Greater Sydney Commission

Western Sydney Growth Infrastructure Compact (GIC)

Analysis Report

December 2019

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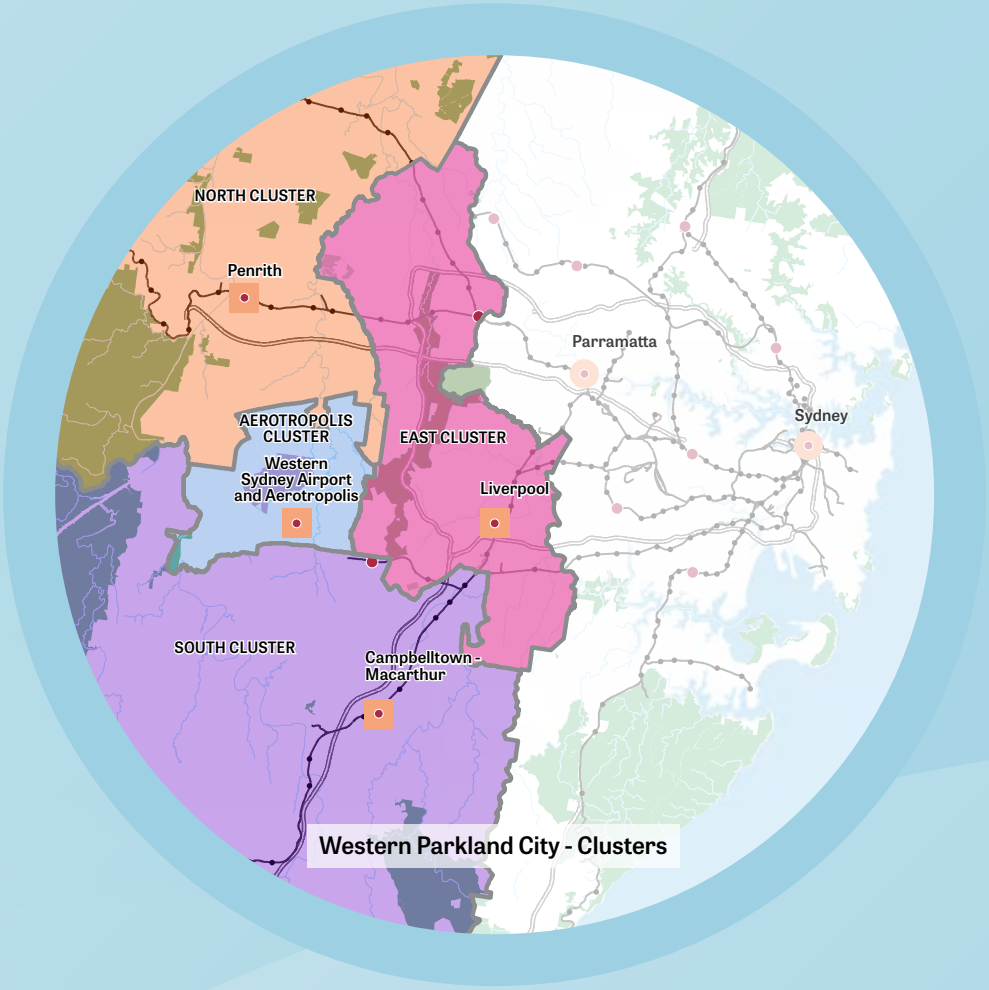
Executive Summary

The Western Parkland City (WPC) encompasses an area of approximately 3,200 square kilometres, and nine Local Government Areas. This Analysis Report examines the spatial opportunities and constraints that exist in the Western Parkland City, identifying the location and extent of developable land within the study area through the process. It provides a strong evidence base for the development of robust growth scenarios for the Western Parkland City, over the next 10, 20 and 40 year time horizons. This document should be read in conjunction with the Western Sydney Growth Infrastructure Compact – Literature Review Report, and forms a necessary precursor to the development of detailed Growth Infrastructure Compacts over the Western Parkland City.



Key Opportunities:

North Cluster

- Improved north-south transport connectivity through the WPC
- Enhanced place based community outcomes which enhance the existing unique character in the rural and suburban communities
- Increased accessibility to health and education
- High accessibility to the natural environment

South Cluster

- Enhanced accessibility to employment opportunities
- Reduced travel times with enhanced transport infrastructure
- Strong urban character in existing settlements
- Locally based health and education facilities
- Increased affordability and variety of housing
- High accessibility to the natural environment

East Cluster

- Close proximity to the Western Sydney Airport
- Increased connectivity to the Western Sydney Airport
- High accessibility to social, health and education facilities

Aerotropolis Cluster

- Greenfield development opportunity with limited constraints
- Social and economic driver for growth in the WPC
- Increased connectivity to new and existing urban areas and centres

Key Constraints:

North Cluster

- Long distances between established areas with limited rapid transport opportunities
- Bounded by natural barriers to the west, north and east
- Limited existing accessibility to social, health and education facilities

South Cluster

- Heavily reliant on a limited number of public transport options
- Constrained by natural barriers to the south, east and west.

East Cluster

- Highly developed urban areas with limited urban redevelopment flexibility

Aerotropolis Cluster

- Current and future flooding around South Creek corridor
- Aircraft noise surrounding the future Western Sydney Airport from 24/7 operations

Potentially Developable Land in the Western Parkland City

The analysis undertaken as part of this analysis report results in the identification of land within the Western Parkland City capable of facilitating future urban development. This high level land capability assessment has been developed through the analysis of natural and built environment constraints which identifies land that is considered either undevelopable (restricted) or land that is potentially developable but constrained, but with futher investigation may be deemed suitable for future urban purposes.

Land identified as undevelopable (restricted) land is not capable of facilitating urban built form but may be used for parklands, playing fields or 'environmental' purposes e.g. biodiversity banking, stormwater detention.

Land identified as potentially developable but constrained within this report contain a number of constraints that may have the potential to restrict the development of the land for urban purposes. The category and degree of potential land constraints are discussed in Chapter 7 of this analysis report.

Table 1.1 and Map 1.1 summarises the land identified as undevelopable (restricted) or potentially developable but constrained.

Large areas with potential for urban development include land north of the future Western Sydney Airport, land to the south and west of Campbelltown-Macarthur, land to the north of penrith, and land to the south of Liverpool.

Further investigation is required to fully determine the capability of the identified land for future urban development.

North Cluster

Opportunities exist to build upon the growth of the nearby and adjacent North West Growth Area. Potentially developable but constrained land has also been identified as those surrounding Penrith and to the south of the North Cluster towards the future Western Sydney Airport.

South Cluster

The South Cluster has the highest amount of potentially developable but constrained land. Land to the west of Campbelltown-Macarthur is identified as potentially capable of urban development building upon the areas identified as the South West Growth Centre. Land identified with the potential for urban development in this Cluster is scattered throughout, located between National Parks to the north and south.

East Cluster

The East Cluster contains the most existing urban development of the four clusters. Land identified with the potential for urban development is clustered to the south of Liverpool towards Holsworthy.

Aerotropolis Cluster

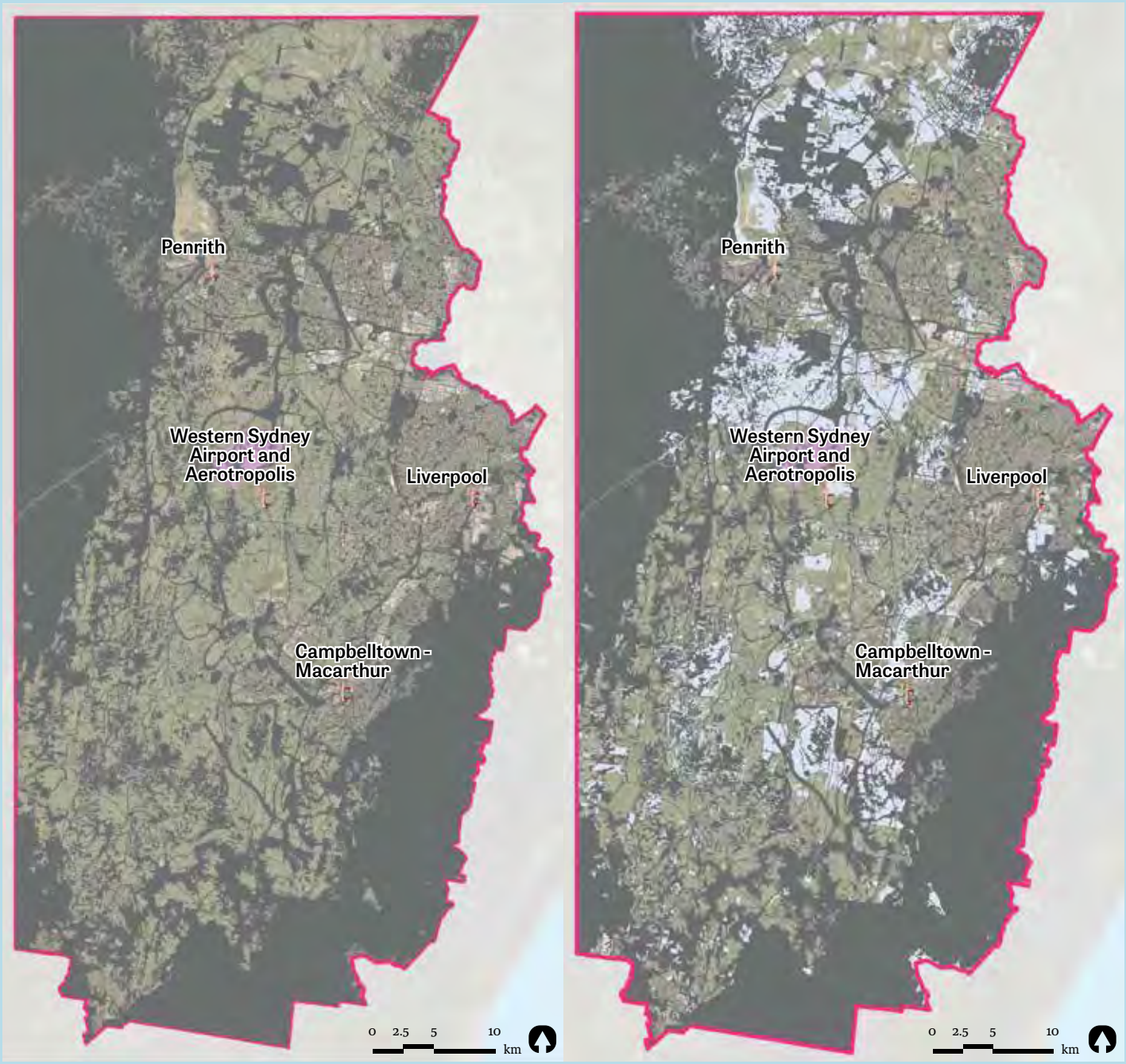
The areas surrounding the future Western Sydney Airport and Aerotropolis core will require further investigation as area grows and demand increases.

Table 1.1: Developable & Undevelopable Land by Cluster

	Western Parkland City	North Cluster	South Cluster	East Cluster	Aerotropolis Cluster
Total Area (ha)	317,492	98,941	154,113	47,924	16,515
Area Undevelopable (Restricted) Land	177,577	62,939	90,132	20,006	4,500
Area Potentially Developable but Constrained Land	42,248	18,887	15,246	6,892	1,223
Potentially Developable Land	**97,667**	**17,115**	**48,735**	**21,025**	**10,793**

Source: Greater Sydney Commission (2019)

Map 1.1 Western Parkland City Undevelopable (Restricted) Land and Potentially Developable but Constrained Land



Source: Greater Sydney Commission (2019)

WPC Boundary	Metropolitan Cluster	Strategic Centre
Western Sydney Airport	Undevelopable (Restricted) Land	Potentially Developable but Constrained Land

2

Background & Purpose

2 Background and Purpose

2.1 Project Background

The Western Sydney City Deal (the City Deal) is a landmark agreement between the Australian Government, NSW Government, and local governments of the Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith, and Wollondilly to deliver the new Western Parkland City (WPC).

The Greater Sydney Commission (the Commission) is undertaking a Western Sydney Growth Infrastructure Compact (GIC) Program to deliver two commitments under the City Deal:

1. P5 – Establishing pilot GICs for the Western Parkland City to coordinate planning and delivery of new housing and ensure that the required infrastructure is delivered as it is needed.

2. P7 – Developing transport and water infrastructure models that innovatively plan for future infrastructure needs, accelerating development application processes and streamlining infrastructure delivery.

The development of the 'Western Sydney GIC: Scenario Development' (the Project) includes documenting place-based outcomes for the WPC, building on the vision of the Western City District Plan and the work undertaken by Councils as part of their Local Strategic Planning Statement (LSPS). This work informs two scenarios using a productivity and sustainability lens approach underpinned by infrastructure macro-assumptions.

2.2 About the Growth Infrastructure Compact (GIC)

A Growth Infrastructure Compact (GIC) is a collaborative strategic process for understanding:

- The growth potential of a place
- State infrastructure and utility needs (what, where, when)
- A preliminary assessment of costs and benefits
- How growth with state infrastructure could be staged and sequenced to deliver better place based outcomes.

2.3 Purpose of This Document

This Analysis Report builds on information gathered from a literature review ('Western Sydney - Growth Infrastructure Compact - Literature Review Report') and stakeholder engagement.

This document seeks to analyse the spatial opportunities and constraints presented in the WPC, identifying the location and extent of developable land within the WPC through the process. It provides a strong evidence base for the development of robust scenarios for the WPC over the next 10, 20 and 40 year time horizons. This document should be read in conjunction with the Western Sydney – Growth Infrastructure Compact – Literature Review Report.

This document will inform the next stages of the Western Sydney Growth Infrastructure Compact (GIC).

2.4 Study Area

The area being considered in this report covers the western third of the Sydney Basin, parts of the Blue Mountains, and Southern Highlands. This region includes land within the following local government areas (Map 2.1):

- Blacktown City Council
- Blue Mountains City Council
- Camden Council
- Campbelltown City Council
- Fairfield City Council
- Hawkesbury City Council
- Liverpool City Council
- Penrith City Council
- Wollondilly Shire Council.

Given the large scale of the study area a framework for analysis communities of interest consist of (Map 2.2):

- The **North Cluster** centred around the Penrith Metropolitan Cluster
- The **South Cluster** centred around the Campbelltown Macarthur Metropolitan Cluster
- The **East Cluster** centred around the Liverpool Metropolitan Cluster
- The **Aerotropolis Cluster** centred around the new Western Sydney Airport and future Aerotropolis.

2.5 Western Sydney Growth Infrastructure Compact (GIC) Program Objectives

The overarching objectives of the Western Sydney GIC program are to:

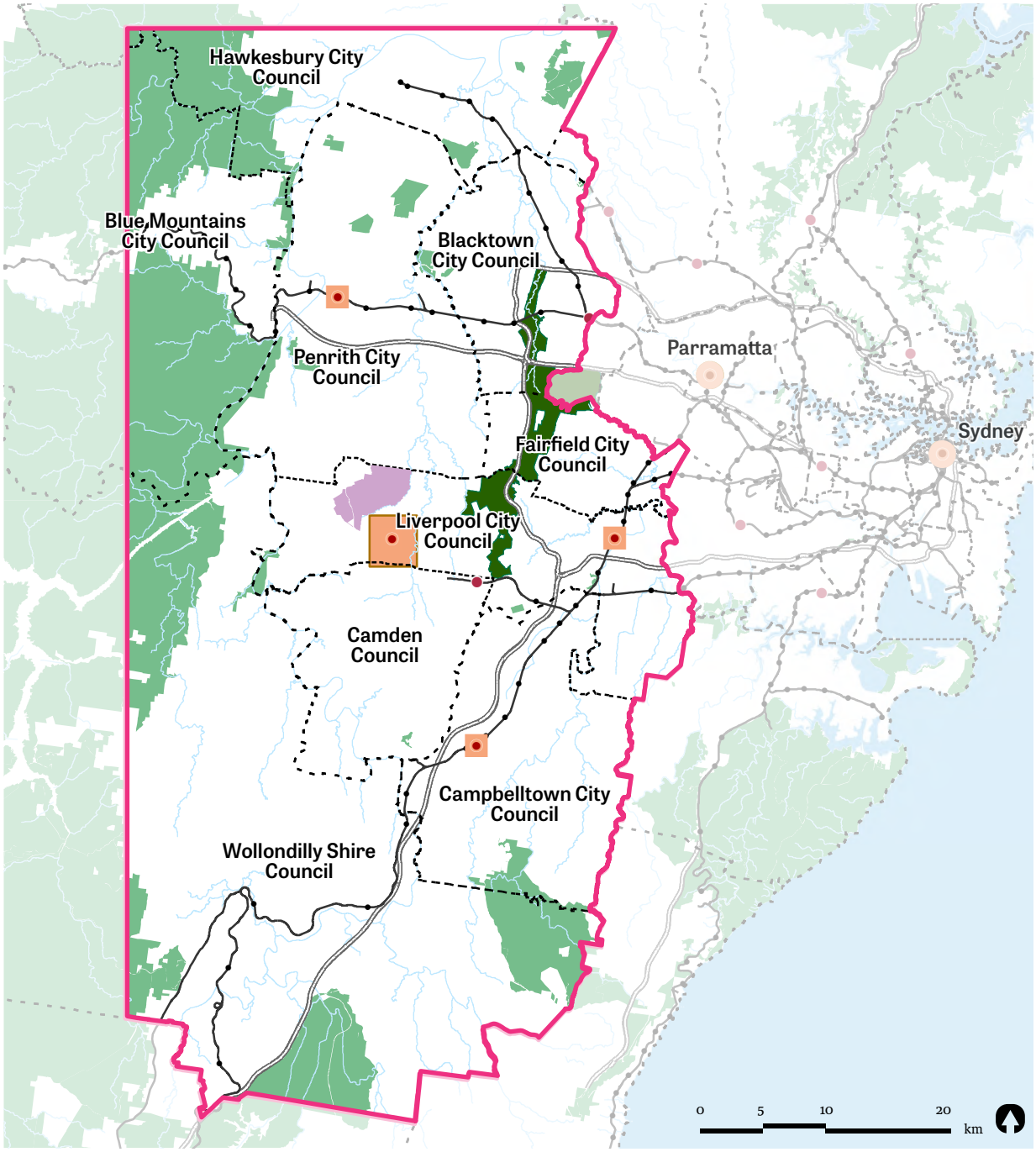
1. Work collaboratively to co-create the City, including the Aerotropolis as a city supported by infrastructure over the next 20 years and beyond
2. Support the partnership and commitments of the Western Sydney City Deal to transform Western Sydney, and its focus on connectivity, jobs for the future, skills and education, liveability, environment, planning and housing
3. Support the vision, objectives and planning priorities of the City District Plan, including the creation of a Western Sydney Economic Corridor
4. Support the unique structures within the metropolitan clusters of the City, including Greater Penrith, Liverpool, Campbelltown-Macarthur, and the Western Sydney Aerotropolis
5. Support the delivery of a range of housing with access to public transport and services to meet the demands of the City
6. Support the South Creek Corridor as the green corridor spine for the City, to keep water in the landscape and mitigate urban heat
7. Identify early the range of infrastructure and services needed to grow and transform the City, the costs involved and how this could be feasibly coordinated and funded over time
8. Identify how to stage growth aligned to infrastructure to optimise coordinated outcomes for the City and its community.

2.6 Project Objectives

The key objectives of this Analysis Report as part of the Western Sydney GIC program are to:

1. Document base case and place outcomes
2. Confirm macro-assumptions
3. Prepare scenarios for the 10, 20 and 40-year horizon using a lens approach
4. Undertake engagement to obtain stakeholder buy-in on 1,2 and 3.

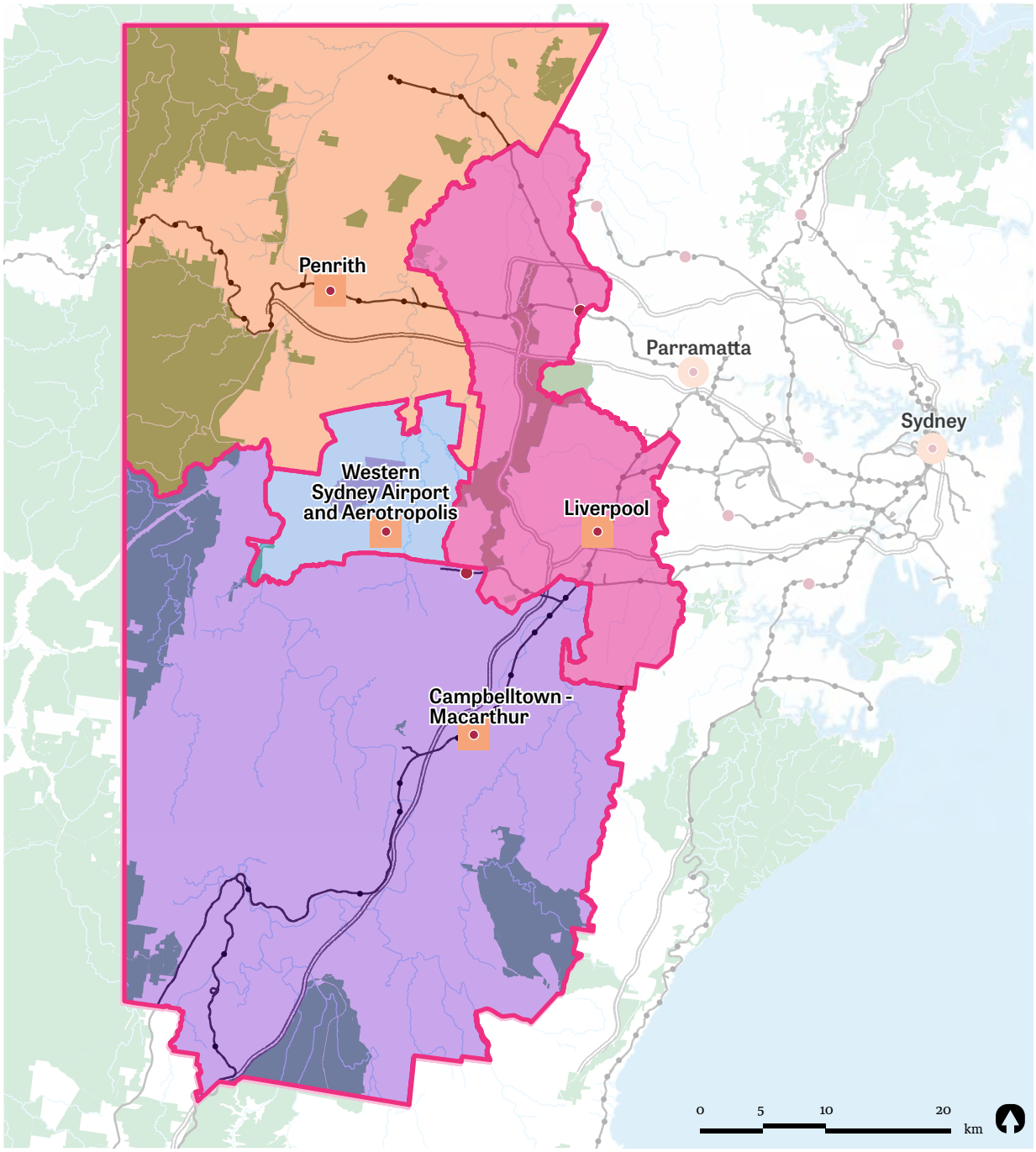
Map 2.1 Study Area



Source: Greater Sydney Commission (2019)

WPC Boundary
Local Government Boundaries
Waterways
Metropolitan Centre
Motorway
Protected Natural Areas
Metropolitan Cluster
Railway
Major Urban Parkland
Strategic Centre

Map 2.2 Study Area by Clusters



Source: Greater Sydney Commission (2019)

WPC & Cluster Boundaries	Motorway	North Cluster
Metropolitan Centre	Railway	South Cluster
Metropolitan Cluster	Waterways	East Cluster
Strategic Centre	Protected Natural Areas	Aerotropolis Cluster

3

Methodology and Data Inputs

3 Methodology and Data Inputs

3.1 Data Inputs

Data inputs to this Analysis Report have originated from a wide range of NSW government agencies and service providers through a highly collaborative process led and co-ordinated by the Greater Sydney Commission (GSC). A comprehensive list of sources have been cited at Section 3.3.

Some data is only available at a Local Government Area (LGA) level of detail. While the majority of LGAs exist entirely within one cluster, the Aerotropolis cluster is formed from portions of the Penrith and Liverpool LGAs. This means that at times results cannot be reported for the Aerotropolis cluster.

3.2 Methodology

The GIC process has been designed to optimise stakeholder engagement, collaboration and inputs into the development of the vision for growth in the Western Parkland City. This has included:

1. Stakeholder Workshop 1 (to co-design Place Outcomes)
2. Stakeholder Workshop 2 (to agree and co-design Base Case Scenarios)
3. Baseline Assessment
4. Literature Review
5. Opportunities and Constraints Spatial Analysis
6. Refined Scenarios
7. Development of a Preliminary Infrastructure Framework.

Stakeholder Workshop 1 included a wide range of stakeholders at the community, council, state and federal levels. The purpose of the workshop was to gather information and co-design place outcomes for the entire Western Parkland City. The resulting place outcomes are included in Chapter 8 of this report.

Stakeholder Workshop 2 included the same range of stakeholders at the community, council, state and federal levels. The purpose of the workshop was to define and agree the base case and to co-design scenarios. These outcomes can be found in the Preliminary Infrastructure Framework.

A **Baseline Assessment** was prepared in conjunction with partner Councils and NSW Government Agencies.

A **Literature Review** and spatial analysis was conducted which included over 30 documents related to the region and was summarised in the Western City Growth Infrastructure Compact (GIC) Literature Review Report. The spatial analysis, is the subject of this report.

Refined Scenarios were developed based on Stakeholder Workshop 2 and the Baseline Assessment (Chapter 9 of this Report).

The **Preliminary Infrastructure Framework** is a digital spatial map that communicates the planned infrastructure (physical and social infrastructure) over the Western Parkland City, which will form the basis of funding prioritisation under the Western City Deal.

3.3 Data Sources

The following documents and data inputs provided by various Government Agencies and Service Providers have been considered as part of this Analysis Report.

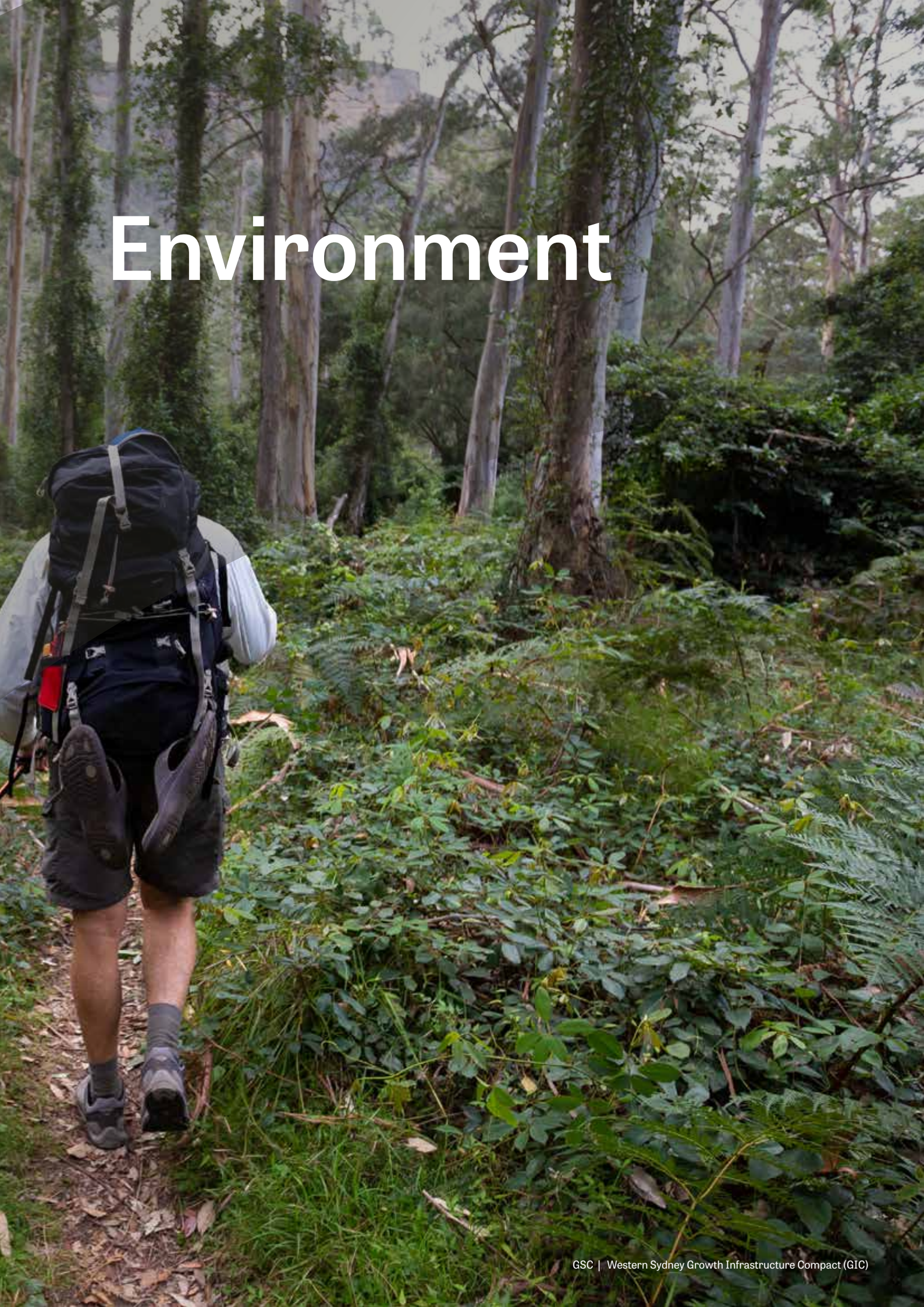
- Greater Macarthur 2040 - An interim plan for the Greater Macarthur Growth Area (November 2018)
- Glenfield Land Use and Infrastructure Analysis 2015
- Glenfield to Macarthur Urban Renewal Corridor Strategy (July 2015)
- Lowes Creek Marylands Precinct Plan - Discussion Paper September 2018
- South Creek West Structure Plan (2018)
- Broader Western Sydney Employment Area Draft Structure Plan 2013
- Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan (Stage 1: Initial Precincts) 2018
- Wilton 2040
- North Wilton Precinct (October 2018)
- South East Wilton Precint (March 2018)
- Western Sydney Aerotropolis Agribusiness Precinct (February 2019)
- Western Sydney Airport Agribusiness Precinct Production Possibilities (October 2018)
- South Creek Sector Review: Integrated land use and water cycle management to achieve the Western Parkland City
- Liverpool Collaboration Area Place Strategy 2018
- Sydney Metro North South Rail Update to City Deal Coordination Committee (March 2019)
- Western Sydney Infrastructure Plan (WSIP) (2018)
- Outer Sydney Orbital (OSO) Draft Strategic Environmental Assessment (SEA) (March 2018)
- Western Sydney Freight Line Corridor Draft Strategic Environmental Assessment (February 2018)
- Bells Line of Road - Castlereagh Connection corridor identification: Consultation on a recommended corridor of land for future motorway (March 2018)
- Bells Line of Road - Castlereagh Connection Corridor Study: Draft Strategy Environmental Assessment (February 2018)
- Greater Sydney Regional Plan: A Metropolis of Three Cities (March 2018 Update) (GSRP)
- Future Transport 2056 (2018)
- Greater Sydney Services and Infrastructure Plan (2018)
- Building Momentum: State Infrastructure Strategy 2018-2038 (February 2018)
- Western City Deal (2018)
- Growth Servicing Plan 2017-2022
- Network Development Strategy 2014.

Maps, graphs and infographics throughout this Analysis Report have been produced using data from the following sources:

- Create NSW Assets (Create NSW) (2019)
- Education Assets (NSW Department of Education) (2019)
- Electricity Assets (Endeavour Energy/Transgrid) (2019)
- Water and Sewage Servicing (Sydney Water) (2019)
- Heat Vulnerability (Office of Environment & Heritage) (2019)
- Urban Heat Island (Office of Environment & Heritage) (2019)
- Urban Vegetation Cover (Office of Environment & Heritage) (2019)
- Future Transport Corridors (Transport for NSW) (2019)
- Precinct Planning (Department of Planning & Environment) (2019)
- Justice Assets (Justice NSW) (2019)
- Contaminated Lands (Environment Protection Authority) (2019)
- National Surface Water Information (Geoscience Australia) (2019)
- Land Ownership (NSW Land Registry Services) (2019)
- Digital Topographic Database (NSW Department of Finance, Services and Innovation) (2019)
- Digital Cadastral Database (NSW Department of Finance, Services and Innovation) (2019)
- World Imagery (Esri, DigitalGloble, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, AeroGRID, IGN and GIS User Community) (2019)
- 2016 Australian Census (Australian Bureau of Statistics).

4

Environment



4 Environment

The Western Parkland City offers a wide diversity of landscapes and environments. It is important to identify, retain and enhance (where possible) the uniqueness of the place, providing a framework for city-wide liveability, sustainability and productivity.

4.1 Data Sources

Data inputs to this Analysis Report have originated from a wide range of NSW Government Agencies and Service Providers, through a highly collaborative process led and co-ordinated by the Greater Sydney Commission. A comprehensive list of data and its source has been detailed in Chapter 3 of this report.

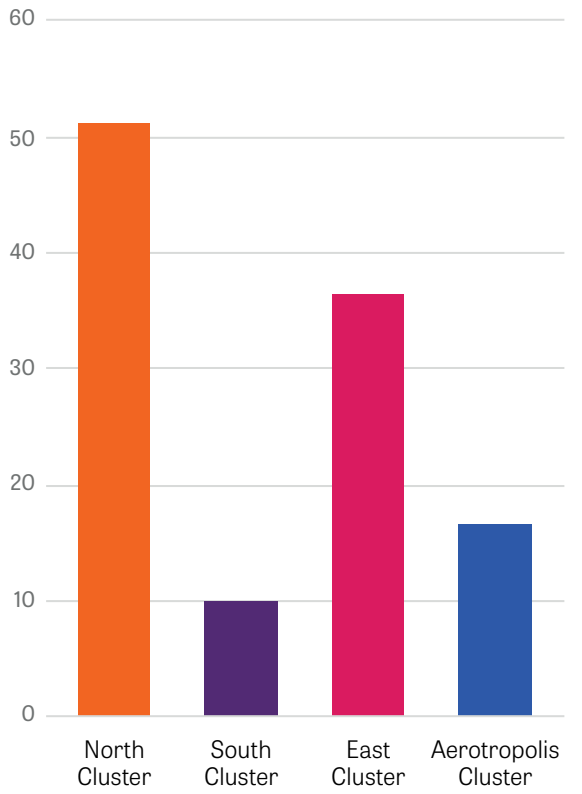
4.2 Flooding

The WPC is characterised by a large number of drainage catchments, with a number of these catchments forming valuable sources of water for Greater Sydney. All clusters have flood affectations along class 2, 3, and 4 watercourses. Some areas are particularly vulnerable to flooding and will require careful management to ensure that future land uses are compatible with flood risks. In such instances, desired place outcomes will need to align with flooding constraints, recognising that population growth, and infrastructure provision will have to be limited and/or contained.

4.3 Areas of High Biodiversity Value

The WPC landscapes and natural environments contain a large store of biodiversity that provides a valuable contribution to its identity and place. Almost 30% of land is identified as having high biodiversity values and/or has been identified for conservation. These contribute to the enhancement of the scenic landscape, recreational, and tourism values. Place outcomes need to consider how these areas will integrate with their surroundings.

Figure 4.2: Area of land affected by 1-in-100 Year flood (km²)



Source: Department of Planning, Industry and Environment (2019)

Areas of High Biodiversity Value

918 km² of High Biodiversity Value

29% of land containing High Biodiversity Values

Source: Department of Planning, Industry and Environment (2019)

4.4 Threatened Species

The WPC contains significant areas of threatened and endangered species and communities. Typical threatened communities include:

- Western Sydney Dry Rainforest and Moist Woodland on Shale
- Shale/Sandstone Transition Forest
- Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest
- Turpentine - Ironbark Forest in the Sydney Basin Bioregion.

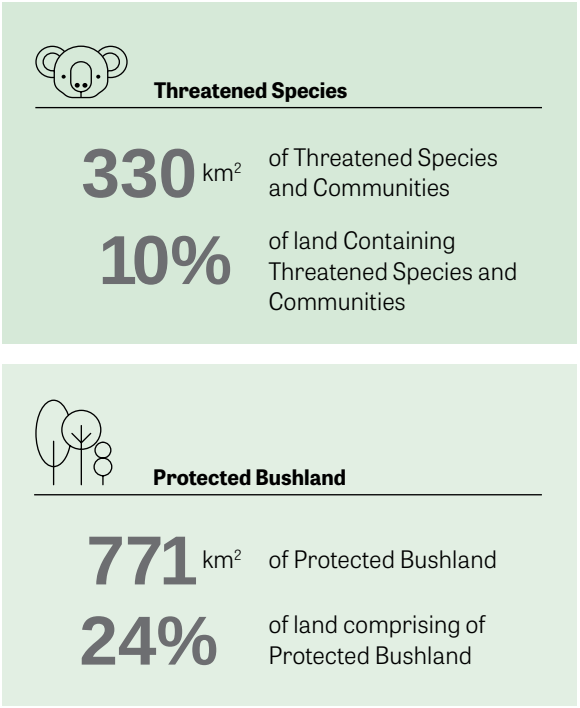
Strategic assessment and biocertification processes is currently ongoing as part of the Cumberland Plain Conservation Plan. Place outcomes need to consider how these communities as well as the habitats for endangered species are integrated with their surroundings and protected from urban encroachment.

4.5 Bushland Protection

Remnant bushland in the WPC consists of areas in declared national parks and conservation areas, and privately held land, where bushland may be protected by legislation. Bushland provides a major store of biodiversity, but also is a valuable contributor to identity and place. The Greater Blue Mountains World Heritage Area, other national parks and conservation areas contribute to the scenic landscape, recreational, and tourism values of the WPC. Bushland corridors promote biodiversity by linking together larger pockets of remnant vegetation. Place outcomes will need to consider how corridors can be preserved and contribute to the liveability and sustainability of the WPC.

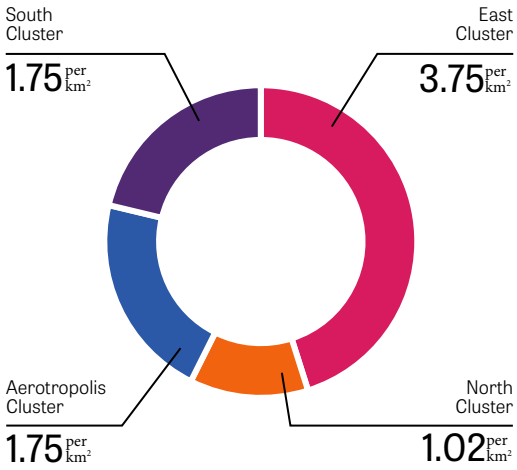
4.6 Heritage

Heritage and culture are major contributing elements to the uniqueness of a place. The WPC is endowed with rich and extensive heritage, providing strong connections to the past for Aboriginal and non-Aboriginal people. Desired place outcomes need to identify how heritage and culture can be recognised and celebrated as the City grows and changes, both in terms of celebrating individual items of heritage and reinforcing the Ochre Grid - that seeks to document, share and safeguard Aboriginal people's knowledge of Country through the development and delivery of a cultural framework that respects the past and strengthens the Australian cultural identity.



Source: Department of Planning, Industry and Environment (2019)

Figure 4.6: Number of Aboriginal Heritage Sites per square kilometre



Source: Greater Sydney Commission (2019)

4.7 Climate

The climate of the WPC is relatively hot compared to the eastern parts of Greater Sydney.

Figures 4.7a and 4.7b provide a comparison of the number of hot and very hot days observed at weather stations near selected centres within the WPC, being:

- Penrith Lakes Automatic Weather Station (AWS)
- Camden Airport Automatic Weather Station (AWS)
- Horsley Park Equestrian Centre Automatic Weather Station (AWS)
- Badgerys Creek Automatic Weather Station (AWS).

These have been compared to the Sydney (Observatory Hill) Weather Station, representing the Sydney CBD.

The data shows that the number of days over 30 degrees Celsius is substantially higher in WPC centres than the Sydney CBD.

The Penrith Lakes weather station in particular records a high rate of hot and very hot days. In 2018 there were 25% more days above 30 degrees Celsius at Penrith Lakes (North Cluster) than Badgerys Creek (Aerotropolis Cluster). This is in significant contrast to the Sydney Observatory Hill weather station which observed 26 days over 30°C and only one day over 40°C in 2018.

Figure 4.7a: Number of days over 30°C in 2018, Sydney CBD vs Western Sydney

Location	Number of days over 30°C (2018)
Sydney CBD [Sydney (Observatory Hill)]	26
North Cluster [Penrith Lakes AWS]	97
South Cluster [Camden Airport AWS]	88
East Cluster [Horsley Park Equestrian Centre AWS]	86
Aerotrpolis Cluster [Badgerys Creek AWS]	77

Source: Bureau of Meteorology (2019)

Figure 4.7b: Number of days over 40°C in 2018, Sydney CBD vs Western Sydney

Location	Number of days over 40°C (2018)
Sydney CBD [Sydney (Observatory Hill)]	1
North Cluster [Penrith Lakes AWS]	12
South Cluster [Camden Airport AWS]	2
East Cluster [Horsley Park Equestrian Centre AWS]	3
Aerotrpolis Cluster [Badgerys Creek AWS]	3

Source: Bureau of Meteorology (2019)

4.8 Urban Heat Island

Urban Heat Island (UHI) measures the temperature difference between urban areas and non-urban vegetated reference points to reveal the effects of urbanisation on land surface temperature. A non-urban vegetated reference would be the average temperature for heavily wooded areas of national parks around Sydney. UHI data has been derived from the analysis of Land Surface Temperature (LST) data from satellite imagery and the thermal and infrared bands with a 25m resolution. This has been integrated with the Australian Bureau of Statistics (ABS) Mesh Block polygon dataset to enable spatial analysis to support local policy and decision making.

The climate of the WPC makes it particularly vulnerable to urban heat island effects. Climate change is increasing the frequency of hot days in the WPC, significantly compromising liveability and increasing the need for cooling systems and associated energy demands. The establishment of urban areas has resulted in significant areas of hard surfaces that absorb and retain heat whereas "green" areas (such as natural areas, parklands, and sporting fields) and "blue" areas (such as rivers and lakes) reflect heat and remain significantly cooler.

Desired place outcomes will need to identify the appropriate suite of Green and Blue Grid initiatives that seek to maximise the efficiency of the natural environment for each place, recognising the wide variation in opportunities and constraints across the WPC. These will need to be coupled with urban design initiatives to limit heat accumulation and radiation opportunities in the built environment.

The existing Western Sydney Parklands will form a major element of the WPC Green Grid, forming an important connection between people and open space at a regional scale, benefiting all clusters within the WPC.

Urban Heat Island temperature difference between urban areas and non-urban vegetated reference points

5% of urban areas have a <2°C difference in temperature

9% of urban areas have a 2-4°C difference in temperature

29% of urban areas have a 4-6°C difference in temperature

28% of urban areas have a 6-8°C difference in temperature

26% of urban areas have a 8-10°C difference in temperature

2% of urban areas have a 10-12°C difference in temperature

<1% of urban areas have a >12°C difference in temperature

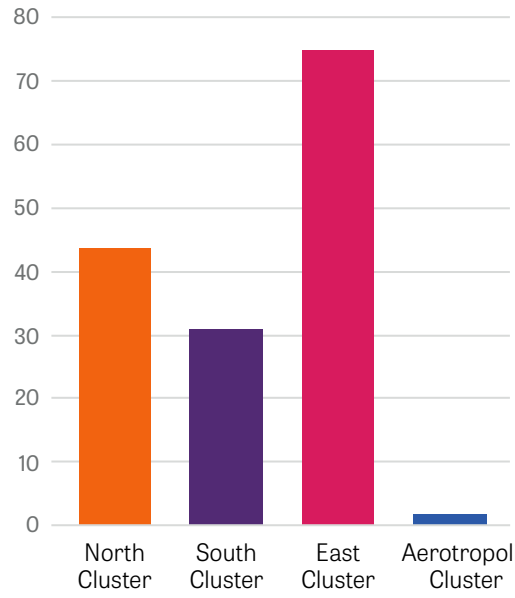
Source: Department of Planning, Industry and Environment (2019)

4.9 Contamination

Parts of the WPC have historically been used for the disposal of a wide variety of wastes, including hazardous liquid wastes and asbestos, via a combination of licensed and unlicensed facilities. These sites may significantly affect the capacity to deliver desired place outcomes by either presenting unacceptable health risks or imposing costs that make the desired land use change unviable.

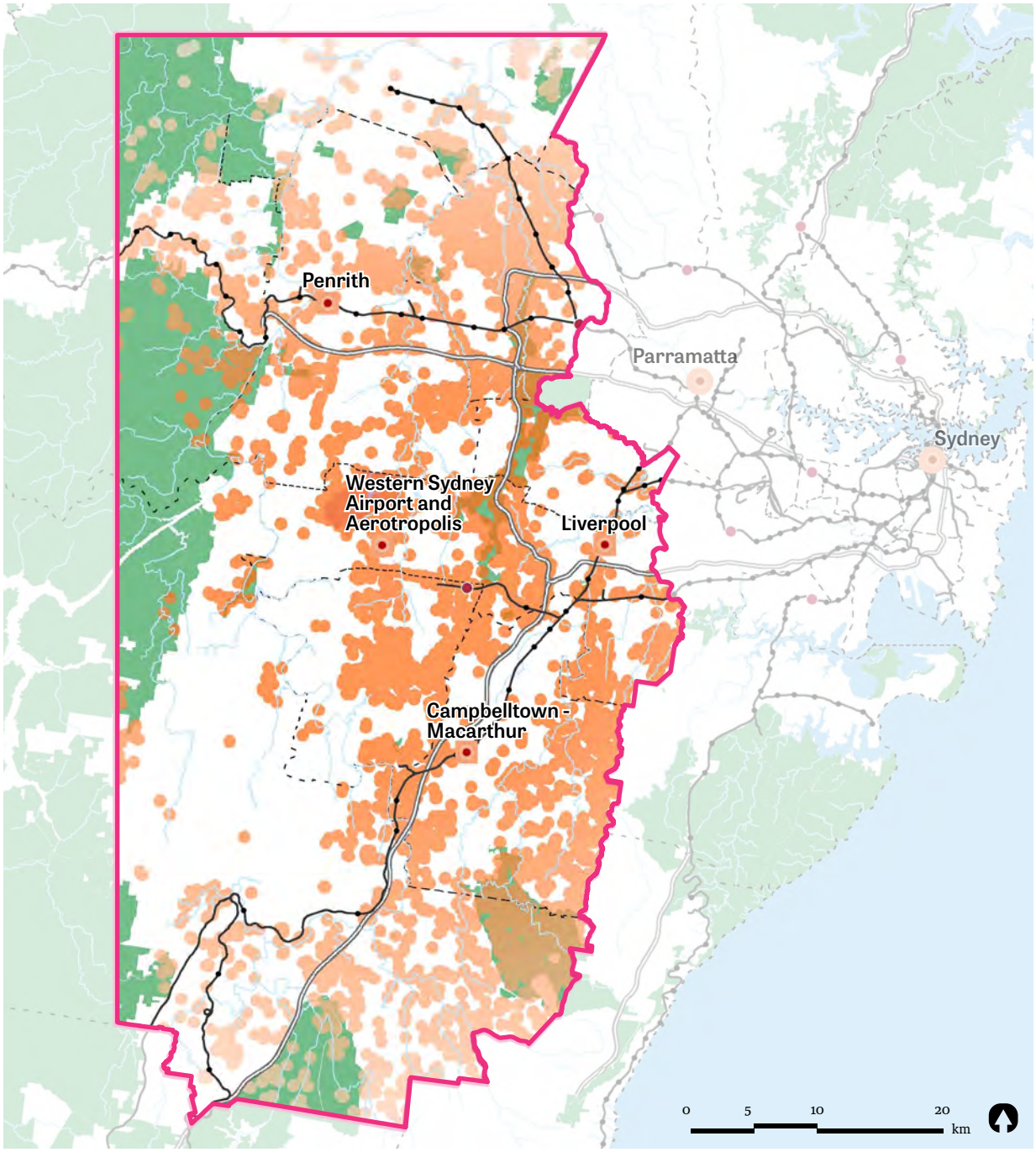
Contaminated sites will need to be addressed on a site-by-site basis.

Figure 4.8: Number of known contaminated sites within the WPC Boundary



Source: Department of Planning, Industry and Environment (2019)

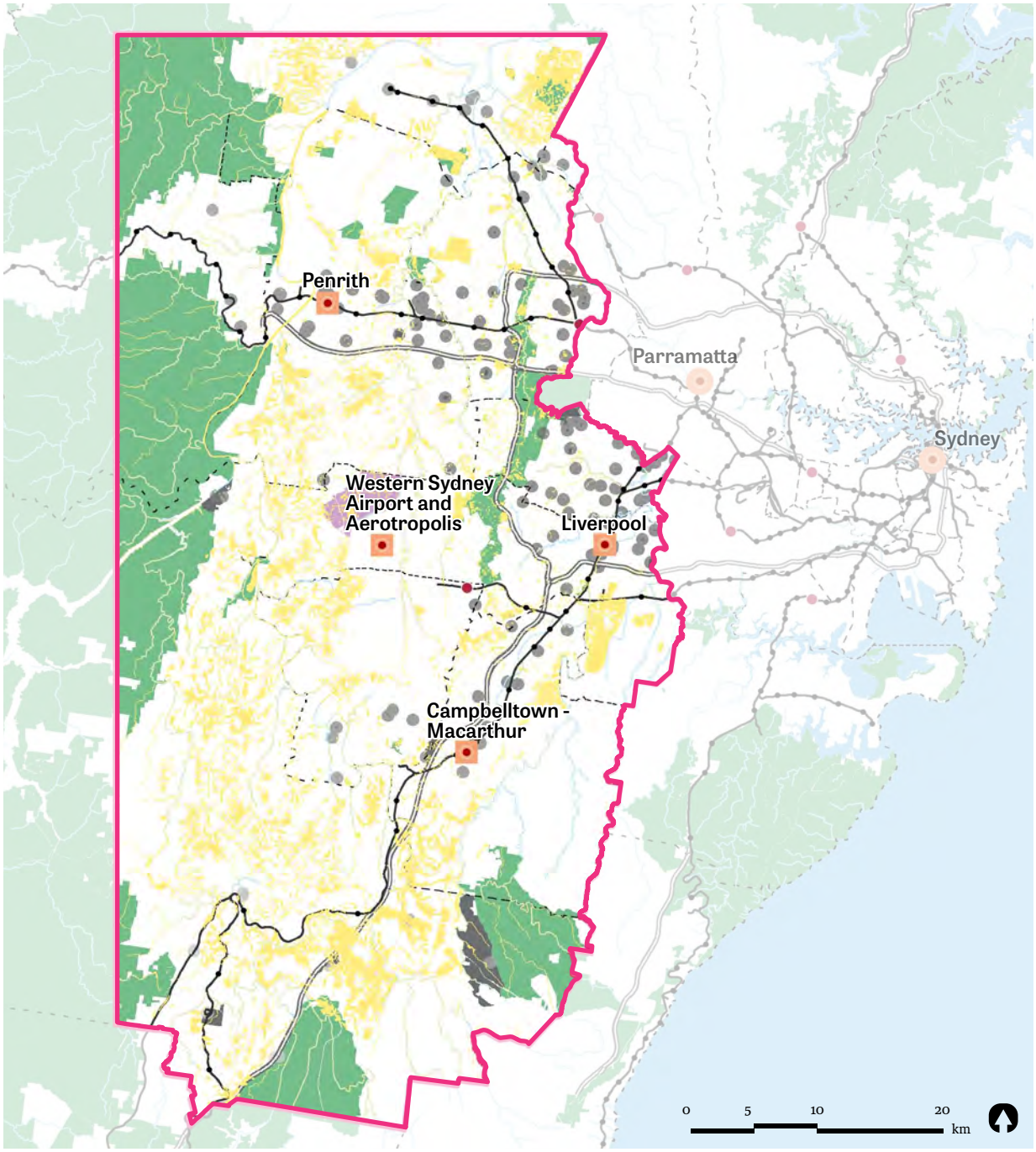
Map 4.1.1 Environmental Elements: Aboriginal Sites



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Waterways
Metropolitan Centre	Railway	Protected Natural Areas
Metropolitan Cluster	Strategic Centre	Aboriginal Sites

Map 4.1.2 Environmental Elements: Threatened Species and Contamination



Source: Department of Planning, Industry and Environment (2019)

WPC Boundary	Motorway	Waterways
Metropolitan Centre	Railway	Threatened Species or Ecological Communities
Metropolitan Cluster	Strategic Centre	EPA Notified Contaminated Sites
Protected Natural Areas		

4.10 Environmental Elements - North Cluster

The iconic Greater Blue Mountains World Heritage Area is the flagship of the North Cluster. Protecting scenic and cultural landscapes will contribute to a sense of belonging and cultural identity. Other key environmental assets are the Nepean River and South Creek catchments. Agricultural landscapes such as equine facilities, offer a combination of Green and Blue Grid opportunities. Low frequency flooding in the Nepean River catchment will require careful consideration.

Analysis of the Aboriginal sites and threatened species data reveals a clustering of constrained and unconstrained lands. This pattern may require a mixture of land uses and development strategies to appropriately respond to these environmental assets.

The 1-in-100 year average recurrence interval flood zone for the South Creek area creates a corridor which also acts as a natural barrier between the North and East clusters within the WPC Boundary. The flood zone could be enhanced and utilised to help define the unique characteristics of these clusters. Flooding affects not only South Creek, but also the Hawkesbury River and its tributaries. Land adjacent to these watercourses will require thoughtful planning and consideration to respond to additional upstream development.

Known contaminated sites are limited within this cluster and are more common towards the Eastern and Southern portions associated with historical development patterns.

Contaminated sites will require remediation suitable to facilitate future uses. It may be necessary to further investigate the classification of contaminated land in some instances prior to identifying future land use zones.

The urban development over the last 15 years in this region has substantially impacted on the local climate. The heat retained in the urban landscape has increased, and with further development planned along new infrastructure routes, urban heat management is a key issue to be managed in the North Cluster. Enhancement of the Green and Blue grids, consideration of the urban mix, parks and reserves and urban trees will be required to mitigate Urban Heat Island (UHI) effect.

Aboriginal Heritage

999	Aboriginal Heritage Items
1.02	Aboriginal Heritage Items per km^2

Contamination

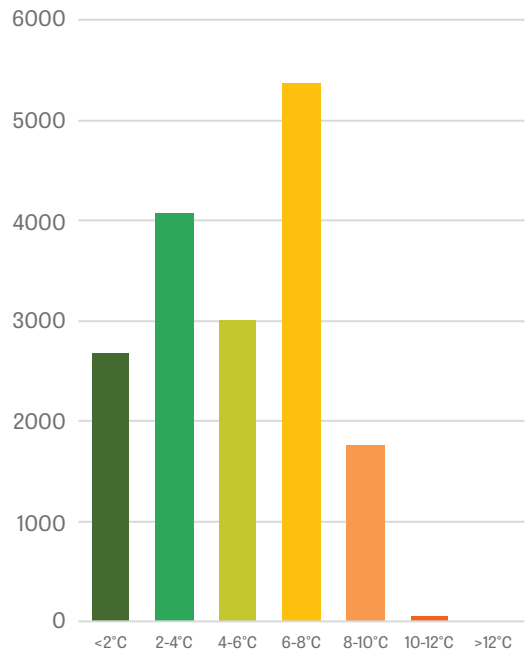
44	EPA Notified Contaminated Sites
0.04	EPA Notified Contaminated Sites per km^2

Threatened Species

87	km^2	Threatened Species and Communities
10%	of land	Containing Threatened Species and Communities

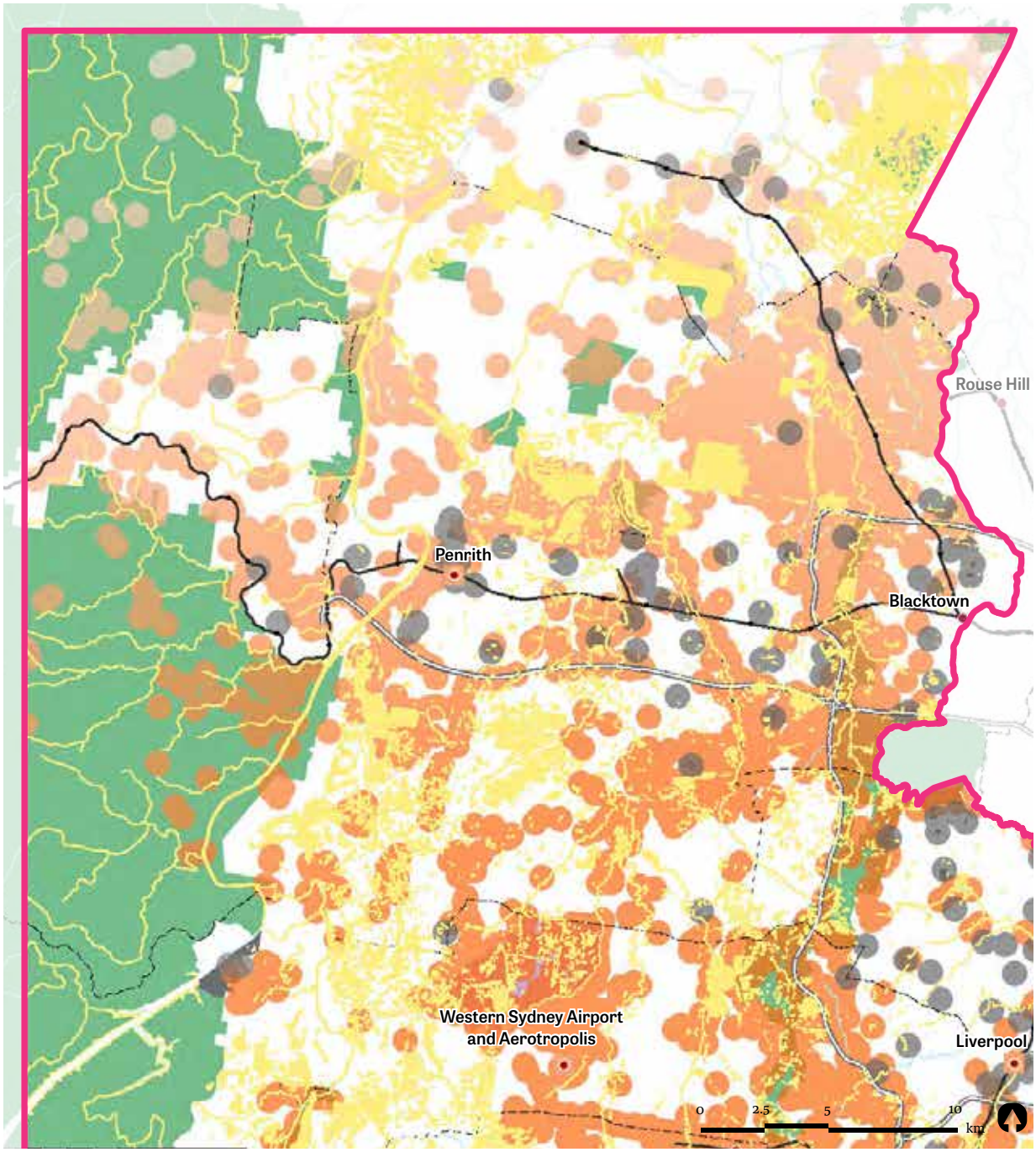
Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

Figure 4.9: Area (ha) of urban lands by temperature difference to non-urban vegetated lands



Source: Department of Planning, Industry and Environment (2019)

Map 4.1a Environmental Elements - North Cluster



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

WPC Boundary	Motorway	Waterways
Metropolitan Centre	Railway	EPA Notified Contaminated Sites
Metropolitan Cluster	Protected Natural Areas	Aboriginal Sites
Strategic Centre	Major Urban Parkland	Threatened Species or Ecological Communities

4.11 Environmental Elements - South Cluster

The South Cluster offers a wide variety of landscapes and biodiversity stores, some of which are unique to Sydney. Scenic and cultural landscapes represent a significant liveability opportunity. The Nepean River offers Blue grid connectivity opportunities. Shale-sandstone transition forests and koala habitats will need careful consideration when developing place outcomes.

There are very few sites in this cluster that are known to be contaminated. Future development may identify further sites. Contaminated land holdings in strategic sites may require further investigation to inform structure planning.

The upper catchment of South Creek falls within this cluster. Development within the South Cluster will likely result in modified flows into South Creek, potentially contributing to flooding in the Aerotropolis and North Clusters. The Nepean River and its tributaries similar to that of the Hawkesbury River, will be affected by additional overland flows created by intensified urban development.

Opportunities exist for future urban uses to consider the use of alternative stormwater and wastewater treatment technologies in order to lessen the impact on the environment and mitigate flood impacts.

The planned urban development in this region along the Campbelltown-Macarthur Corridor, South West Growth Centre, and Wilton are likely to result in greater heat retention as a result of newly formed urban landscapes. Enhancement of the Green and Blue grids, protection of the local biodiversity assets, consideration of a varied mix of urban parks, reserves, and urban trees will be required to mitigate Urban Heat island (UHI) effect.

Aboriginal Heritage

2720	Aboriginal Heritage Items
1.77	Aboriginal Heritage Items per km^2

Contamination

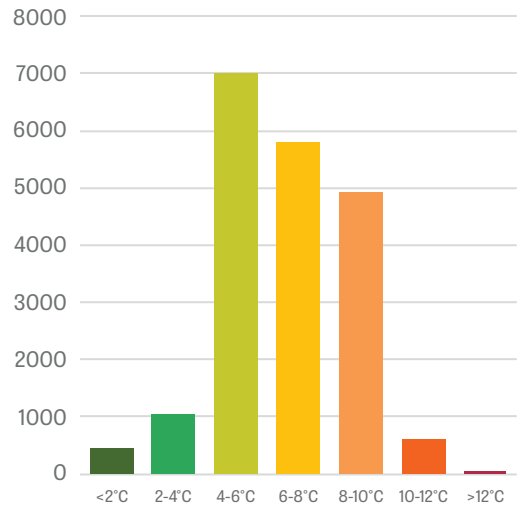
31	EPA Notified Contaminated Sites
0.02	EPA Notified Contaminated Sites per km^2

Threatened Species

178	km^2	Threatened Species and Communities
12%	of land	Containing Threatened Species and Communities

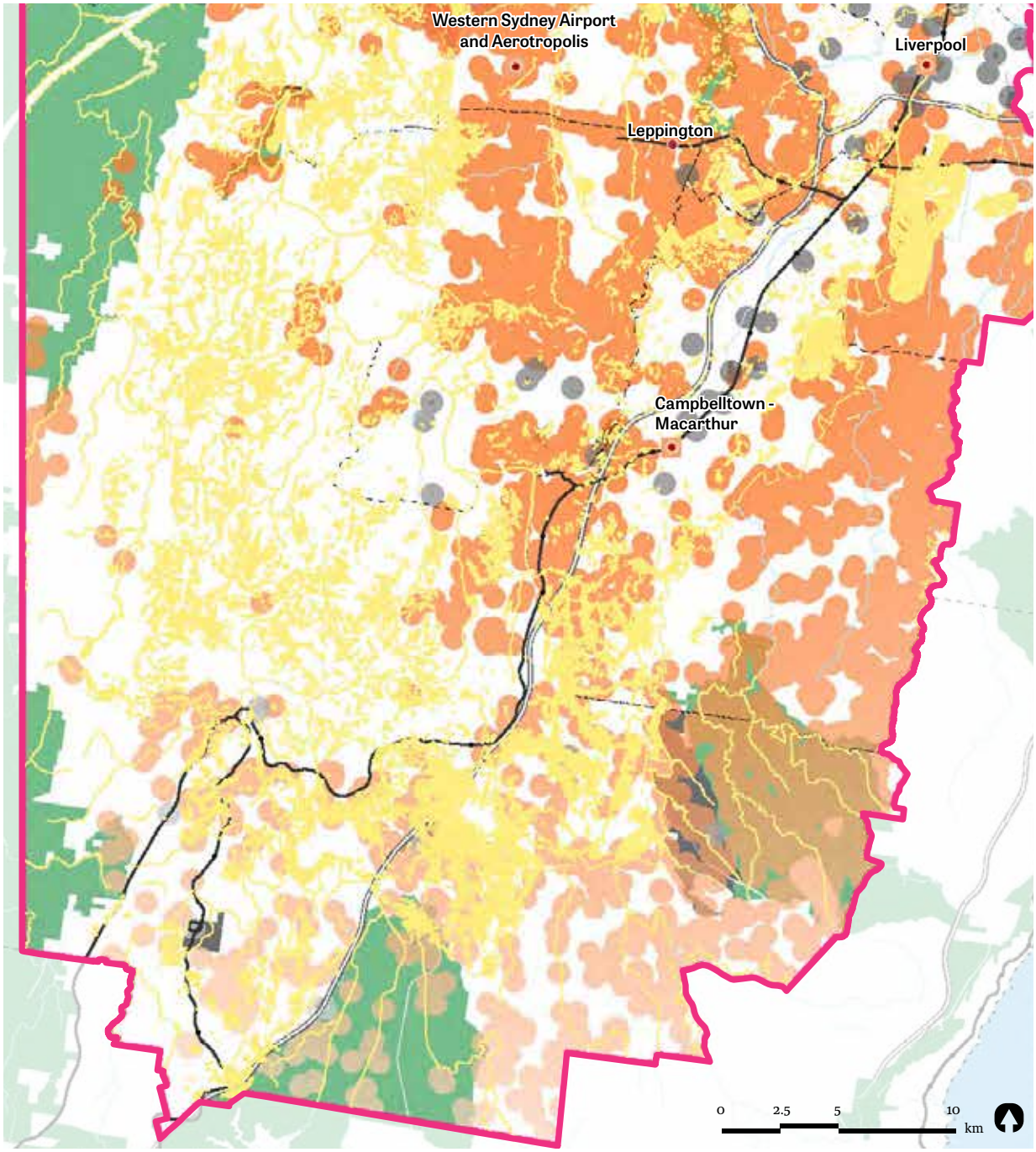
Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

Figure 4.10: Area (ha) of urban lands by temperature difference to non-urban vegetated lands



Source: Department of Planning, Industry and Environment (2019)

Map 4.1b Environmental Elements - South Cluster



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

WPC Boundary	Motorway	Waterways
Metropolitan Centre	Railway	EPA Notified Contaminated Sites
Metropolitan Cluster	Protected Natural Areas	Aboriginal Sites
Strategic Centre	Major Urban Parkland	Threatened Species or Ecological Communities

4.12 Environmental Elements - East Cluster

The Western Sydney Parklands are particularly valuable in this cluster given the relatively high level of urbanisation compared to the rest of the WPC. The existing open space has the capacity to be enhanced through Green Grid linkages. There may be opportunities to enhance the Blue Grid outcomes associated with the Georges River which may also offer opportunities to manage existing flooding issues.

Contaminated sites are located in the existing urban footprint within the East Cluster, focused around agricultural and industrial land holdings. Contaminated sites will require appropriate remediation to facilitate future uses. Further investigation of the classification of contaminated land may be necessary in some instances prior to identifying future land use zones.

The East Cluster is primarily comprised of established urban development, with the urban heat island effect impacting on a large proportion of this cluster. The urban heat retention within the East Cluster will require a different approach to the other clusters which are still developing and have larger areas of natural vegetation. Enhancement of the Blue and Green grids will improve both the natural ecosystem and increase habitat for threatened species and communities.

Aboriginal Heritage

1831 Aboriginal Heritage Items

3.75 Aboriginal Heritage Items per km²

Contamination

75 EPA Notified Contaminated Sites

0.2 EPA Notified Contaminated Sites per km²

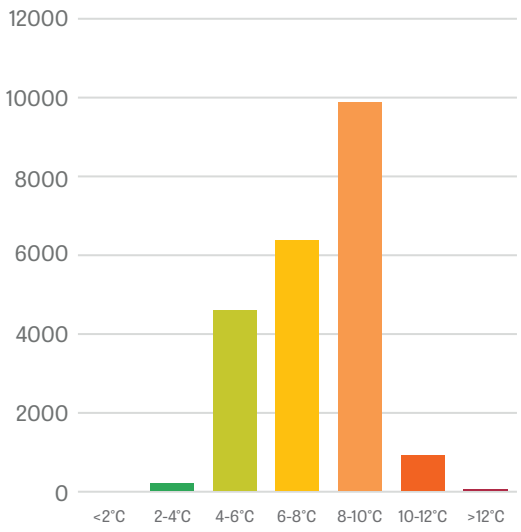
Threatened Species

45 km² Threatened Species and Communities

9% of land Containing Threatened Species and Communities

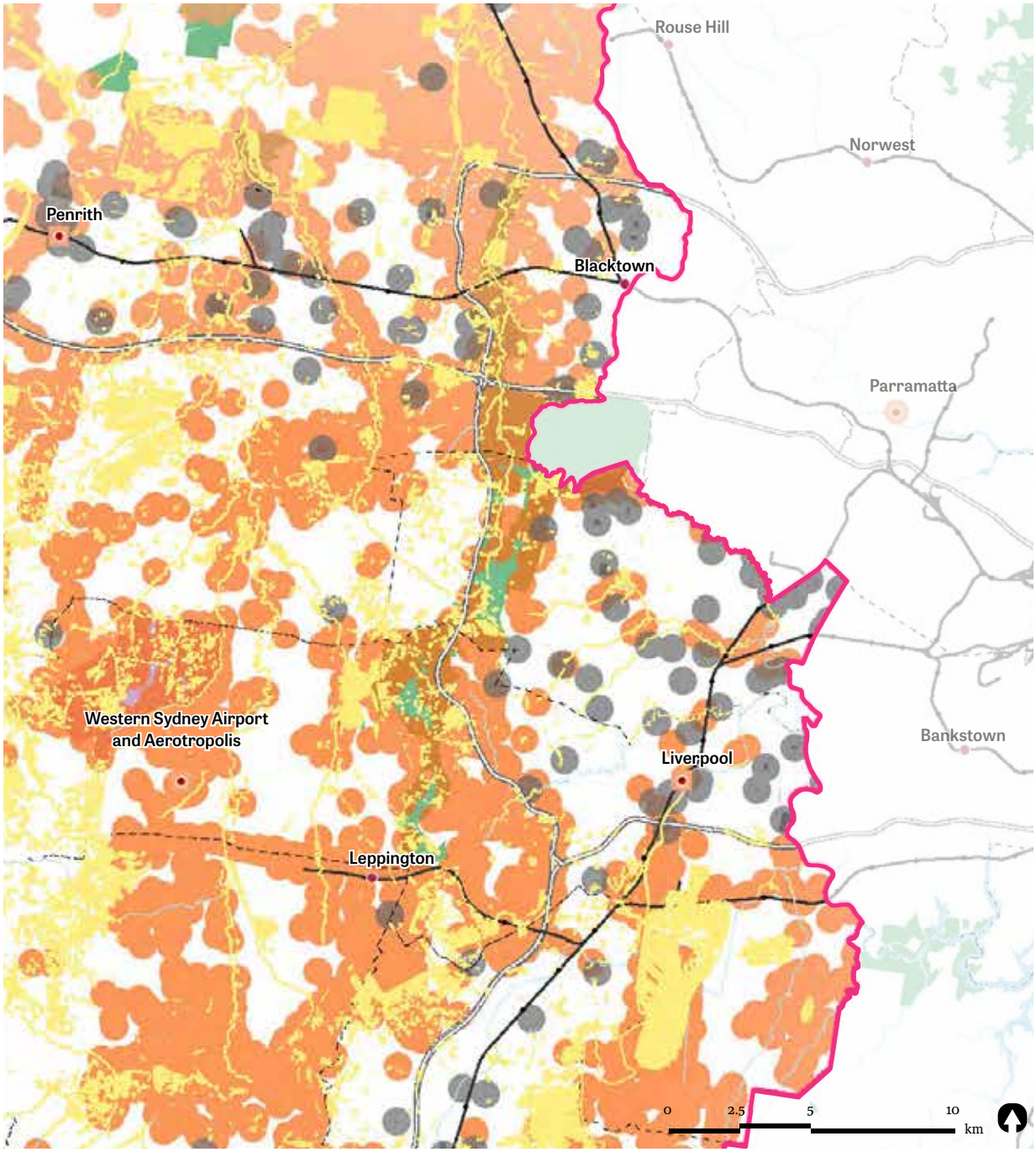
Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

Figure 4.11: Area (ha) of urban lands by temperature difference to non-urban vegetated lands



Source: Department of Planning, Industry and Environment (2019)

Map 4.1c Environmental Elements - East Cluster



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

WPC Boundary	Motorway	Waterways
Metropolitan Centre	Railway	EPA Notified Contaminated Sites
Metropolitan Cluster	Protected Natural Areas	Aboriginal Sites
Strategic Centre	Major Urban Parkland	Threatened Species or Ecological Communities

4.13 Environmental Elements - Aerotropolis Cluster

The Western Sydney Airport and Aerotropolis planning initiatives will provide landmark opportunities to deliver high quality environmental outcomes. Connectivity to the South Creek corridor will form an important element of the Green Grid, with the South Creek corridor enhancing liveability and sustainability functions that also address flooding risks in an integrated manner.

The Aerotropolis has the opportunity to demonstrate emerging innovative technologies to reduce carbon emissions, demonstrate water efficiency and foster a research environment that seeks to meet, improve, and exceed sustainability outcomes.

There are a very limited number of contaminated sites within this cluster. This may be due to limited data available in this location or that the history of the land uses indicate that there has been minimal activity that would result in contamination. There is likely to be isolated contamination encountered on a site by site basis including asbestos buildings, poultry farms and livestock treatment areas. Localised contamination is unlikely to have a significant impact on the development potential of the land in this cluster.

The Aerotropolis precinct is planned to grow substantially over the next 40 years. Currently primarily farmland, the area will be transformed into large expanses of hard surfaces in the form of runways for the new airport, large industrial and education precincts. South Creek provides a large natural asset to the precinct. The evolution of this precinct into an urban environment provides a challenge in addressing and combating urban heat retention.

Aboriginal Heritage

293	Aboriginal Heritage Items
1.78	Aboriginal Heritage Items per km^2

Contamination

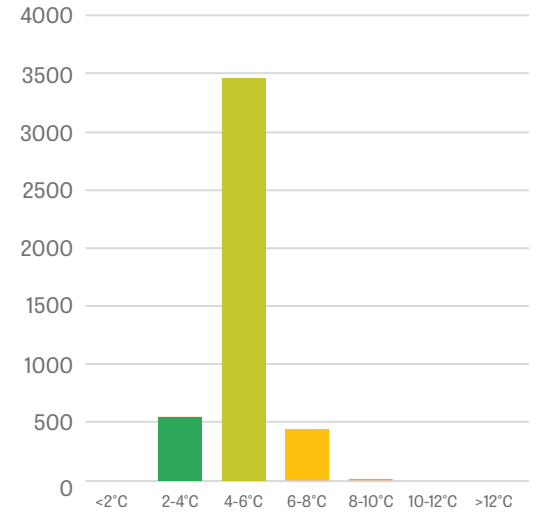
2	EPA Notified Contaminated Sites
0.01	EPA Notified Contaminated Sites per km^2

Threatened Species

19	km^2	Threatened Species and Communities
12%	of land	Containing Threatened Species and Communities

Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

Figure 4.12: Area (ha) of urban lands by temperature difference to non-urban vegetated lands



Source: Department of Planning, Industry and Environment (2019)

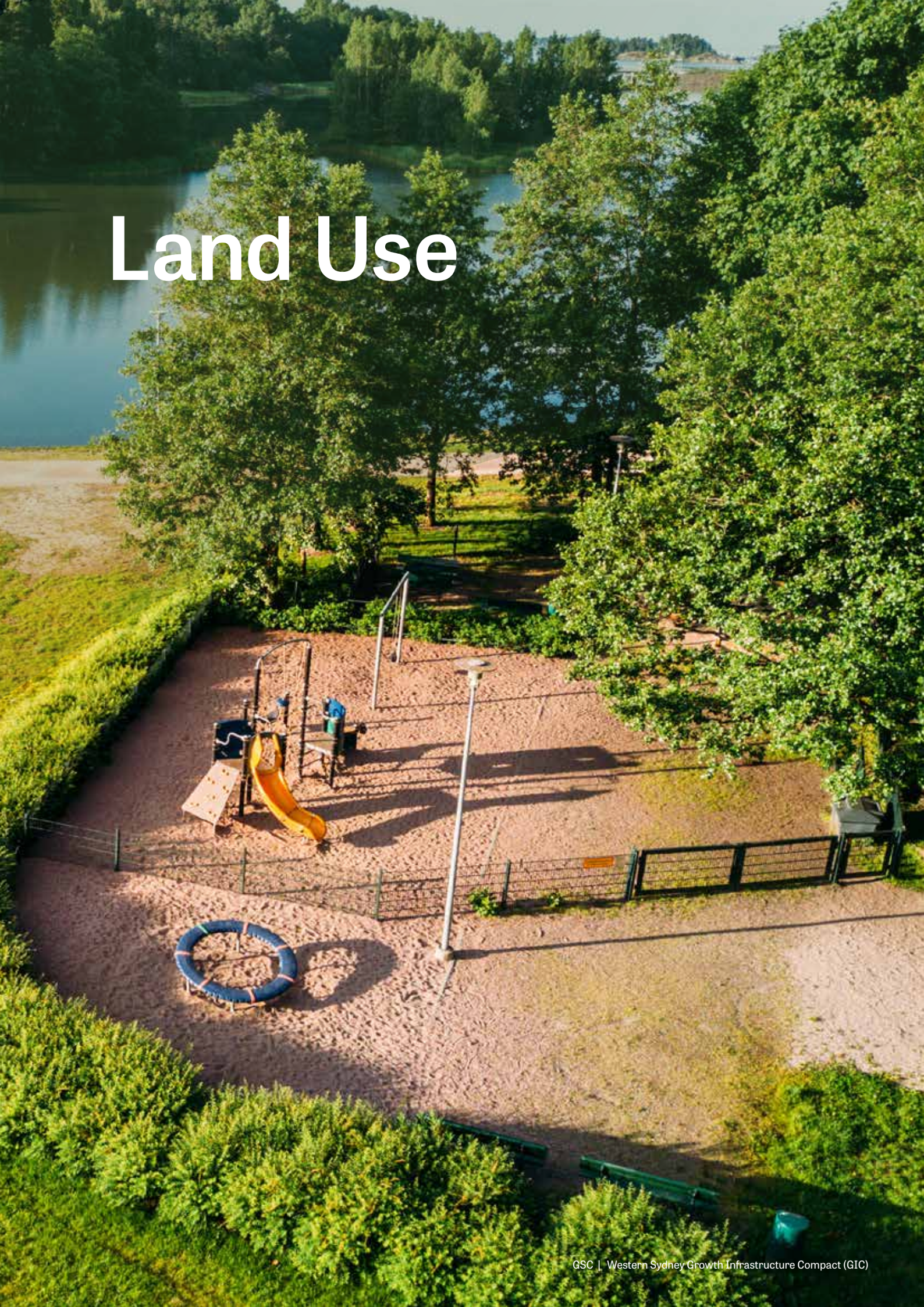
Map 4.1d Environmental Elements - Aerotropolis Cluster

Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

Metropolitan Centre	Motorway	EPA Notified Contaminated Sites
Metropolitan Cluster	Railway	Aboriginal Sites
Strategic Centre	Protected Natural Areas	Threatened Species or Ecological Communities
Waterways	Major Urban Parkland	

5

Land Use



5 Land Use

The Western Parkland City (WPC) is nearly equal parts rural, urban, and protected natural land uses. The urban lands are concentrated along the eastern boundary of the WPC, rural land in the central third and most of the natural protected lands towards the western third of the City.

5.1 Data Sources

Data inputs to this Analysis Report have originated from a wide range of NSW Government agencies and service providers, through a highly collaborative process led and co-ordinated by the Commission. A comprehensive list of data used within this report is detailed in Chapter 3.

5.2 Existing Land Use Zoning

67% of the WPC is identified as rural lands, conservation lands and waterways. Of the urban uses, employment generating land uses account for approximately 13% of urban uses or 4% of the overall WPC area. This is in contrast to residential land uses which account for approximately 40% of urban uses or 13% of the overall WPC area.

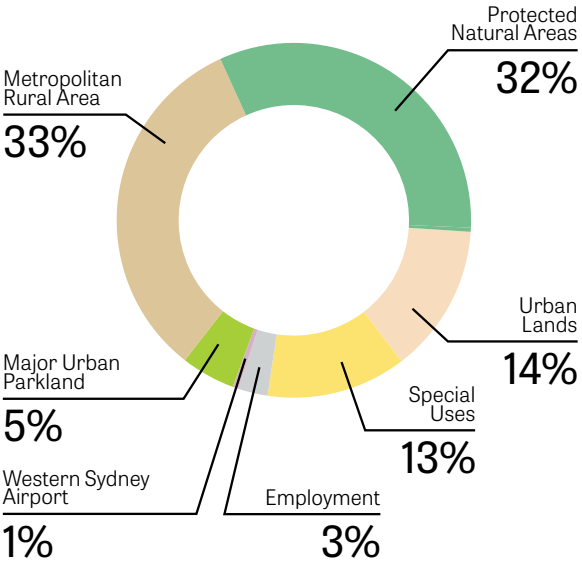
Opportunities exist to increase the number of jobs in the WPC to encourage and enable local residents to live and work close to home.

The capacity to make good places is strongly influenced by the existing use of land in the WPC.

Established urban areas are constrained by fragmented land ownership, while large rural holdings have the capacity to develop rapidly once services are provided and the landholder is willing to cease their existing land use. Large scale land use change is generally regulated through a precinct planning approach using various State Environmental Planning Policies and can be initiated by government or through the Precinct Acceleration Protocol by private landholders.

Precinct level planning has the capacity to facilitate good place making at scale. If integrated with infrastructure staging plans, precinct planning should be able to coordinate growth and infrastructure as intended in the GIC program.

Figure 5.2a: Existing Land Use within the WPC Boundary



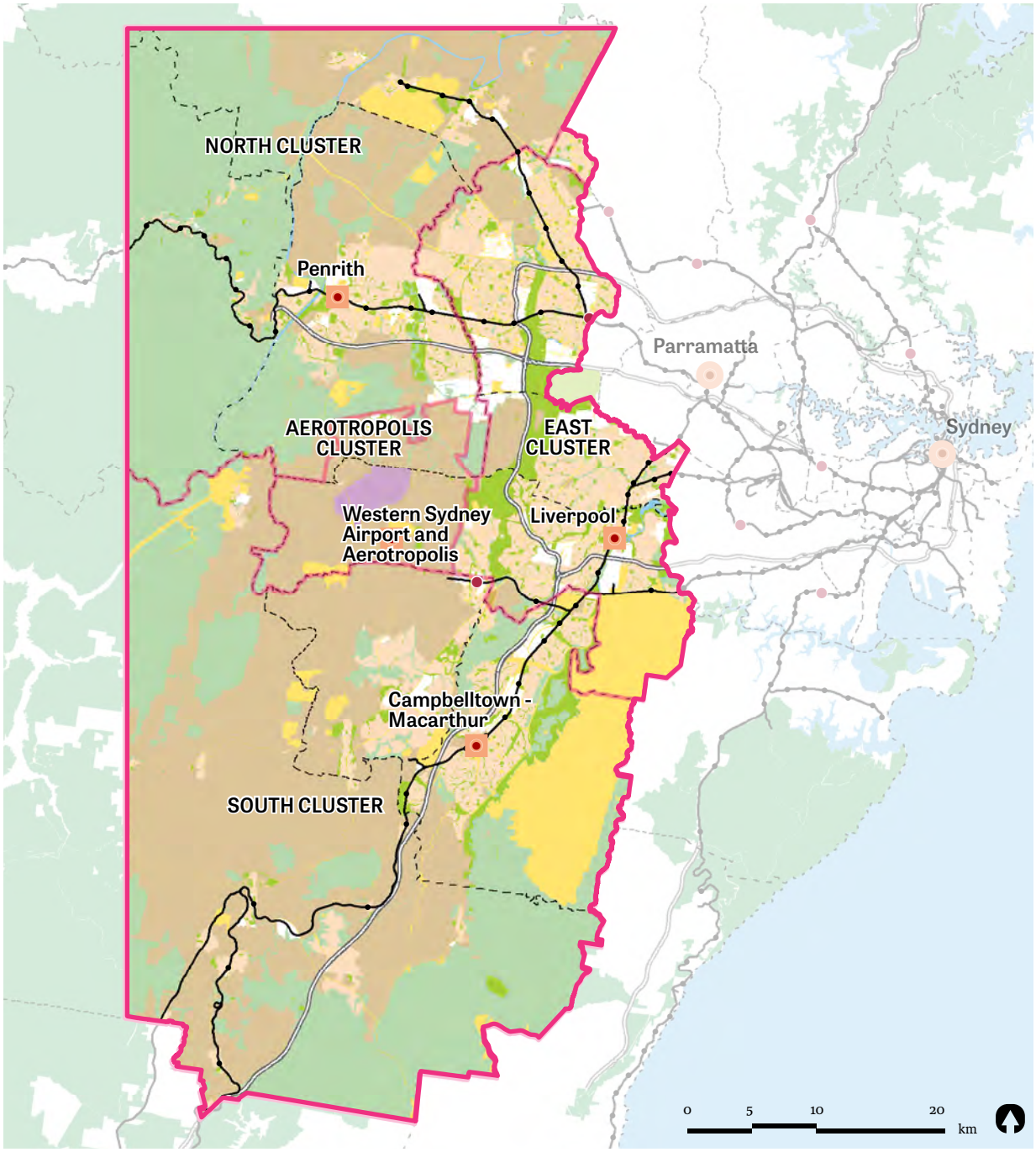
Source: Department of Planning, Industry and Environment (2019)

Figure 5.2b: Major Land Use Zoning by Area (ha)

Major Land Use	Area (ha)	% of WPC
Non-Urban Uses	**212,000**	**67%**
Rural	106,000	33%
Conservation Lands and Waterways	106,000	33%
Urban Uses	**98,000**	**31%**
Residential Uses	42,000	13%
Urban Centres	2,000	1%
Employment Lands	9,000	3%
Infrastructure and Services	28,000	9%
Open Space and Recreation	16,000	5%
Other Land Uses	9,000	3%
Total	319,000	100%

Source: Department of Planning, Industry and Environment (2019)

Map 5.1 Western Parkland City Existing Land Use



Source: Department of Planning, Industry and Environment (2019)

WPC Boundary	Local Council Boundary	Metropolitan Rural Area
Cluster Boundaries	Motorway	Urban Lands
Metropolitan Centre	Railway	Special Uses
Metropolitan Cluster	Waterways	Major Urban Parkland
Strategic Centre	Western Sydney Airport	Protected Natural Areas

5.3 Existing Land Use - North Cluster

Land north of the M4 Motorway is developed or substantially zoned for development. Areas outside of identified precincts are unlikely to be released for urban development due to the higher costs of servicing in the short to medium term. Place outcomes should target using this residual land for regional scale Green Grid opportunities and to provide visually attractive rural landscapes that retain their agricultural industry.

Current land uses within the north cluster are focused around motorways and rail lines, rural villages and the North West Growth Centre. Urban development is limited in this Cluster by the Hawkesbury River, the Blue Mountains National Park, national parks and reserves as well as accessibility to services (such as public transport, water, sewage, and electricity services).

The North Cluster has opportunities to enhance Green and Blue grids with progressive urban development along committed transport infrastructure. Future urban growth including employment generating development and residential development has the opportunity to embrace the existing rural and natural landscape character of the cluster.

Low Density Residential

7% of land zoned for low density residential

Medium/High Density Residential

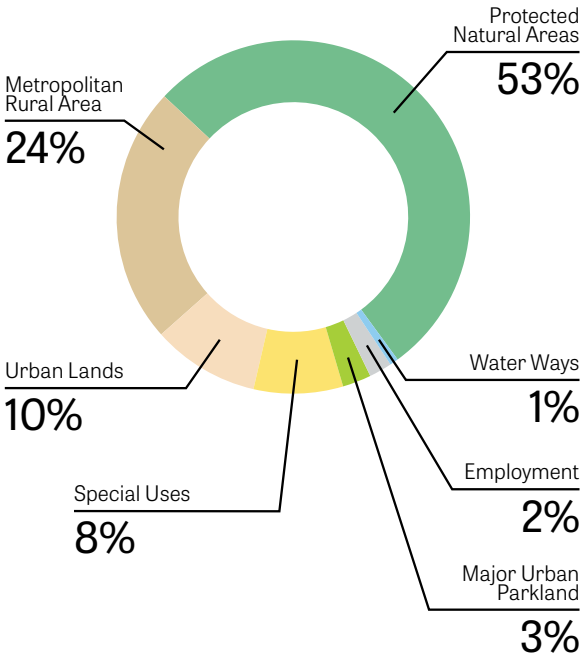
<1% of land zoned for medium/high density residential

Rural/Village Residential

1% of land zoned for rural/village residential

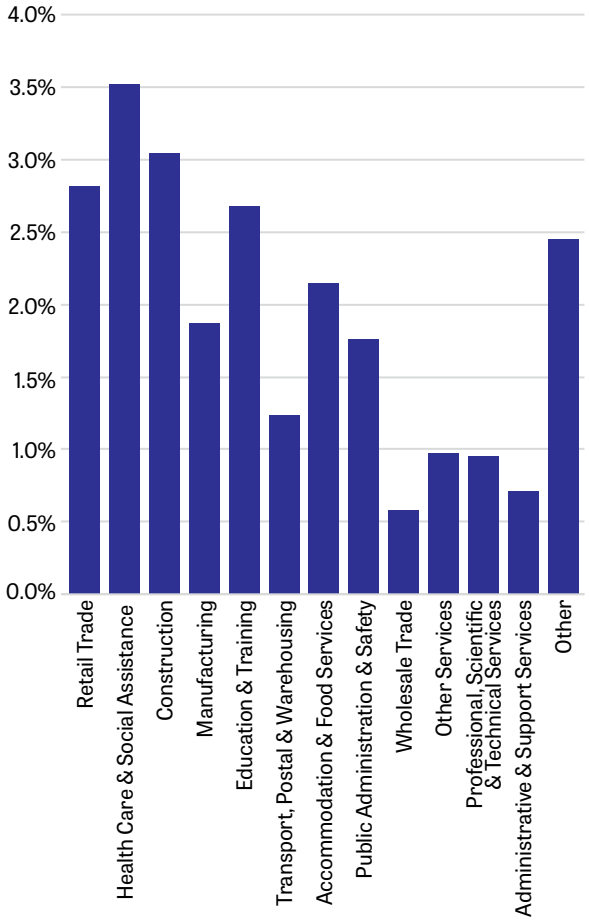
Source: Department of Planning, Industry and Environment (2019)

Figure 5.3a: Existing Land Use within the North Cluster



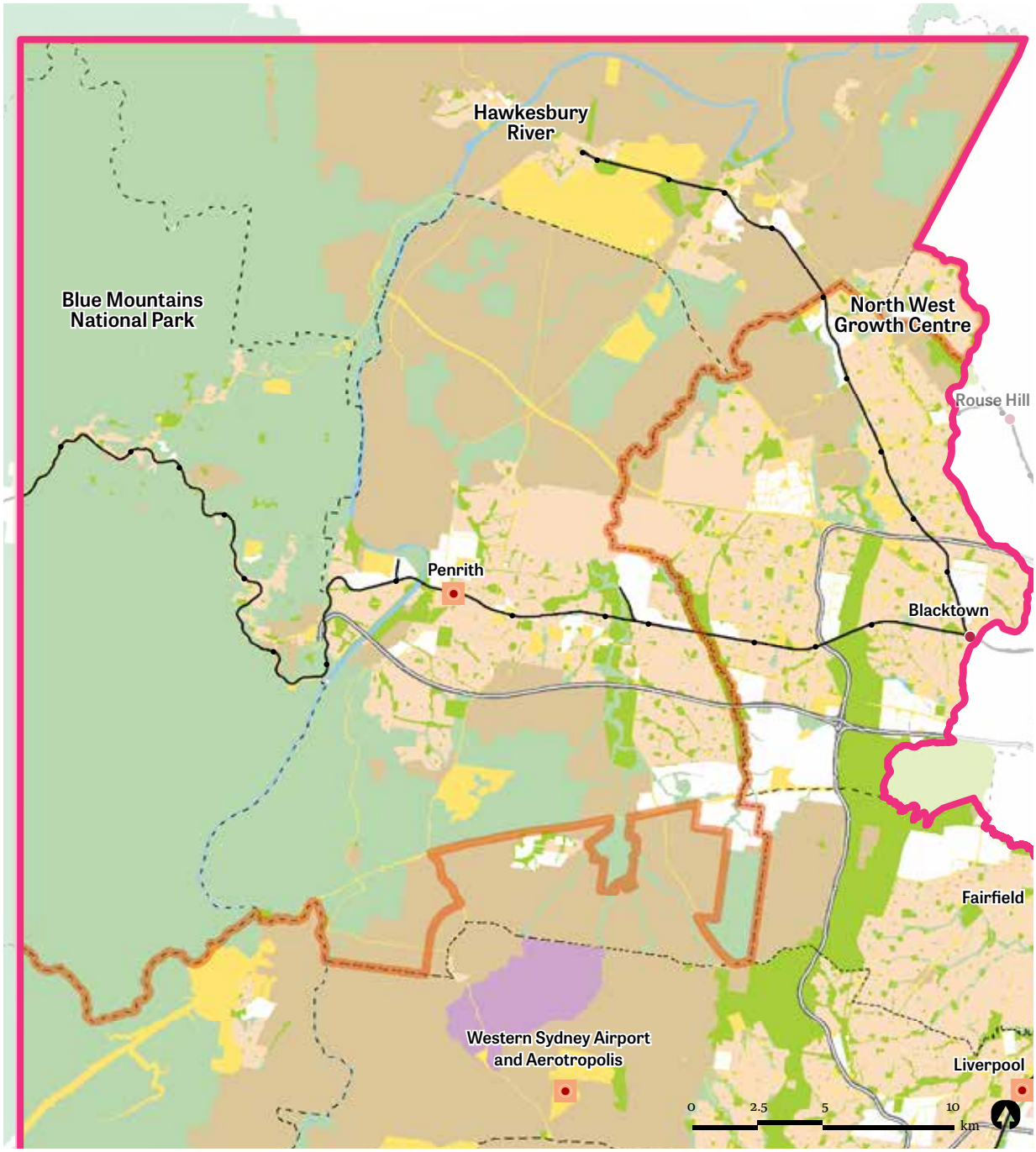
Source: Department of Planning, Industry and Environment (2019)

Figure 5.3b: Employment industries within the North Cluster (% of WPC)



Source: www.economy.id.com.au (2019)

Map 5.1a Western Parkland City Existing Land Use - North Cluster



Source: Department of Planning, Industry and Environment (2019)

WPC Boundary	Local Council Boundary	Urban Lands
North Cluster Boundary	Railway	Special Uses
Metropolitan Centre	Motorway	Major Urban Parkland
Metropolitan Cluster	Waterways	Metropolitan Rural Area
Strategic Centre	Western Sydney Airport	Protected Natural Areas

5.4 Existing Land Use - South Cluster

Urban land uses in the South Cluster, like in the North Cluster, are focused around major linear transport corridors with a scattering of rural villages. The South West Growth Centre and Campbelltown-Macarthur corridor has largely been released or rezoned for urban land uses with development currently under way. Development of the South Cluster is largely restricted by natural landscape features and significant areas of state forest and National Parks.

The majority of land use change in the South Cluster is being managed using precinct planning processes, including areas such as Wilton and Oran Park. The existing precinct planning is investigating urban development along The Northern Road corridor, with the Lowes Creek-Maryland Precinct being the northern-most precinct under consideration along this corridor.

The South Cluster, similar to the North Cluster has opportunities to enhance Green and Blue grids with progressive urban development along transport infrastructure and in planned new towns. The South Cluster has a strong rural character within its rural villages that represent a strong sense of place for these communities.

Low Density Residential

7% of land zoned for low density residential

Medium/High Density Residential

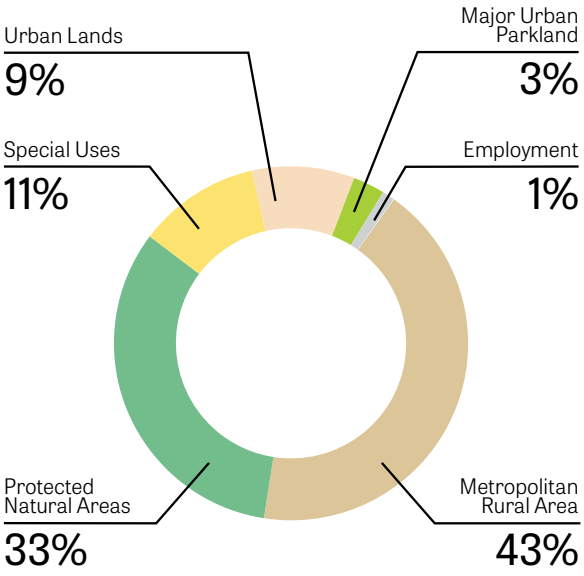
<1% of land zoned for medium/high density residential

Rural/Village Residential

1% of land zoned for rural/village residential

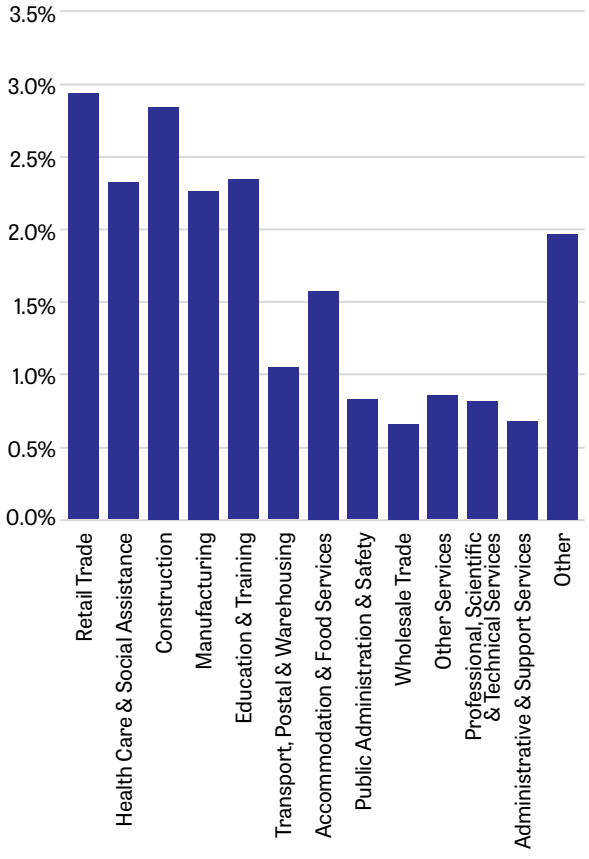
Source: Department of Planning, Industry and Environment (2019)

Figure 5.4: Existing Land Use within the South Cluster



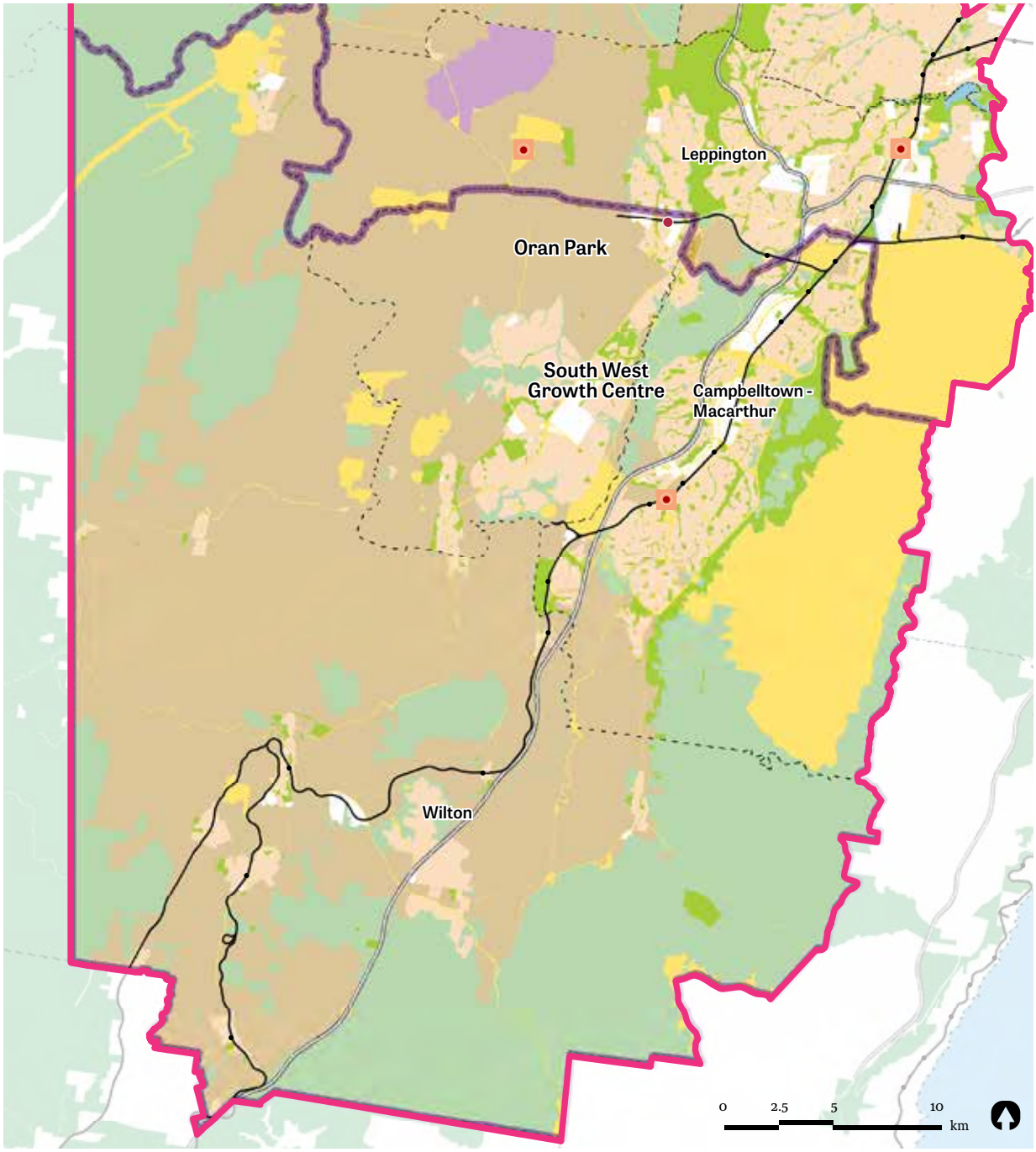
Source: Department of Planning, Industry and Environment (2019)

Figure 5.4b: Employment industries within the South Cluster (% of WPC)



Source: www.economy.id.com.au (2019)

Map 5.1b Western Parkland City Existing Land Use - South Cluster



Source: Department of Planning, Industry and Environment (2019)

WPC Boundary	Local Council Boundary	Urban Lands
South Cluster Boundary	Railway	Special Uses
Metropolitan Centre	Motorway	Metropolitan Rural Area
Metropolitan Cluster	Waterways	Major Urban Parkland
Strategic Centre	Protected Natural Areas	

5.5 Existing Land Use - East Cluster

The East Cluster can be considered in two parts (North and South). The northern part is centred around Blacktown and is north of the M4 Motorway. This section of the East Cluster is highly urbanised with a central spine of parkland with the older suburbs of Blacktown to the East and the new urban areas in the Northwest Growth Area. The Southern section centres around Liverpool with urban land uses generally located east of the M7 Motorway. The existing urban landscape of the East cluster is dominated by low density residential development with a clear higher density urban centre towards the Liverpool CBD.

Almost 30% of the cluster contains special uses lands. Special uses are dominated by the Holsworthy Military Reserve (Department of Defence) and Hurlstone Agricultural High School (Glenfield - NSW Department of Education).

Future land uses in the East Cluster are largely defined by the established existing environment, due to limited greenfield opportunities within the Cluster. The majority of opportunities consist of brownfield intensification of development such as in the Glenfield-Macarthur corridor, and the completion of already zoned land. The Mount-Vernon-Cecil Hills Urban Investigation Area is an area which could be rezoned for urban development.

The land use make up in the East Cluster is unlikely to change significantly over the planning timeframe. Higher density residential development around employment, education, and transport nodes are likely to represent the most likely change. Opportunities exist to improve the Blue and Green grids as density increases around identified nodes and across the Cluster.

Low Density Residential

31% of land zoned for low density residential

Medium/High Density Residential

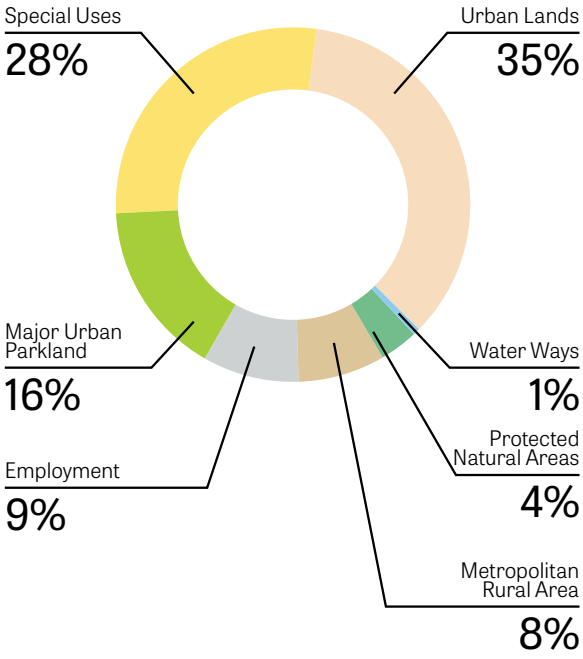
1% of land zoned for medium/high density residential

Rural/Village Residential

0% of land zoned for rural/village residential

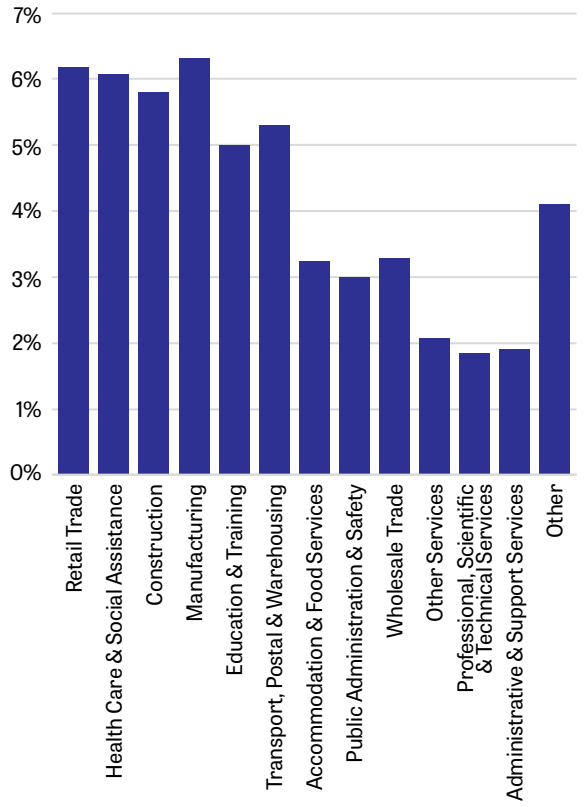
Source: Department of Planning, Industry and Environment (2019)

Figure 5.5: Existing Land Use within the East Cluster



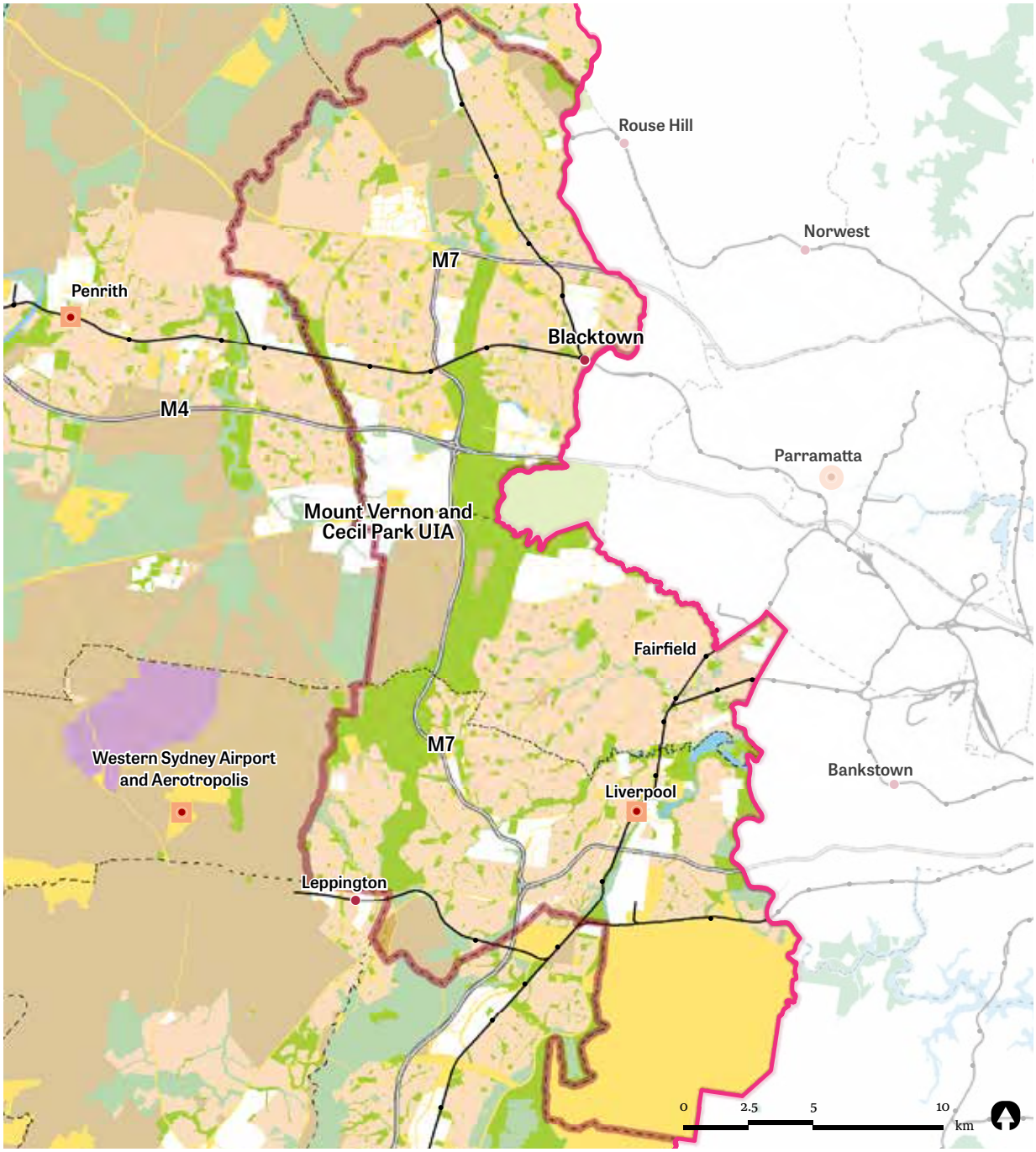
Source: Department of Planning, Industry and Environment (2019)

Figure 5.4b: Employment industries within the South Cluster (% of WPC)



Source: www.economy.id.com.au (2019)

Map 5.1c Western Parkland City Existing Land Use - East Cluster



Source: Department of Planning, Industry and Environment (2019)

WPC Boundary	Local Council Boundary	Urban Lands
East Cluster Boundary	Railway	Special Uses
Metropolitan Centre	Motorway	Major Urban Parkland
Metropolitan Cluster	Waterways	Metropolitan Rural Area
Strategic Centre	Western Sydney Airport	Protected Natural Areas

5.6 Existing Land Use - Aerotropolis Cluster

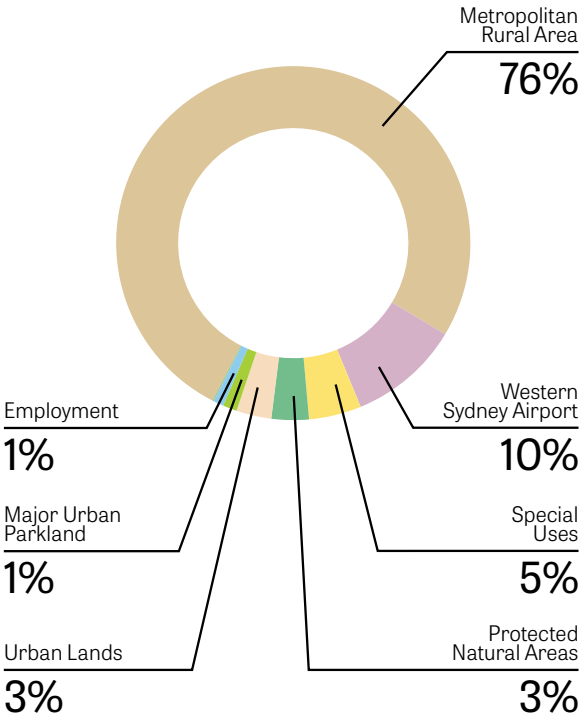
Over 75% of the Aerotropolis Cluster consists of productive or dormant agricultural land uses. The land use controls applying to the majority of the cluster do not allow for employment or urban living.

The majority of land zoned for urban purposes is located in the Sydney Science Park, a recently approved planning proposal in the northern part of the cluster..

The *Western Sydney Aerotropolis Land Use and Infrastructure Plan Stage 1* provides a broad structure for the future Aerotropolis. At this stage rezoning of the land has not occurred. The effect of the Plan at this stage is to limit development that could compromise future land use outcomes.

Biodiversity, landscape character, and other features that contribute to liveability, amenity, and the protection of the existing natural environment will need addressing as the Cluster grows and develops.

Figure 5.6: Existing Land Use within the Aerotropolis Cluster



Source: Department of Planning, Industry and Environment (2019)

Low Density Residential

0% of land zoned for low density residential

Medium/High Density Residential

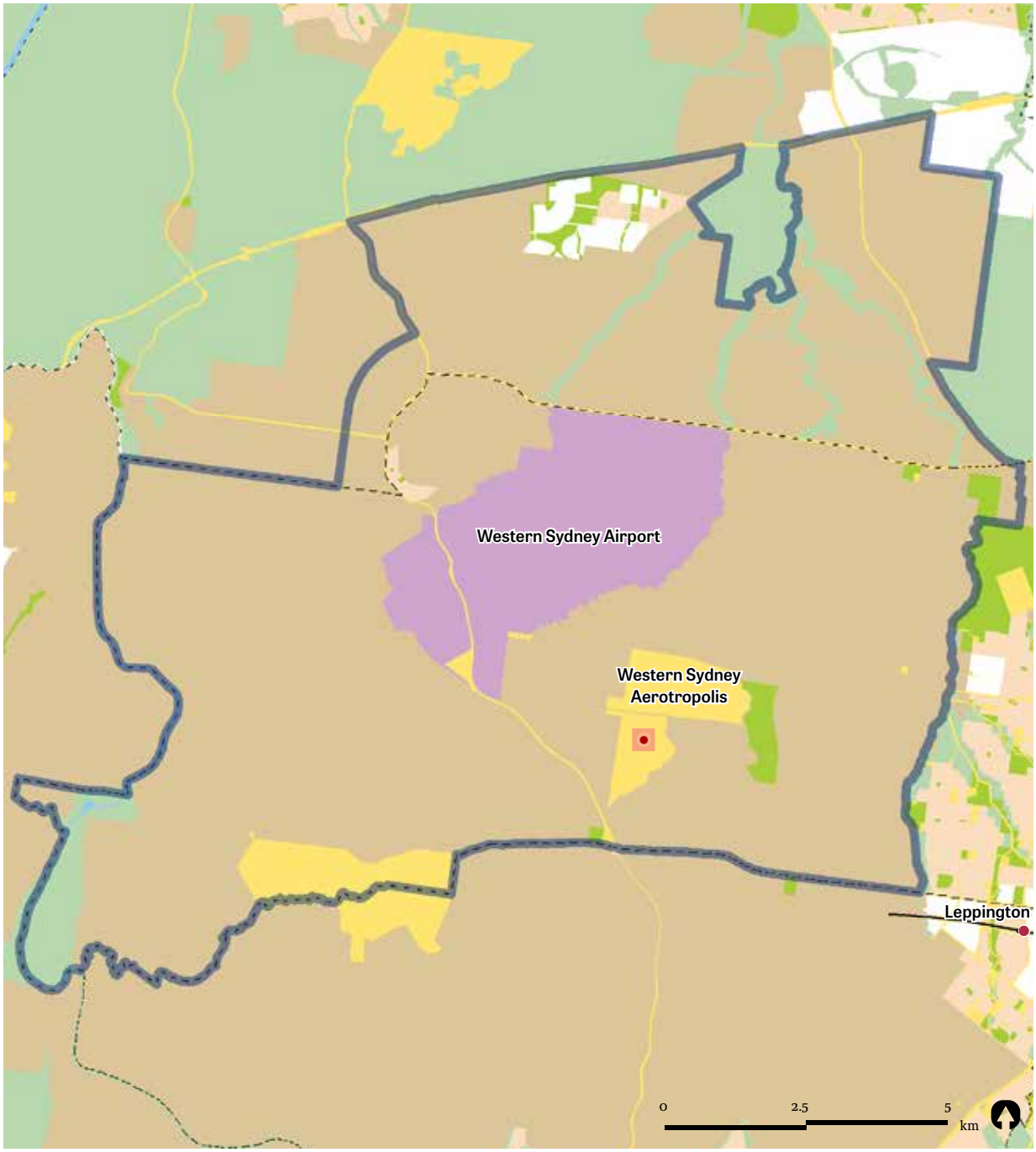
0% of land zoned for medium/high density residential

Rural/Village Residential

2% of land zoned for rural/village residential

Source: Department of Planning, Industry and Environment (2019)

Map 5.1d Western Parkland City Existing Land Use - Aerotropolis Cluster



Source: Department of Planning, Industry and Environment (2019)

Aerotropolis Cluster Boundary	Railway	Urban Lands
Local Council Boundary	Motorway	Special Uses
Metropolitan Centre	Waterways	Major Urban Parkland
Metropolitan Cluster	Protected Natural Areas	Metropolitan Rural Area
Strategic Centre	Western Sydney Airport	

5.7 Government Owned Land

Significant land uses within the WPC include National Parks and Australian Defence Force sites. The major Commonwealth land holdings consist of the Western Sydney Airport site and a number of defence establishments. Place outcomes need to consider the expected remaining life of the Defence sites. The majority of land under control of the state government consists of the National Parks estate and related conservation and recreation areas such as the Western Sydney Parklands. While these sites have no development potential, there are opportunities for these areas to integrate with the Green Grid where this is compatible with conservation objectives. Other state government land consists of strategic purchases for future and existing transport projects, utility corridors and social housing in developed suburbs.

5.8 Government Owned Land - North Cluster

The North Cluster has a wide variety of government owned land by scale and government level ownership. Within the existing urban footprints and around existing transport corridors smaller parcels of local and state government owned land is identifiable. Large parcels of state government owed land such as the Scheyville National Park are located outside of the existing urban footprint and are held for conservation and recreation purposes. Smaller state government owned land are commonly held for social infrastructure purposes such as schools.

Federally owned land is representative of ongoing or historical Australian Defence Force operations. Defence Establishment Orchard Hills in the south of the Cluster and RAAF Base Richmond in the north of the Cluster are two notable federal defence force holdings.

5.9 Government Owned Land - South Cluster

Local and regional open space and recreational facilities are scattered across the south cluster. These are generally local government owned as opposed to state government owned land like in other clusters. State government owned land has been identified in the South cluster as major infrastructure corridors, national parks, state forests and reserves.

The Holsworthy Military Reserve under federal government ownership is a significant land holding centered at Holsworthy and extends south towards Campbelltown-Macarthur from the South-Western section of the East Cluster to the North-Eastern section of the South Cluster.

5.10 Government Owned Land - East Cluster

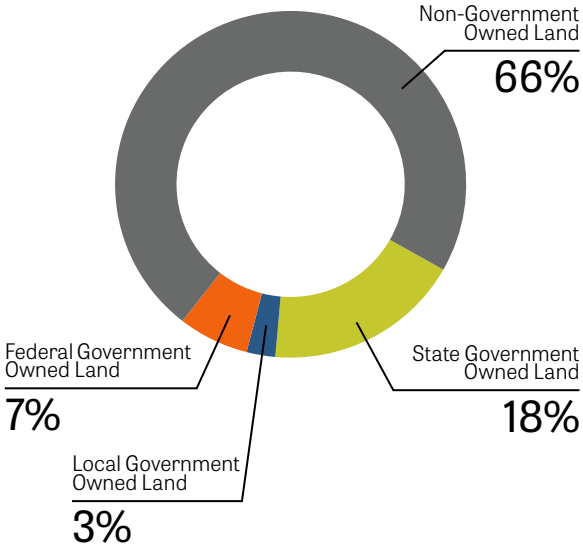
Large numbers of small local and state government landholdings are evident in the existing urban footprint. These landholdings are generally of local and regional open space intermixed with land required to facilitate localised infrastructure such as drainage. Large state government owned land holdings represent significant parklands, forest areas and recreation facilities. Regional transport and other service infrastructure corridors can be identified by their linear nature.

Federal government land holdings are generally defence force related land uses with smaller federal government owned land parcels also present within the Cluster.

5.11 Government Owned Land - Aerotropolis Cluster

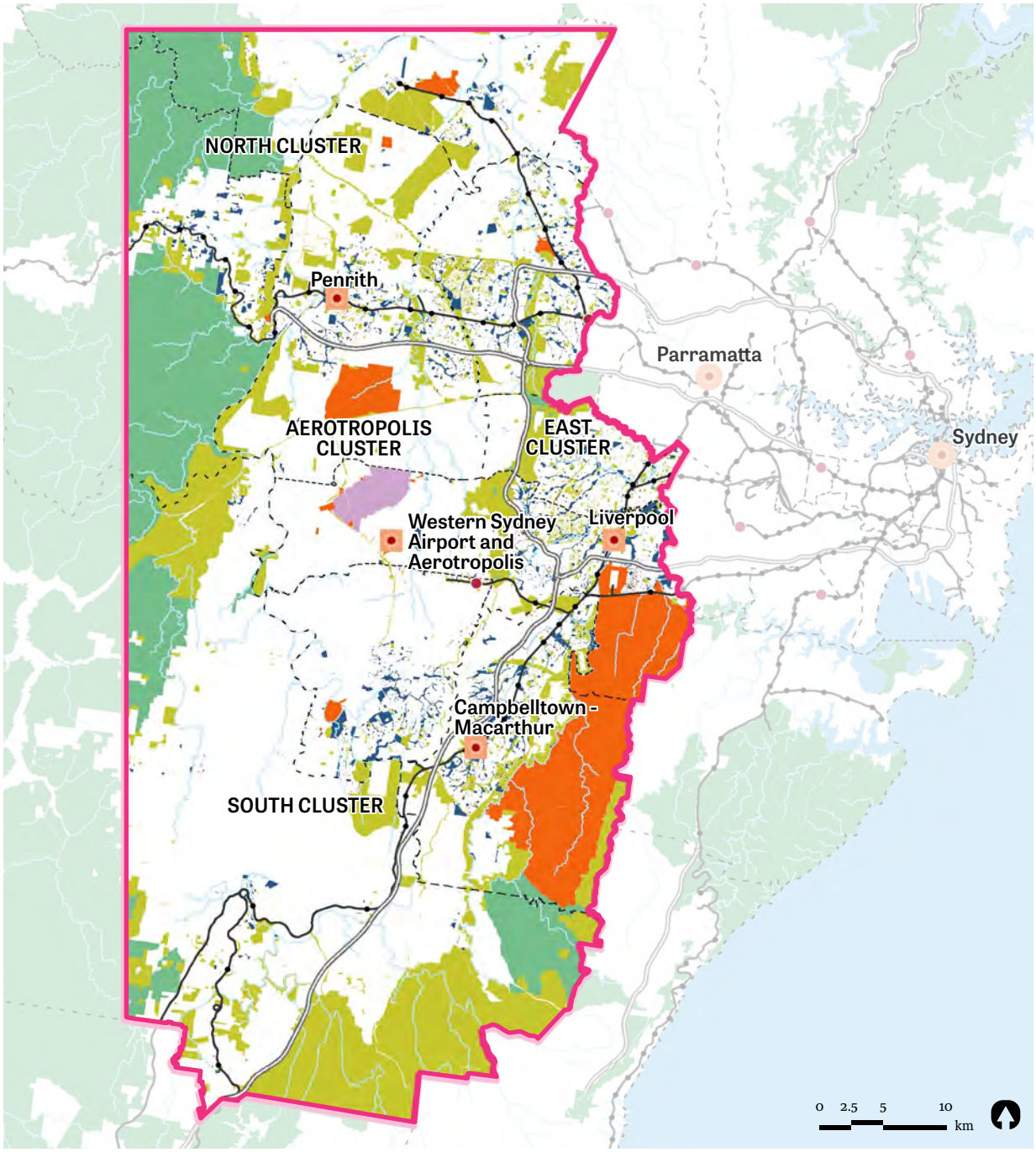
The Aerotropolis Cluster is primarily within private ownership. There are small federal land holdings around the airport and a defence force site along Badgerys Creek Road located South of the Western Sydney Airport. State government owned land can be seen where the Northern Road corridor has been reserved for upgrade to the west of the airport.

Figure 5.7: Government Owned Land within the WPC



Source: NSW Land Registry Services (2019)

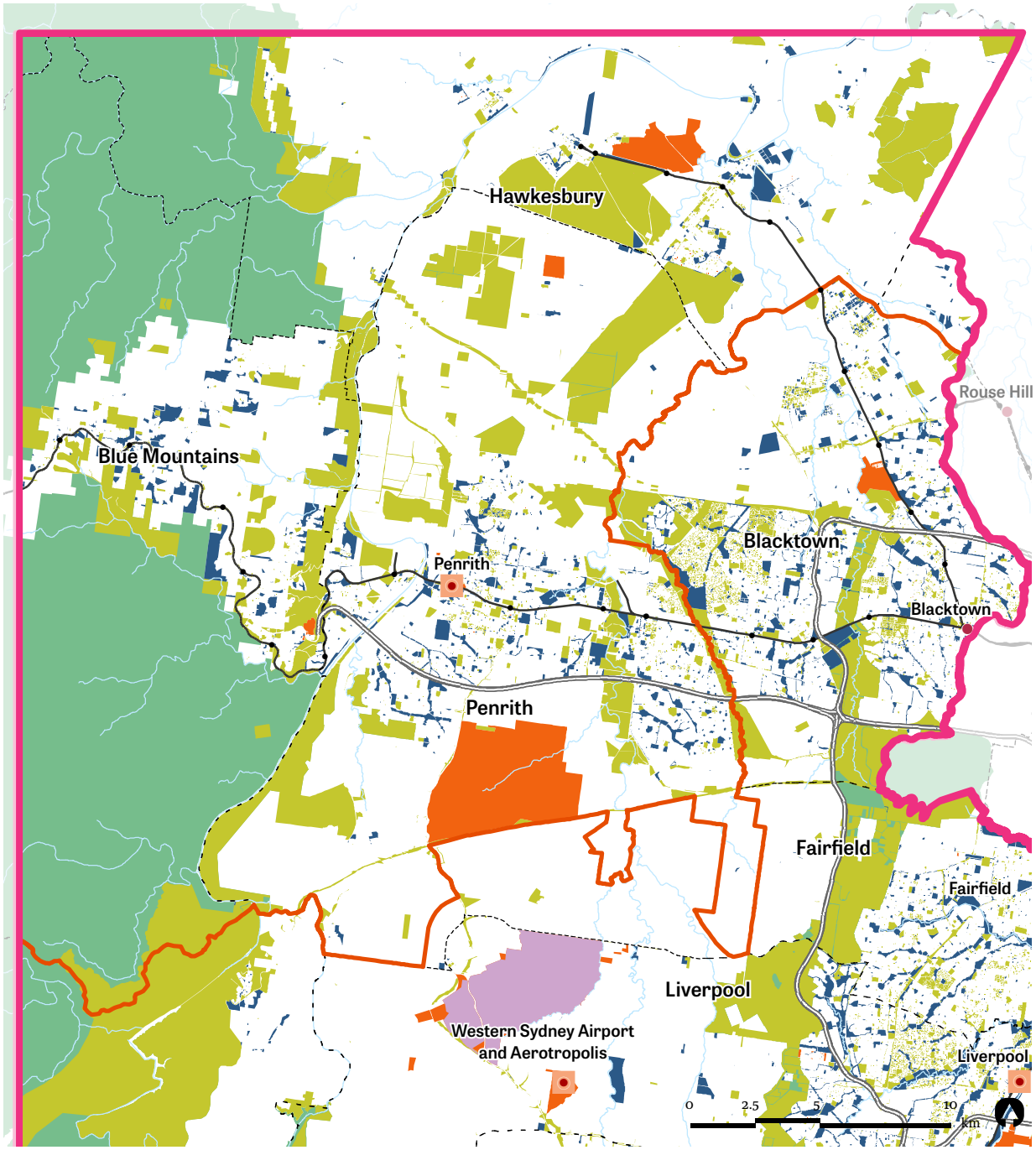
Map 5.7 Government Owned Land



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

WPC Boundary	Railway	Western Sydney Airport
Metropolitan Centre	Waterways	Federal Government Land
Metropolitan Cluster	Protected Natural Areas	State Government Land
Strategic Centre	Major Urban Parkland	Local Government Land
Motorway		

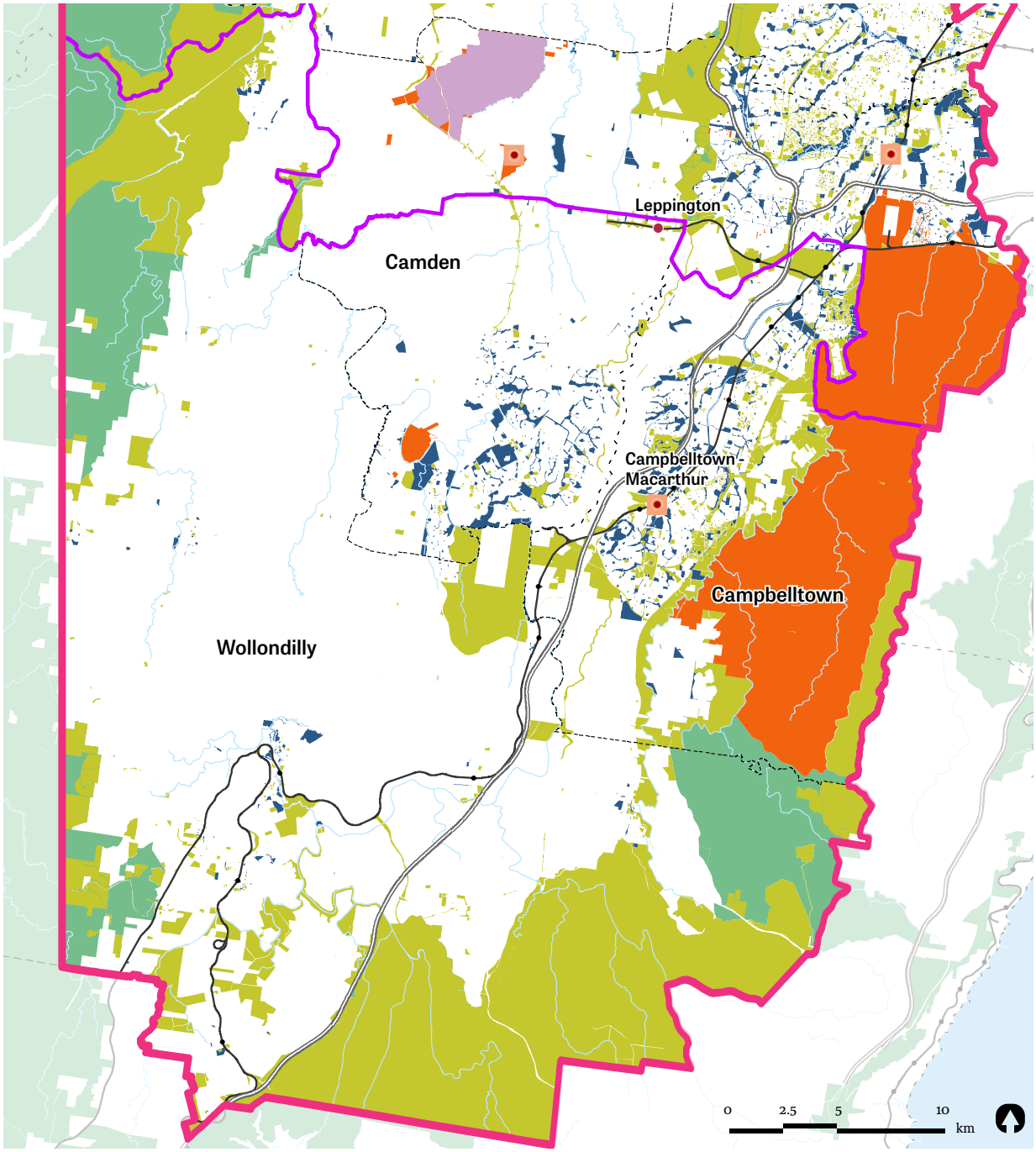
Map 5.7a Government Owned Land - North Cluster



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

WPC Boundary	Motorway	Western Sydney Airport
North Cluster Boundary	Railway	Federal Government Land
Metropolitan Centre	Waterways	State Government Land
Metropolitan Cluster	Protected Natural Areas	Local Government Land
Strategic Centre	Major Urban Parkland	

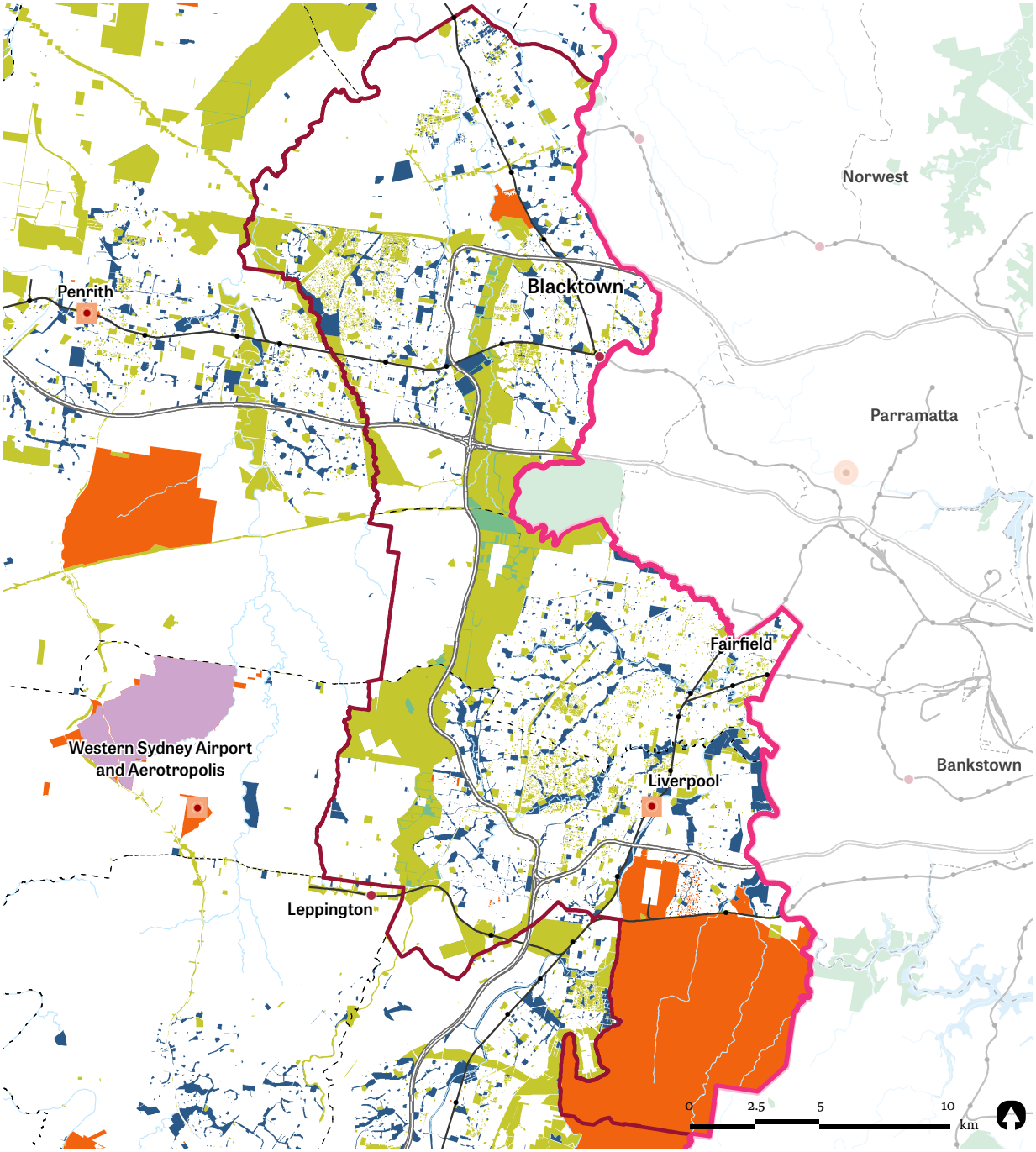
Map 5.7b Government Owned Land - South Cluster



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

WPC Boundary	Railway	Major Urban Parkland
South Cluster Boundary	Motorway	Federal Government Land
Metropolitan Centre	Waterways	State Government Land
Metropolitan Cluster	Protected Natural Areas	Local Government Land
Strategic Centre		

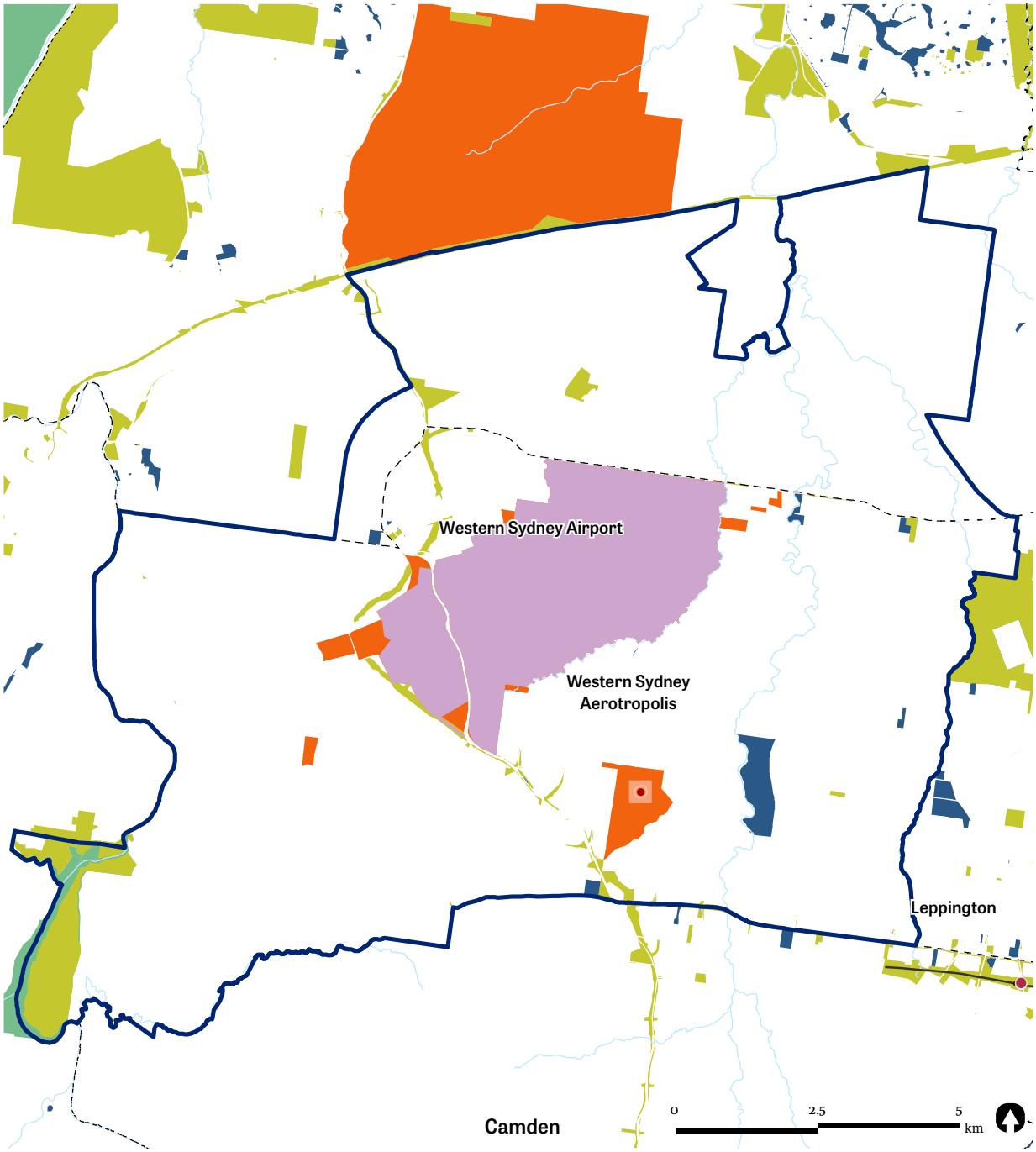
Map 5.7c Government Owned Land - East Cluster



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

WPC Boundary	Motorway	Western Sydney Airport
East Cluster Boundary	Railway	Federal Government Land
Metropolitan Centre	Waterways	State Government Land
Metropolitan Cluster	Protected Natural Areas	Local Government Land
Strategic Centre	Major Urban Parkland	

Map 5.7d Government Owned Land - Aerotropolis Cluster



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

Aerotropolis Cluster Boundary	Railway	Western Sydney Airport
Metropolitan Centre	Waterways	Federal Government Land
Metropolitan Cluster	Protected Natural Areas	State Government Land
Strategic Centre	Major Urban Parkland	Local Government Land
Motorway		

5.12 Large Private Land Holdings

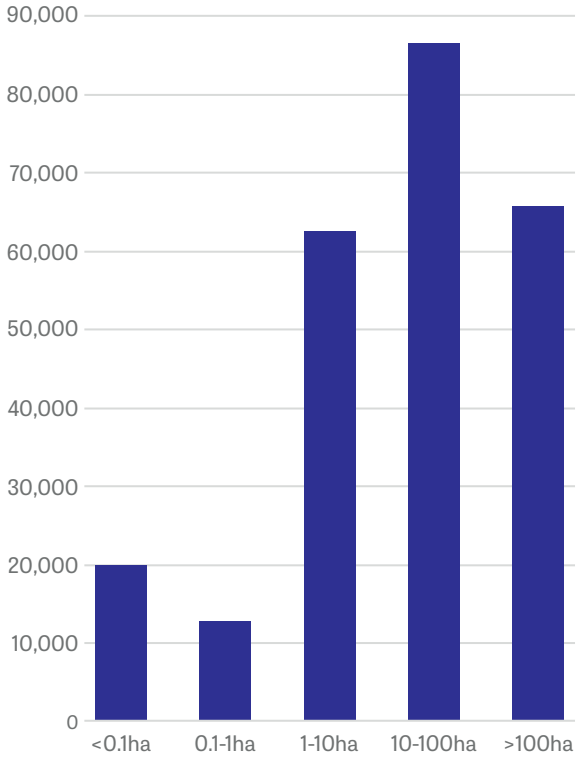
Large portions of land within the WPC have been acquired by developers and land bankers, either through options or outright purchase. Various university holdings and the Sydney Science Park site have significant development potential as land use change progresses.

The top 10 private land holdings within the WPC equate to approximately 9,000 ha or 0.28% of the total WPC area. Large land holdings provide opportunities for holistic approaches to land development that facilitates coordinated development outcomes, investment in local and regional open space, environment protection, and transport initiatives as well as providing for the short, medium, and long term land use evolution.

Land holdings larger than 10 ha offer some capacity for streamline the development process, subject to government coordination of infrastructure provision and staged release.

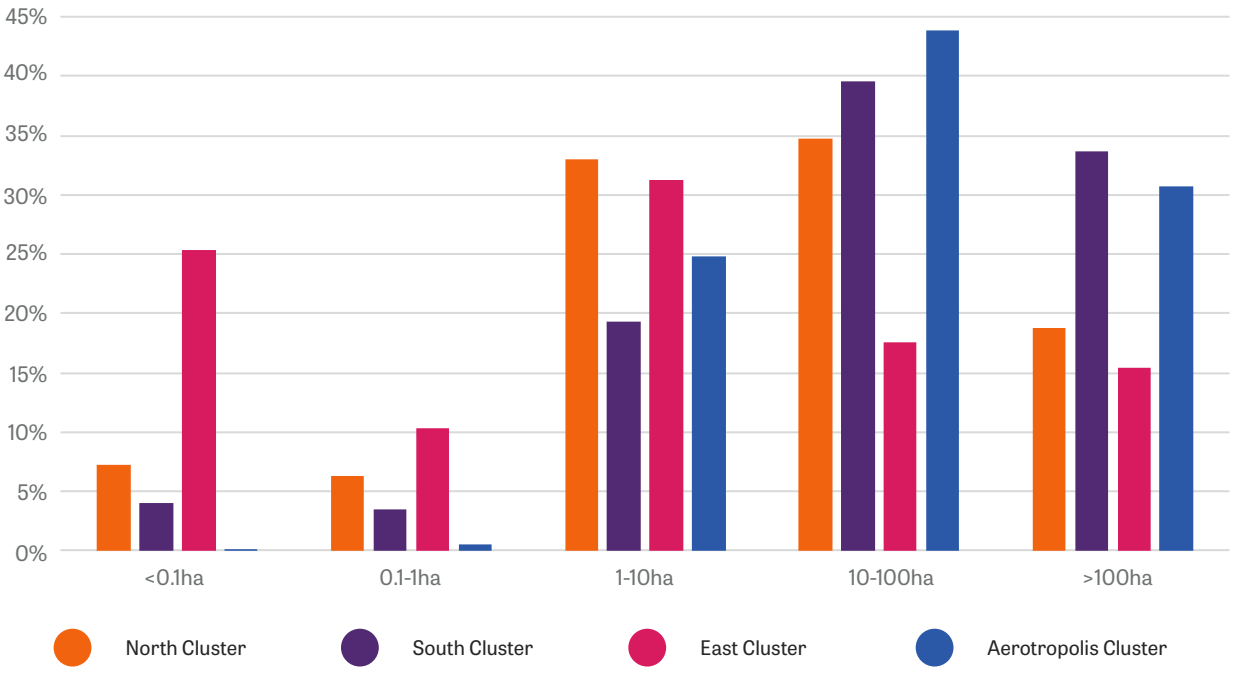
Figure 5.12b shows that the Aerotropolis and South clusters in particular feature large lot sizes, particularly for lots larger than 100 ha.

Figure 5.12a: Number of lots by size within the WPC boundary



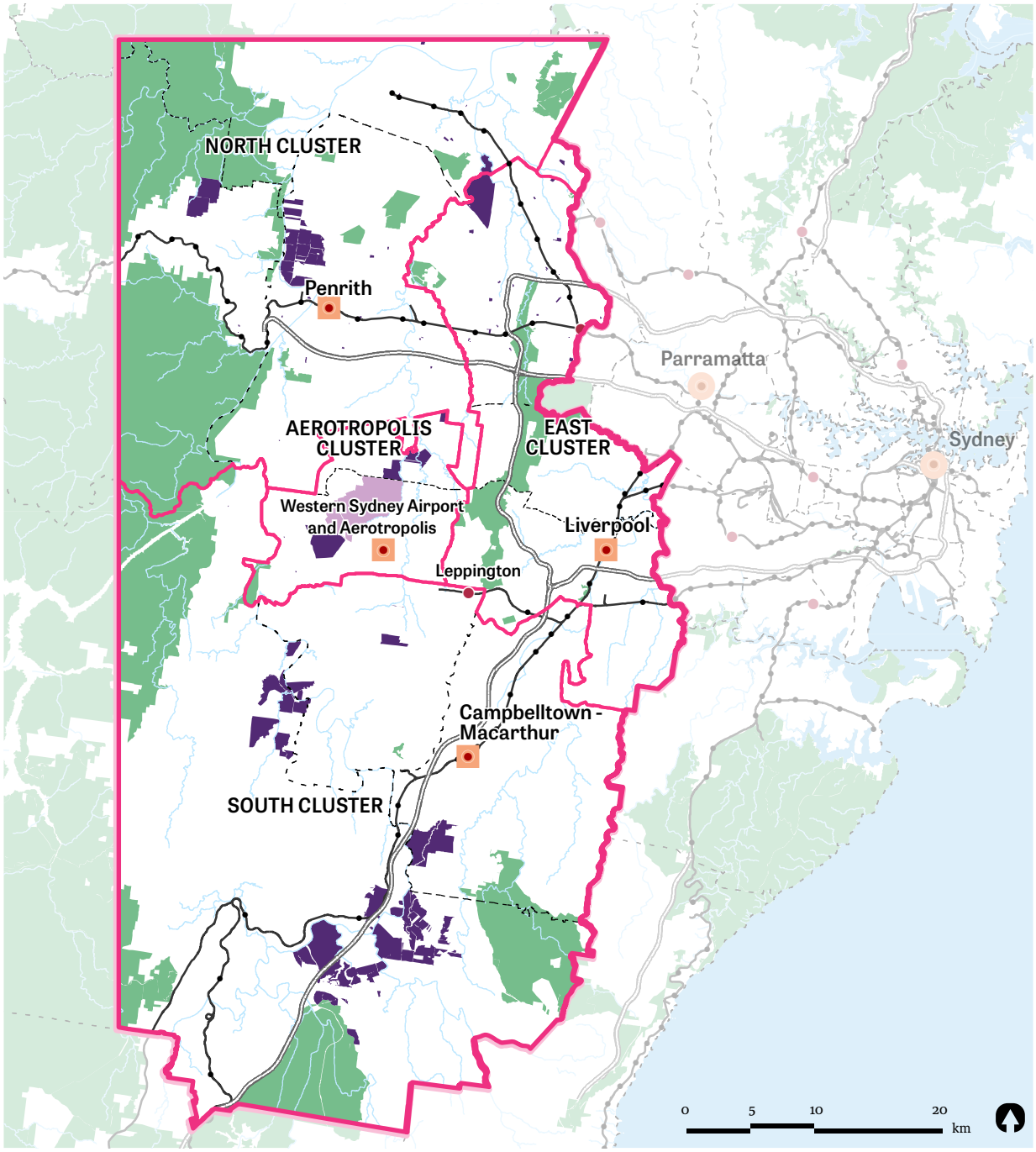
Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

Figure 5.12b: Percentage of lots by size by Cluster



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

Map 5.8 Large Private Land Holdings



Source: Greater Sydney Commission (2019), Department of Planning, Industry and Environment (2019)

WPC Boundary	Local Government Boundaries	Waterways
Cluster Boundaries	Motorway	Protected Natural Areas
Metropolitan Centre	Railway	10 largest private land holdings by area within the WPC
Metropolitan Cluster	Strategic Centre	

5.13 Status of Planned Developments

190 square kilometres of land within the WPC is subject to planned development. A further 473 square kilometres of land identified as potential future growth areas by the NSW Department of Planning and Environment. The majority of the planned development is occurring within the East Cluster with a significant proportion of land within the Aerotropolis Cluster identified for potential growth.

Compared to the other clusters, the North Cluster is showing limited current growth as well as minimal areas identified for future growth. The South Cluster, with the South West Growth Centre, Campbelltown to Macarthur Growth Corridor and Wilton new town, has both planned and potential opportunities for urban development.

Western Parkland City

473 km²	of land identified as potential growth area	9.1%	of the WPC identified as potential growth areas
37 km²	of land exhibited as growth areas	1.2%	of the WPC exhibited as growth areas
153 km²	of land zoned for urban uses	4.8%	of the WPC zoned for urban uses

North Cluster

0.6%	of the North Cluster undergoing planned development
0.02%	of the North Cluster identified as potential growth areas
0.4%	of the North Cluster exhibited as growth areas
0.2%	of the North Cluster zoned for urban uses

East Cluster

23.3%	of the East Cluster undergoing planned development
0.2%	of the East Cluster identified as potential growth areas
5.6%	of the East Cluster exhibited as growth areas
17.5%	of the East Cluster zoned for urban uses

South Cluster

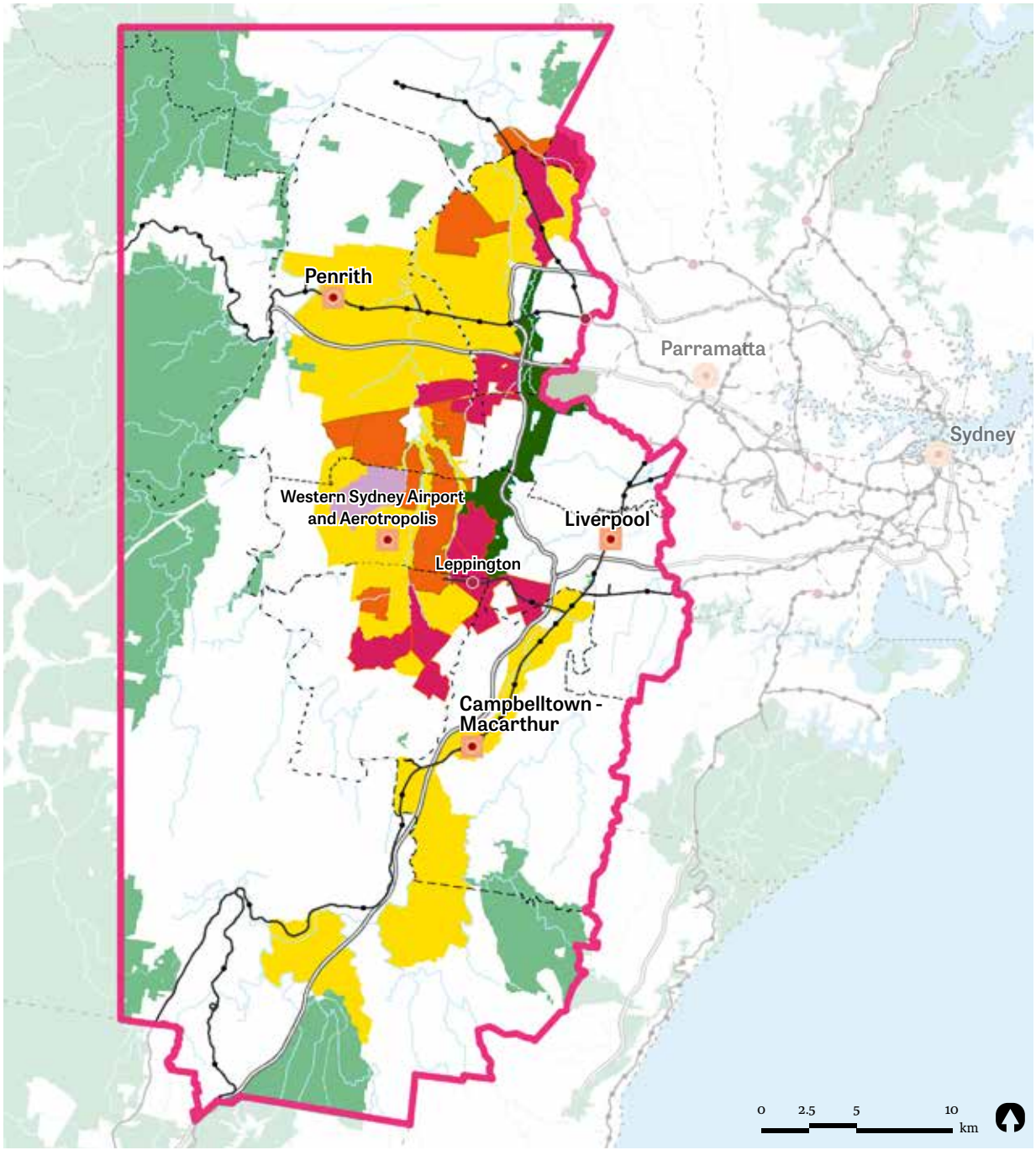
14.9%	of the South Cluster undergoing planned development
10.3%	of the South Cluster identified as potential growth areas
0.4%	of the South Cluster exhibited as growth areas
4.2%	of the South Cluster zoned for urban uses

Aerotropolis Cluster

77.3%	of the Aerotropolis Cluster undergoing planned development
77.3%	of the Aerotropolis Cluster identified as potential growth areas
0%	of the Aerotropolis Cluster exhibited as growth areas
0%	of the Aerotropolis Cluster zoned for urban uses

Source: Greater Sydney Commission (2019)

Map 5.13 Status of Planned Development Precincts



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Identified Growth Areas
Local Government Boundaries	Railway	Exhibited Growth Areas
Metropolitan Centre	Waterways	Zoned for Urban Development
Metropolitan Cluster	Protected Natural Areas	Western Sydney Airport
Strategic Centre	Western Sydney Parklands	

6

Infrastructure

GSC | Western Sydney Growth Infrastructure Compact (GIC)

6 Infrastructure

6.1 Data Sources

Data inputs to this Analysis Report have originated from a wide range of NSW Government Agencies and Service Providers, through a highly collaborative process led and co-ordinated by the Commission.

6.2 Existing Transport Infrastructure

Existing transport systems lack connectivity between places within the Western Parkland City (WPC). Urban areas are generally serviced with heavy rail service connections to the Sydney and/or Parramatta CBDs supported by feeder bus services. Urban road networks focus on connections to motorways with limited active transport infrastructure.

6.3 Future Transport Infrastructure

The Western Sydney Airport and Aerotropolis presents an opportunity to reorient transport systems in a manner that supports the formation of an integrated WPC with Penrith, Liverpool, and Campbelltown-Macarthur as key centres contributing to the success of the new airport and Aerotropolis precinct. The efficient movement of people and goods will allow the strengths of each place to contribute to the success of the WPC as a whole. Transport systems will need to be developed which consider diverse transport needs and in a manner that recognises that the scale and pattern of movement will change over time as the WPC grows and land uses change.

Land for Future Transport Infrastructure

23 km^2

of land for future transport corridors (approx.)

Land reserved for the Proposed M9 Outer Sydney Orbital

20 km^2

of land for the proposed M9 Outer Sydney Orbital (approx.)

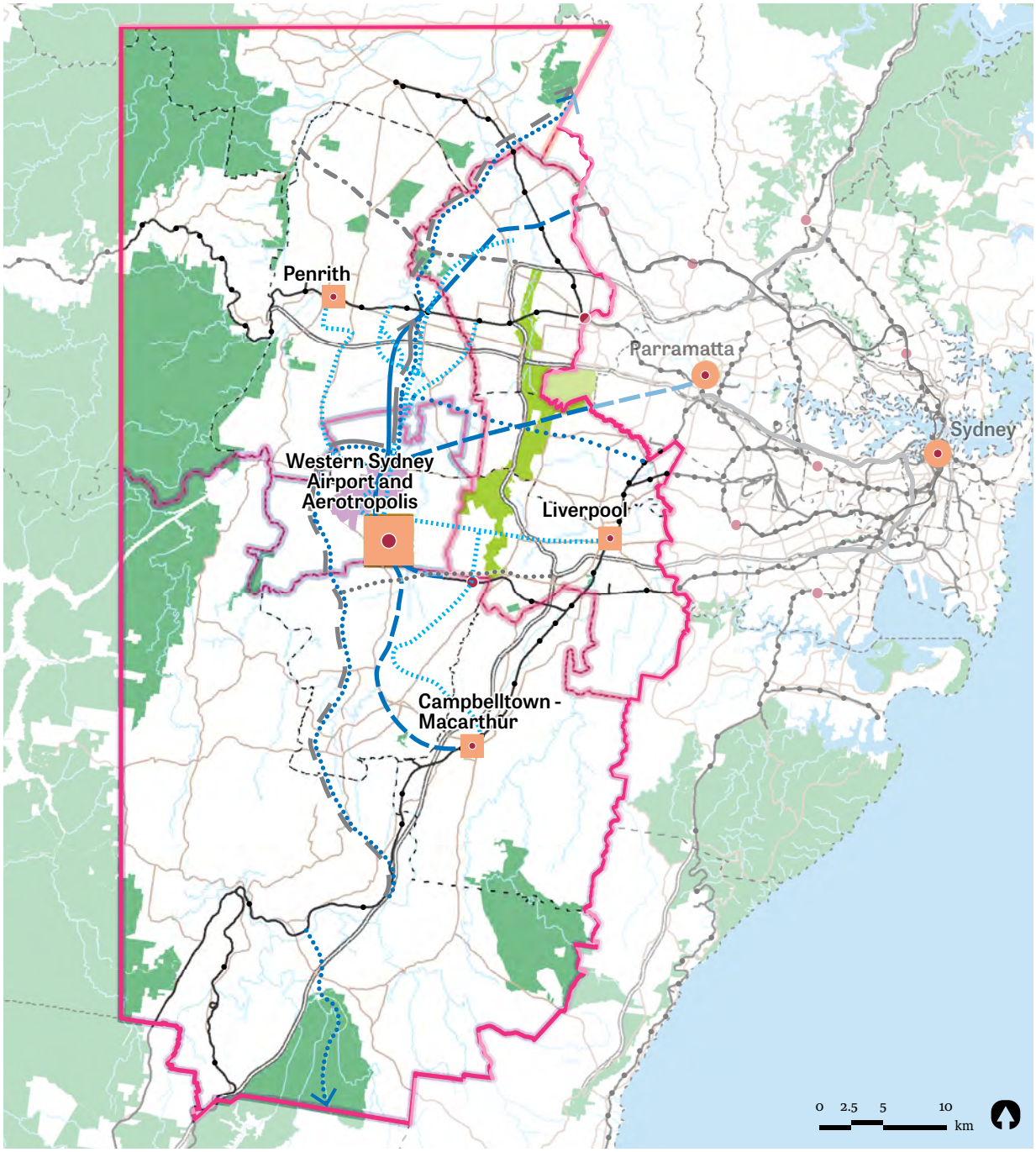
Land for Future Rail Infrastructure at Leppington

2.76 km^2

of land for future rail infrastructure at Leppington

Source: NSW Roads and Maritime Services (2019)

Map 6.1 Existing & Proposed Transport Network



Source: NSW Roads and Maritime Services (2019)

WPC Boundary	Motorway	Existing Roads
Metropolitan Centre	Railway	Committed & Proposed Motorways
Metropolitan Cluster	Waterways	Committed & Proposed Rail Lines
Strategic Centre	Protected Natural Areas	Proposed Rapid Transport
Western Sydney Airport	Major Urban Parkland	Freight Rail Investigation

6.4 Transport Infrastructure - North Cluster

Currently movement systems in the North Cluster focus on East-West access using the Sydney Trains T1 Richmond and Western Line and M4 Western Motorway, accessing centres outside of the Western Parkland City such as the Parramatta and Sydney CBD. Connectivity is limited with the rest of the WPC with The Northern Road (A9) forming the primary link between Penrith, Campbelltown-Macarthur, and the future Aerotropolis. While the committed Sydney Metro Greater West link from St Marys to the Aerotropolis Cluster will provide new connectivity improvements, further links are required for the North Cluster to integrate with the rest of the City.

Land for the Sydney Metro Greater West (Stage 1)

23 km²

of land for the North South Rail Link, Western Sydney Aerotropolis to St Marys

6.5 Transport Infrastructure - South Cluster

The Sydney Trains T8 Airport and South Line provides good accessibility from urban portions of the South Cluster to Sydney and Liverpool with an interchange at Glenfield. The M31 Hume Motorway, M5 South-Western Motorway, and M7 West-link provides high speed road access to a number of centres. The Northern Road (A9) forms the primary link between Campbelltown-Macarthur, Penrith, and the future Aerotropolis. The South Cluster has the capacity to make a significant contribution to the Western Parkland City if movement systems are improved to allow for fast, reliable connections to the Aerotropolis Cluster.

Land for the Western Sydney Freight Line

0.99 km²

of land for the Western Sydney Freight Line, Kemps Creek to M7

Source: Greater Sydney Commission (2019)

6.6 Transport Infrastructure - East Cluster

The East Cluster offers suburban rail connections to a variety of centres including Campbelltown-Macarthur, the Parramatta CBD and the Sydney CBD. Motorways and freight rail links are able to provide freight access to employment lands within the cluster, a significant contributor to economic activity in the Western Parkland City. The proximity of Liverpool to the Aerotropolis Cluster creates opportunities for the East Cluster to provide industrial services and a skilled labour market, particularly during the early stages of development.

Land for the North South Rail Line

0.62 km²

of land for the North South Rail Line, Campbelltown/Macarthur to Western Sydney Airport

6.7 Transport Infrastructure - Aerotropolis Cluster

The new Western Sydney Airport and Aerotropolis are currently poorly connected to Sydney, due to its current rural character. The Aerotropolis Cluster will require a diverse range of transport connections to cater for commuting workers, airport passengers, freight services, and the needs of new residents within the cluster.

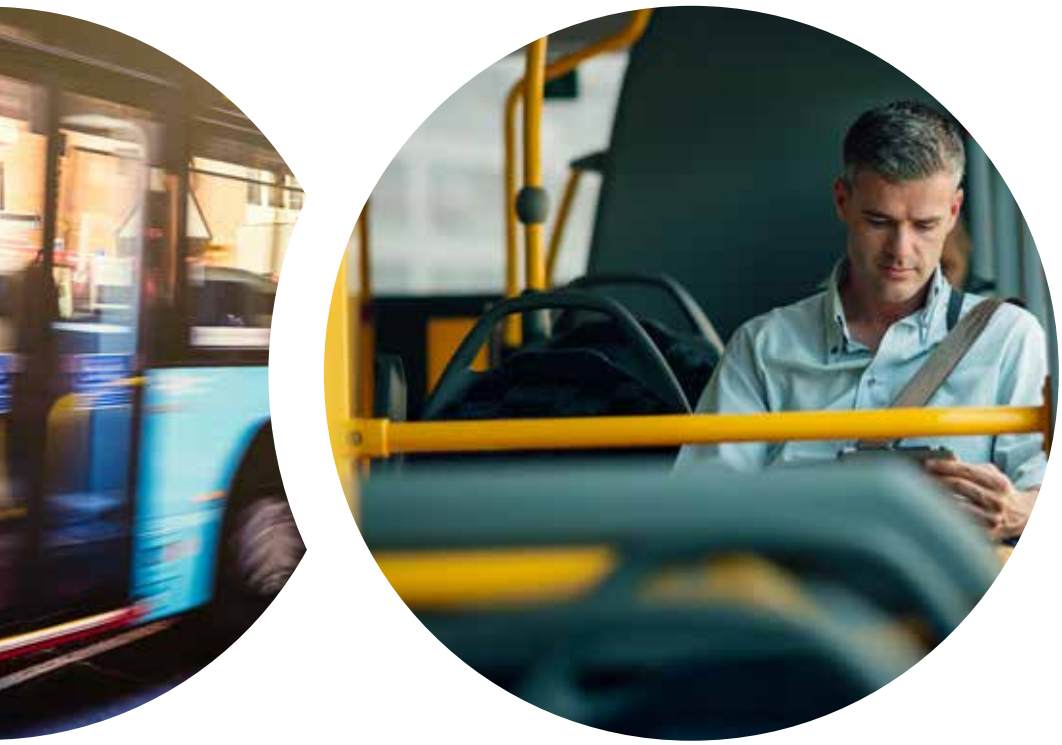
As the airport is established to be an international gateway, key routes will need to offer fast connections to the major centres of Greater Sydney, but also offer wide coverage services to the local area in order to support the economic activity planned for the cluster.

Land Reserved for the South West Rail Line Extension Bringelly to Leppington

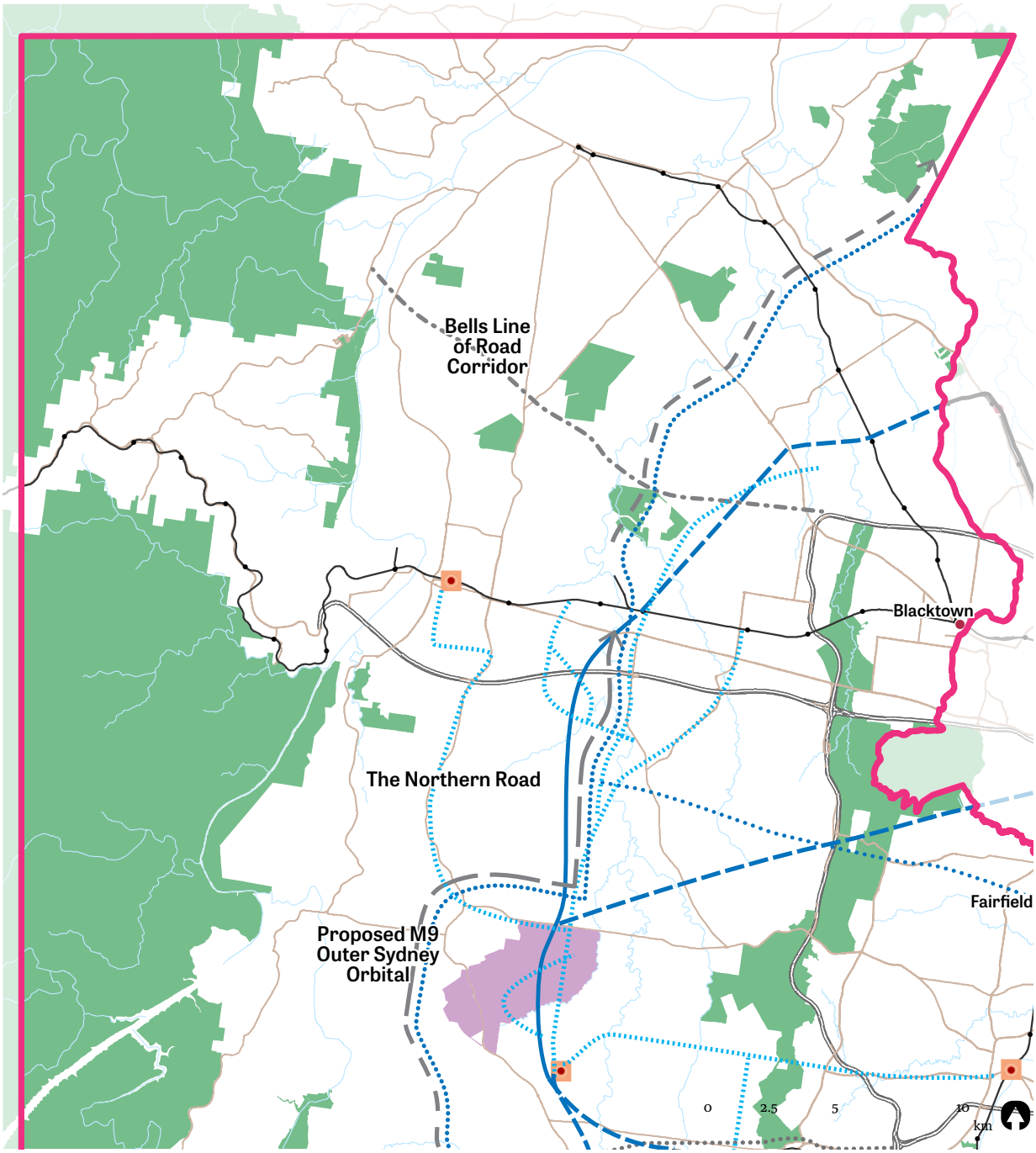
0.45 km²

of land for the South West Rail Line, Bringelly to Leppington

Source: Greater Sydney Commission (2019)



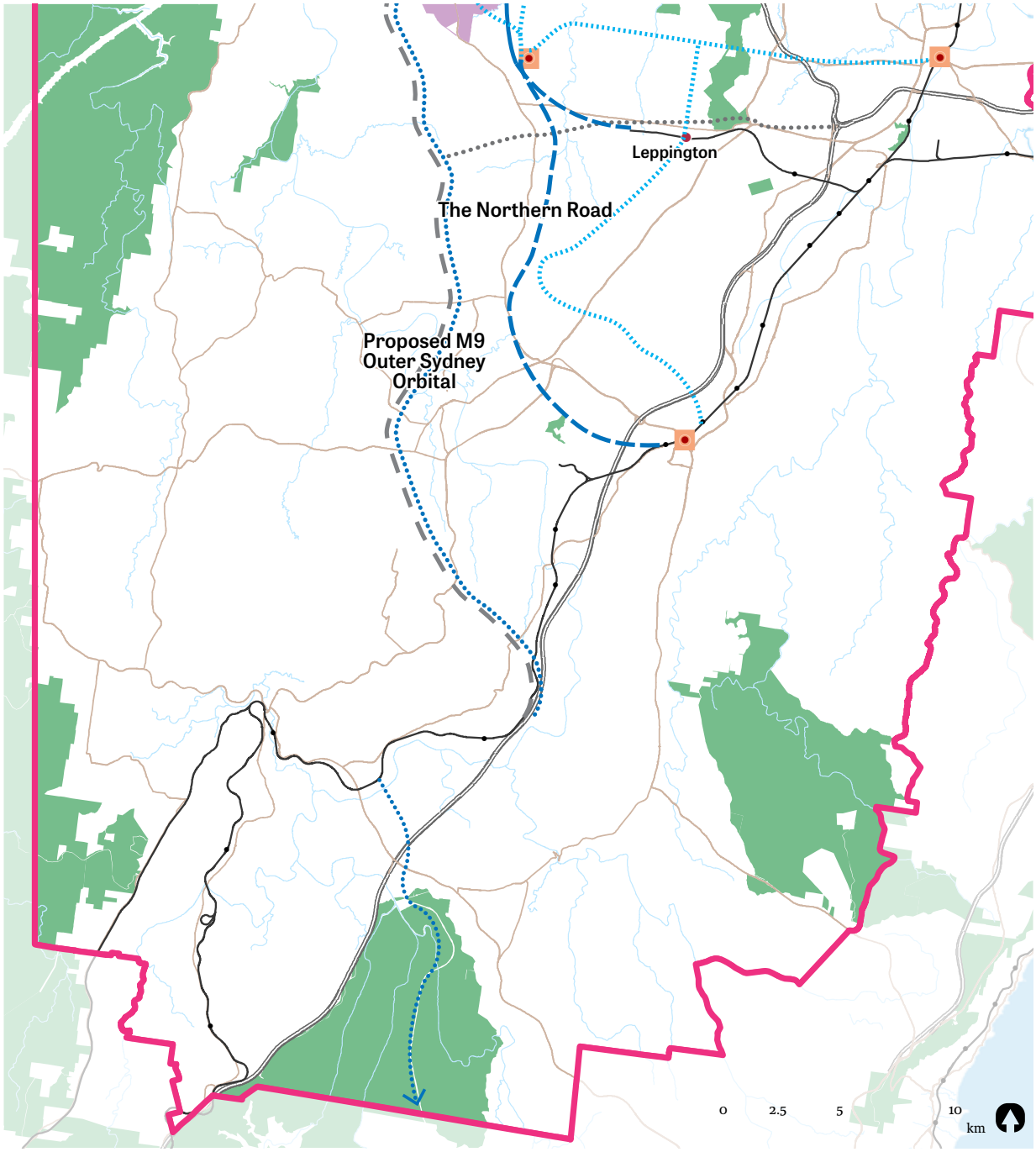
Map 6.1a Existing & Proposed Transport - North Cluster



Source: NSW Roads and Maritime Services (2019)

WPC Boundary	Motorway	Existing Roads
Metropolitan Centre	Railway	Committed & Proposed Motorways
Metropolitan Cluster	Waterways	Committed & Proposed Rail Lines
Strategic Centre	Protected Natural Areas	Proposed Rapid Transit
Western Sydney Airport	Major Urban Parkland	Freight Rail Investigation

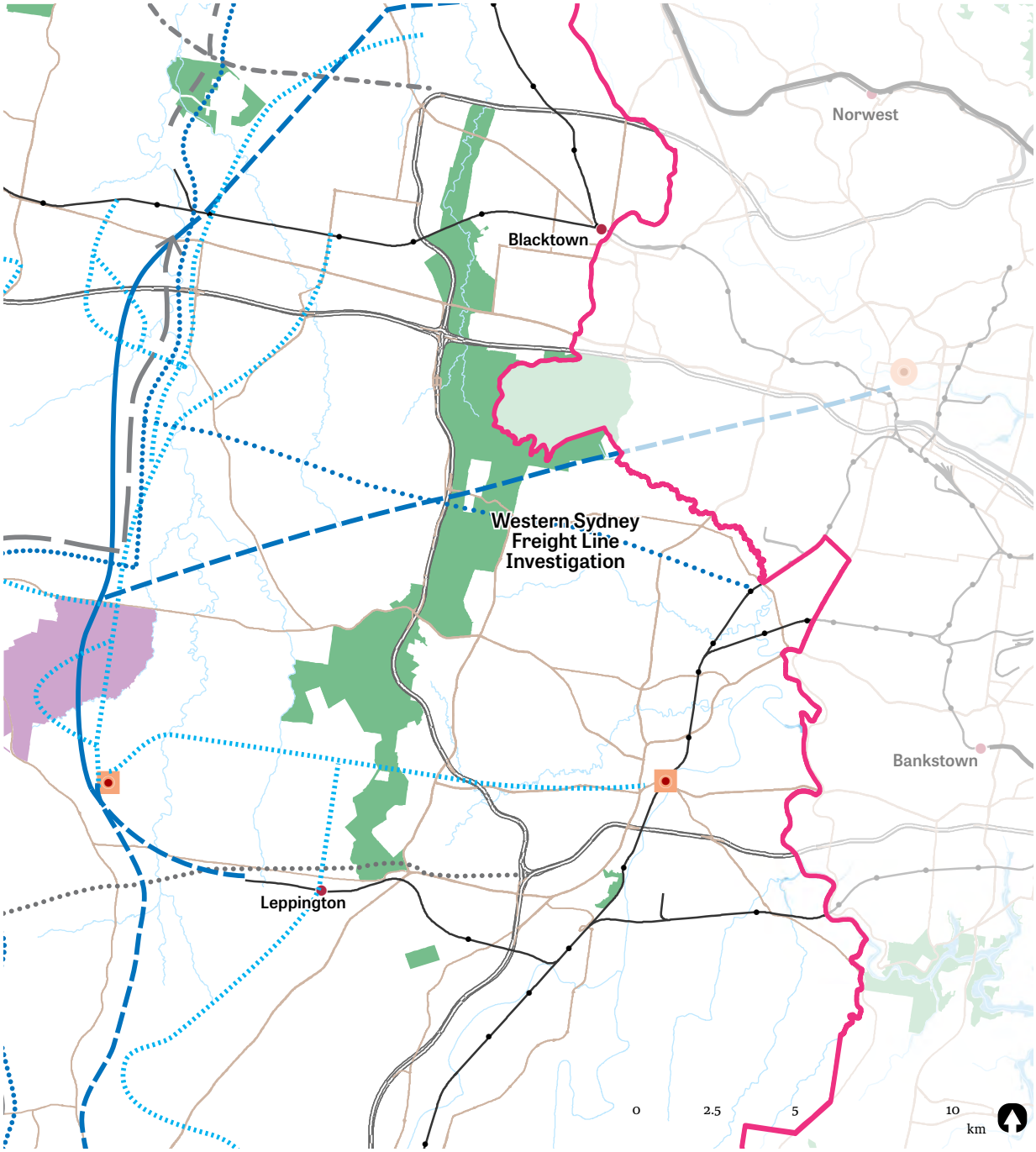
Map 6.1b Existing & Proposed Transport - South Cluster



Source: NSW Roads and Maritime Services (2019)

WPC Boundary	Motorway	Existing Roads
Metropolitan Centre	Railway	Committed & Proposed Motorways
Metropolitan Cluster	Waterways	Committed & Proposed Rail Lines
Strategic Centre	Protected Natural Areas	Proposed Rapid Transit
Western Sydney Airport	Major Urban Parkland	Freight Rail Investigation

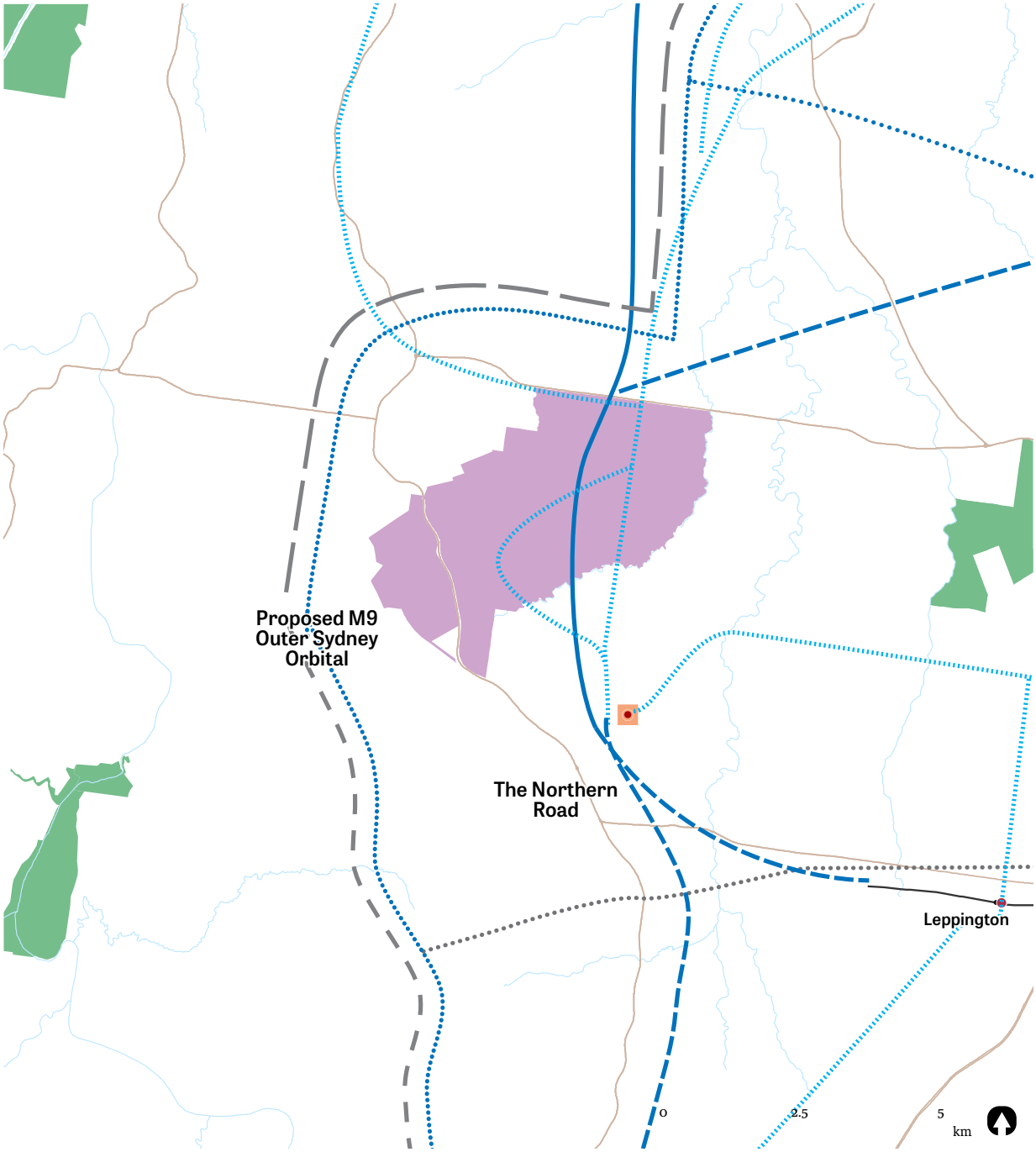
Map 6.1c Existing & Proposed Transport - East Cluster



Source: NSW Roads and Maritime Services (2019)

WPC Boundary	Motorway	Existing Roads
Metropolitan Centre	Railway	Committed & Proposed Motorways
Metropolitan Cluster	Waterways	Committed & Proposed Rail Lines
Strategic Centre	Protected Natural Areas	Proposed Rapid Transit
Western Sydney Airport	Major Urban Parkland	Freight Rail Investigation

Map 6.1d Existing & Proposed Transport - Aerotropolis



Source: NSW Roads and Maritime Services (2019)

Metropolitan Centre	Waterways	Committed & Proposed Motorways
Metropolitan Cluster	Existing Roads	Committed & Proposed Rail Lines
Strategic Centre	Western Sydney Airport	Proposed Rapid Transit
Motorway	Protected Natural Areas	Freight Rail Investigation
Railway	Major Urban Parkland	

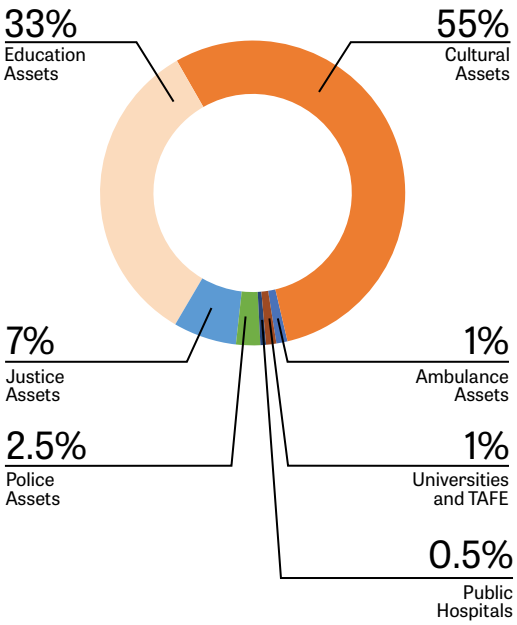
6.8 Social Infrastructure

Social infrastructure in the Western Parkland City is largely concentrated in existing urbanised areas and is closely aligned with transport corridors and strategic centres. Outside of urban areas, provision of social infrastructure is limited. Early provision is required to ensure the sustainable growth of new urban centres.

Opportunities exist for joint or shared use of social infrastructure, particularly around education facilities, to address capacity challenges and/or to improve the flexibility of assets whose traditional use is in decline eg libraries, community halls, and religious facilities.

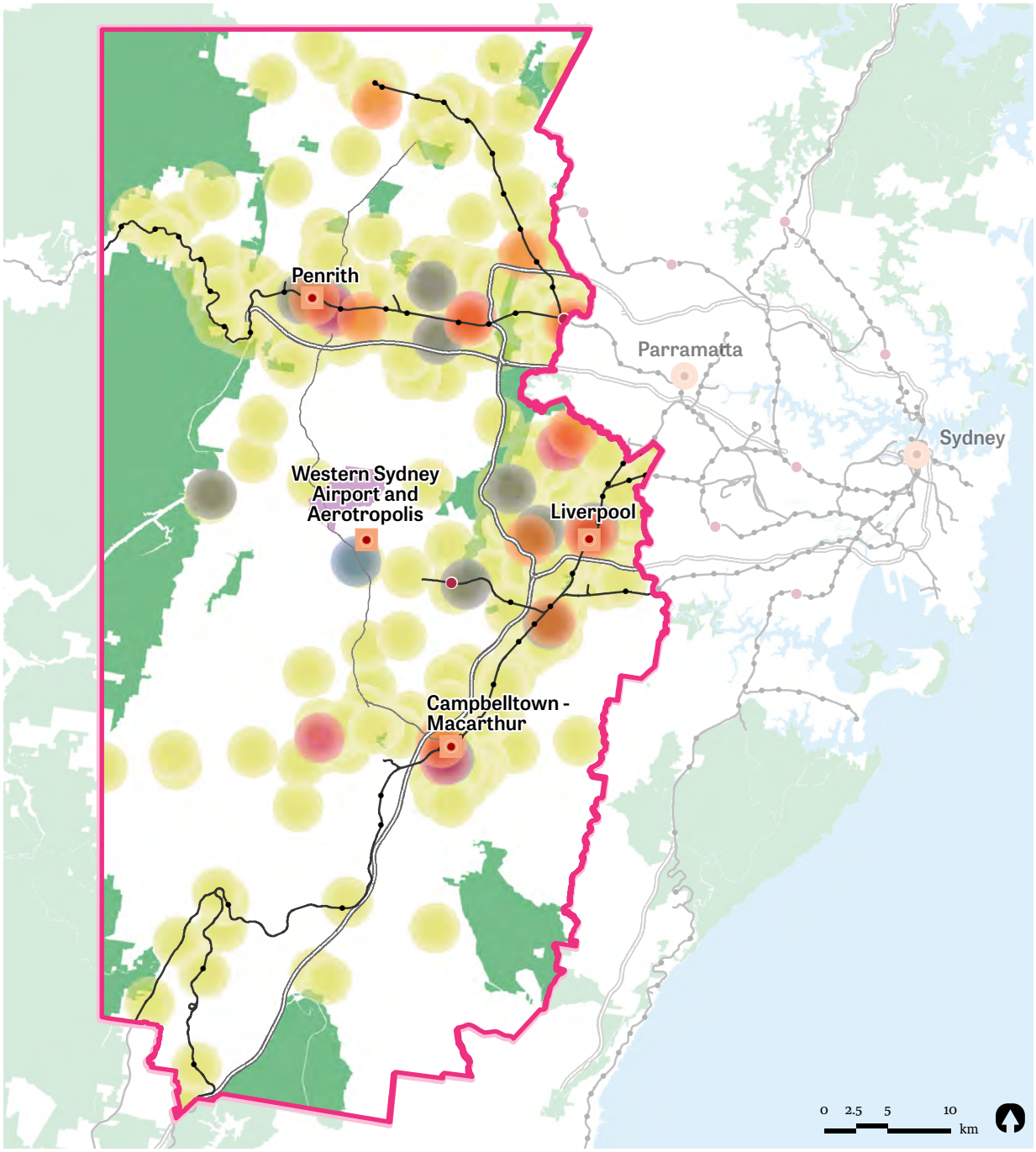
There are also opportunities for the provision of higher order social infrastructure such as university campuses, to further contribute to a sense of place and identity.

Figure 6.8: Percentage of Social Infrastructure Services and Assets within the WPC Boundary



Source: Greater Sydney Commission (2019)

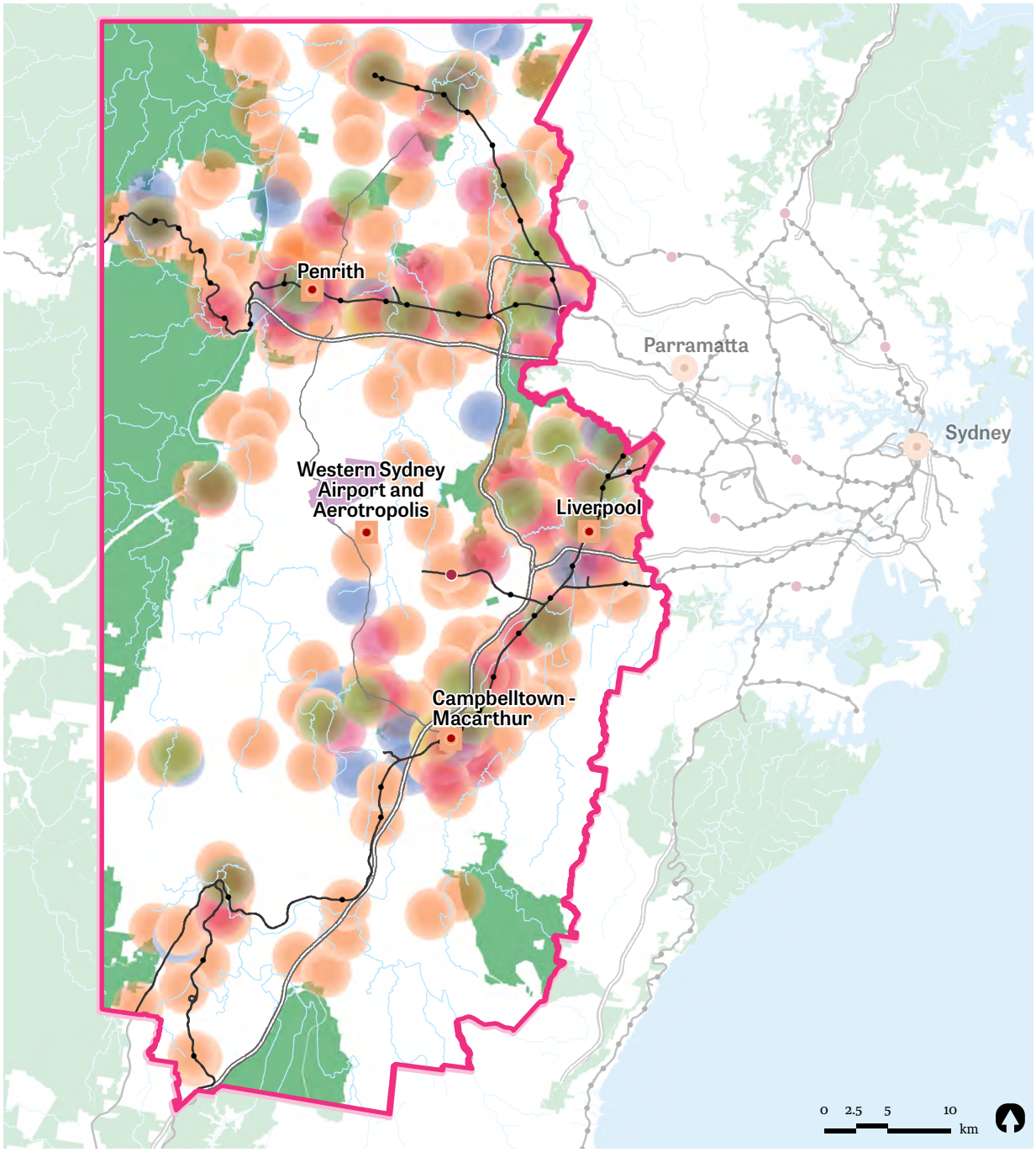
Map 6.2 Social Infrastructure: Health and Education



Source: Greater Sydney Commission (2019)

WPC Boundary	Strategic Centre	Public Hospitals
Metropolitan Centre	Education Assets	Community Health Services
Metropolitan Cluster	Universities and TAFE Assets	Ambulance Services

Map 6.3 Social Infrastructure: Community and Justice



Source: Greater Sydney Commission (2019)

WPC Boundary	Strategic Centre	Libraries and Archives
Metropolitan Centre	Justice Assets	Community Facilities
Metropolitan Cluster	Police Assets	Arts & Cultural Facilities

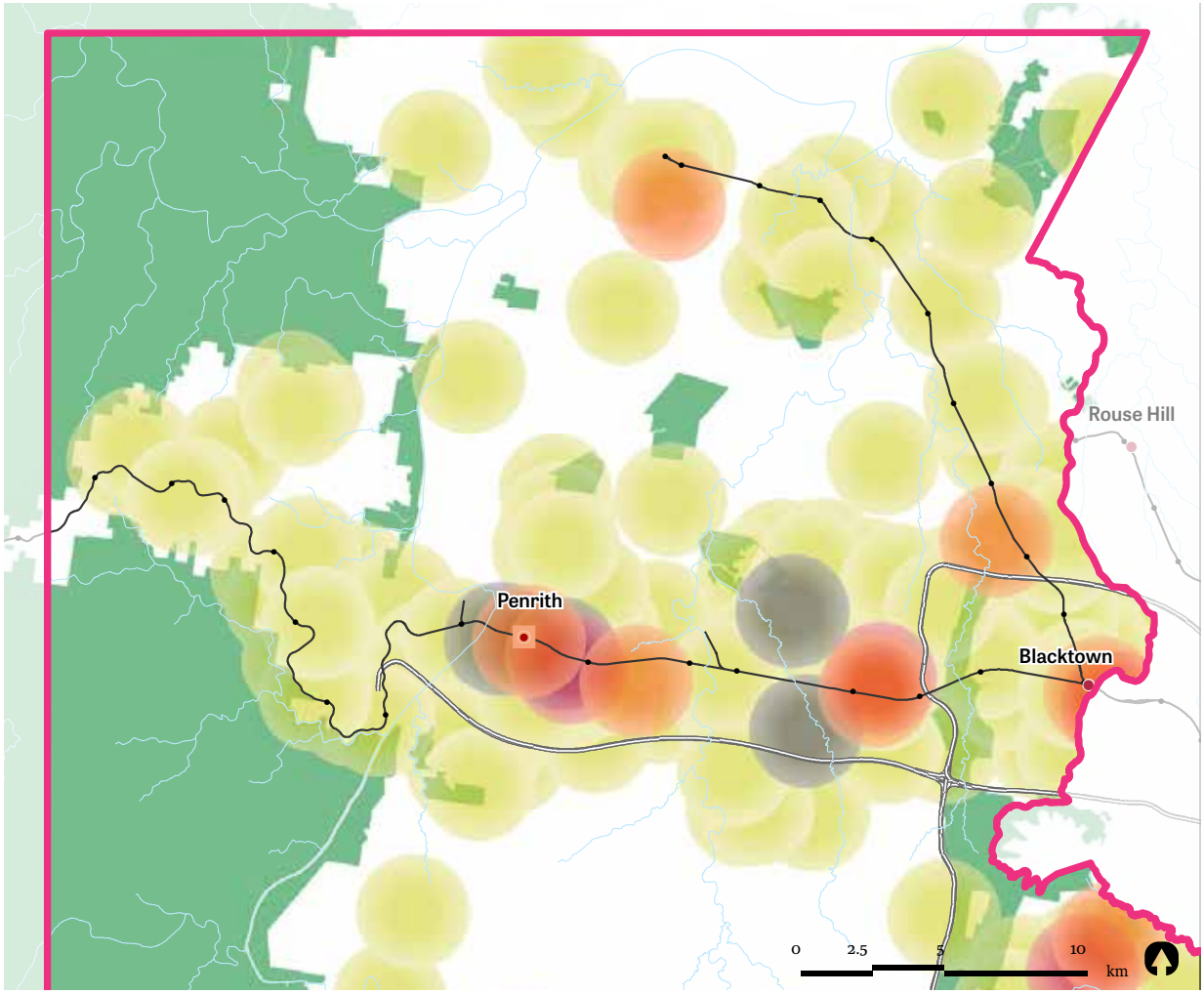
6.9 Social Infrastructure: Health & Education - North Cluster

In the North Cluster, most health and education assets are located along railway corridors, reflecting older patterns of development in the WPC. Smaller scale health and education facilities are located in the rural villages with the concentration of high school, tertiary education and major health services within the larger regional centres of Richmond, Penrith and Blacktown.

Within the urban areas, there are opportunities through greater collaboration, for joint and shared use arrangements, specifically within health and education facilities.

86	Education Assets
3	TAFE and Higher Education Facilities
3	Ambulance Stations
1	Public Hospitals
0	Community Health Services

Map 6.2a Social Infrastructure: Health and Education - North Cluster



Source: Greater Sydney Commission (2019)

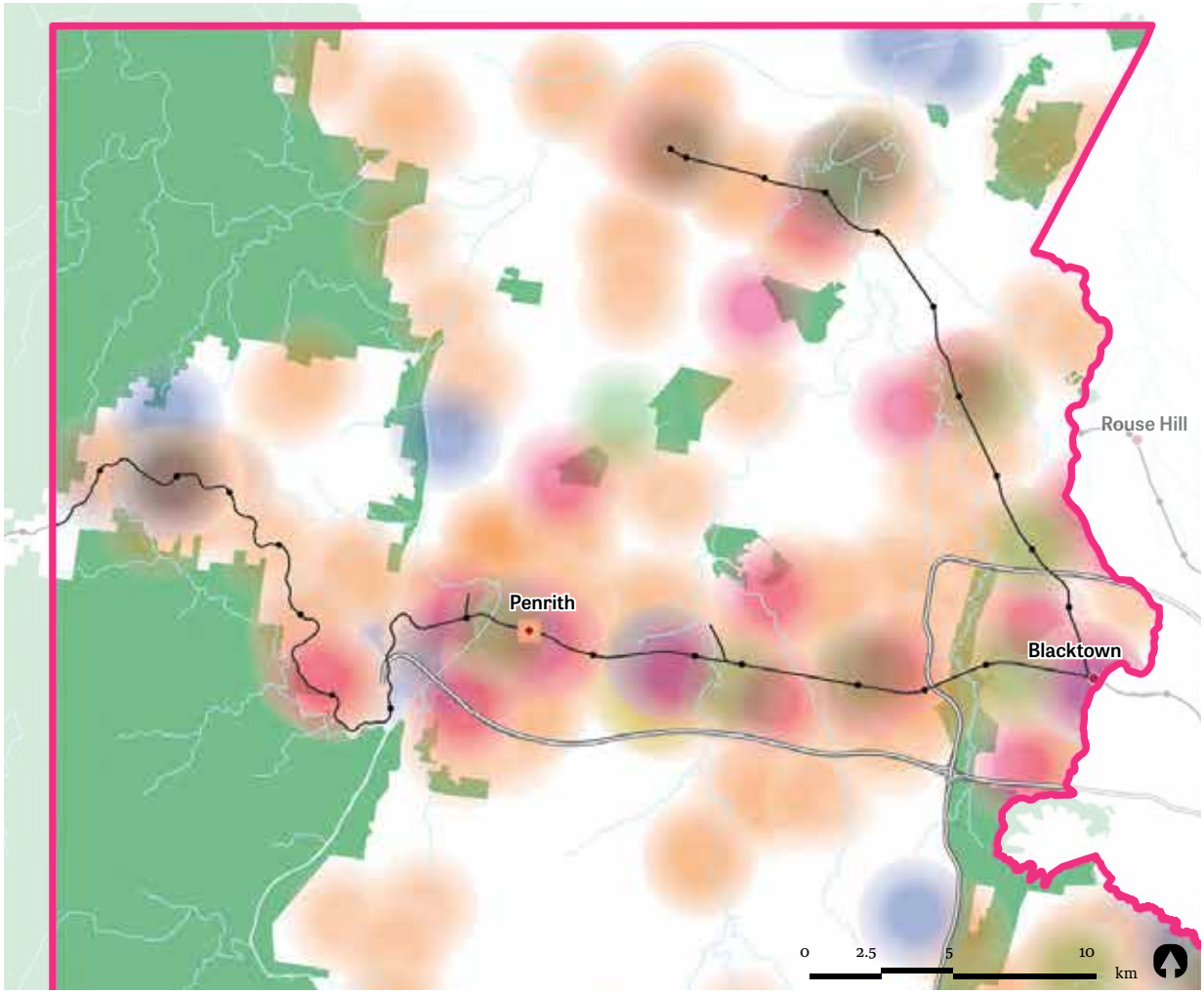
WPC Boundary	Strategic Centre	Public Hospitals
Metropolitan Centre	Education Assets	Community Health Services
Metropolitan Cluster	Universities and TAFE Assets	Ambulance Services

6.10 Social Infrastructure: Community & Justice - North Cluster

In the north Cluster Community and Justice facilities have generally been provided at rates in line with development. Facilities are located close to higher population, often close to major transport corridors. Community services and justice needs, while traditionally a reactive service, require future planning to enable new urban areas to establish a high level of service that greater reflects the needs of new and growing communities.

9	Libraries and Archives
110	Community Facilities
23	Arts and Cultural Facilities
22	Justice Assets
8	Police Assets

Map 6.3a Social Infrastructure: Community and Justice - North Cluster



Source: Greater Sydney Commission (2019)

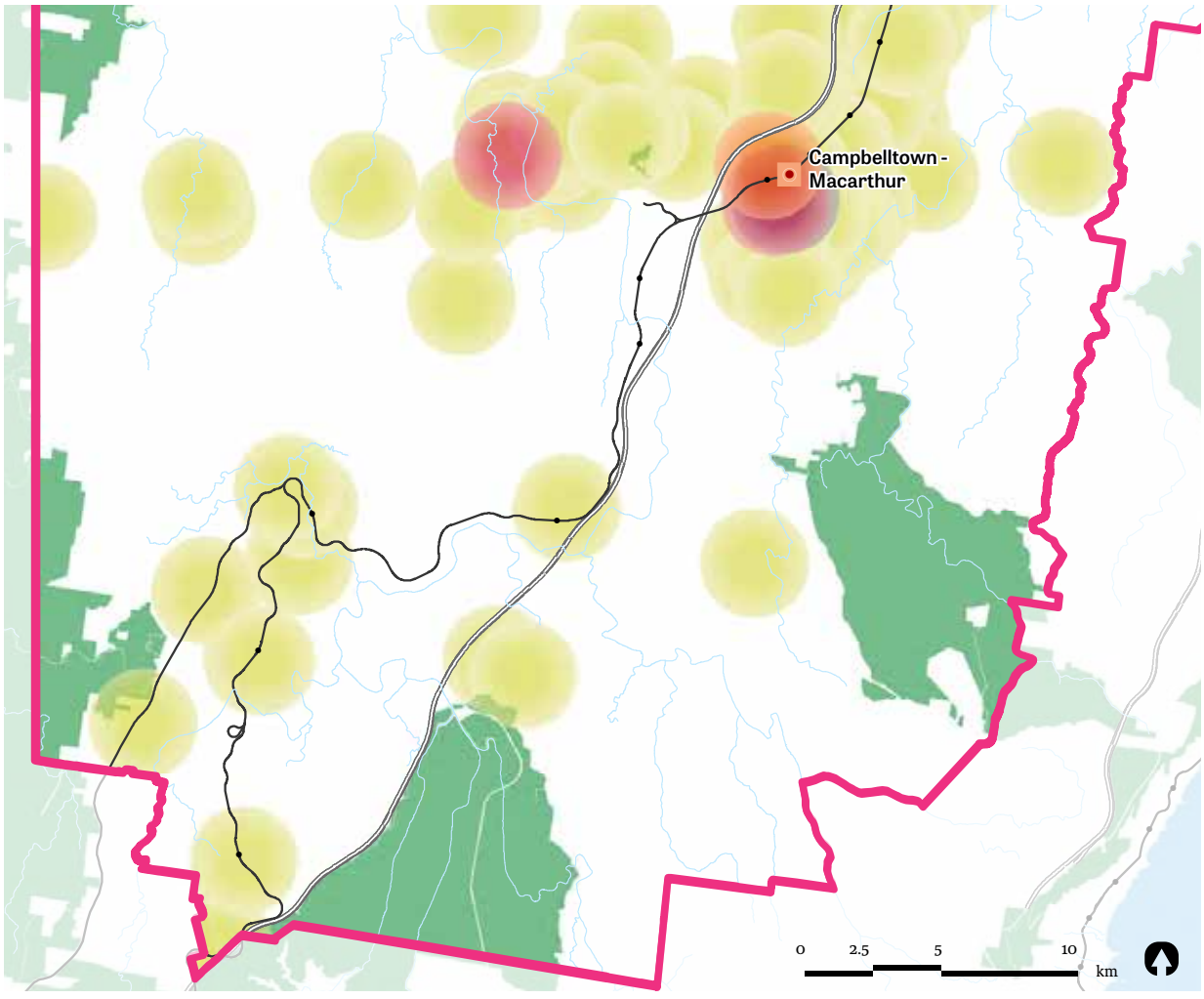
WPC Boundary	Strategic Centre	Libraries and Archives
Metropolitan Centre	Justice Assets	Community Facilities
Metropolitan Cluster	Police Assets	Arts & Cultural Facilities

6.11 Social Infrastructure: Health & Education - South Cluster

The provision of health and education social infrastructure is closely aligned to the existing rail corridors and within the established metropolitan clusters. The provision of education infrastructure appears to be lagging behind the new residential developments along the Narellan Road/ The Northern Road corridor. The majority of infrastructure is concentrated west of the Western Sydney Parklands and North of the Western Motorway (M4).

92	Education Assets
4	TAFE and Higher Education Facilities
2	Ambulance Stations
2	Public Hospitals
0	Community Health Services

Map 6.2b Social Infrastructure: Health and Education - South Cluster



Source: Greater Sydney Commission (2019)

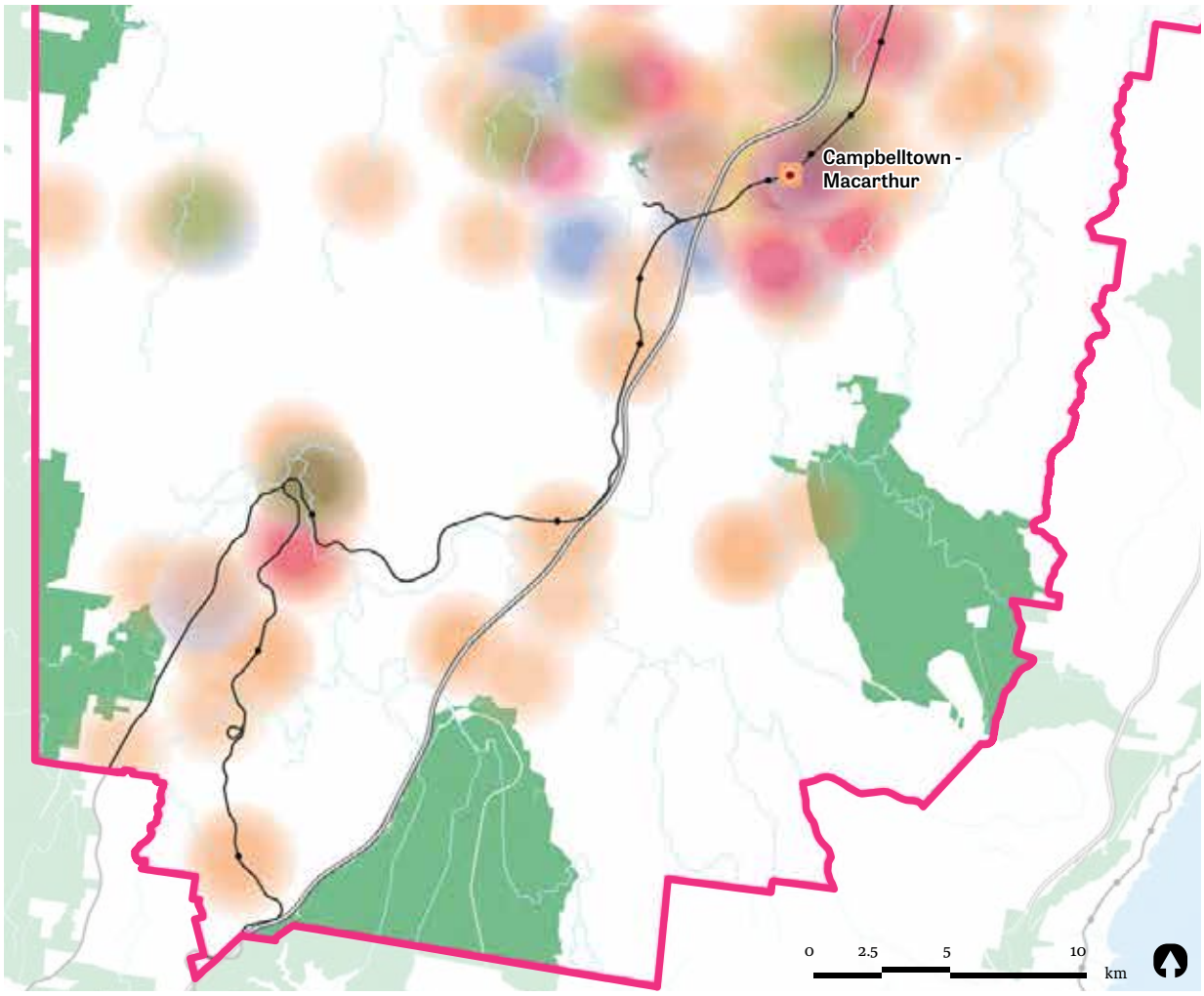
WPC Boundary	Strategic Centre	Public Hospitals
Metropolitan Centre	Education Assets	Community Health Services
Metropolitan Cluster	Universities and TAFE Assets	Ambulance Services

6.12 Social Infrastructure: Community & Justice - South Cluster

The community and justice social infrastructure follows general population growth trends and traditionally have been responding to growth. Community and justice facilities are located wherever there are clusters of residential accommodation along the major transport corridors. Future, community and justice services will require detailed planning to enable new areas to achieve a high level of service that are complementary to existing and established services.

9	Libraries and Archives
104	Community Facilities
16	Arts and Cultural Facilities
19	Justice Assets
9	Police Assets

Map 6.3b Social Infrastructure: Community and Justice - South Cluster



Source: Greater Sydney Commission (2019)

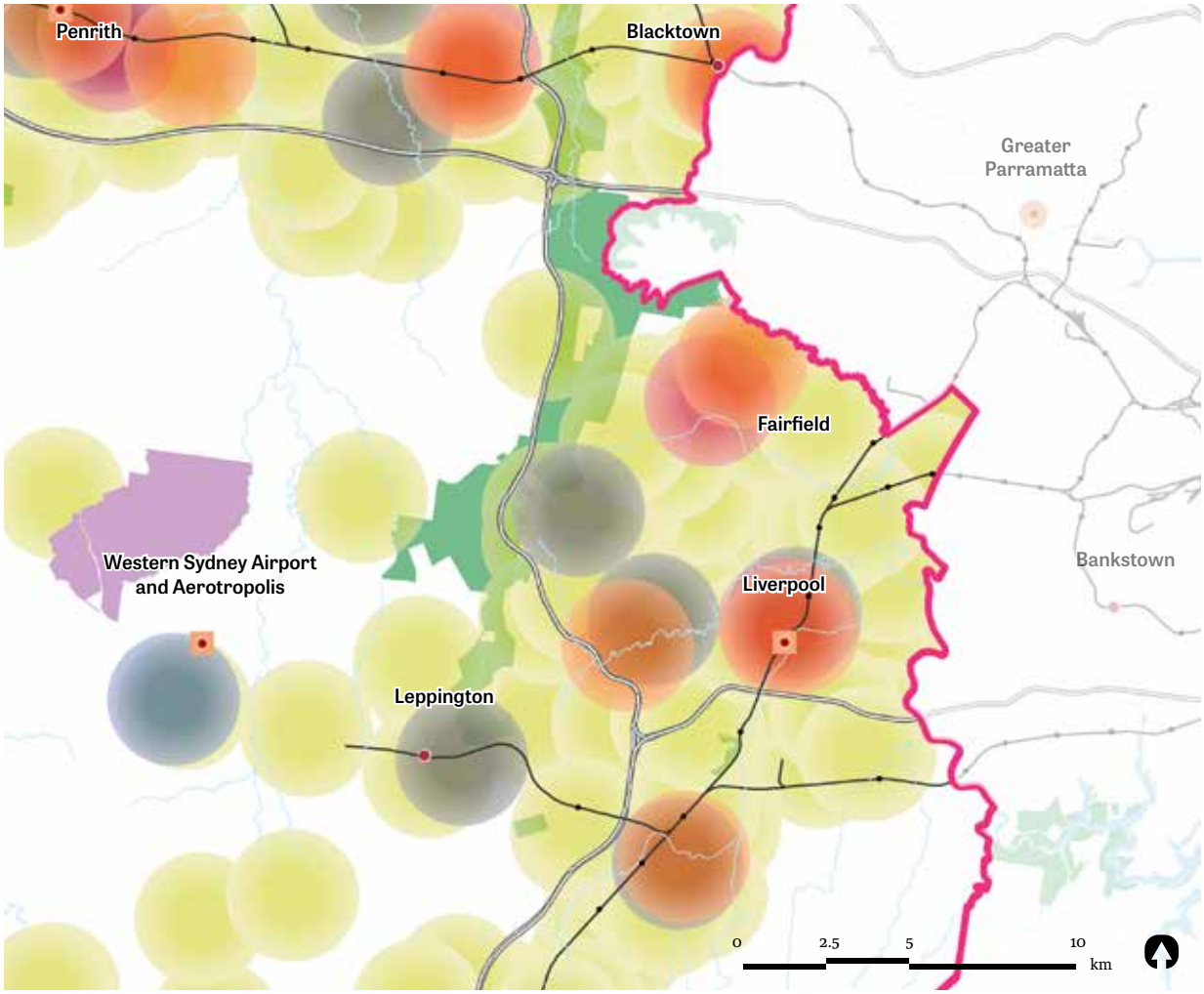
WPC Boundary	Strategic Centre	Libraries and Archives
Metropolitan Centre	Justice Assets	Community Facilities
Metropolitan Cluster	Police Assets	Arts & Cultural Facilities

6.13 Social Infrastructure: Health & Education - East Cluster

The urbanised nature of the East Cluster means that there is a broader distribution of infrastructure and services. Liverpool Hospital provides critical health services to the surrounding population and a strong foundation for its developing Health and Education Precinct.There are opportunities to leverage the nearby airport and aerotropolis to provide and enhance health and education facilities.

156	Education Assets
6	TAFE and Higher Education Facilities
5	Ambulance Stations
3	Public Hospitals
0	Community Health Services

Map 6.2c Social Infrastructure: Health and Education - East Cluster



Source: Greater Sydney Commission (2019)

WPC Boundary	Strategic Centre	Public Hospitals
Metropolitan Centre	Education Assets	Community Health Services
Metropolitan Cluster	Universities and TAFE Assets	Ambulance Services

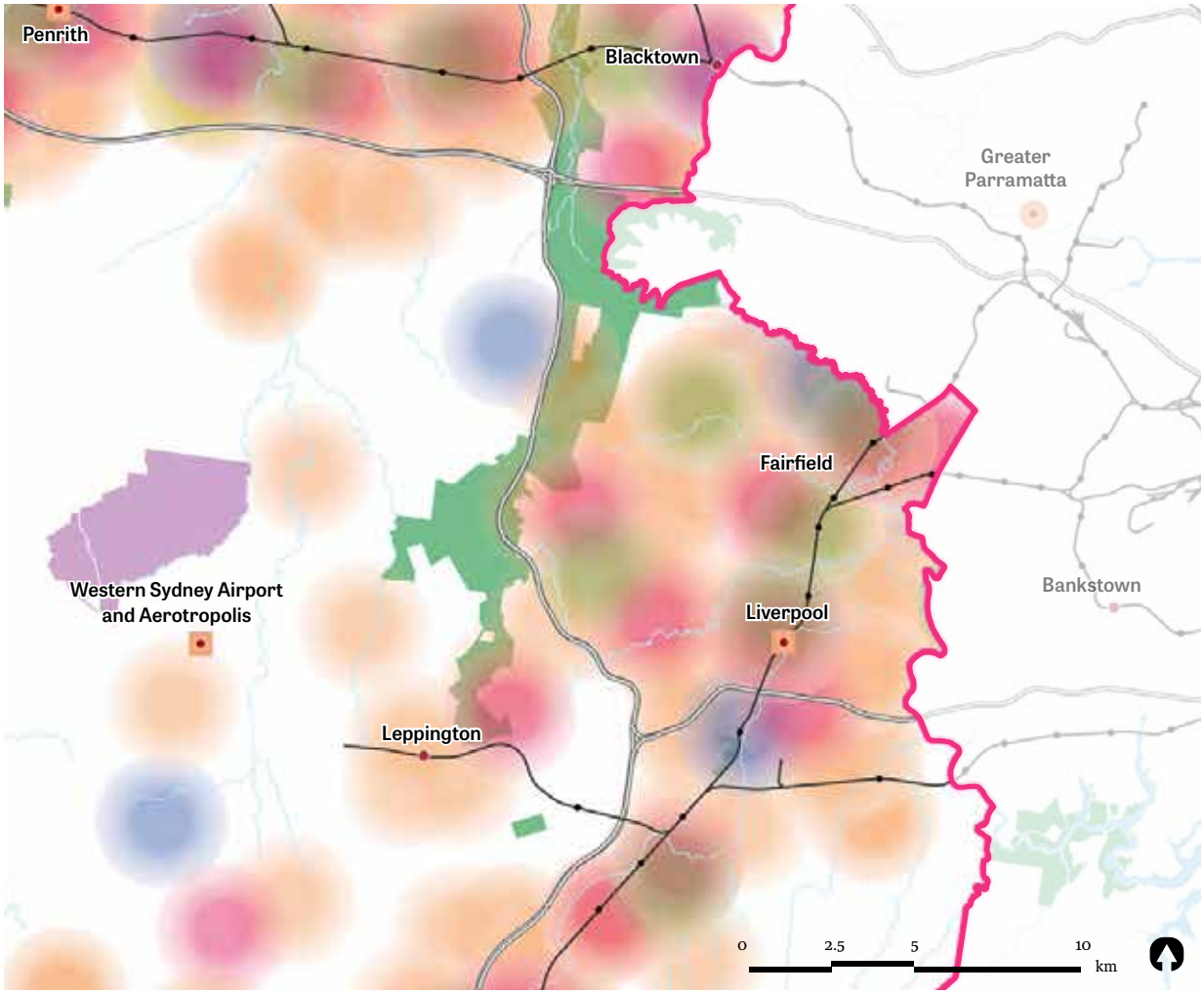
6.14 Social Infrastructure: Community & Justice - East Cluster

There are a variety of community and justice services spread out across the East Cluster, allowing it to service the community effectively. Community facilities are more prevalent in established urban areas with a wide variety of services within the metropolitan clusters and town centres.

Additional community and justice resources may be required to support urban growth outside of existing metropolitan clusters.

13	Libraries and Archives
109	Community Facilities
11	Arts and Cultural Facilities
26	Justice Assets
9	Police Assets

Map 6.3c Social Infrastructure: Community and Justice - East Cluster



Source: Greater Sydney Commission (2019)

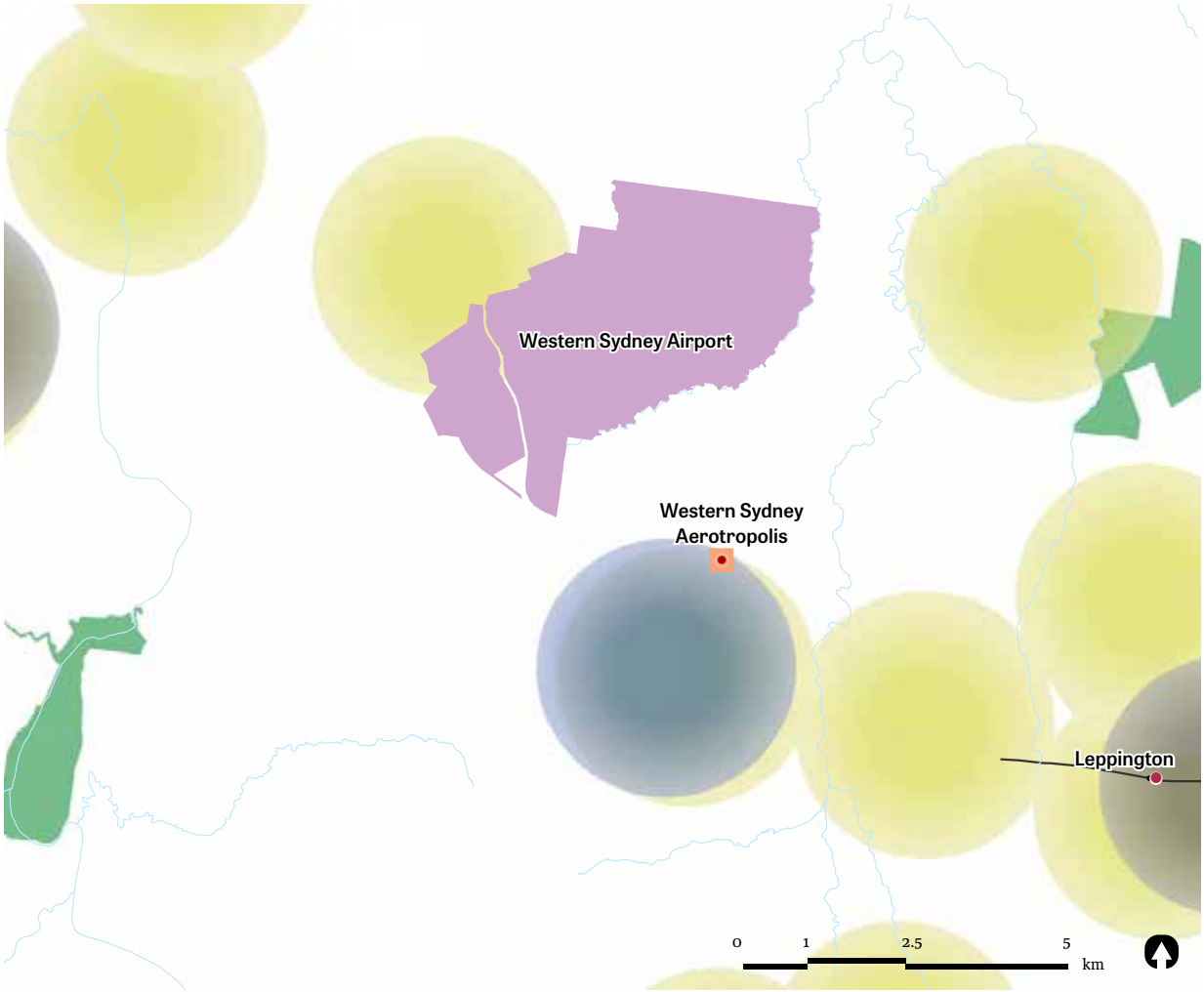
WPC Boundary	Strategic Centre	Libraries and Archives
Metropolitan Centre	Justice Assets	Community Facilities
Metropolitan Cluster	Police Assets	Arts & Cultural Facilities

6.15 Social Infrastructure: Health & Education - Aerotropolis Cluster

A small number of health and education facilities have been established within the Aerotropolis Cluster, however opportunities exist to further develop and expand these services. Future development has the potential to integrate social infrastructure with centres and transport services, ensuring that health and education services are located close to the emerging population.

2	Education Assets
0	TAFE and Higher Education Facilities
0	Ambulance Stations
0	Public Hospitals
1	Community Health Services

Map 6.2d Social Infrastructure: Health and Education - Aerotropolis Cluster



Source: Greater Sydney Commission (2019)

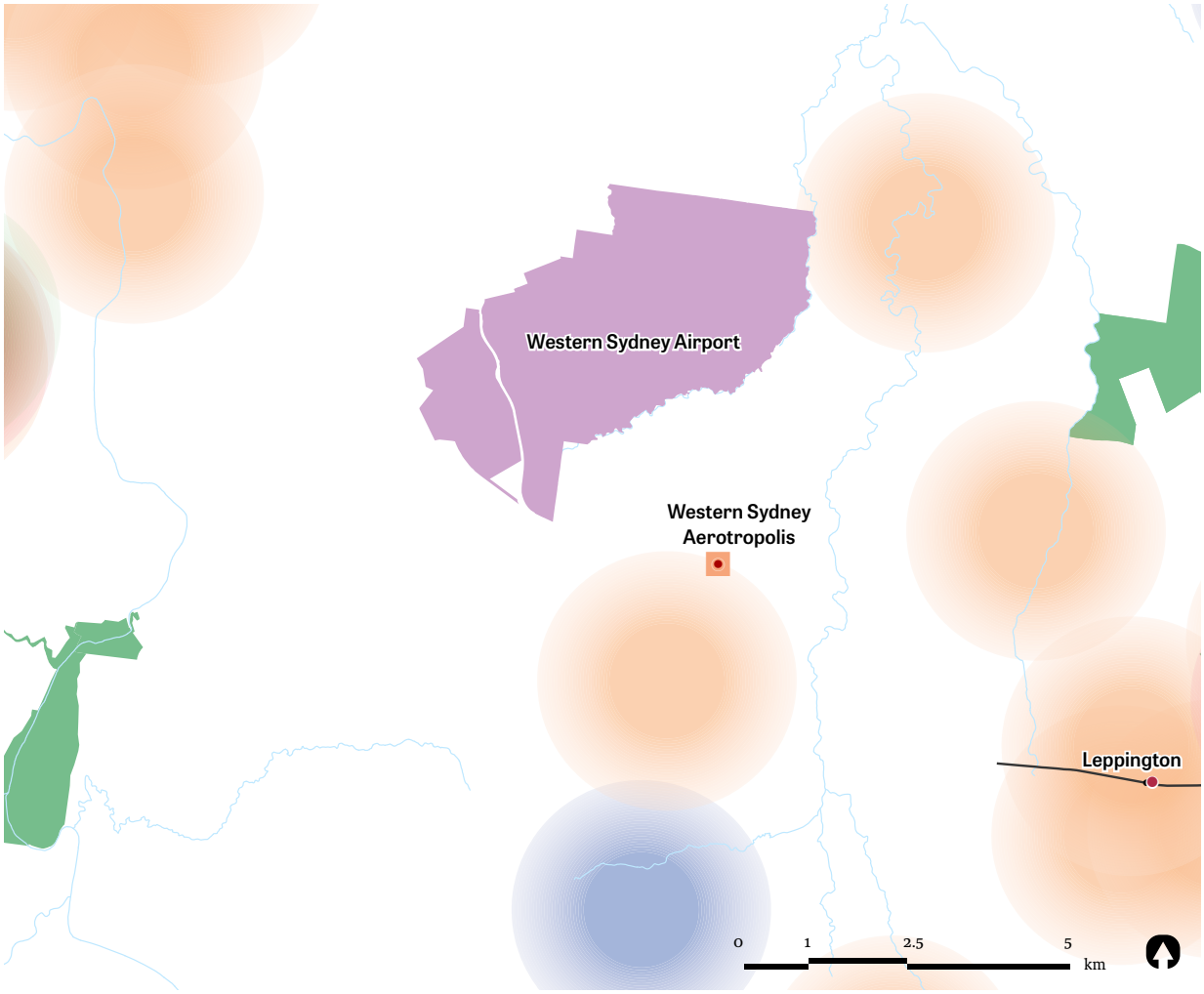
WPC Boundary	Strategic Centre	Public Hospitals
Metropolitan Centre	Education Assets	Community Health Services
Metropolitan Cluster	Universities and TAFE Assets	Ambulance Services

6.16 Social Infrastructure: Community & Justice - Aerotropolis Cluster

The undeveloped nature of this Cluster presents opportunities to deliver social infrastructure integrated with centres and transport services. There will be a need for social infrastructure strategies to identify how higher order services will be accessed during earlier stages of development before there is sufficient demand and population to support these functions.

0	Libraries and Archives
0	Community Facilities
0	Arts and Cultural Facilities
0	Justice Assets
0	Police Assets

Map 6.3d Social Infrastructure: Community and Justice - Aerotropolis Cluster



Source: Greater Sydney Commission (2019)

WPC Boundary	Strategic Centre	Libraries and Archives
Metropolitan Centre	Justice Assets	Community Facilities
Metropolitan Cluster	Police Assets	Arts & Cultural Facilities

6.17 Service Utilities

While the majority of services are clustered in the existing urban area, a number of Sydney's core service corridors pass through the non-urban parts of the Western Parkland City. This includes the primary water supply channels, pipelines linking the water supply dams to treatment plants, and high-voltage transmission lines. Utility servicing needs will significantly affect the staging of new development, but there are opportunities to deploy alternative technologies that may avoid the need to rely on trunk connections to centralised utilities. Target place outcomes will need to consider the opportunities and risks associated with alternative servicing against centralised service connections.

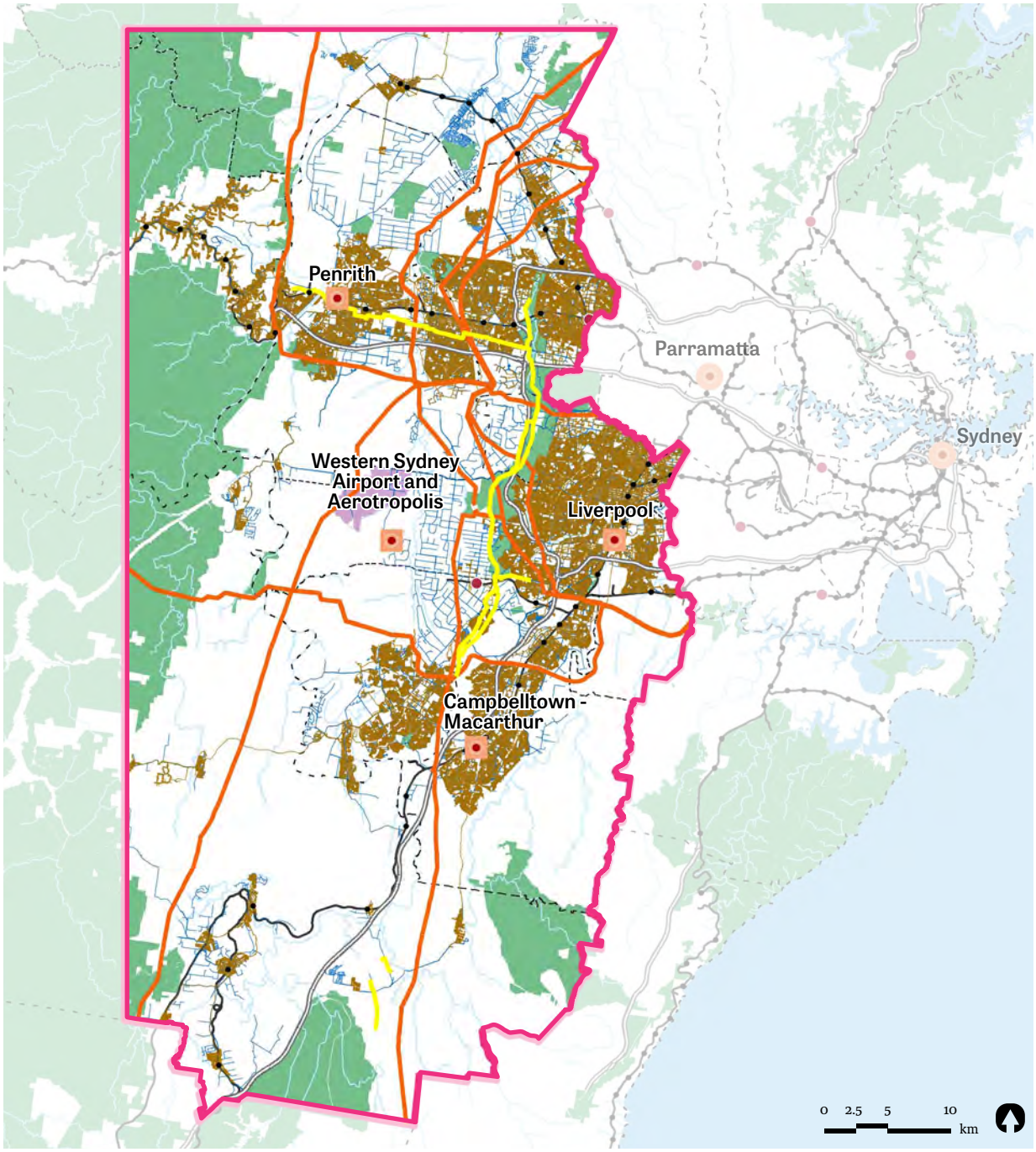
With the evolution of technology, there are opportunities to utilise alternative servicing strategies that facilitate the achievement of circular economy based communities. The utilisation of natural features within the landscape for water storage and treatment as well as local power generation can facilitate development that does not have access to the trunk infrastructure.

Service Utilities within the WPC Boundary

31%	of land provided with piped drinking water
22%	of land serviced by Sewerage
565	kilometres of high voltage infrastructure
87	kilometres of main gas pipelines

Source: Sydney Water (2019), Endeavour Energy (2019), Transgrid (2019)

Map 6.17 Utilities



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Water and Sewerage Service
Metropolitan Centre	Railway	Water Service only
Metropolitan Cluster	Waterways	Major Gas Service
Strategic Centre	Protected Natural Areas	Major Transmission Lines
Western Sydney Airport		

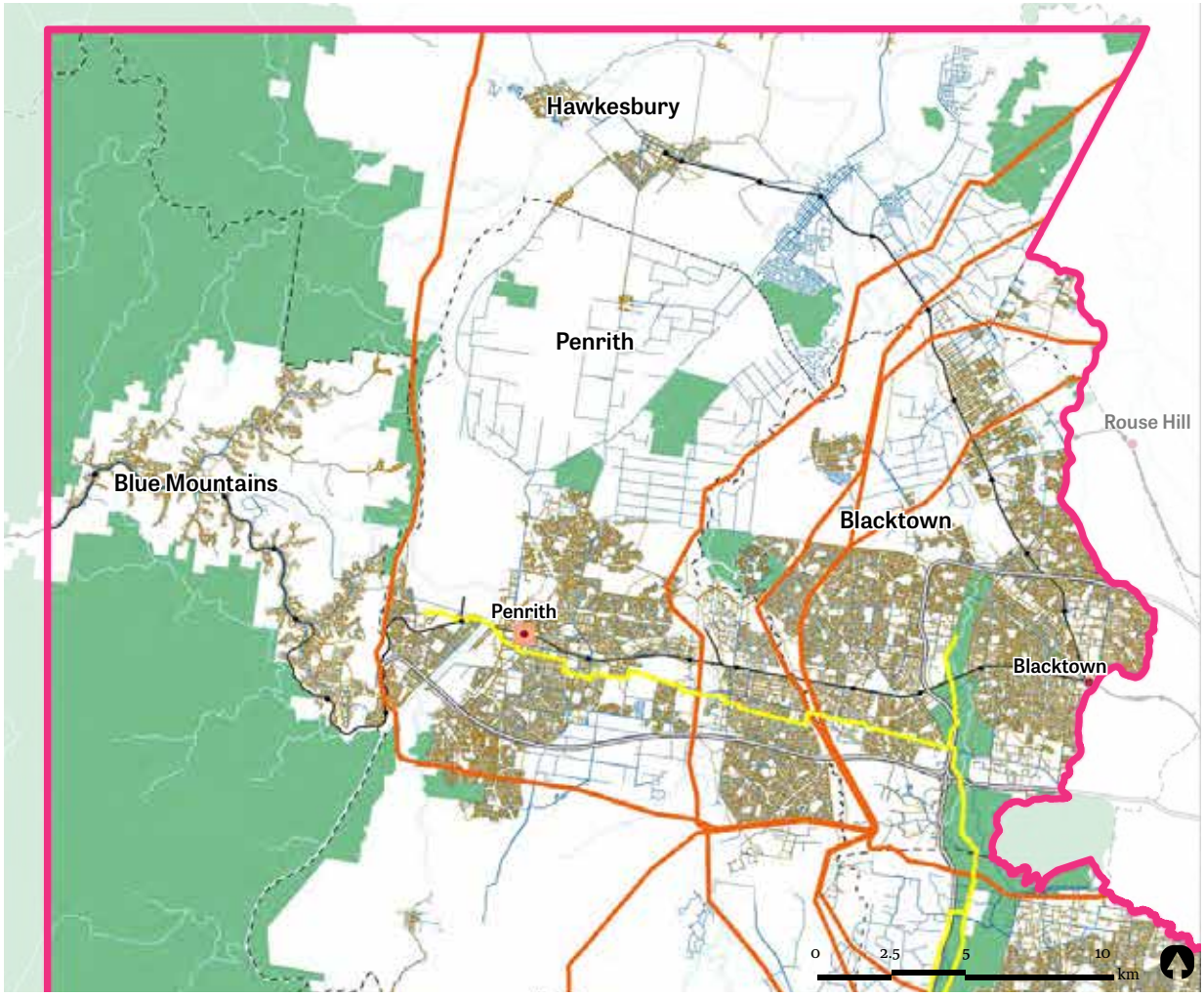
6.18 Utility Services Infrastructure: North Cluster

Water and electricity services in the North Cluster are generally available due to the proximity of major trunk infrastructure, subject to development being staged in a manner that allows for new trunk lines to be efficiently utilised.

Service Utilities in the North Cluster

31%	of land provided with piped drinking water
20%	of land serviced by Sewerage
186	kilometres of high voltage infrastructure
17	kilometres of main gas pipelines

Map 6.17a Utilities - North Cluster



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Water and Sewerage Service
Metropolitan Centre	Railway	Water Service only
Metropolitan Cluster	Waterways	Major Gas Service
Strategic Centre	Protected Natural Areas	Major Transmission Lines

6.19 Utility Services Infrastructure: South Cluster

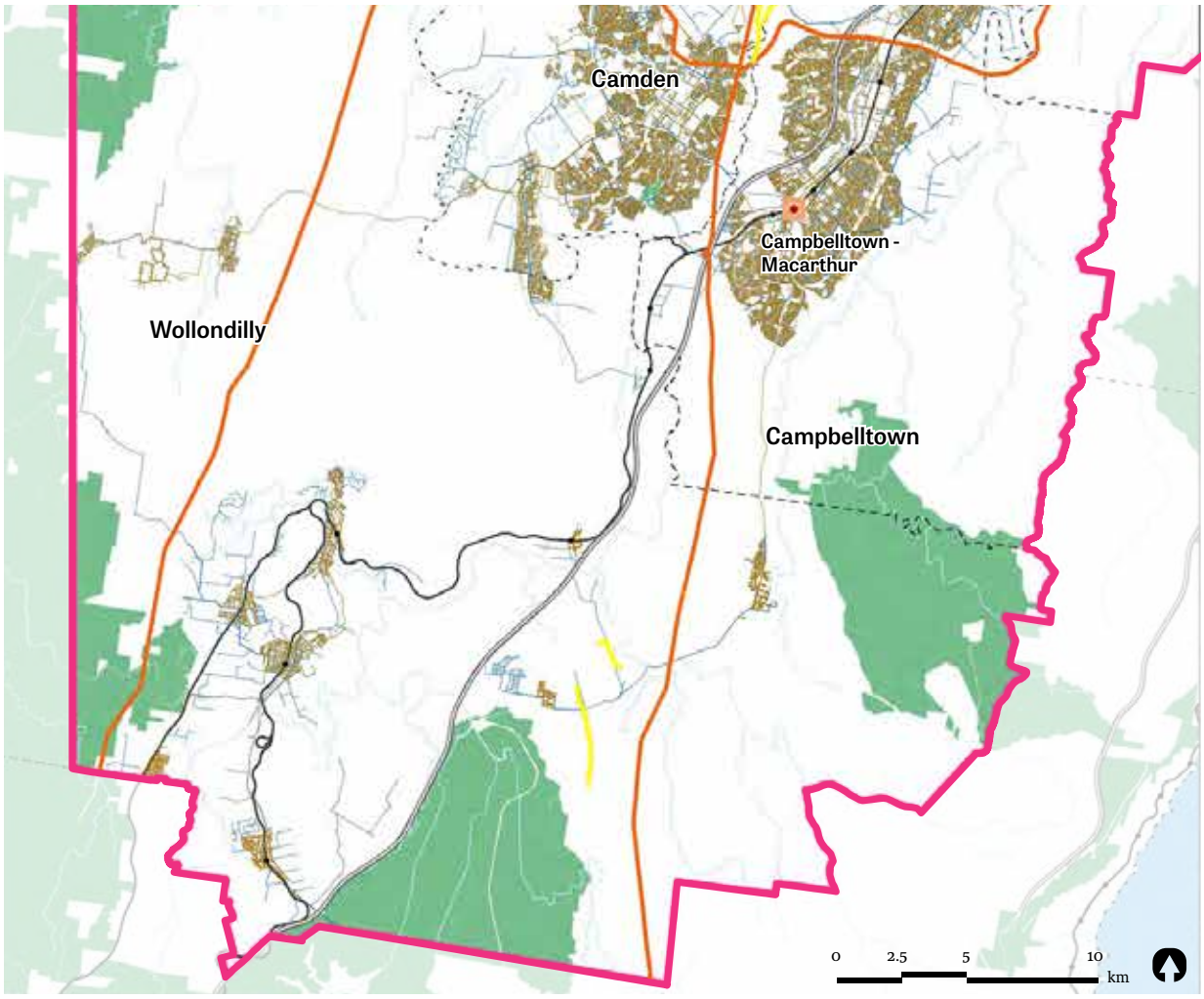
The urbanisation in the South Cluster has resulted in a significant expansion of services to parts of the Camden Local Government Area (LGA). Traditional servicing approaches will encourage development to focus on The Northern Road corridor.

There are limited existing services in much of the greenfield and rural land in the Camden and Wollondilly LGA. While drinking water services may be available, waste water treatment and connections do not extend to much of these LGAs.

Service Utilities in the South Cluster

20%	of land provided with piped drinking water
14%	of land serviced by Sewerage
160	kilometres of high voltage infrastructure
16	kilometres of main gas pipelines

Map 6.17b Utilities - South Cluster



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Water and Sewerage Service
Metropolitan Centre	Railway	Water Service only
Metropolitan Cluster	Waterways	Major Gas Service
Strategic Centre	Protected Natural Areas	Major Transmission Lines

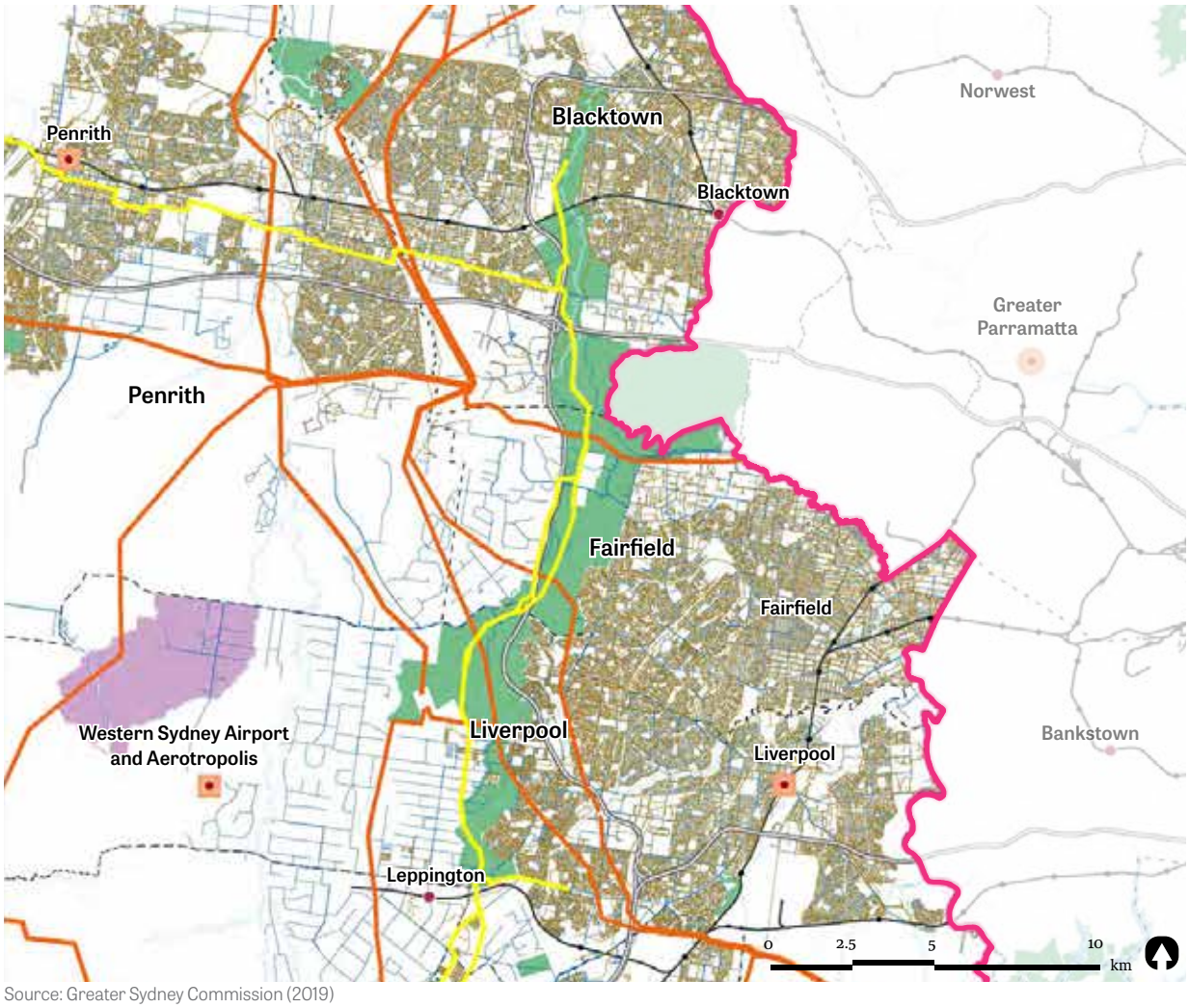
6.20 Utility Services Infrastructure: East Cluster

This highly urbanised cluster is well-serviced by existing utilities, existing infrastructure may require upgrading over time to meet the demands of growing communities or increased demand as a result of redevelopment. There may be some capacity to extend services to the adjacent Aerotropolis Cluster, at least to provide temporary service until more permanent arrangements become viable.

Service Utilities in the East Cluster

70%	of land provided with piped drinking water
61%	of land serviced by Sewerage
181	kilometres of high voltage infrastructure
54	kilometres of main gas pipelines

Map 6.17c Utilities - East Cluster



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Water and Sewerage Service
Metropolitan Centre	Railway	Water Service only
Metropolitan Cluster	Waterways	Major Gas Service
Strategic Centre	Protected Natural Areas	Major Transmission Lines

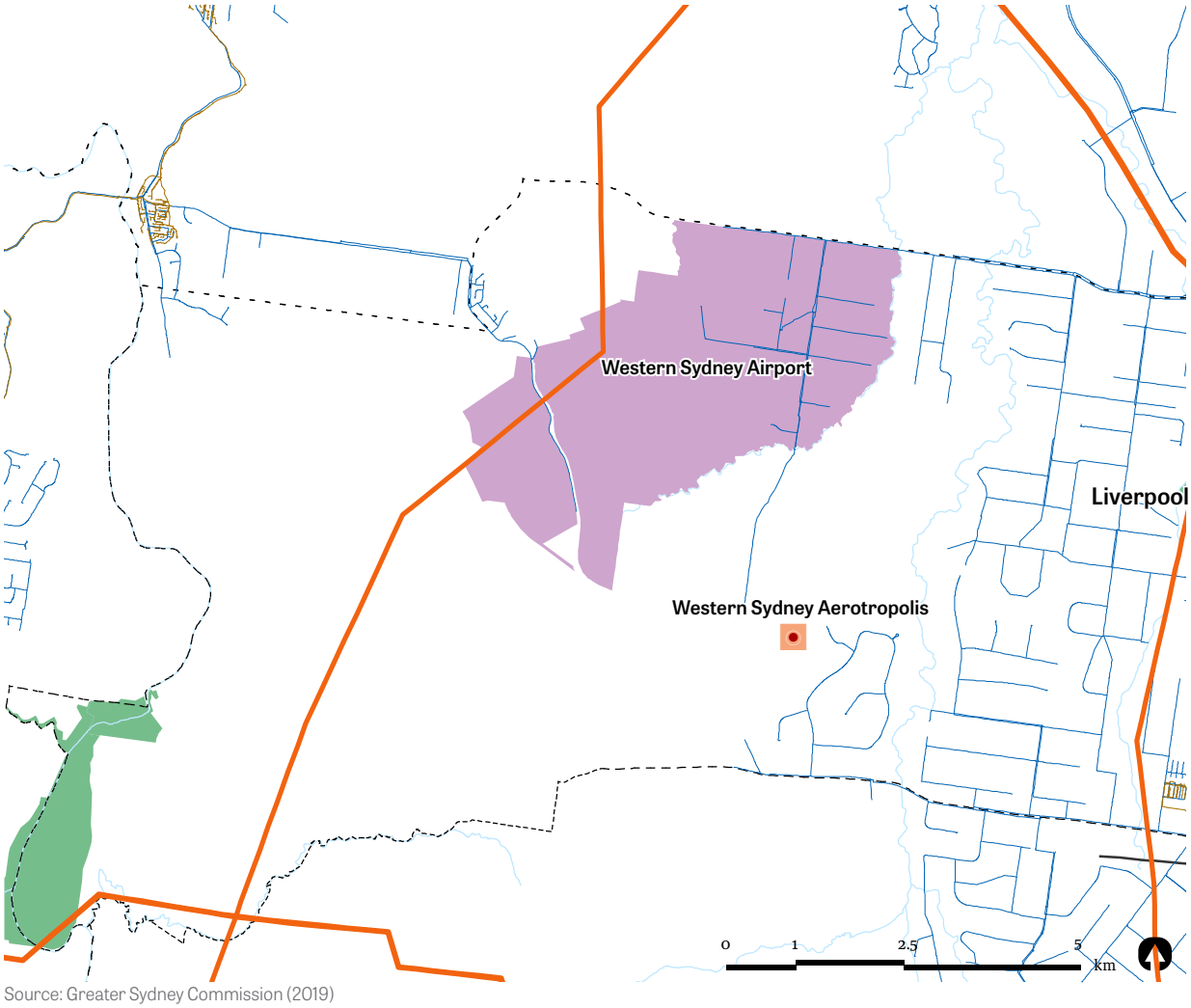
6.21 Utility Services Infrastructure: Aerotropolis Cluster

Servicing of the Aerotropolis Cluster will require significant extensions to existing services from the South, or the implementation of decentralised services using alternative technologies. There are good opportunities for alternative technologies to be used that promote a low-carbon economy approach to the Aerotropolis.

Service Utilities in the Aerotropolis Cluster

24%	of land provided with piped drinking water
0.05%	of land serviced by Sewerage
39	kilometres of high voltage infrastructure
0	kilometres of main gas pipelines

Map 6.17d Utilities - Aerotropolis Cluster



Source: Greater Sydney Commission (2019)

Metropolitan Centre	Railway	Water and Sewerage Service
Metropolitan Cluster	Waterways	Water Service only
Strategic Centre	Protected Natural Areas	Major Gas Service
Motorway	Major Transmission Lines	

7

Constraints and Opportunities

7 Constraints and Opportunities

7.1 Overview

Future land development in the Western Parkland City (WPC) is inevitable. The growth that will occur with the construction and operation of the Western Sydney Airport, Metro Greater West and other transport, social, health and education capital investment projects will not only support the existing City but also facilitate its future growth. Constraints to future urban land uses as well as potential city-shaping opportunities are derived by first developing a high level analysis of existing constraints into a consolidated map that allows the investigation of land that is:

- development constrained;
- potentially developable with constraints; and
- potentially developable.

7.2 Cumulative Constraints

An analysis of the cumulative physical constraints of the WPC is provided in Map 7.1. This map illustrates the degree of potential constraint to development as a result of underlying natural and physical characteristics.

The ranking of development potential is based on the following definitions:

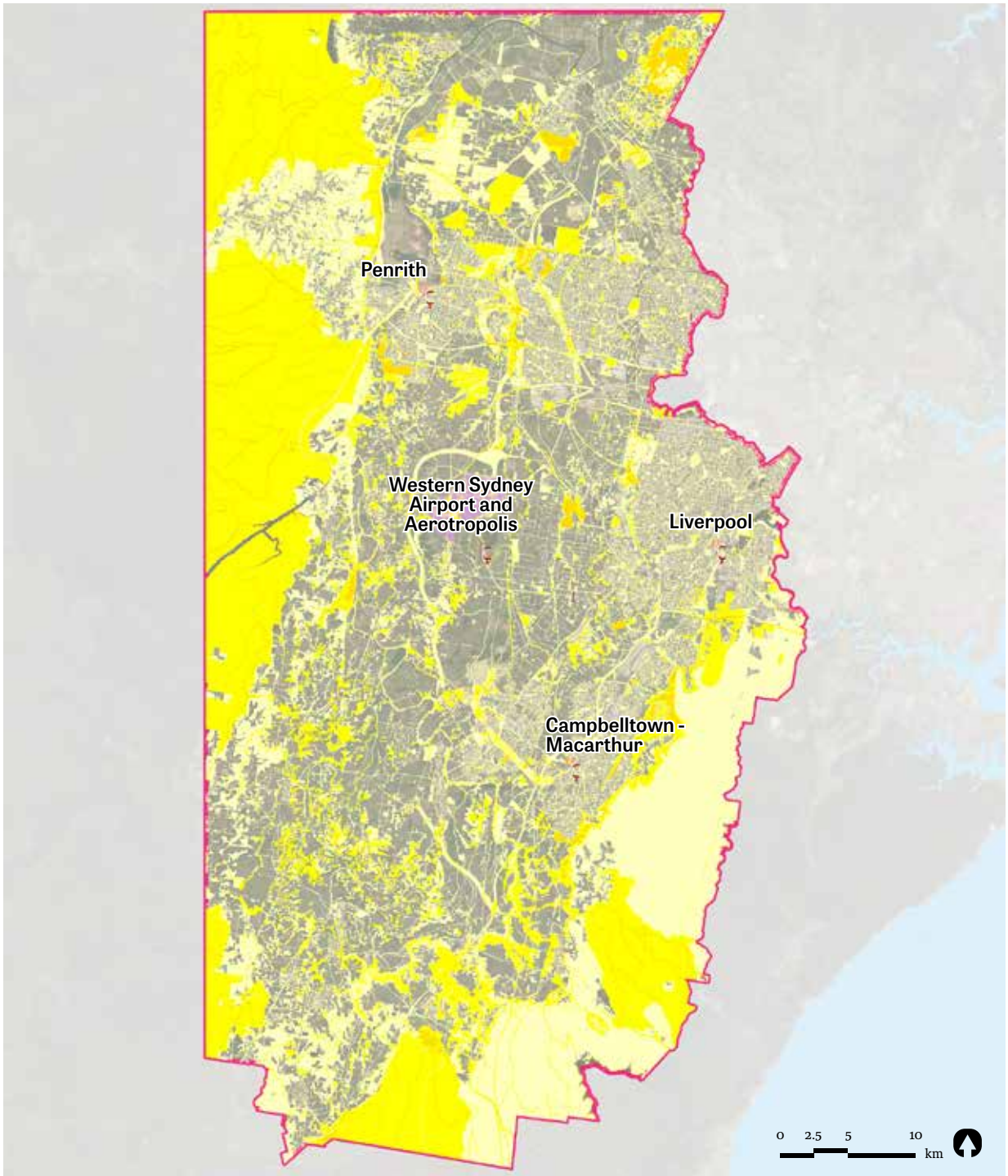
- High Constraint (4-5 constraints) – Land contains a high degree of constraint, requiring substantial mitigation, which most likely precludes development
- Moderate Constraint (2-3 constraints) – Land contains a degree of constraint which requires mitigation, but does not generally preclude development
- Low Constraint (0-1 constraint) – Land is generally developable, but constraints may limit the specific location, intensity or type of land uses that are possible.

Table 7.1: Number of Constraints by Cluster (ha)

Area	Number of Constraints (%)					
	Total	1	2	3	4	5
North Cluster	63.50%	24.36%	36.39%	2.71%	0.03%	0%
South Cluster	58.50%	34.06%	23.18%	1.24%	0.01%	0%
East Cluster	40.95%	32.60%	7.12%	1.18%	0.05%	0%
Aerotropolis Cluster	27.26%	19.53%	6.75%	0.97%	0.01%	0%
Total Western Parkland City	55.72%					

Source: Greater Sydney Commission (2019)

Map 7.1 Western Parkland City - Number of Constraints



Source: Greater Sydney Commission (2019)

WPC Boundary	Western Sydney Airport	Three Constraints
Metropolitan Centre	One Constraint	Four Constraints
Metropolitan Cluster	Two Constraints	Five Constraints
Strategic Centre		

7.3 Undevelopable (Restricted) Land

A number of constraints have been identified that will preclude the use of the land for future urban development. The land uses identified in Table 7.3 below as not suitable for urban development may still be used for parklands, playing fields or other organised or informal recreational uses.

Map 7.2 illustrates the degree of constraint to urban development as a result of the underlying natural and physical characteristics. Constraints identified at this level include significant areas of land with a high biodiversity value. More constrained land has been identified surrounding the metropolitan clusters of Penrith, Liverpool and Campbelltown-Macarthur due to a higher degree of information of potential constraints on the land in these areas. Additional areas with restricted development potential are likely to be identified as investigations progress.

There are a number of other constraints that are not mapped that may also be a constraint to urban land uses in the future including:

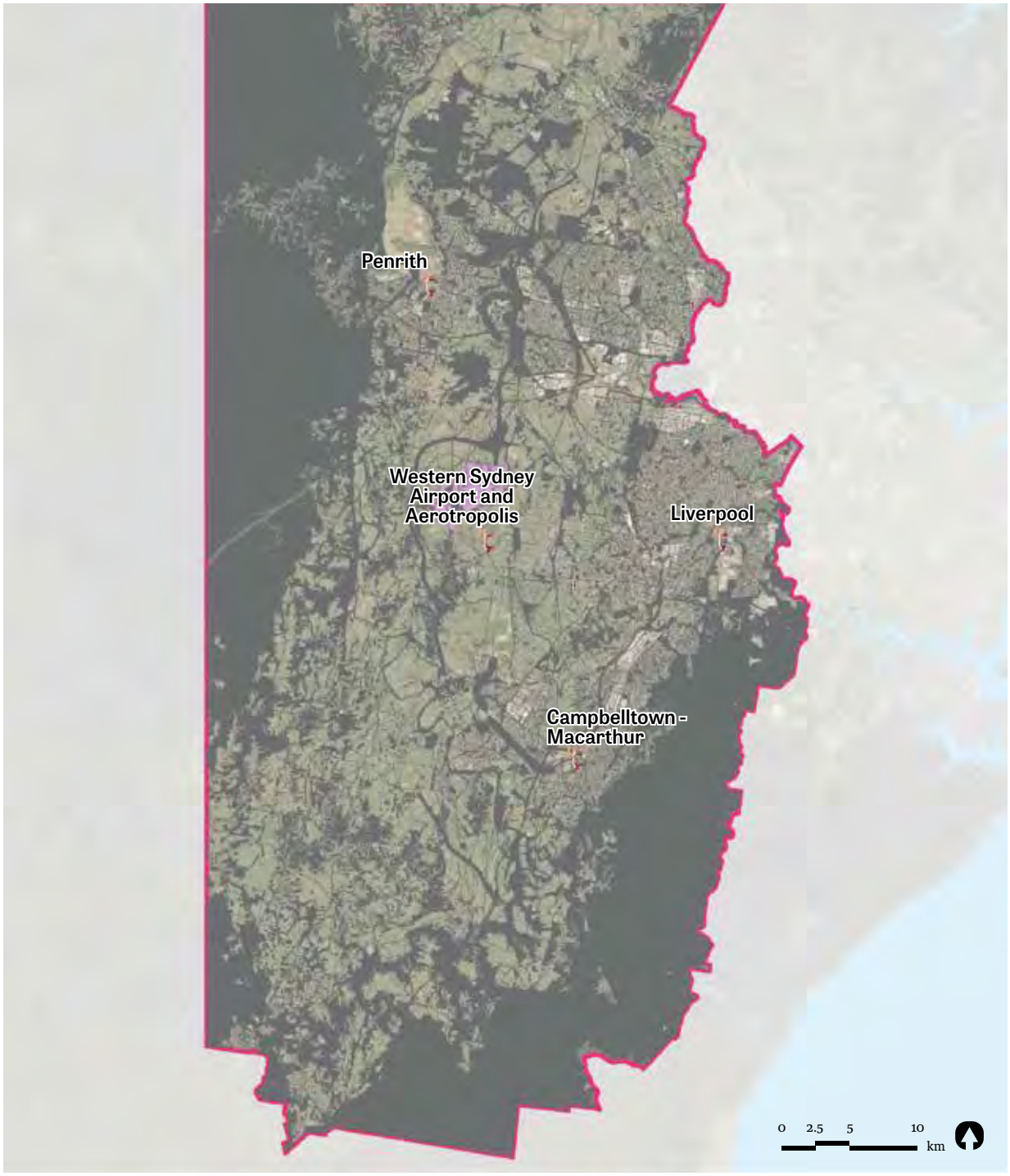
- Aboriginal heritage which may in some instances be considered a constraint to future land development. Development of land with Aboriginal heritage value are to be dealt with on a site-by-site basis.
- Land mapped for infrastructure easements or land identified for corridor protection, are subject to further investigation
- Flooding information has been included for the South Creek Corridor, however City-wide flood information is currently not available.

Table 7.3: Undevelopable (Restricted) Land Definitions

Category	Definition
Existing Infrastructure	State and regionally significant infrastructure including: • State and Regional Roads • Rail Infrastructure • Sewer and water trunk assets • Power transmission lines (over 132kV) and gas mains
Protected Natural Areas	Existing protected natural areas including • National Parks • Western Sydney Parklands.
Urban Parklands	EPI zoned RE1 Public Recreation or RE2 Private Recreation
Existing Vegetation	EPI biodiversity values riparian land and threatened species
Land Reservations and Easements for Infrastructure	State and regionally significant infrastructure easements or gazetted corridor protection including: • State and Regional Roads • Rail Infrastructure • Metro Infrastructure
Flooding	Based on Probable Maximum Flood (PMF) data on the basis that at minimum evacuation planning is required for land falling within the PMF.
Bushfire Prone Land	High Risk
Non-Aboriginal Heritage	EPI heritage buildings and areas

Source: Greater Sydney Commission (2019)

Map 7.2 Western Parkland City - Undevelopable (Restricted) Land



Source: Greater Sydney Commission (2019)

WPC Boundary
Metropolitan Cluster
Strategic Centre
Western Sydney Airport
Undevelopable (Restricted) Land

7.4 Potentially Developable but Constrained Land

A number of constraints have been identified that may have the potential to restrict the capability of the land for future urban uses. The land in Table 7.5 below identified as being potentially developable but constrained will require further specific assessment to confirm the extent of constraints.

Land identified as not capable of facilitating urban development may be used for parklands, playing fields or 'environmental' purposes (e.g. bio banking, stormwater detention). Map 7.3 illustrates the potentially developable but constrained land for urban development within the WPC. This map is to be read in addition to Map 7.2 - Undevelopable (Restricted) Land Map.

The key constraints that may deem land constrained for urban development are detailed in Table 7.4 below. There are a number of other constraints that are not mapped that may also be a constraint to urban land uses in the future including:

- Aboriginal heritage which may in some instances be considered a constraint to future land development. Development of land with Aboriginal heritage value due to the importance and sensitivity of these lands are to be dealt with on a site by site basis.
- Fragmented landholdings which present a restriction to redevelopment in some instances, this is dependent on the scale of proposed change.
- Farm dams and lower category watercourses may be constraints or beneficial to urban development for water storage, treatment or to provide amenity benefits.
- Contamination data is provided as point data and therefore the extent and type of contamination across the WPC is yet unknown. Contaminated sites require further investigation.
- Existing native vegetation in private landholdings is has not mapped. Current legislation requires offsetting for the clearing of native vegetation which will impact on the development potential of some landholdings.

Table 7.4: Potentially Developable but Constrained Land Definitions

Category	Definition
Defence Land	Land within Defence ownership
Existing Vegetation	Existing native vegetation within private ownership
Slope Areas >20%	Slope greater than 20% is generally not suitable for urban development
Non Aboriginal Heritage	EPI local and state listed heritage items and areas
Bushfire Prone Land	Medium risk
Contaminated Land	Dot point data used to identify land holdings subject to contamination, levels of contamination unknown

Source: Greater Sydney Commission (2019)

Table 7.5: Area (ha) of Constraints and Opportunities in the WPC and by Cluster

	Western Parkland City	North Cluster	South Cluster	East Cluster	Aerotropolis Cluster
Total Area (ha)	317,492	98,941	154,113	47,924	16,515
Area Undevelopable (Restricted) Land	177,577	62,939	90,132	20,006	4,500
Area Potentially Developable but Constrained Land	42,248	18,887	15,246	6,892	1,223
Potentially Developable Land	**97,667**	**17,115**	**48,735**	**21,025**	**10,793**

Source: Greater Sydney Commission (2019)

Map 7.3 Western Parkland City - Potentially Developable but Constrained Land

Source: Greater Sydney Commission (2019)

WPC Boundary	Metropolitan Cluster	Strategic Centre
Western Sydney Airport	Undevelopable (Restricted) Land	Potentially Developable but Constrained Land

Note: The data set for Map 7.3 (Existing native vegetation) does not cover the full extent of the WPC Boundary thereby showing straight lines in the western and southern thirds of Map 7.3.

8

Place Outcomes

8 Place Outcomes

8.1 Urban Clusters

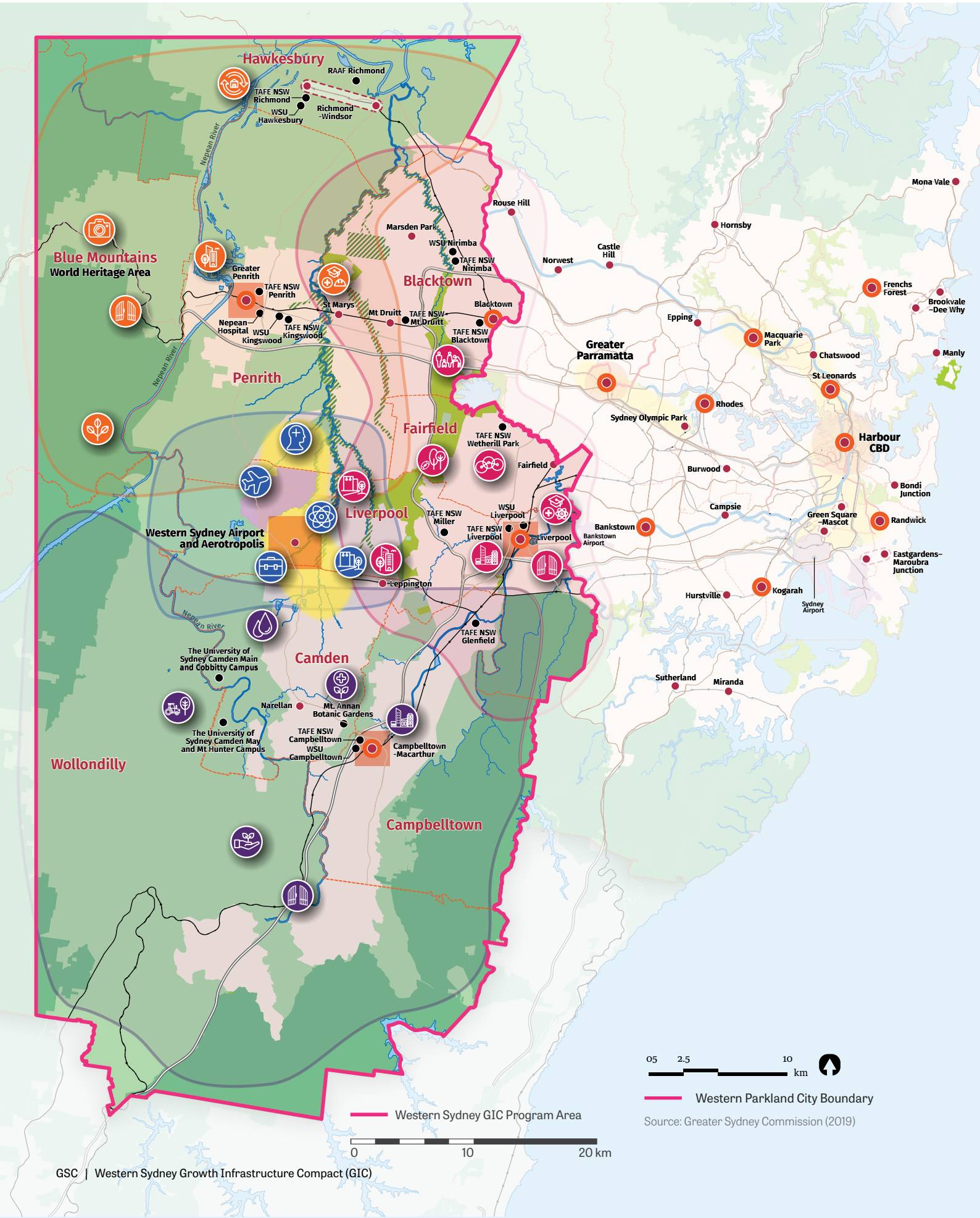
The Western Parkland City contains many diverse places, each having an identity formed out of its history and its current role as part of Greater Sydney. Each of these places will continue to develop its own identity. The unique attributes of these places will contribute to the success of the Western Parkland City by offering a diverse range of places to visit, live, and work.

Places will be supported by appropriate infrastructure and services, offering physical and social connectivity between communities and surrounding landscapes.

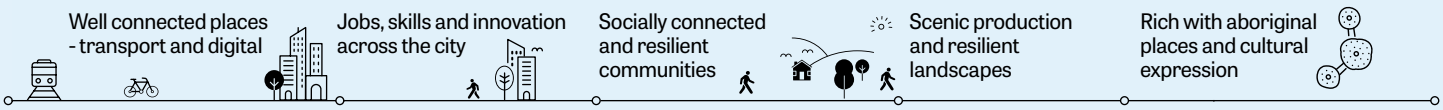
Desired place outcomes establish the vision for each of the four Clusters within the WPC . These place outcomes have been developed through consideration of existing constraints and opportunities, strategic planning, population analysis, and in-depth stakeholder engagement.

- North Cluster
- South Cluster
- East Cluster
- Aerotropolis Cluster

Map 8.1 Western Parkland City - Place Outcomes



GSC | Western Sydney Growth Infrastructure Compact (GIC)



Metropolitan Cluster
Penrith, Blue Mountains, Hawkesbury

- The Western Gateway to Greater Sydney and connector to Western NSW
- Greater Penrith Metropolitan Cluster offering cosmopolitan and cultural lifestyles, with relaxed living
- Internationally renowned and protected Natural Assets, including Blue Mountains World Heritage Area, Hawkesbury Nepean and South Creek Catchments and land with rich agricultural soils
- Resilient Village Communities with diverse lifestyles, their own Unique Character and celebrated Aboriginal and European Heritage
- Major and growing tourism destination anchored by the Blue Mountains World Heritage Area, adventure and recreation facilities, a strong focus on local colonial history, rural character, and beautiful rivers
- Key places delivering Defence, Equine, Education, Science, Innovation, Health, Agriculture and Agribusiness, Commercial, Industrial, and Urban Services

Metropolitan Cluster
Campbelltown, Camden, Wollondilly

- The Southern Gateway to Greater Sydney and connector to the Illawarra and Southern Highlands
- Campbelltown-Macarthur Metropolitan Centre offering regional essential and lifestyle services and facilities, including health and education, transport connections and higher order employment, with a local, district and regional catchment
- Providing Rural and Semi-Rural Lifestyles, grounded in scenic and cultural landscapes, and villages with strong community spirit and character benefitting from supporting infrastructure
- Enhanced Unique Biodiversity and significant Heritage and Natural Assets including Hawkesbury Nepean River, Cumberland Plain and shale sandstone transition forest, and significant koala habitat
- Major Agricultural Producer, Water Supply and Mining Sector, with viable nature, heritage and agriculture-based Tourism

Metropolitan Cluster
Liverpool, Fairfield, Blacktown

- The Eastern Gateway to the Western Sydney Airport and Aerotropolis and connector to Greater Sydney's Central and Eastern Cities
- Vibrant mixed-use Liverpool Metropolitan Centre with commerce, business, tourism and hospitality, together with essential and lifestyle services and facilities
- Growing Strategic Centres with quality public domain, oriented around transit and active transport, and Complementary Industries and Services to Western Sydney Airport and Aerotropolis
- Innovative and growing Industrial, Manufacturing, Retail, Warehousing, Agriculture and Agribusiness Sectors
- Urban living with access to Services and Amenity and valued natural assets in the South Creek Catchment
- A Welcoming, Harmonious and Proud Community that values diversity of lifestyles, mix of cultures, and plentiful local activities and opportunities.
- Focus on Health and Education, Research and Innovation
- Western Sydney Regional Parkland Open Space as a major Tourism Destination and Sporting and Recreation Facilities meeting the needs of the Western City

Metropolitan Cluster Western Sydney Airport and Aerotropolis

- A world class 24-hour International Airport and associated infrastructure, amenities, and tourism facilities
- Significant Economic Corridor with new businesses and jobs in aerospace, aviation, defence and technology, agriculture and agribusiness, tourism, creative industries, retail and hospitality, and commercial and manufacturing industries
- Focus on tertiary education, research and innovation in science, aerospace, aviation, agriculture, technology, engineering, and mathematics
- Focus on skills and vocational training to support local industries – tourism and hospitality, freight and logistics, agriculture and agribusiness, construction, and aviation
- Mixed-use living built around a central green spine, respecting and benefiting from the natural assets within the South Creek catchment

8.2 North Cluster

The North Cluster, anchored by Penrith, forms the western gateway to Greater Sydney. The Cluster offers good connectivity to Greater Sydney's existing Metropolitan Centres, yet also enjoys the natural beauty of the internationally renowned Blue Mountains Heritage Area, Nepean River and South Creek catchments. Outside of the urban area the Cluster offers a village community environment, with strategically important Defence sites and an established Equine industry.

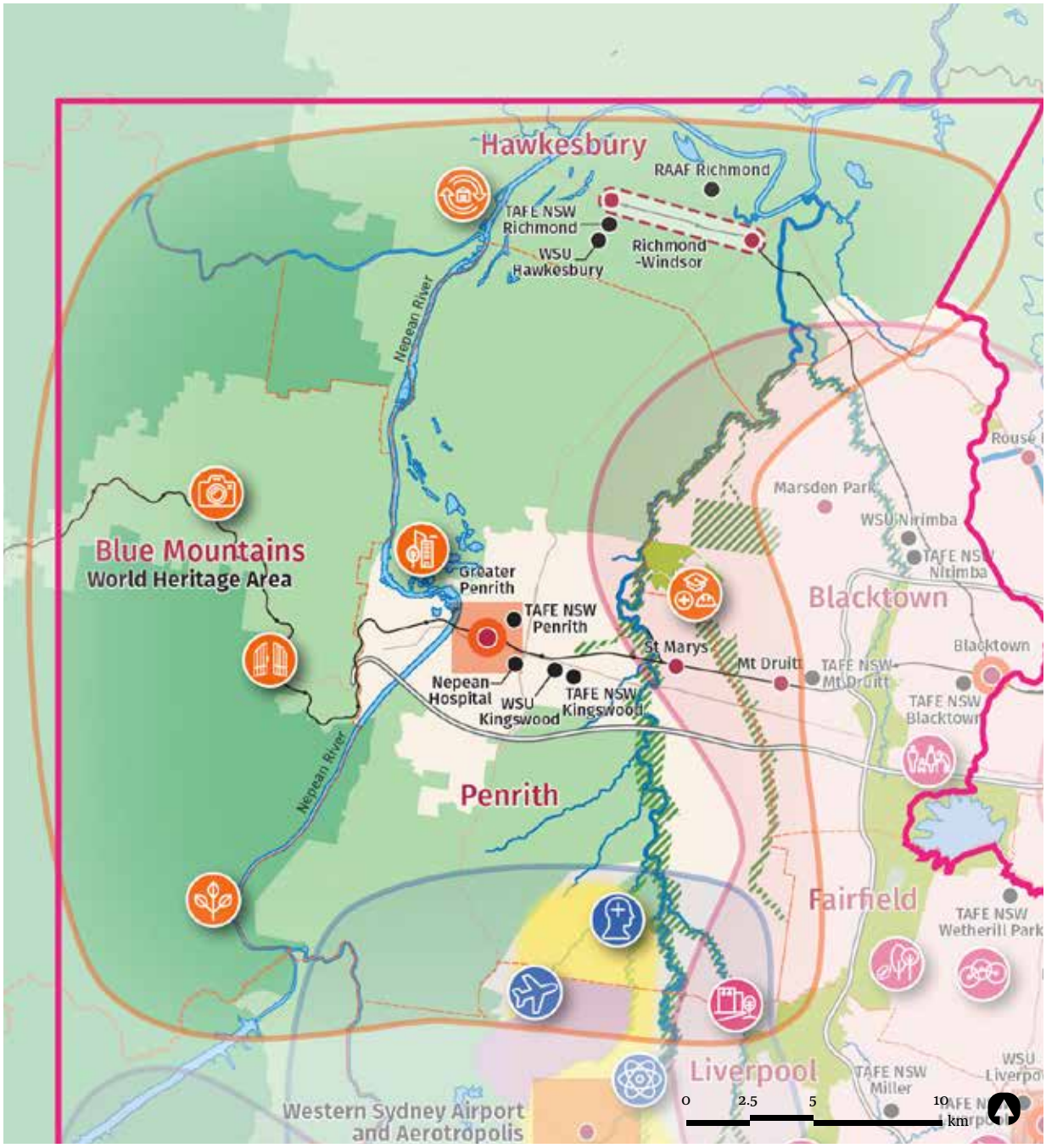
The North Cluster will benefit from new transport connections to Western Sydney Airport, providing new opportunities for business activity and tourism as well as the benefits of a closer airport for residents.

North Cluster Place Outcomes

- The Western Gateway to Greater Sydney and connector to Western NSW
- Greater Penrith Metropolitan Cluster offering cosmopolitan and cultural lifestyles, with relaxed living
- Internationally renowned and protected Natural Assets, including Blue Mountains World Heritage Area, Hawkesbury Nepean and South Creek Catchments and land with rich agricultural soils
- Resilient Village Communities with diverse lifestyles, their own Unique Character and celebrated Aboriginal and European Heritage
- Major and growing tourism destination anchored by the Blue Mountains World Heritage Area, adventure and recreation facilities, a strong focus on local colonial history, rural character, and beautiful rivers
- Key places delivering Defence, Equine, Education, Science, Innovation, Health, Agriculture and Agribusiness, Commercial, Industrial, and Urban Services

Blue Mountains National Park (Blue Mountains City Council)

Map 8.1a Western Parkland City - North Cluster Place Outcomes



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Economic Corridor
Metropolitan Centre	Railway	Transport Gateway
Metropolitan Cluster	Waterways	Land Release Areas
Strategic Centre	Protected Natural Areas	Metropolitan Rural Area

8.3 South Cluster

The South Cluster is anchored by the Campbelltown-Macarthur corridor which offers essential and lifestyle services to surrounding rural and semi-rural communities.

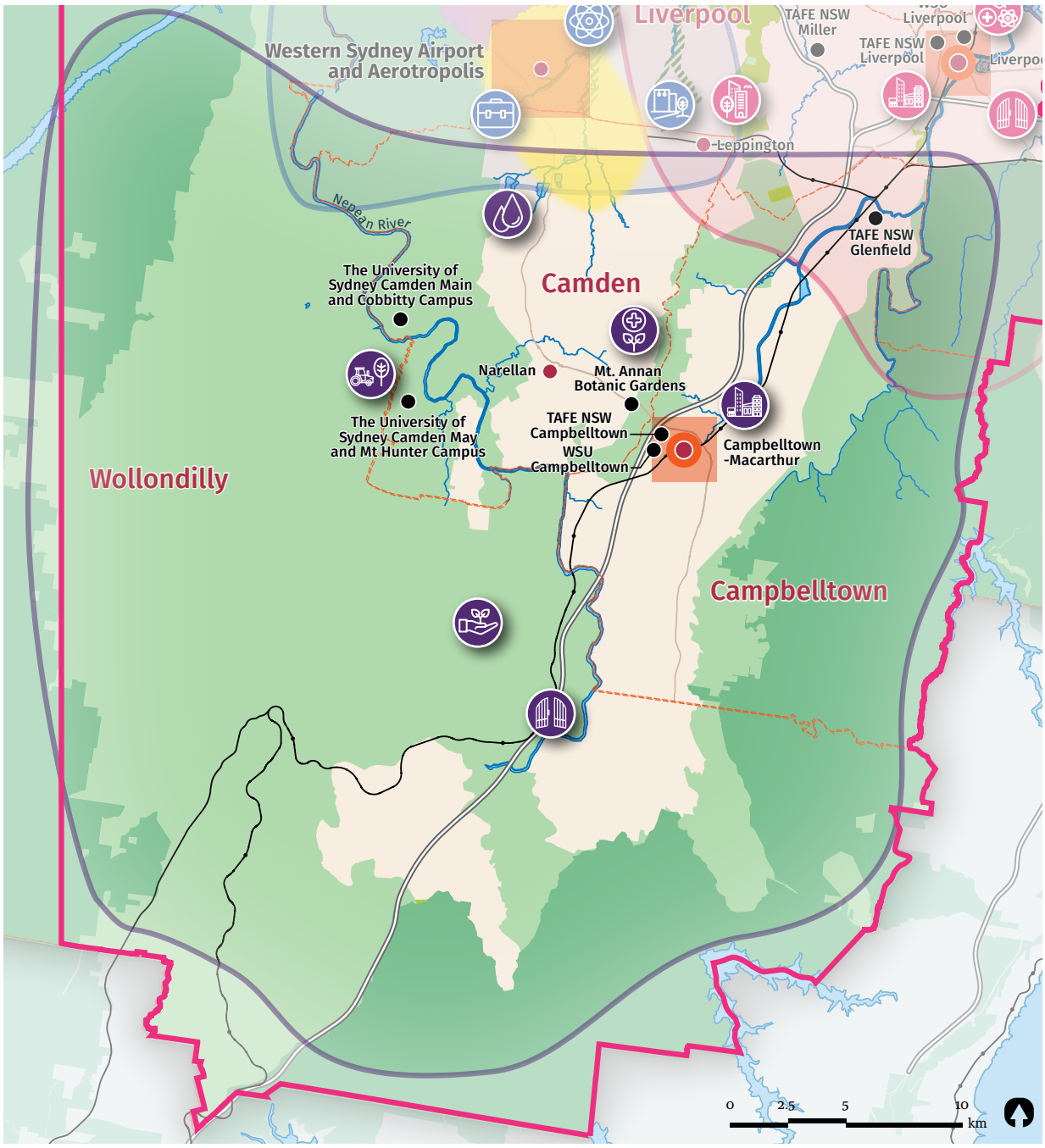
Outside the urban development of the South Cluster, there are unique and significant heritage and natural assets including the Hawkesbury Nepean River, the Cumberland Plain, and Shale-Sandstone Transition Forest.

The South Cluster also provides significant agricultural, educational, and research facilities and opportunities, which can be enhanced for continued productivity and excellence in their respective fields, and complement the continued development of the Aerotropolis Cluster.

South Cluster Place Outcomes

- The Southern Gateway to Greater Sydney and connector to the Illawarra and Southern Highlands
- Campbelltown-Macarthur Metropolitan Centre offering regional essential and lifestyle services and facilities, including health and education, transport connections and higher order employment, with a local, district and regional catchment
- Providing Rural and Semi-Rural Lifestyles, grounded in scenic and cultural landscapes, and villages with strong community spirit and character benefitting from supporting infrastructure
- Enhanced Unique Biodiversity and significant Heritage and Natural Assets including Hawkesbury Nepean River, Cumberland Plain and shale sandstone transition forest, and significant koala habitat
- Major Agricultural Producer, Water Supply and Mining Sector, with viable nature, heritage and agriculture-based Tourism
- A centre of excellence for Plant Sciences and Medical Research at Australian Botanic Gardens Mount Annan

Map 8.1b Western Parkland City - South Cluster Place Outcomes



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Economic Corridor
Metropolitan Centre	Railway	Transport Gateway
Metropolitan Cluster	Waterways	Land Release Areas
Strategic Centre	Protected Natural Areas	Metropolitan Rural Area

8.4 East Cluster

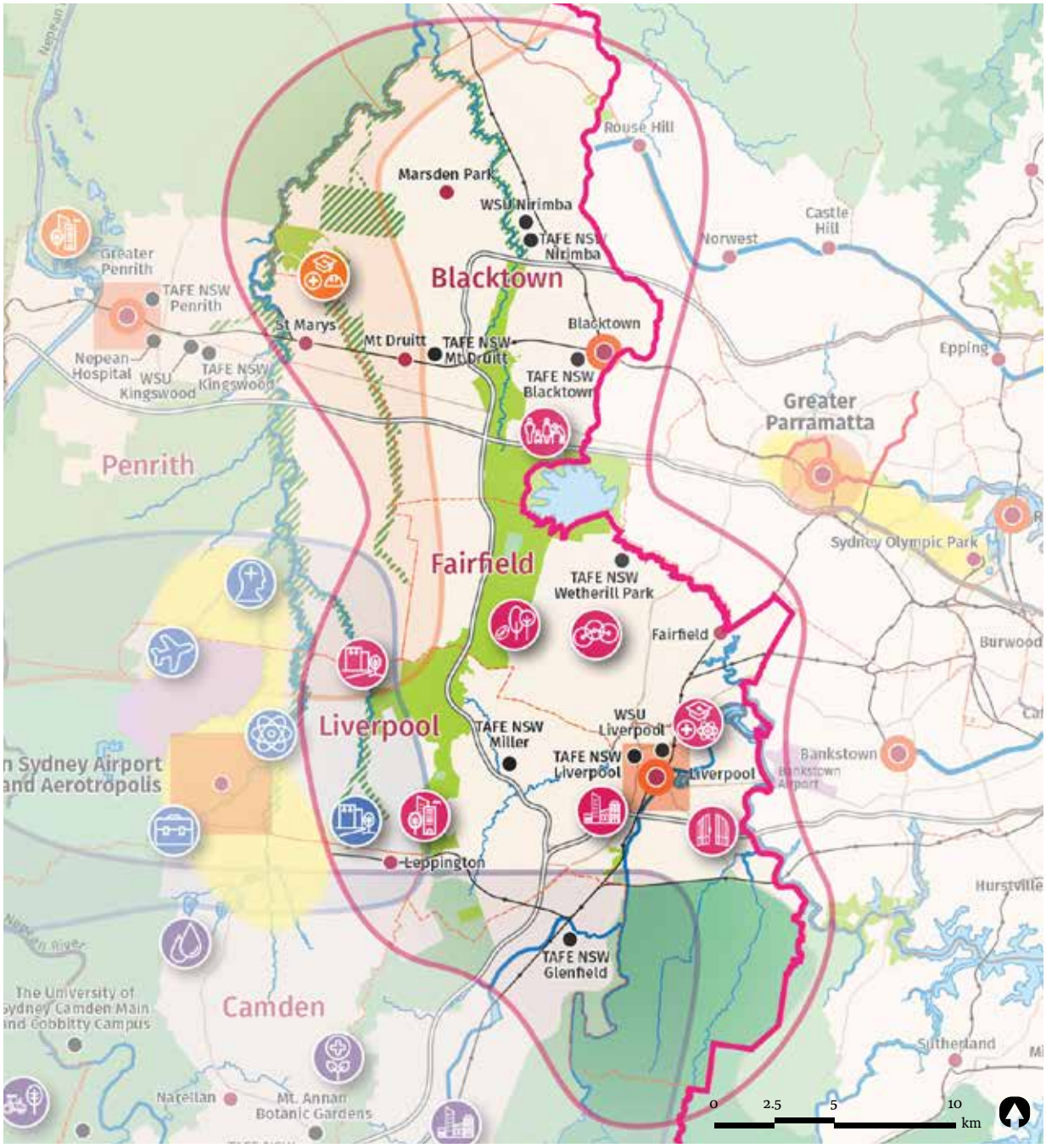
The East Cluster, anchored by Liverpool, offers an established residential population, employment lands, and the natural assets of the Western Sydney Parklands. Public transport provides access to a wide range of destinations within the Cluster and to a wide range of metropolitan centres within Western Sydney, in addition to Parramatta and Sydney CBDs.

The East Cluster will provide a base for a variety of complementary industries and services to the Western Sydney Airport, particularly in the early stages as the Aerotropolis Cluster develops. Residents within this Cluster will form an important source of workers for the developing industries in the Aerotropolis.

East Cluster Place Outcomes

- The Eastern Gateway to the Western Sydney Airport and Aerotropolis and connector to Greater Sydney's Central and Eastern Cities
- Vibrant mixed-use Liverpool Metropolitan Centre with commerce, business, tourism and hospitality, together with essential and lifestyle services and facilities
- Growing Strategic Centres with quality public domain, oriented around transit and active transport, and Complementary Industries and Services to Western Sydney Airport and Aerotropolis
- Innovative and growing Industrial, Manufacturing, Retail, Warehousing, Agriculture and Agribusiness Sectors
- Urban living with access to Services and Amenity and valued natural assets in the South Creek Catchment
- A Welcoming, Harmonious and Proud Community that values diversity of lifestyles, mix of cultures, and plentiful local activities and opportunities.
- Focus on Health and Education, Research and Innovation
- Western Sydney Regional Parkland Open Space as a major Tourism Destination and Sporting and Recreation Facilities meeting the needs of the Western City

Map 8.1c Western Parkland City - East Cluster Place Outcomes



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Economic Corridor
Metropolitan Centre	Railway	Transport Gateway
Metropolitan Cluster	Waterways	Land Release Areas
Strategic Centre	Protected Natural Areas	Metropolitan Rural Area

8.5 Aerotropolis Cluster

The Aerotropolis Cluster will focus on the new Western Sydney Airport and the surrounding Aerotropolis, providing the nucleus for the creation of new businesses and jobs in the Western Parkland City. Growth of the Cluster will be assisted by the established population and businesses of the surrounding clusters.

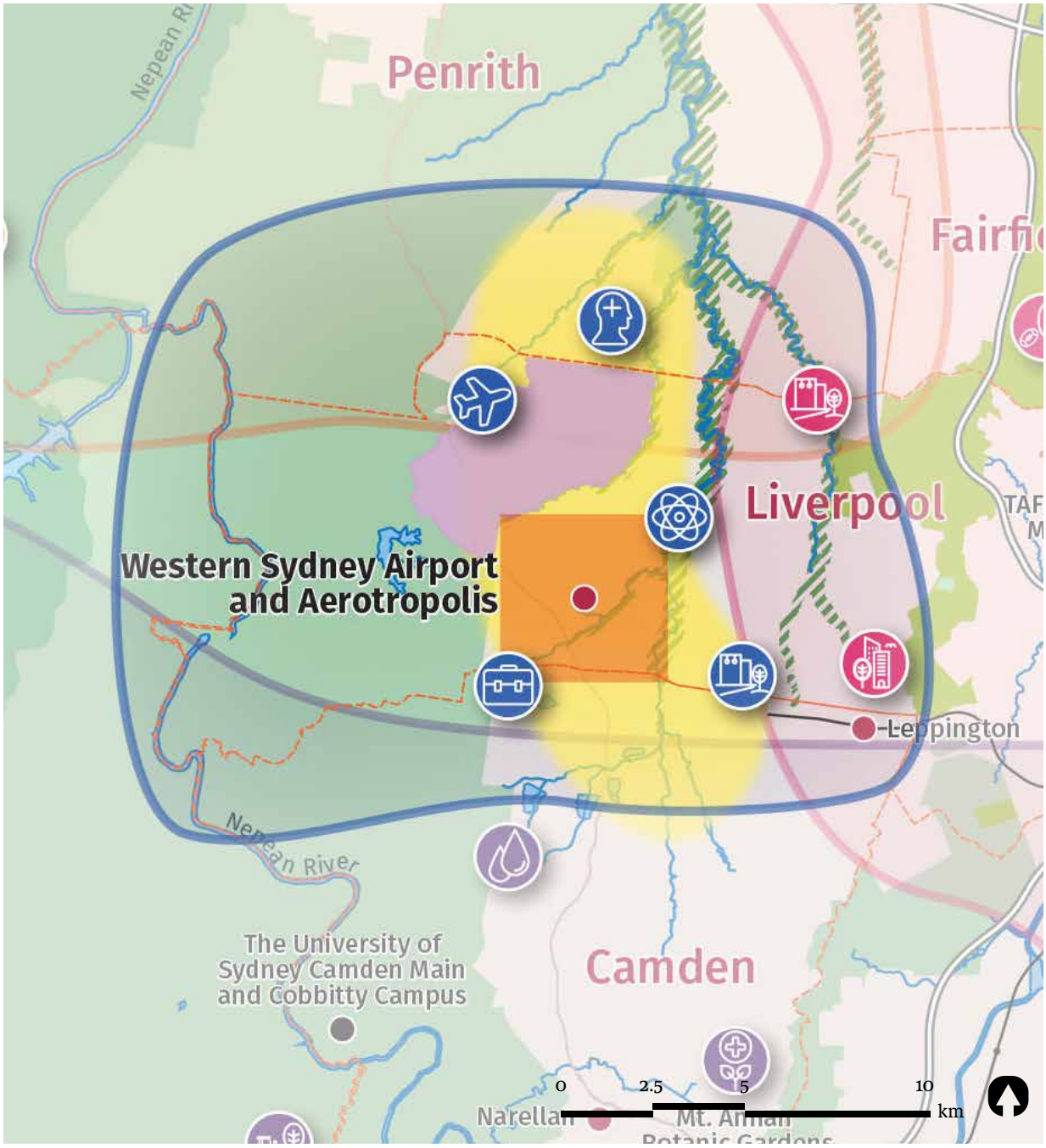
Development of the Aerotropolis Cluster will be aided by new transport links making the area a viable place to work and live and promoting its role as a new economic corridor.

In time, it is expected that the Aerotropolis will become a centre of education, research, and innovation as it develops into an international gateway into Australia.

Aerotropolis Cluster Place Outcomes

- A world class 24-hour International Airport and associated infrastructure, amenities, and tourism facilities
- Significant Economic Corridor with new businesses and jobs in aerospace, aviation, defence and technology, agriculture and agribusiness, tourism, creative industries, retail and hospitality, and commercial and manufacturing industries
- Focus on tertiary education, research and innovation in science, aerospace, aviation, agriculture, technology, engineering, and mathematics
- Focus on skills and vocational training to support local industries – tourism and hospitality, freight and logistics, agriculture and agribusiness, construction, and aviation
- Mixed-use living built around a central green spine, respecting and benefiting from the natural assets within the South Creek catchment

Map 8.1d Western Parkland City - Aerotropolis Cluster Place Outcomes



Source: Greater Sydney Commission (2019)

Metropolitan Centre	Railway	Economic Corridor
Metropolitan Cluster	Waterways	Transport Gateway
Strategic Centre	Protected Natural Areas	Land Release Areas
Motorway	Metropolitan Rural Area	

9

Macro Assumptions

9 Macro Assumptions

9.1 Data Sources

Data inputs to this Analysis Report have originated from a wide range of NSW Government Agencies and Service Providers, through a highly collaborative process led and co-ordinated by the Commission.

9.2 Macro Assumptions

The Western City begins its internationally significant transformation anchored by the new Western Sydney International (Nancy Bird-Walton) Airport connected to the Main Western Rail Line via a new link.

The Base Case includes only committed and funded projects that have had funding approved by NSW Government Cabinet Standing Committee on Expenditure Review (ERC).

The Base Case is the assumed starting point for all scenario work within the Western Parkland City (WPC). The Macro Assumptions included in this study are based off:

- Committed and construction funded transport infrastructure
- No policy changes. Existing planning controls apply only, no future rezonings occur. Includes existing LEPs and recently rezoned land at:

  - Sydney Science Park

  - Austral, Leppington, Edmondson Park
- No policy changes. Existing pricing and environmental regulatory frameworks continue for all utilities

Macro assumptions for short (0-10), medium (10-20) and long horizons (20-40 years) aligned with existing plans (GSRP, Future Transport, SIS) form the basis of narrative focused place specific outcomes for the whole WPC and the four clusters within it. These narratives are represented by the following two scenario lenses.

9.3 Scenario Lens 1

The WPC will evolve with a transport and accessibility focus. Key drivers and outcomes for the 10, 20 and 40 year horizons are focused on reduced point to point travel times facilitating healthy work/lifestyle balances as well as more sustainable environments. Transport connectivity between existing and new centres for employment, recreation, accommodation, health services and education is a key place outcome for this lens to achieve the 30 minute city objectives of the Western City District Plan.

Transport infrastructure planning, driven by the Future Transport will guide the infrastructure roll out. Land use and other infrastructure will be focused to follow the transport infrastructure provision time frames under this lens. Land use provisions and the location of service infrastructure should facilitate development that achieves the 30 minute city objective.

9.4 Scenario Lens 2

Scenario Lens 2 has a primary placed based outcome that includes the provision of social and environmental infrastructure within close proximity to existing and new communities. Building on the existing character of existing urban areas, small towns and rural settlements, health, education, recreation, emergency service and community facilities will be the primary growth drivers. Increased transport options will allow for a more efficient use of social infrastructure as their catchment area increases.

The 30 minute City objective is achieved in this Scenario Lens through the provision of localised employment, housing and social infrastructure in localised regions reducing travel distances for residents in the WPC.

9.5 Base Case Scenario - No Policy Change

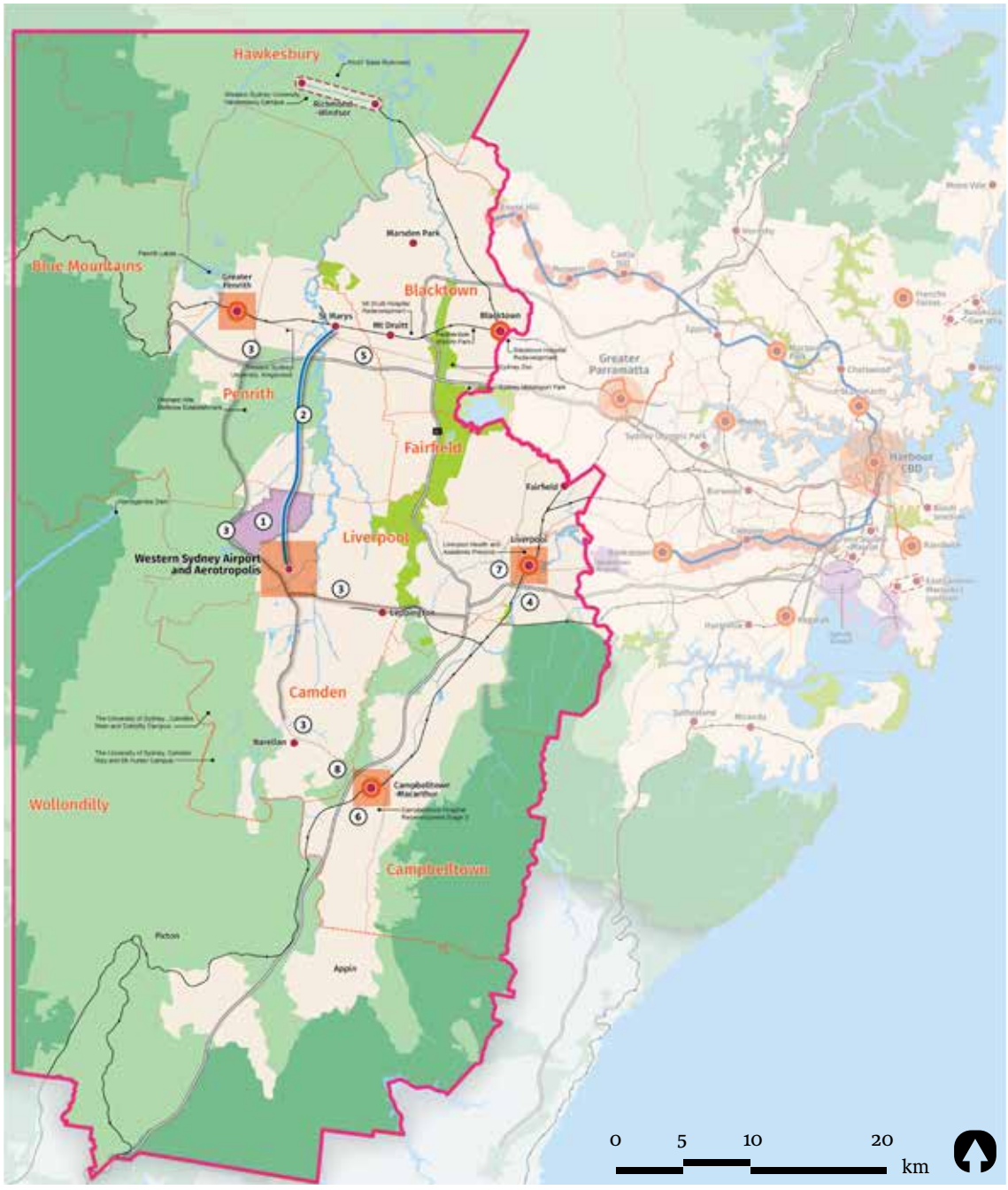
The **Western City begins its internationally significant transformation** anchored by the new Western Sydney International (Nancy Bird-Walton) Airport and Sydney Metro Greater West Stage 1

Table 9.5: Base Case Scenario Macro Assumptions

Infrastructure Context	0-10 Years
Networks and Systems	① Western Sydney Airport ② Sydney Metro Greater West Stage 1 – St Marys to Western Sydney Airport/ Aerotropolis (partially funded by the Commonwealth Government, subject to Final Business Case) ③ Western Sydney Roads: – The Northern Road upgrade – Bringelly Road upgrade ④ Moorebank Intermodal Terminal ⑤ M4 Smart Motorway - Mays Hill to Lapstone ⑥ BAU – water, wastewater, stormwater, electricity, gas and waste
People and Places	⑦ Liverpool Health and Academic Precinct ⑧ Western Sydney Centre of Innovation in Plant Sciences at Mount Annan

Source: Greater Sydney Commission (2019)

Map 9.1 Base Case Scenario Macro Assumptions



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Major Urban Parkland
Metropolitan Centre	Railway	Metropolitan Rural Area
Metropolitan Cluster	Waterways	Urban Area
Strategic Centre	Protected Natural Areas	Transport Gateway

9.6 Scenario 1 - Productivity

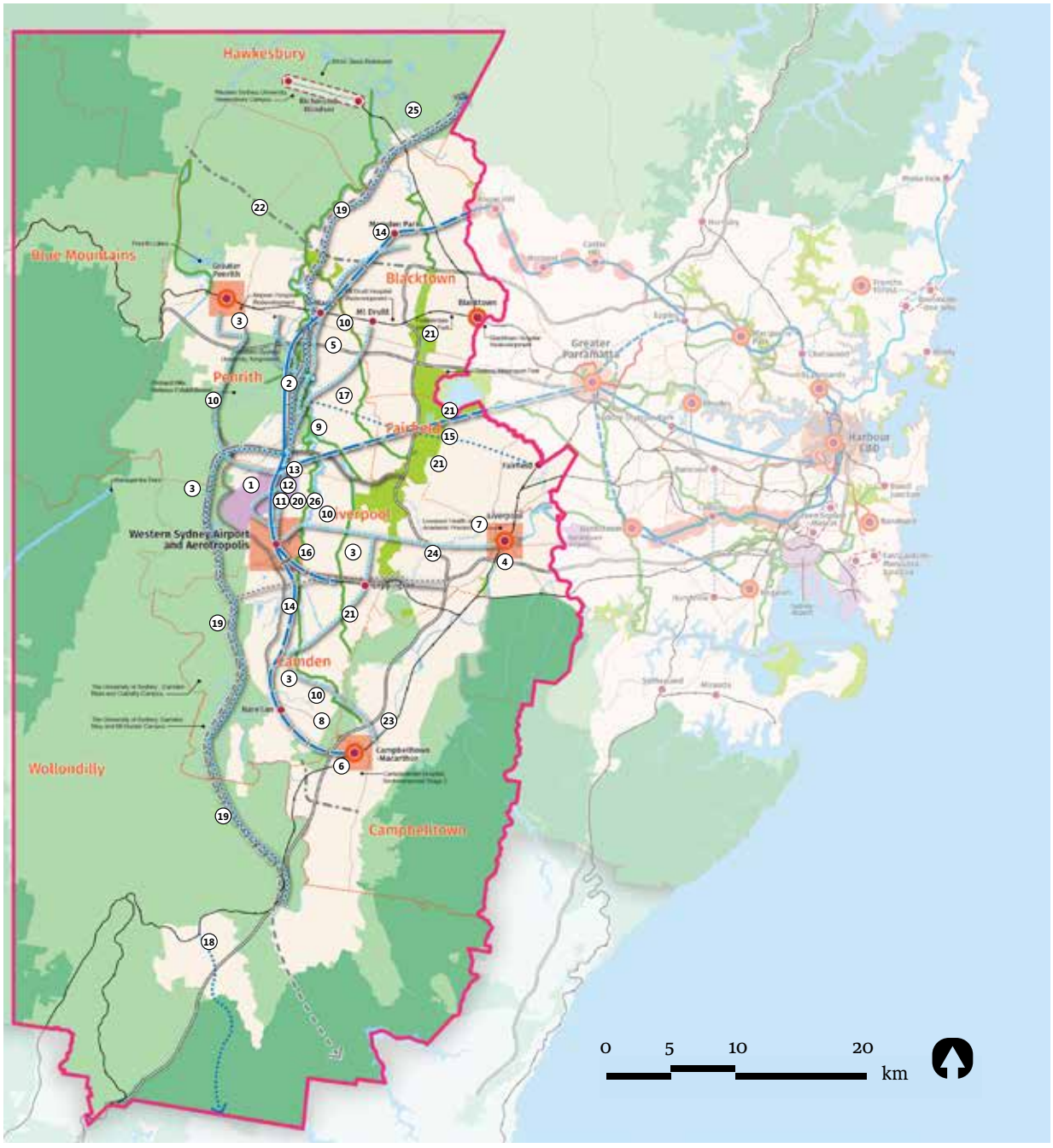
The **Western City is transformed into a productive 30-minute city, with world class digital connectivity, a diversity of jobs, skills and innovation** across the Metropolitan Cluster of Liverpool, Penrith, Campbelltown and the Airport-Aerotropolis.

Table 9.6: Scenario 1 Macro Assumptions

Infrastructure Context	0-10 Years	10-20 Years	20-40 Years
Networks and Systems	As the Base Case, plus: (9) M12 Motorway (10) Rapid bus services: - Penrith to WSA - Liverpool to WSA - Campbelltown to WSA - Blacktown to WSA	As Base Case, plus: (14) Sydney Metro Greater West extensions – St Mary's to Tallawong – Aerotropolis to Campbelltown/Macarthur (15) East-West Rail - Parramatta to WSA/ Aerotropolis (16) South West Rail Link Extension (17) Western Sydney Freight Line (18) Maldon to Dombarton Rail (19) Outer Sydney Orbital – Stage 1 Richmond Rd to Hume Mwy	As Base Case, plus: (21) City-serving Transit Corridor: – Blacktown to Prairewood – Bonnyrigg to WSA/ Aerotropolis – Mt Druitt to WSA/ Aerotropolis – Liverpool – North Austral – Leppington – Narellan – Campbelltown/Macarthur (22) Castlereagh Motorway (23) Sydney Metro Southwest extension to Liverpool (24) M5 extension – Liverpool to Outer Sydney Orbital (25) Outer Sydney Orbital: – Stage 2 Hume Mwy to the Illawarra – Stage 3 Richmond Rd to Central Coast
People and Places	(11) New Western Sydney Education Super precinct (multiversity) in Aerotropolis (Phase 1) (12) TAFE NSW Western Sydney Construction Hub (subject to final business case) (13) Permanent VET facility in Aerotropolis (focusing on construction, aviation and aeronautical-related engineering)	(20) New Western Sydney Education Super precinct (multiversity) in Aerotropolis (Phase 2)	(26) New Western Sydney Education Super precinct (multiversity) in Aerotropolis (Phase 3)

Source: Greater Sydney Commission (2019)

Map 9.2 Scenario 1 Macro Assumptions



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Major Urban Parkland
Metropolitan Centre	Railway	Metropolitan Rural Area
Metropolitan Cluster	Waterways	Urban Area
Strategic Centre	Protected Natural Areas	Transport Gateway

9.7 Scenario 2 - Liveability and Sustainability

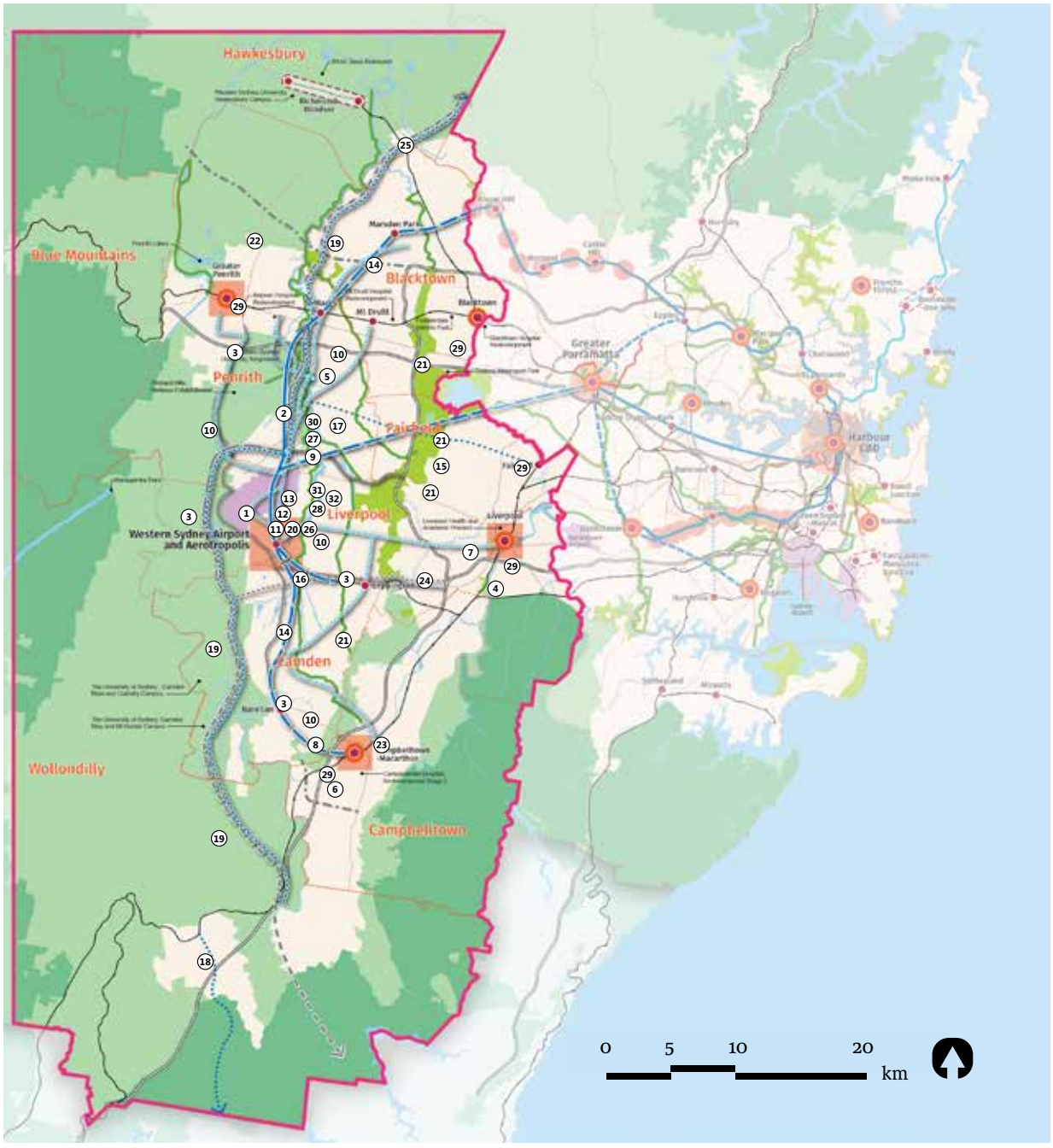
The **Western Parkland City becomes a more urbanised inclusive and resilient city with great places for the people and visitors** with affordable living, more socially connected communities and scenic, productive and resilient landscape.

Table 9.7: Scenario 2 Macro Assumptions

Infrastructure Context	0-10 Years	10-20 Years	20-40 Years
Networks and Systems	Transport projects as per Scenario 1 plus: New integrated water cycle (27) Management of the South Creek catchment for Aerotropolis and major land release areas adopting the Parkland City urban typologies (per South Creek Sector Review) (28) South Creek Corridor spine in Aerotropolis and major new release areas for parks, walking and cycling trails, community facilities, ecological services, including nutrient capture, urban cooling and local habitat (per District Plan)	Transport projects as per Scenario 1 plus: Mainstream integrated water cycle (30) Management of the South Creek catchment, including new release areas and urban renewal areas utilising Parkland City urban typologies (31) South Creek Corridor spine in Aerotropolis and major new release areas for parks, walking and cycling trails, community facilities, ecological services, including nutrient capture, urban cooling and local habitat (per District Plan) • Enhanced resource recovery	Transport projects as per Scenario 1 plus: Integrated water cycle management for the wider Western Parkland City (32) South Creek Corridor spine in Aerotropolis and major new release areas for parks, walking and cycling trails, community facilities, ecological services, including nutrient capture, urban cooling and local habitat (per District Plan) • Resource recovery and energy generation
People and Places	A high quality of urban design with amenity and services, and cultural facilities as places urbanised, renewed and revitalised (29) Redevelopment of old housing estates in the Penrith, Blacktown, Fairfield, Liverpool and Campbelltown LGAs linked to catalytic infrastructure to ensure more diverse, mixed-tenure (social, affordable, private) vibrant and safer communities	As for 0-10 plus: • Provision of new social and affordable housing	As for 10-20 years

Source: Greater Sydney Commission (2019)

Map 9.3 Scenario 2 Macro Assumptions



Source: Greater Sydney Commission (2019)

WPC Boundary	Motorway	Major Urban Parkland
Metropolitan Centre	Railway	Metropolitan Rural Area
Metropolitan Cluster	Waterways	Urban Area
Strategic Centre	Protected Natural Areas	Transport Gateway

Western Sydney Growth Infrastructure Compact (GIC) – Partners

Blacktown City Council
Blue Mountains City Council
Camden Council
Campbelltown City Council
Fairfield City Council
Hawkesbury City Council
Liverpool City Council
Penrith City Council
Wollondilly Shire Council
Greater Sydney Commission
Planning Partnership Office
Western City & Aerotropolis Authority
Department of Planning, Industry & Environment
Transport for NSW
Sydney Metro
Roads and Maritime Services
Department of Premier and Cabinet
Treasury NSW
Infrastructure NSW
Department of Education
NSW Health
Property NSW
Sydney Water
Justice NSW
NSW Land and Housing Corporation
Create NSW
NSW Environment Protection Authority
TAFE NSW
Endeavour Energy
Transgrid
Jemena

Greater Sydney Commission

Mt Tomah, Blue Mountains

Appendix A.
Population

A. Population

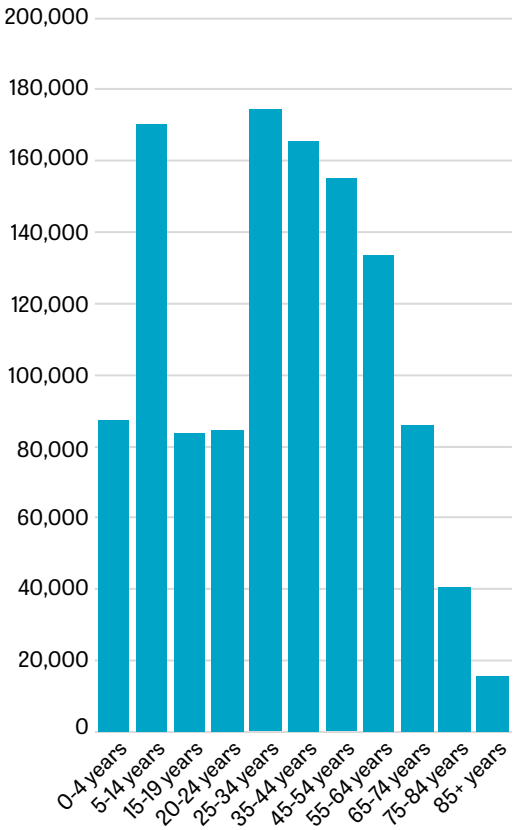
A.1 Data Sources

Data inputs to this chapter have originated from the 2016 Australian Census Data, provided by the Australian Bureau of Statistics (ABS). The census data used as part of this chapter has been subject to ABS data randomisation policy.

A.2 Population Overview

The population of the Western Parkland City is expected to grow to 1,740,400 people by 2036. Growth is expected across all age ranges with the majority of the population between 25 and 64 years of age. The current population is concentrated around the major centres of Blacktown, Liverpool, Campbelltown, and Penrith, however urban growth opportunities have been identified both inside and outside of these centres.

Figure A.1: Population by age within the WPC Boundary



Source: Australian Bureau of Statistics (2016)

Population Overview (2016)

1.2 million
people residing within the Western Parkland City

4.3 million
people residing within Greater Sydney

Aged 0-4 years

7.3% of the WPC Population are aged 0-4 years

6.5% of the Greater Sydney Population are aged 0-4 years

Aged 85+ years

1.3% of the WPC Population are aged 85+ years

1.9% of the Greater Sydney Population are aged 85+ years

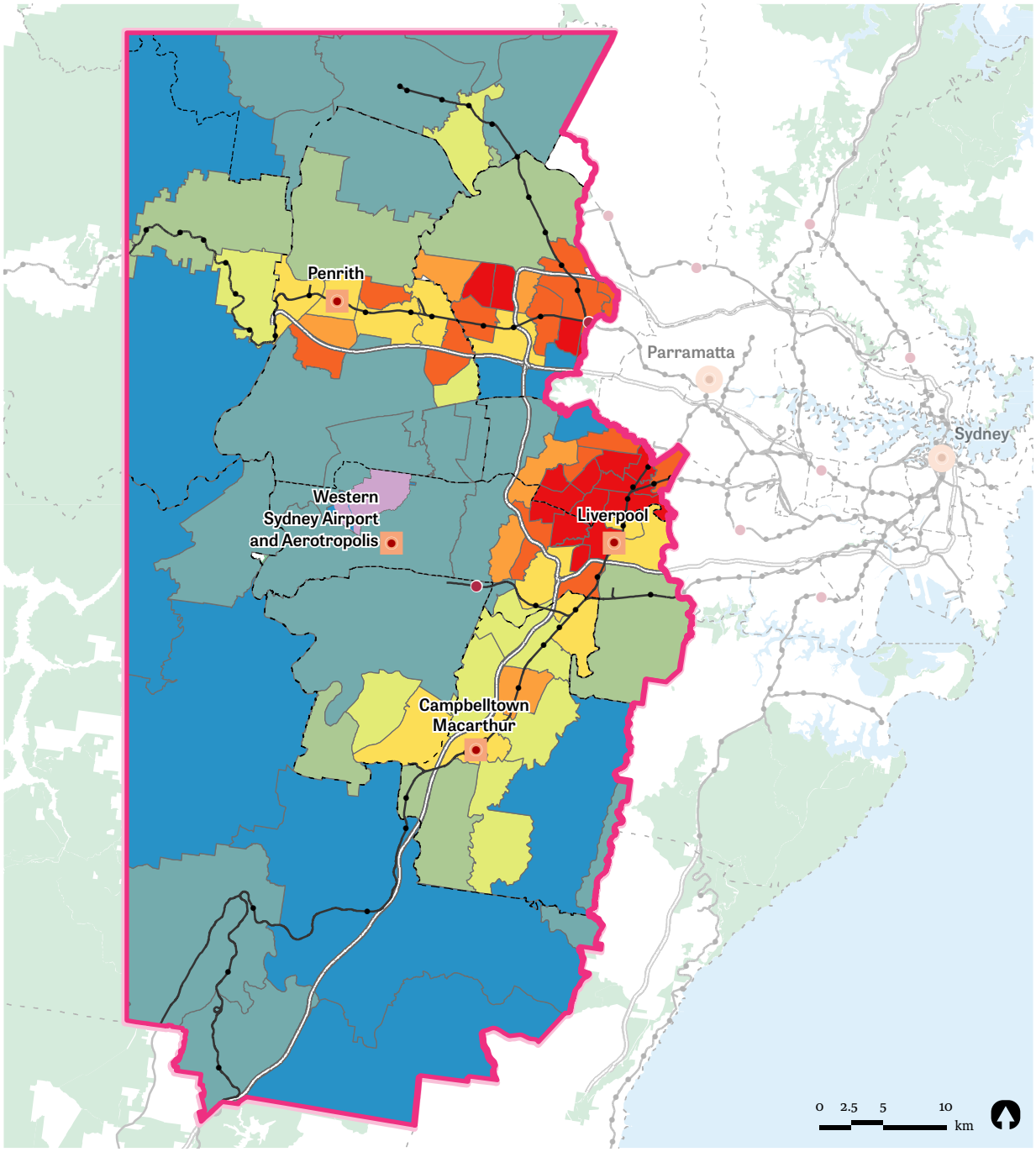
Working Age Population (15-64 years)

67% of the WPC Population are aged between 15-64 years

68% of the Greater Sydney Population are aged between 15-64 years

Source: Australian Bureau of Statistics (2016)

Map A.1 Western Parkland City Population Density



Source: Australian Bureau of Statistics (2016)

WPC Boundary	Motorway	300 people / km²
Metropolitan Centre	Railway	1200 people / km²
Metropolitan Cluster	Waterways	1800 people / km²
Strategic Centre	Protected Natural Areas	> 3001 people / km²
Western Sydney Airport	< 50 people / km²	

A.3 Population - North Cluster

Population Overview

276,000 people within the North Cluster

23% of the population within the WPC

Aged 0-4 years

19,500 aged 0-4 years

8% of the North Cluster

Aged 85+ years

3,900 aged 85+ years

1% of the North Cluster

Working Age Population (15-64 years)

183,000 aged 15-64 years

66% of the North Cluster

A.4 Population - South Cluster

Population Overview

275,000 people within the South Cluster

23% of the population within the WPC

Aged 0-4 years

21,000 aged 0-4 years

8% of the South Cluster

Aged 85+ years

3,200 aged 85+ years

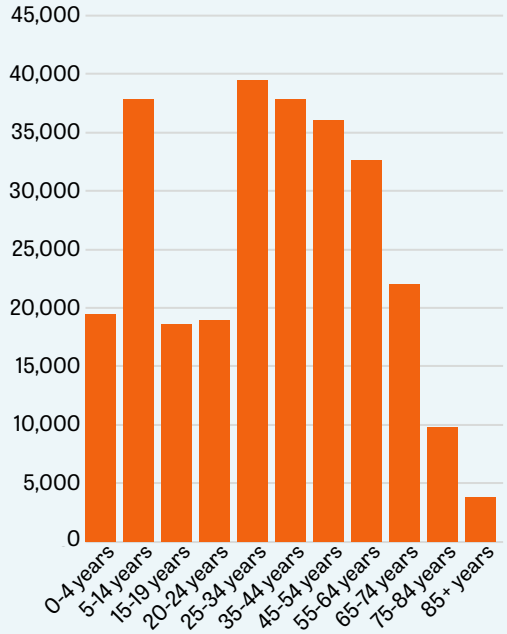
1% of the South Cluster

Working Age Population (15-64 years)

182,000 aged 15-64 years

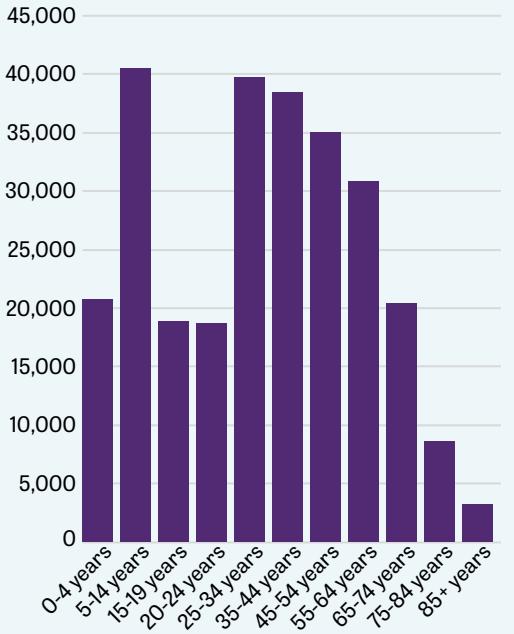
66% of the South Cluster

Figure A.1a: Population by age within the North Cluster



Source: Australian Bureau of Statistics (2016)

Figure A.1b: Population by age within the South Cluster



Source: Australian Bureau of Statistics (2016)

A.5 Population - East Cluster

Population Overview

634,000 people within the East Cluster

53% of the population within the WPC

Aged 0-4 years

47,000 aged 0-4 years

7% of the East Cluster

Aged 85+ years

8,400 aged 85+ years

1% of the East Cluster

Working Age Population (15-64 years)

425,000 aged 15-64 years

64% of the East Cluster

A.6 Population - Aerotropolis Cluster

Population Overview

11,000 people within the Aerotropolis Cluster

1% of the population within the WPC

Aged 0-4 years

600 aged 0-4 years

5% of the Aerotropolis Cluster

Aged 85+ years

200 aged 85+ years

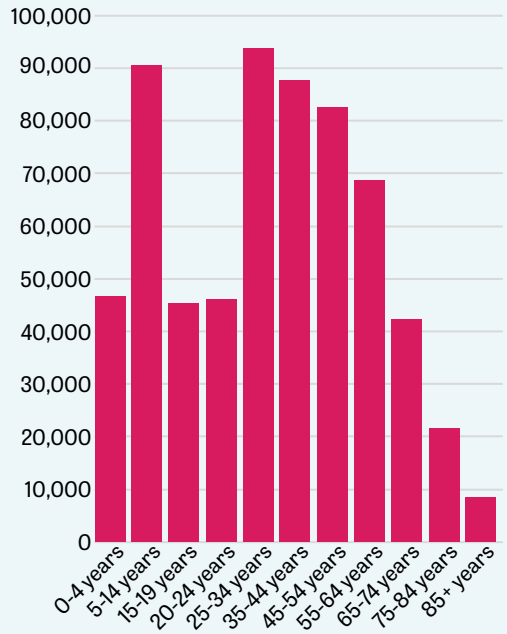
2% of the Aerotropolis Cluster

Working Age Population (15-64 years)

7,100 aged 15-64 years

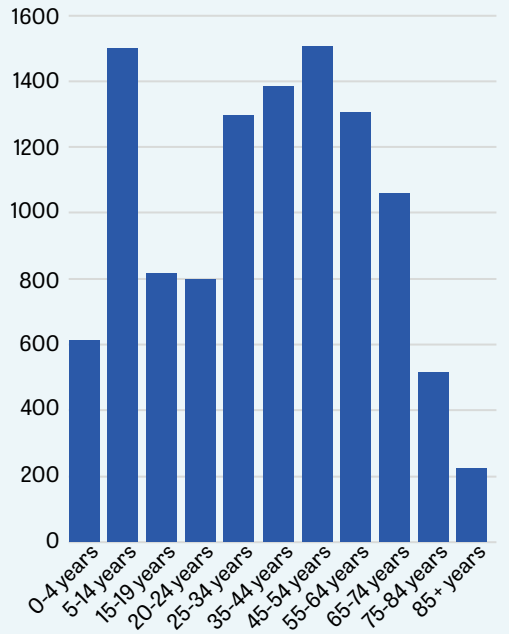
64% of the Aerotropolis Cluster

Figure A.1c: Population by age within the East Cluster



Source: Australian Bureau of Statistics (2016)

Figure A.1d: Population by age within the Aerotropolis Cluster



Source: Australian Bureau of Statistics (2016)

A.7 Education

Overall the proportion of students (school, tertiary and college students) in the WPC is similar to the Greater Sydney Area. However there are significant differences in the proportion of students attending tertiary education.

The number of further education students residing within the Western Parkland City are similar to that of the Greater Sydney area. However, the number of students who reside within the Western Parkland City and attend a university or tertiary education institution is lower than that of the Greater Sydney Area.

The proposed expansion of universities within the Western Parkland City presents opportunities to increase the number of students attending a university or tertiary education institution. The expansion of university or tertiary education institutions is proposed to correspond to the identified strategic locations for growth in the areas of health, agriculture, and within the Aerotropolis Cluster.

WPC Student Population *

32% of the WPC population are students

32% of the Greater Sydney population are students

Technical & Further Education

2.1% of the WPC population attend a Technical or Further Education Institution

1.9% of the Greater Sydney population attend a Technical or Further Education Institution

University & Tertiary Education

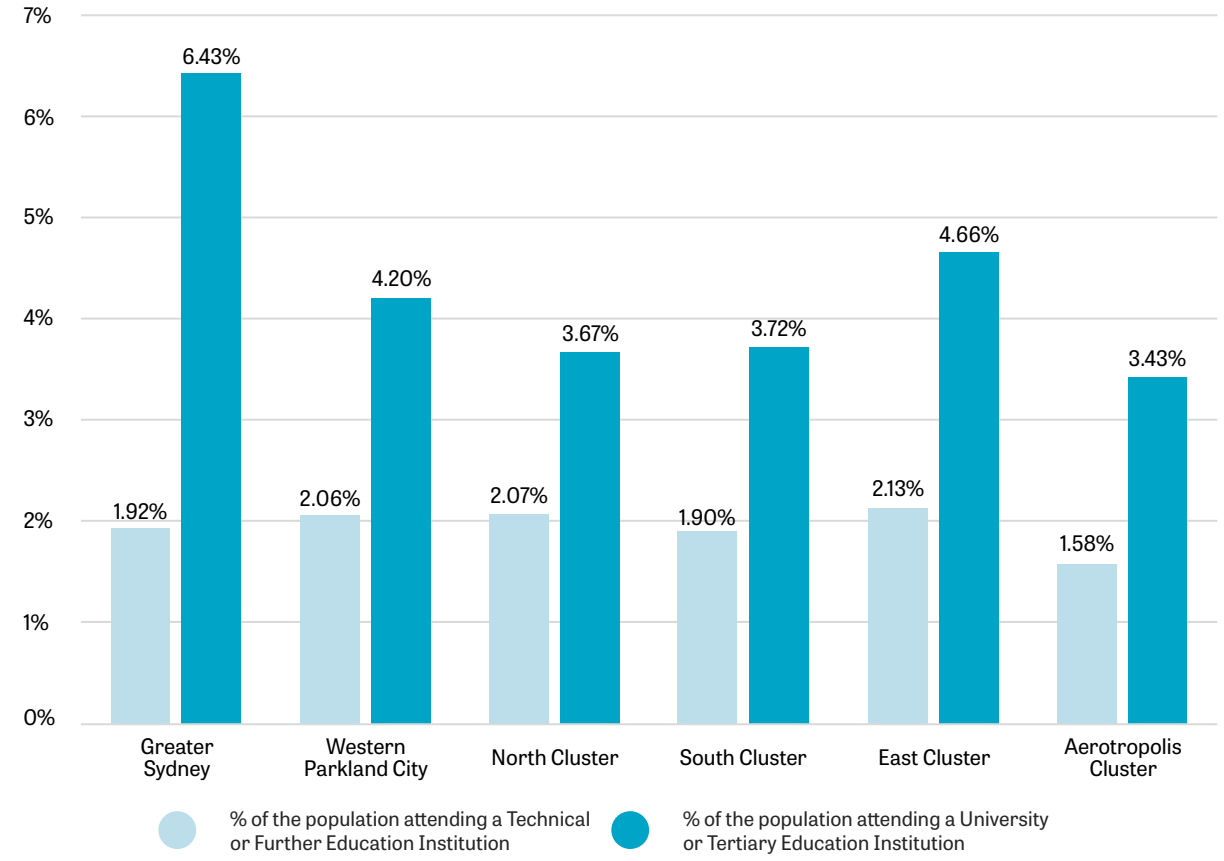
4.2% of the WPC population attend a University or Tertiary Education Institution

6.4% of the Greater Sydney population attend a University or Tertiary Education Institution

Source: Australian Bureau of Statistics (2016)

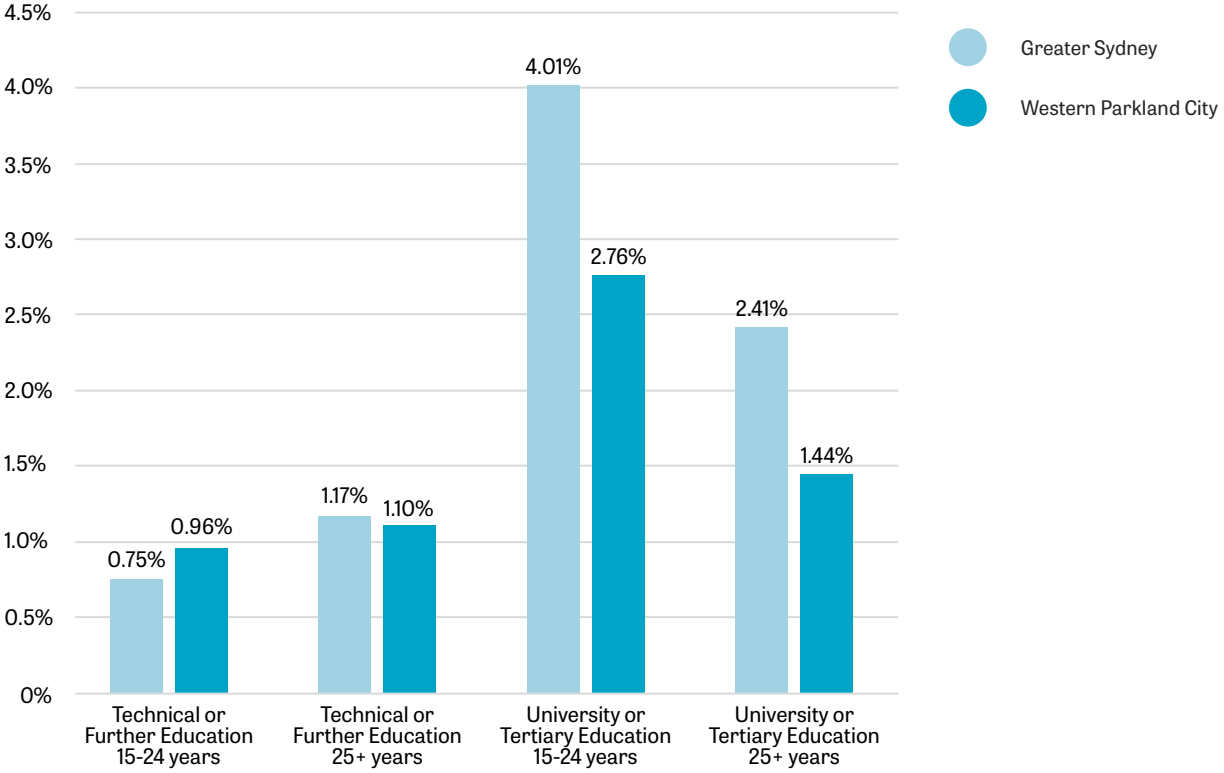
* Attending any pre-school, primary school, secondary school, or post secondary education institution

Figure A.7a: Post Secondary Education Attendance (Greater Sydney, WPC, North/South/East/Aerotropolis Cluster)



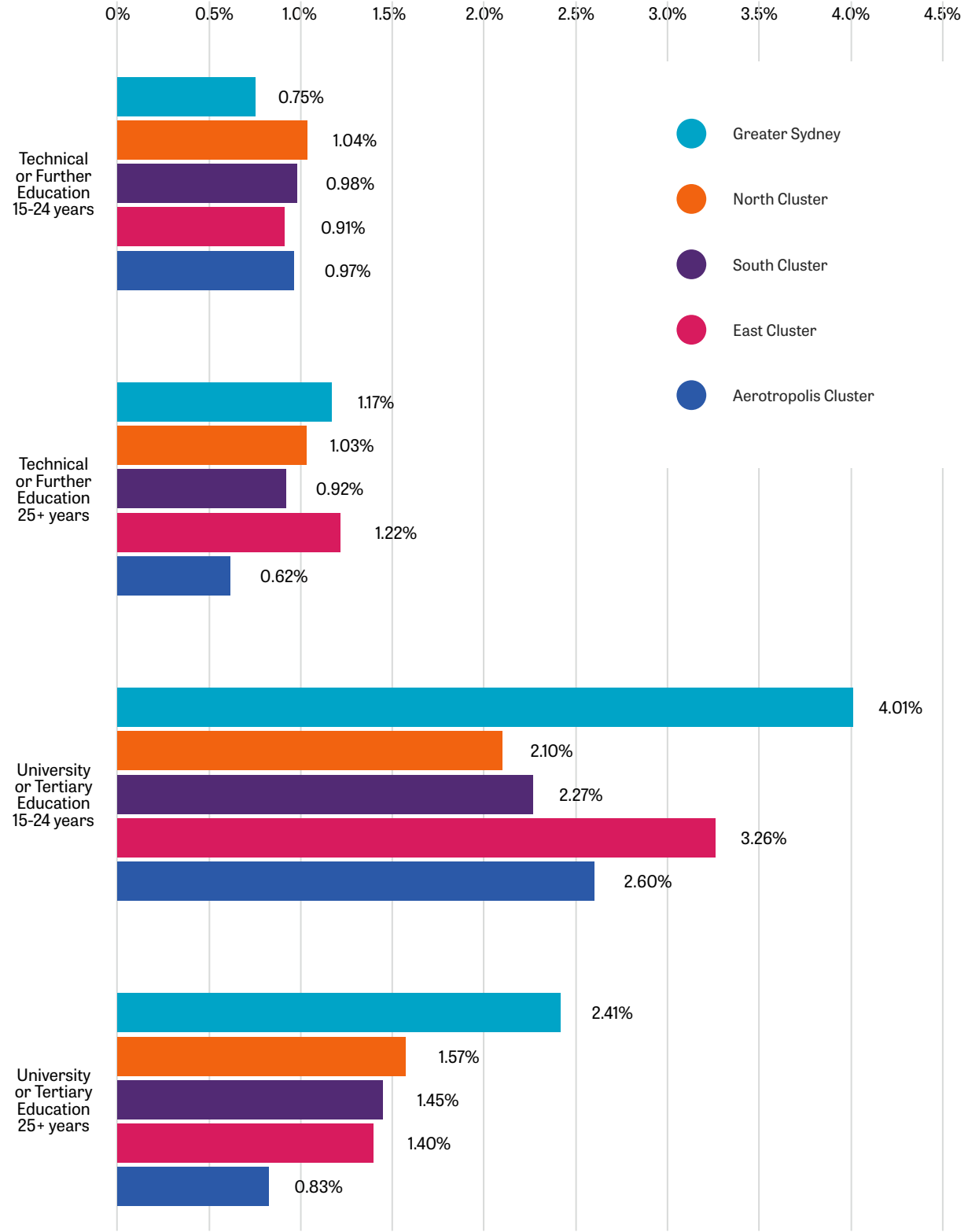
Source: Australian Bureau of Statistics (2016)

Figure A.7b: Post Secondary Education Attendance by Age (Greater Sydney and WPC)



Source: Australian Bureau of Statistics (2016)

Figure A.7c: Post Secondary Education Attendance by Age (Greater Sydney, North/South/East/Aerotropolis Cluster)



Source: Australian Bureau of Statistics (2016)

A.8 Employment Status

A key constraining factor to employment rates in the WPC is the low availability and low diversity of employment opportunities. The location of jobs in Sydney are generally East of the M7 Motorway, between the M2 and the M5 Motorways, with a higher concentration within the metropolitan centres of Liverpool, Parramatta, and Sydney.

The WPC unemployment rate, labour force, labour force participation rate, and working age participation rate are all close to that of the Greater Sydney area. The labour force participation rate in the North, South, and Aerotropolis Clusters are all above the Greater Sydney average, while the East Cluster is substantially lower.

A 30 minute city should remain a key growth driver for the Western Parkland City and the creation of a varied and attractive employment market in the region is a targeted place outcome for all four clusters to minimise journey to work and reinforce communities.

North Cluster Working Age Participation Rate

75% labour force participation rate

South Cluster Working Age Participation Rate

73% labour force participation rate

East Cluster Working Age Participation Rate

64% labour force participation rate

Aerotropolis Cluster Working Age Participation Rate

71% labour force participation rate

Source: Australian Bureau of Statistics (2016)

Employed (Part-Time & Full Time)

43% of the WPC population are employed

47% of the Greater Sydney population are employed

Unemployed (Looking for work)

3.4% of the WPC population are unemployed

3.1% of the Greater Sydney population are unemployed

Labour Force

46% of people in the WPC are in the labour force

50% of the Greater Sydney population are in the labour force

Labour Force Participation Rate

64% labour force participation rate in the WPC Boundary

66% labour force participation rate in the Greater Sydney area

Working Age Participation Rate

69% working age participation rate in the WPC Boundary

71% working age participation rate in the Greater Sydney area

Source: Australian Bureau of Statistics (2016)

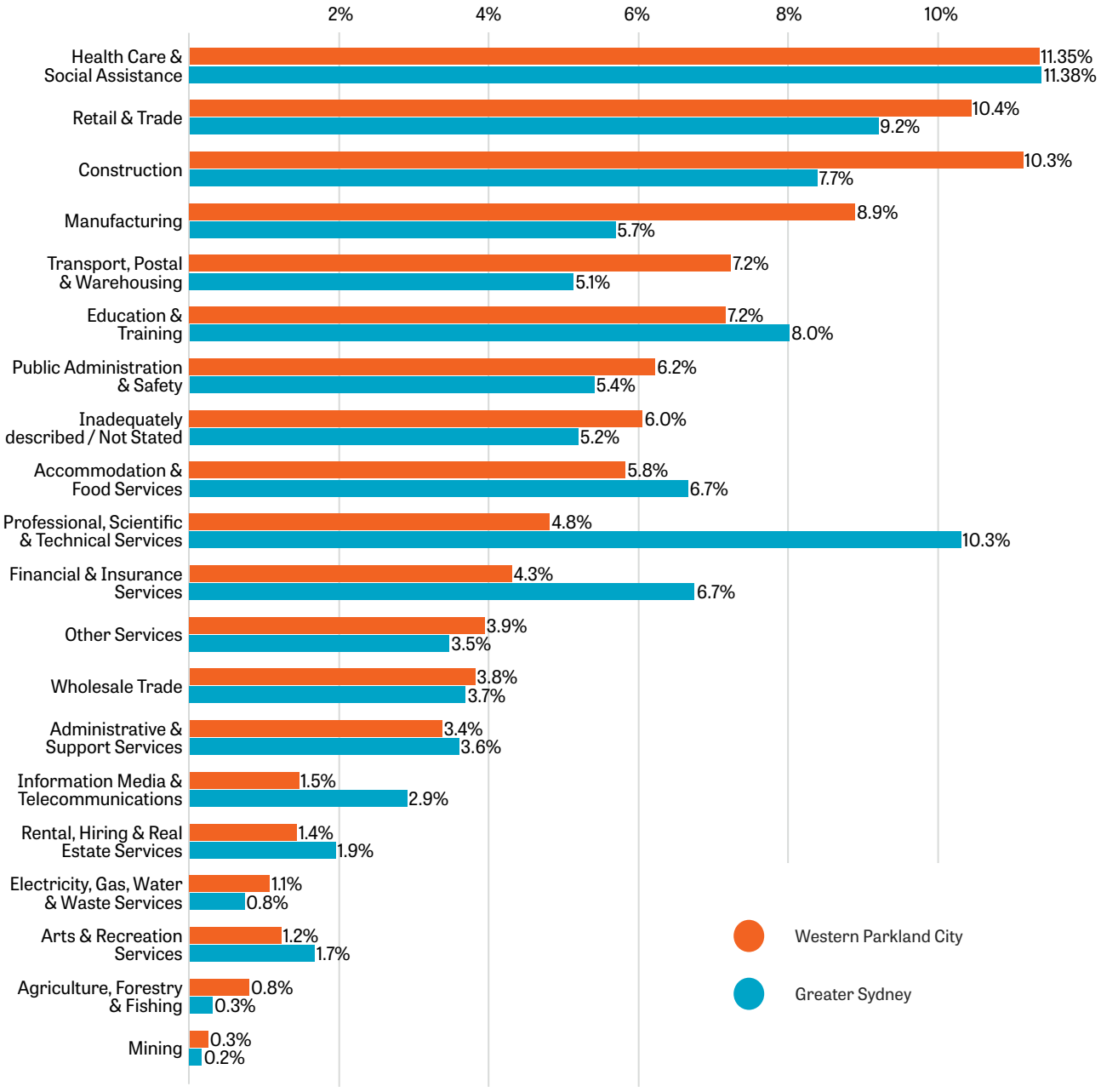
A.9 Employment by Industry

The largest employment within the WPC are within the industries of health care and social assistance, retail and trade, construction and manufacturing. Figures 5.13a and 5.13b illustrate the WPC residents' industries of employment which point to a significant lack of residents employed in the areas of professional, scientific and technical, and financial and insurance services when compared to the Greater Sydney Area.

The Aerotropolis Cluster has a significant number of residents employed in the construction, agriculture, forestry and fishing industries in comparison to the other areas of the WPC and the Greater Sydney area. This reflects the existing uses of the Cluster and highlights its potential to grow and develop with the establishment of the Western Sydney Airport and Aerotropolis precinct.

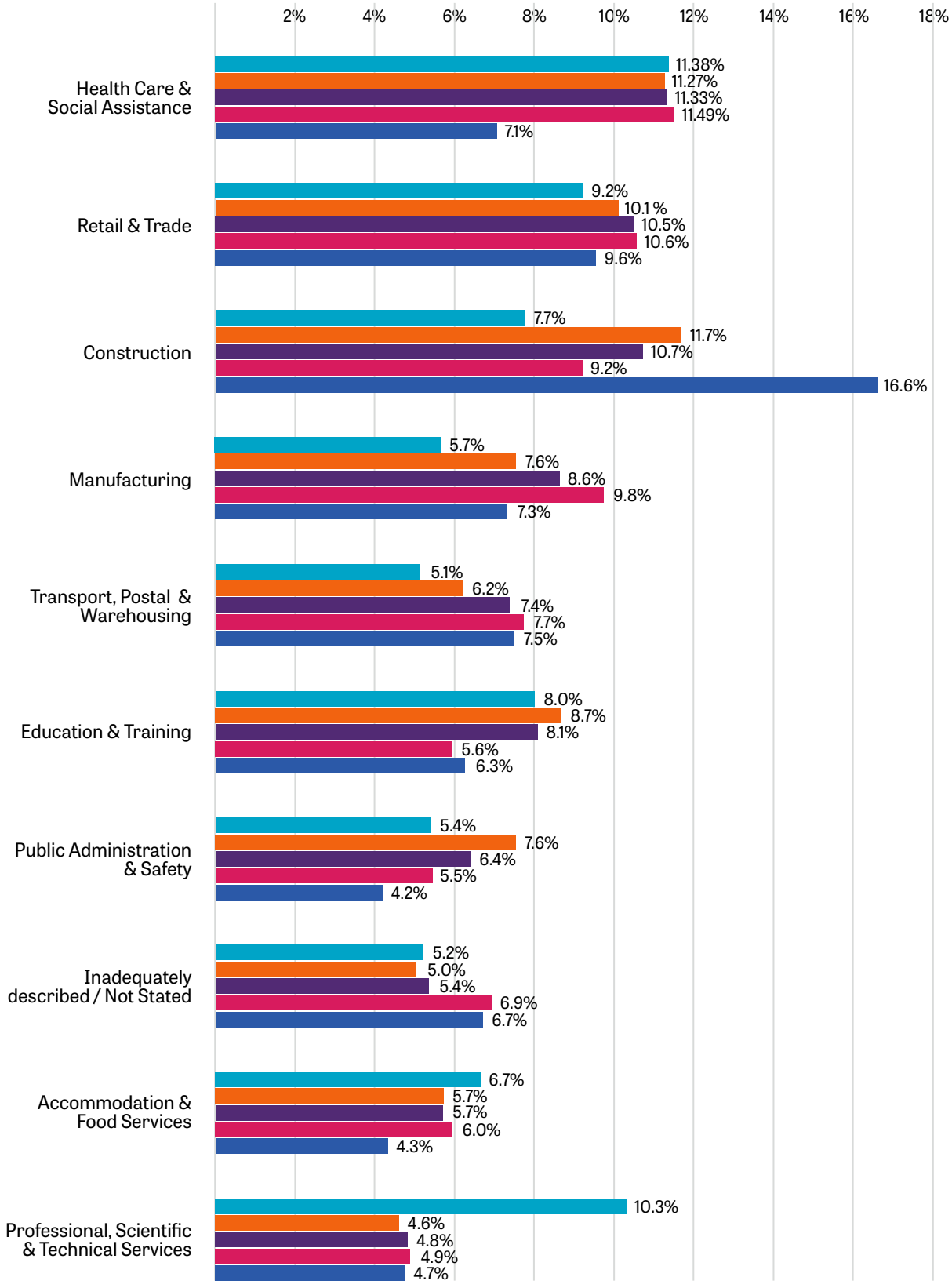
The key challenges for the growth of the Western Parkland City include maintaining and promoting existing employment zones, while facilitating new complementary employment and generating development around new infrastructure with a high level of accessibility to the local population.

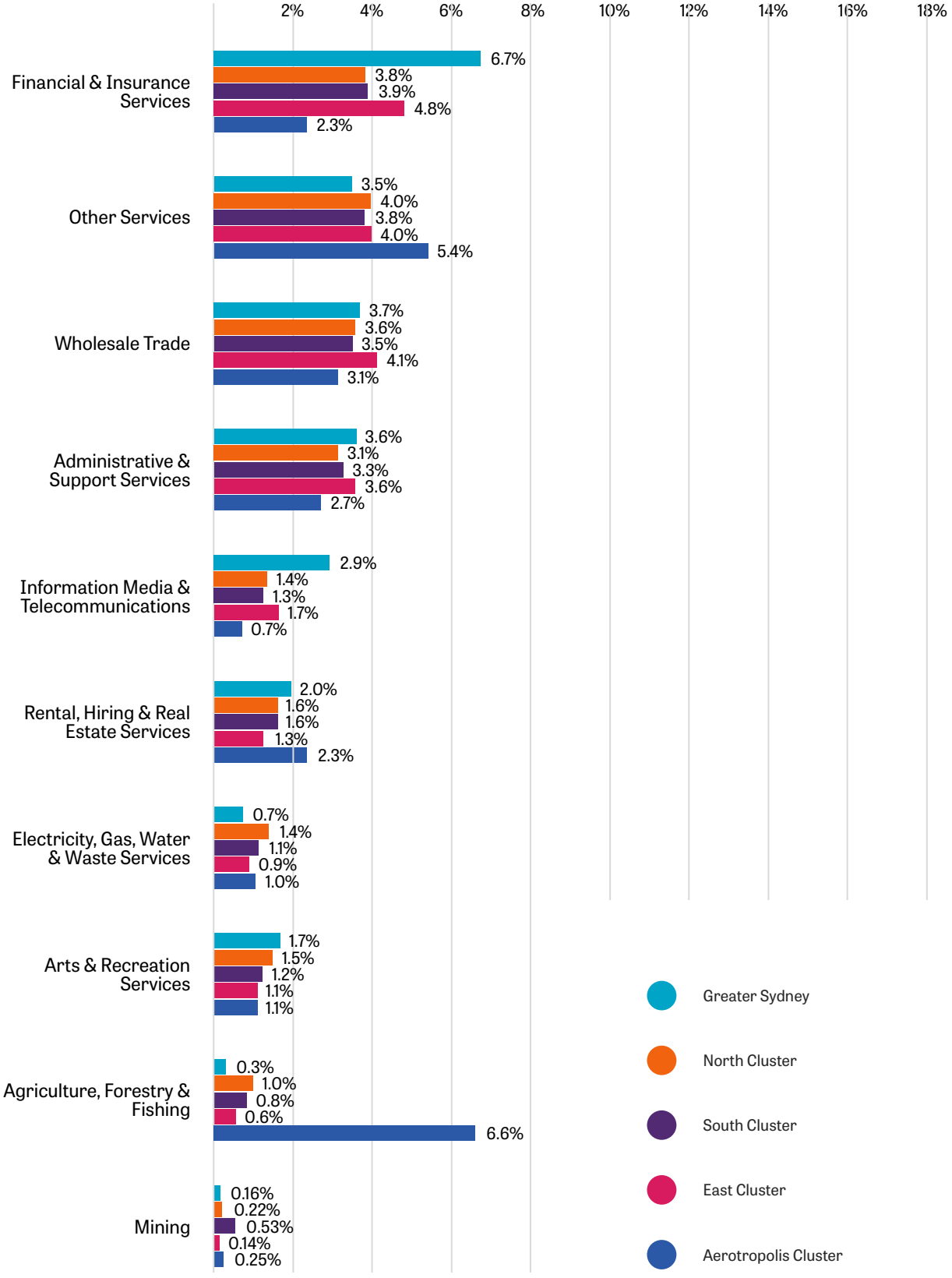
Figure A.9a: Employment by Industry (WPC Residents) and Employment by Industry (Greater Sydney)



Source: Australian Bureau of Statistics (2016)

Figure A.9b: Employment by Industry (Greater Sydney, North Cluster, South Cluster, East Cluster, Aerotropolis Cluster)





Source: Australian Bureau of Statistics (2016)

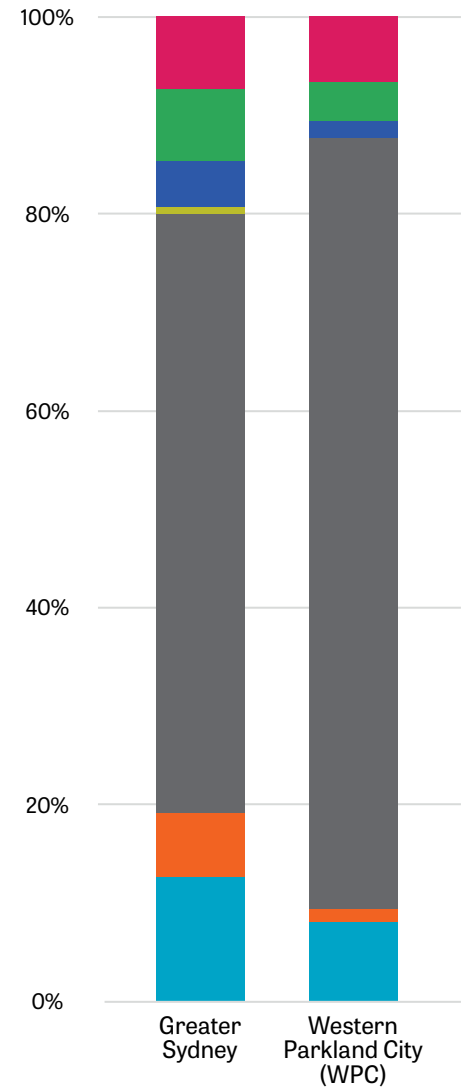
A.10 Journey to Work

Accessibility throughout the Western Parkland City remains a key challenge for many residents. The use of public transport as a method of transport from the Western Parkland City is significantly lower than that of Greater Sydney, resulting in an increased reliance on private vehicles as the primary mode of transport within the region.

New road infrastructure including the establishment of the M12 Motorway and upgrades to The Northern Road will continue the reliance on private vehicles. The extension of the Sydney Metro to the Metropolitan Cluster of Penrith via the Western Sydney Airport and Aerotropolis core and potentially onto Campbelltown-Macarthur will create new employment and residential opportunities, as well as facilitate changes in travel habits for residents that live within an accessible distance of the proposed metro. Active travel in the Western Parkland City is significantly lower than the Greater Sydney area. The co-location of employment and residential opportunities will encourage and enable active travel as a primary transport mode.

Accessibility is a key focus of the Western Parkland City and facilitating a 30 minute city with a variety of public and private transport options, all of which are vital in creating high amenity, productive, and cohesive communities.

Figure A.10: Journey to Work (Greater Sydney vs WPC Residents)



Mode of Transport	Greater Sydney	Western Parkland City (WPC)
Train	13%	8%
Bus	7%	1%
Private Vehicle	61%	78%
Bicycle	1%	0%
Walk Only	5%	2%
Other	7%	4%
Multiple Modes	7%	7%

Source: Australian Bureau of Statistics (2016)

Note: Journey to Work includes those going to school/educational institutions.

A.11 North Cluster Journey to Work

Private Vehicle
81% of trips by private vehicle

Train
6% of trips by train

Bus
1% of trips by bus

Bicycle
0% of trips by bicycle

Walk Only
2% of trips walk only

Multiple Modes
5% of trips using multiple modes

Other
5% of trips using other means

Source: Australian Bureau of Statistics (2016)
Note: Journey to Work includes those going to school/educational institutions.

A.12 South Cluster Journey to Work

Private Vehicle
80% of trips by private vehicle

Train
8% of trips by train

Bus
1% of trips by bus

Bicycle
0% of trips by bicycle

Walk Only
1% of trips walk only

Multiple Modes
6% of trips using multiple modes

Other
4% of trips using other means

Source: Australian Bureau of Statistics (2016)

A.13 East Cluster Journey to Work

Private Vehicle
76% of trips by private vehicle

Train
9% of trips by train

Bus
2% of trips by bus

Bicycle
0% of trips by bicycle

Walk Only
2% of trips walk only

Multiple Modes
7% of trips using multiple modes

Other
3% of trips using other means

Source: Australian Bureau of Statistics (2016)
Note: Journey to Work includes those going to school/educational institutions.

A.14 Aerotropolis Cluster Journey to Work

Private Vehicle
79% of trips by private vehicle

Train
3% of trips by train

Bus
0% of trips by bus

Bicycle
0% of trips by bicycle

Walk Only
3% of trips walk only

Multiple Modes
3% of trips using multiple modes

Other
11% of trips using other means

Source: Australian Bureau of Statistics (2016)