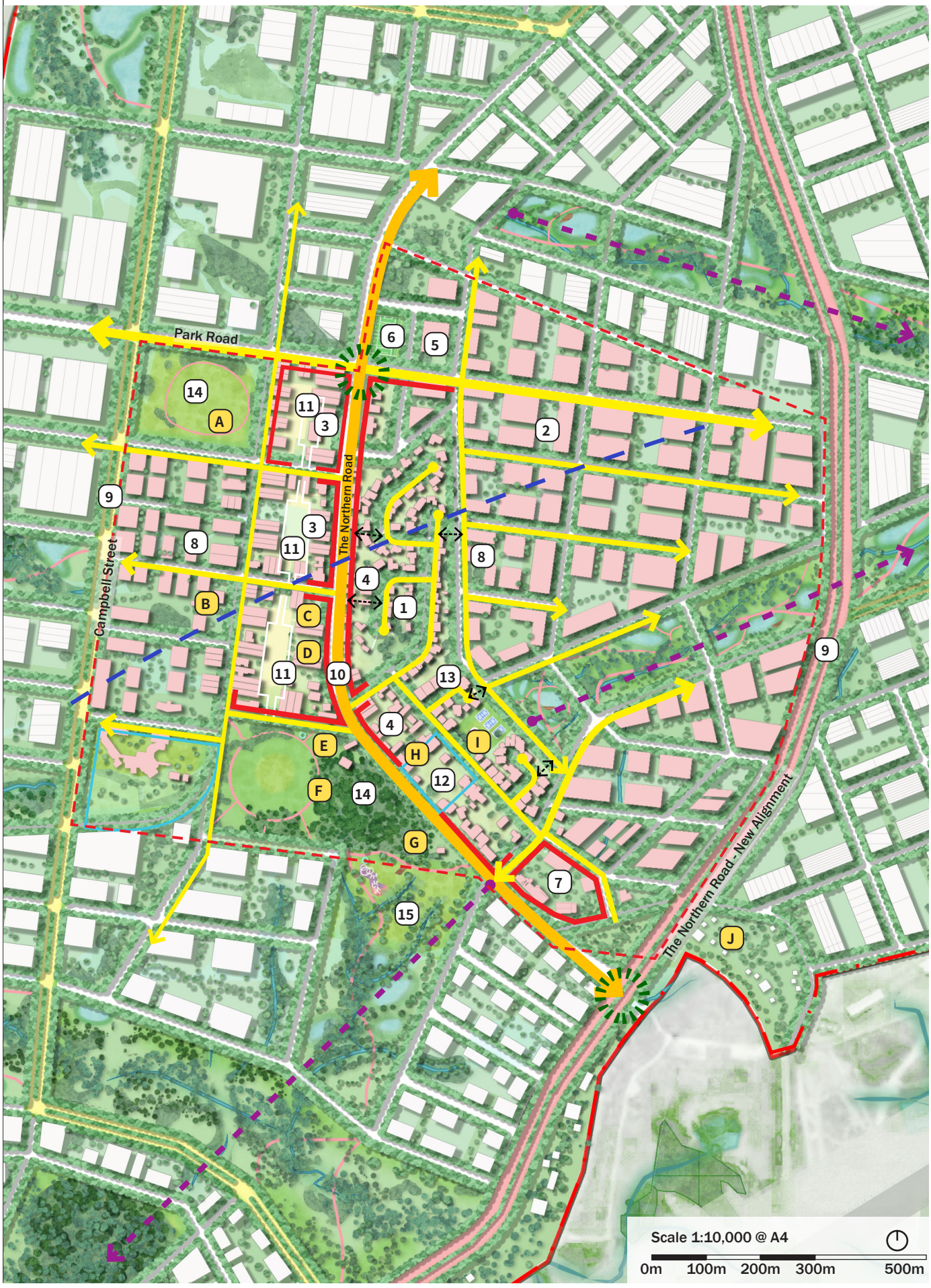
1. Existing residential dwellings
2. Loading docks and hard stand is located away from the village and parkland
3. New development will prioritise active frontages to the Northern Road and adjacent streets
4. Sensitively scaled infill development within existing residential uses
5. New local community centre with branch library and childcare centre
6. New gateway park at the intersection of Park Road and the old Northern Road celebrates one's arrival into Luddenham and provides a buffer between Agribusiness land uses and the residential village.
7. Existing local shops set within the Agri-Park. A potential future site for an Agri-Park cultural centre or museum that would benefit from the strategic view corridors and views across Country.
8. Knowledge workers from research and innovation Agribusinesses benefit from the activity of Luddenham including hospitality offerings
9. Freight movements are limited through Luddenham so as to improve pedestrian amenity and safety. The realigned Northern Road and new sub-arterial roads provide alternative routes.
10. The Northern Road is transformed into a tree lined 'Green Boulevard', providing shade and contributing to the landscape character of place
11. The interior of deep blocks is activated with flexible landscaped shared zones that combine parking with space for local produce markets and events.
12. Luddenham Public School expands within a compact footprint to maximise the amount of green space and provide additional landscape linkages between adjacent parkland.
13. Pedestrian and cycle links improve connectivity between Luddenham Local Centre and surrounds.
14. Heritage items such as Luddenham Showground and the Luddenham Progress Hall are sensitively rejuvenated to accommodate the expanding community around Luddenham Village
15. The Agri-Park frames the southern end of Luddenham village and provides landscaped views wet, towards the Blue Mountains.

Heritage Listed Items

- A Showground
- B Brick Cottage
- C Weatherboard Cottage
- D Weatherboard Cottage
- E Luddenham Progress Hall
- F Luddenham Uniting Church
- G St. James Anglican Church
- H Luddenham Public School
- I Wilmington Reserve
- J Lawson's Thistle Inn

LEGEND

- Landscape Gateway to Village
- Luddenham Village boundary (SEPP)
- Main Street - The Old Northern Road
- Streets
- Primary active frontage
- Landscape Links
- Pedestrian and cycle links
- ANEC20 noise contour
- Existing schools


Park Road
Campbell Street
The Northern Road
The Northern Road - New Alignment
Scale 1:10,000 @ A4
0m
100m
200m
300m
500m

View south along The Old Northern Road 'Main Street' with gateway park and community facility on the left and active frontages throughout

Bakery

HEIGHT FRAMEWORK

The heights across the Agribusiness are controlled cognisant of a range of broad objectives:

- Achieve the density and population targets established by the WSAP
- Ensuring buildings and structures do not impede on the Obstacle Limitation Surface (OLS) associated with the airport
- Maintain landscape vistas and character by limiting heights to within tree canopy heights and locating new development outside key vistas
- Ensure landscape, as opposed to built form, is the predominant view on the horizon
- Providing urban density adjacent to the amenity of the parkland network.

Heights are categorised into the following zones with more detailed objectives:

A : Luddenham Village Local Centre (Existing Village Heights)

- Heights limited to align with existing built form within Luddenham Village, in particular adjacent heritage items. Heights subject to review and will be confirmed following finalisation of Luddenham Village Plan

B : Duncans Creek and tributaries

- Heights limited to preserve views west to the Blue Mountains from within the Agribusiness Precinct

C : West of Luddenham Village and the predominant north south ridgeline (Max 24m)

- Heights limited to preserve views west to the Blue Mountains from Luddenham Village Local Centre
- Heights benefit from the fall of the land to the west of Luddenham Village Local Centre
- Heights are 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.

D : East of Luddenham Village and the predominant north south ridgeline (Max 24m)

- Heights limited to preserve views east towards Cosgroves Creek from Luddenham Village Local Centre
- Heights benefit from the fall of the land to the east of Luddenham Village Local Centre
- Heights are 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.

E : General heights (Max 24m)

- Heights are 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.
- Within these areas heights would lower to respond to adjacent uses and built form (Dwyer Road, North Luddenham, Northern Gateway, Aerotropolis Core, Western Sydney International (Nancy-Bird Walton) Airport)

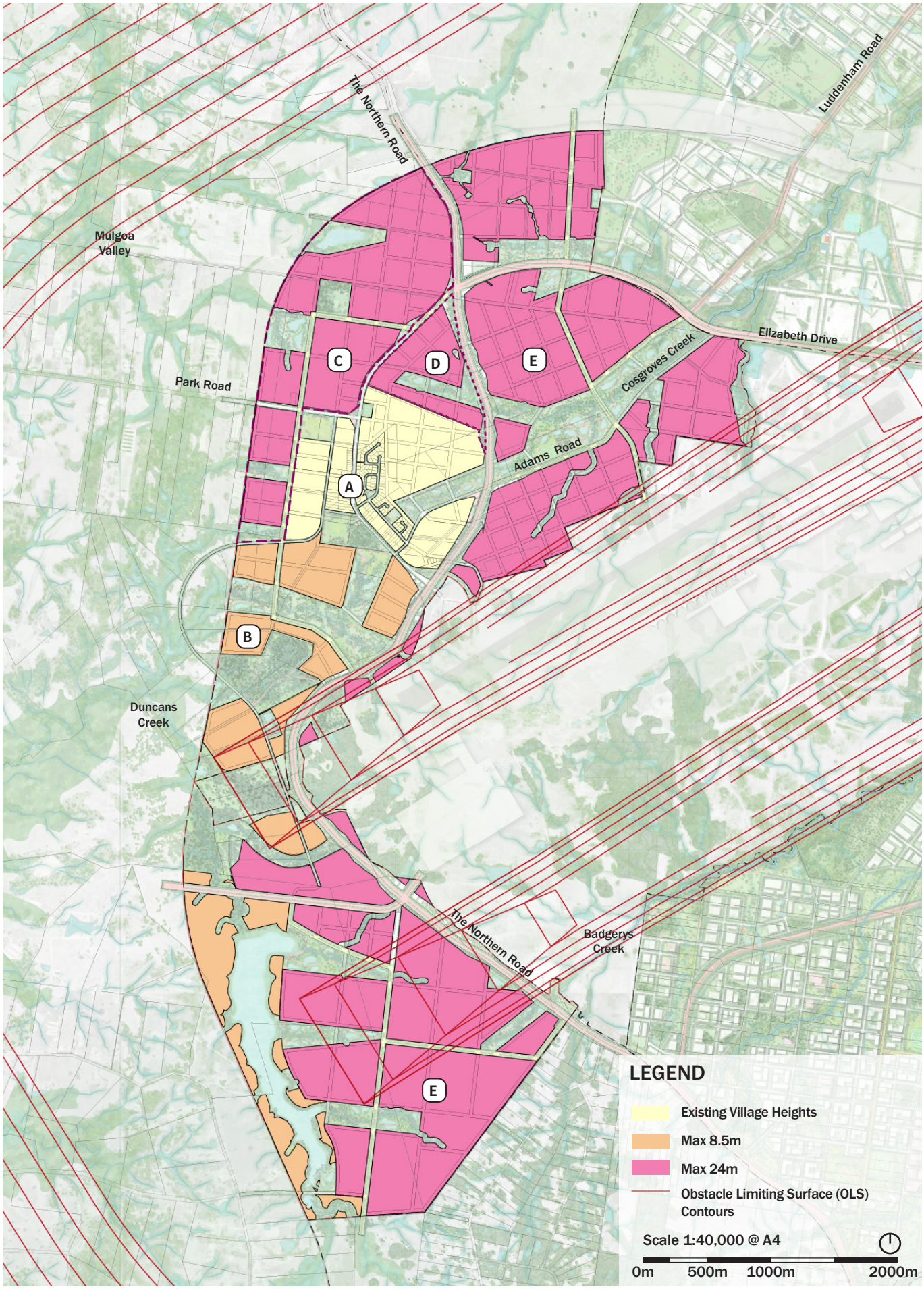
The height map adjacent describes the maximum heights that may be applied to achieve the desired built form and land use outcomes across the Agribusiness precinct.

OLS Constraints

Notwithstanding maximum heights, all buildings and structures, including equipment used during construction (such as cranes) are required to be contained within Obstacle Limitation Surface (OLS) limits established in the Western Sydney Aerotropolis Plan.

Legend

The Urban Design Framework Plan

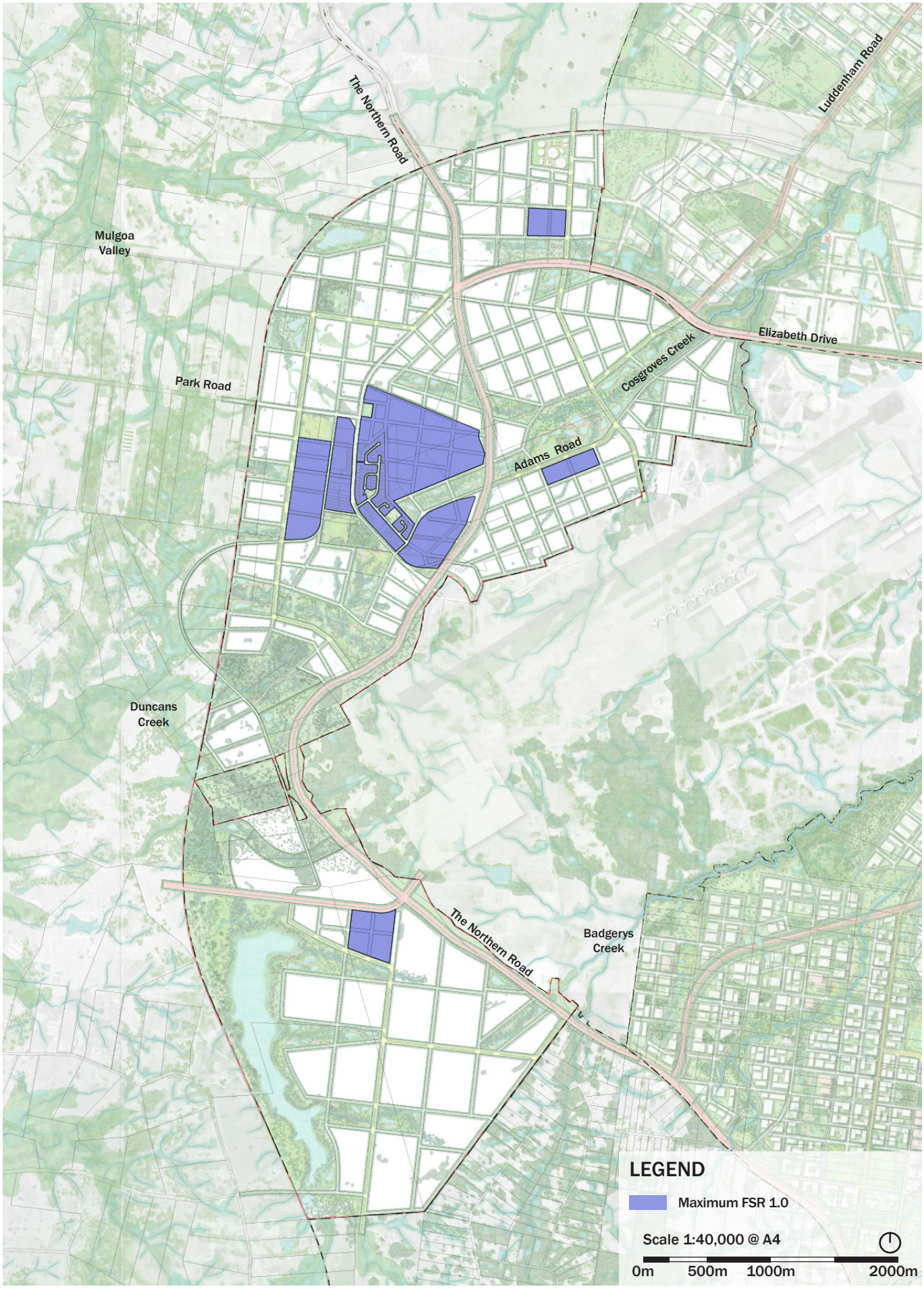


FSR FRAMEWORK CENTRES

LUDDENHAM VILLAGE LOCAL CENTRE AND EMPLOYMENT ZONE CENTRE FSR CONTROLS

The floor space ratio map to the right describes the controls applying to development across the Luddenham Village and the Neighbourhood Hubs (as applied by the Western Sydney Aerotropolis SEPP).

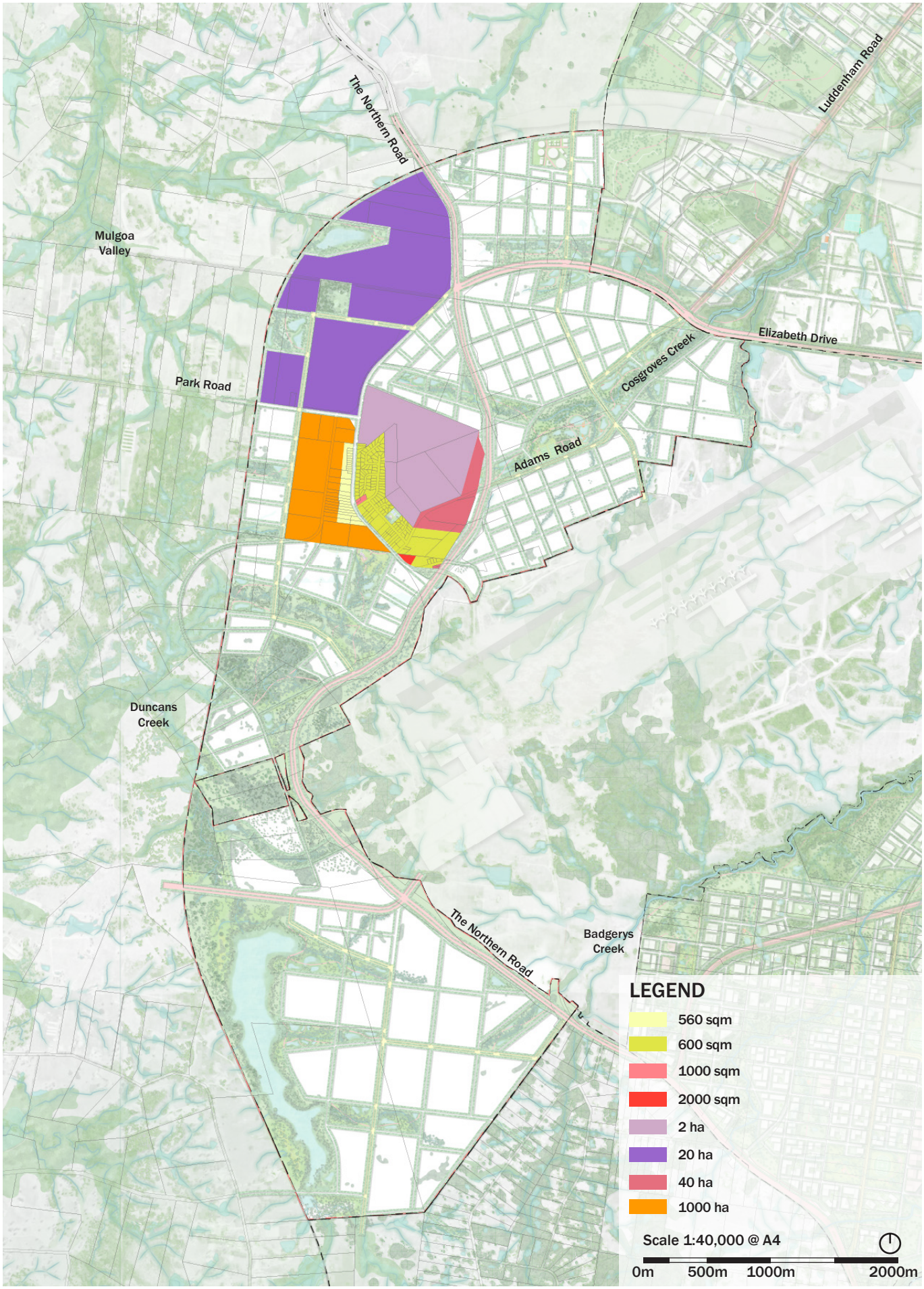
The controls have been derived based on the desired built form outcome, the employment and population targets established in the WSAP, and help to ensure appropriate bulk, massing, articulation and separation of development. It is an important control to help achieve built form quality.


The Northern Road
Luddenham Road
Mulgoa Valley
Elizabeth Drive
Cosgroves Creek
Park Road
Adams Road
Duncans Creek
The Northern Road
Badgerys Creek
LEGEND
Maximum FSR 1.0
Scale 1:40,000 @ A4
0m
500m
1000m
2000m

MINIMUM LOT SIZE

The land within the northern area of the Agribusiness Precinct should be a minimum of 20ha as depicted on the map. This is intended to ensure that the lot sizes are large enough to support intensive sustainable food production.

Minimum lot sizes within Luddenham Village maintain their existing minimum lot sizes, and are subject to review and will be confirmed following finalisation of Luddenham Village Plan.


The Northern Road
Luddenham Road
Mulgoa Valley
Elizabeth Drive
Cosgroves Creek
Park Road
Adams Road
Duncans Creek
The Northern Road
Badgerys Creek
LEGEND
560 sqm
600 sqm
1000 sqm
2000 sqm
2 ha
20 ha
40 ha
1000 ha
Scale 1:40,000 @ A4
0m
500m
1000m
2000m

SOCIAL + CULTURAL FRAMEWORK

Principles

1. Co-location with open space

→ School - sport & recreation facility - open space
→ Libraries, social & cultural institutions with park frontage

2. Co-location of complementing institutions & services

→ Libraries, social and cultural institutions
→ Libraries & tertiary institutions

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 local recreational facilities

Sports fields and courts are located within parkland adjacent to each of the centres of the Agribusiness precinct.

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

2. Educational facilities

Educational facilities are added to Luddenham Public School which sits adjacent existing and expanded parkland across Jamison Street.

3. Social and cultural infrastructure

Libraries are the core of the community life - for residents, workers and visitors alike. A new library is located within Luddenham Village alongside parkland to encourage indoor and outdoor community activity.

An Agile Work Centre is recommended to be located in Luddenham Village and support knowledge workers and the broader community within the precinct. This could be co-located with other community facilities such as the branch library and childcare.

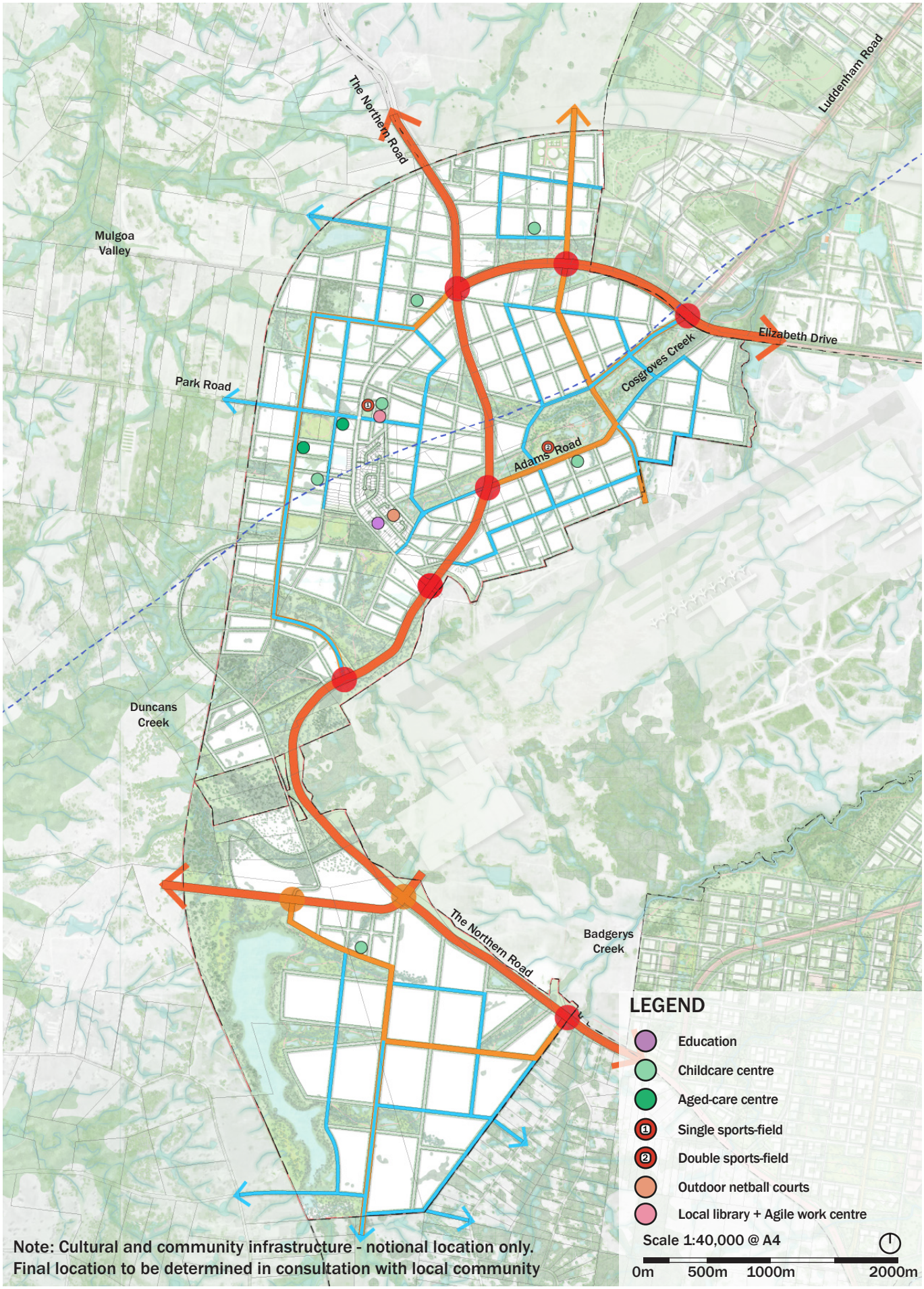
4. Childcare facilities

Childcare centres provide support to families and are located in Luddenham village and each employment centre.

5. Aged Care facilities

Aged care facilities are located within Luddenham Village alongside parks to encourage walking, outdoor activities, engagement with nature and a healthy lifestyle within the heritage rich village.

ANEC 20+ noise contours will limit the placement of new noise sensitive social and cultural offerings. Existing facilities that sit within the ANEC 20 contours will need to consider upgrades to alleviate the impact of airport noise.


The Northern Road
Luddenham Road
Mulgoa Valley
Elizabeth Drive
Cosgroves Creek
Park Road
Adams Road
Duncans Creek
The Northern Road
Badgerys Creek
LEGEND
Education
Childcare centre
Aged-care centre
Single sports-field
Double sports-field
Outdoor netball courts
Local library + Agile work centre
Scale 1:40,000 @ A4
0m
500m
1000m
2000m
Note: Cultural and community infrastructure - notional location only.
Final location to be determined in consultation with local community

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