

Sustainability Profile

Greater Sydney Sustainability Profile



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The maps in this document are not intended to be used for site assessment at the property scale.



01 Introduction to the Sustainability Profile

This Sustainability Profile of Greater Sydney has been developed to provide supporting information on the environment, climate and biophysical system of Greater Sydney.

1.1 Purpose

The Sustainability Profile brings together a series of maps and graphs to tell the story of the people and places in Greater Sydney. It covers the landscape and environmental characteristics of places, energy, waste and transport emissions and water consumption across districts, residential density, access to open space, as well as the resilience of communities to natural hazards. It has been compiled to support the information contained in the Sustainability Section of the District Plans, as well as assist discussion and ongoing collaboration on sustainability issues and opportunities for planning.

1.2 Themes

The Sustainability Profile draws on the following key themes:

1. A city in its landscape
2. An efficient city
3. A resilient city

1.3 Limitations

This profile has been prepared to support strategic planning and contains information at a regional and district level.



02 A city in its landscape

The landscape of Greater Sydney has influenced the pattern of urban development, helping to shape the character of communities and providing a legacy of environmental assets.





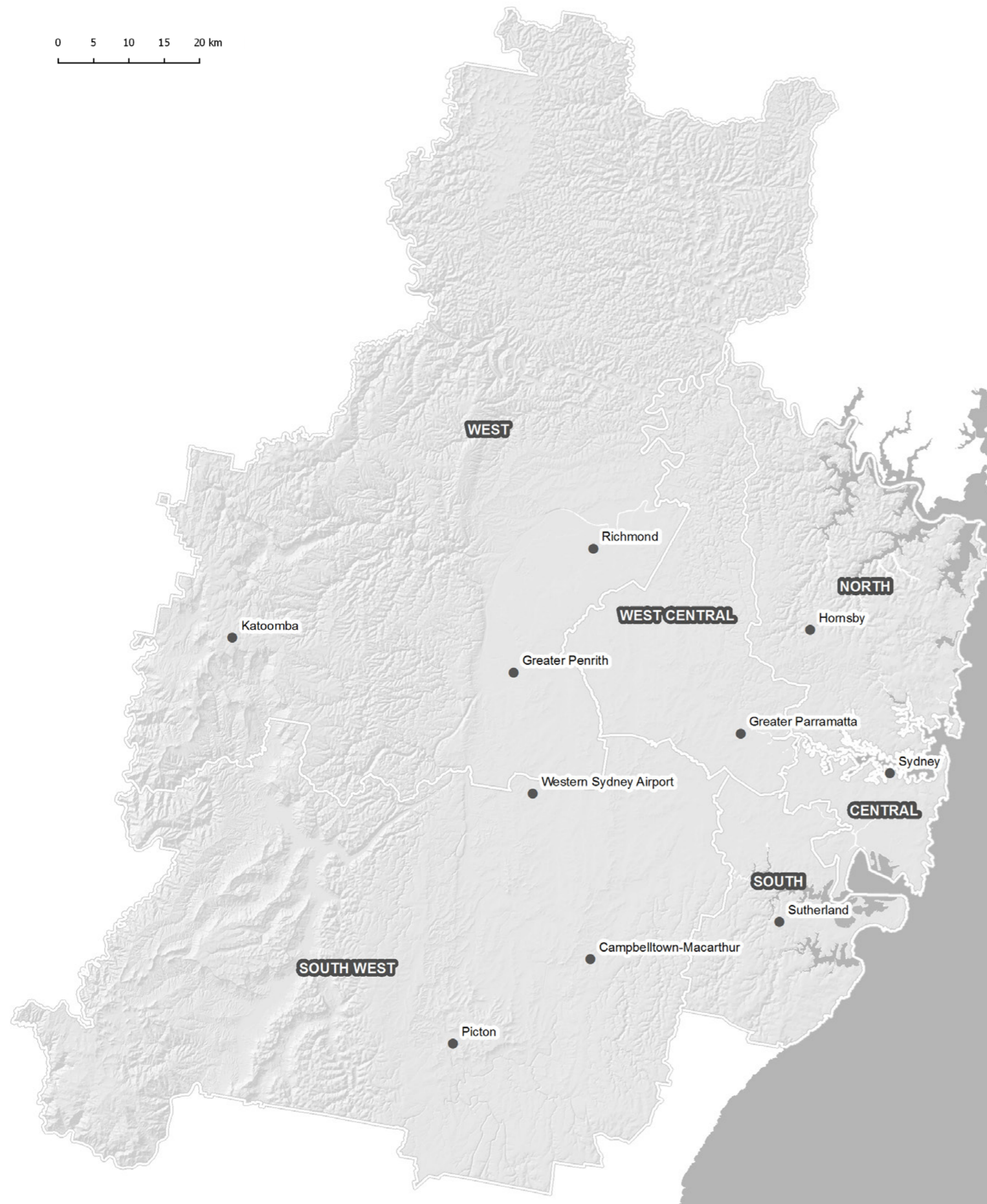
02 A city in its landscape

2.1 Geophysical

2.1.1 Topography

Key points

- This map shows the terrain of the Greater Sydney Region. It shows the mountains, plateaux and plains of the land.

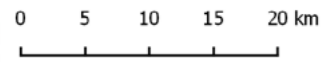


— District Boundary

● Location

● Water

Data Source: 25m Grid Digital Terrain Model NSW Land and Property Information (2013)



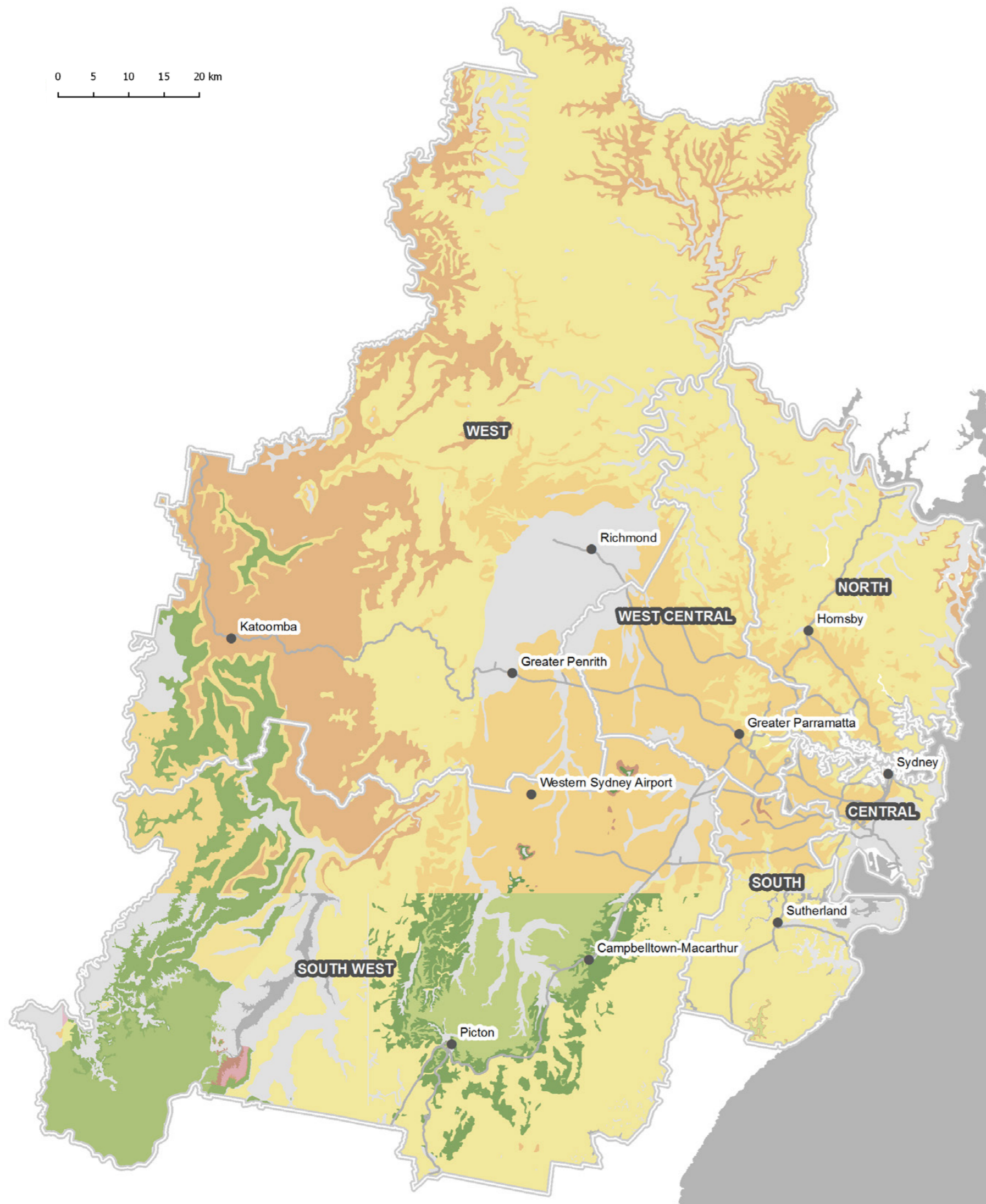
02 A city in its landscape

2.1 Geophysical

2.1.2 Geological Formation

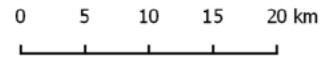
Key points

- This map shows the different types of rocks and rock formations in Greater Sydney. The map is made of two geological source maps, and that is why there is a sudden colour change in the South-West District.
- Greater Sydney is mostly underlain by sandstone and shale. Sandstone is a very hard rock that tends to break away in large blocks resulting in the rock outcrops and vertical cliffs typical of much of Greater Sydney's landscape. Shale is not as hard as sandstone and tends to weather and erode to form flatter plains.
- The types of rocks and rock formations impacts the foundation of buildings and roads, as well as influencing types of agricultural activity.



	Annan Shale		Hawkesbury Sandstone/ Narrabeen Group		Potts Hill Sandstone
	Ashfield Shale		Illawarra Coal Measures		Snapper Point Formation
	Berry Siltstone		Lambie Group		Stanwell Park Claystone
	Bindook Volcanic Complex		Liverpool Subgroup		Uncategorised
	Bringelly Shale		Megalong Formation		Wandrawandian Siltstone
	Bulgo Sandstone		Mittagong Formation		Whipbird Creek Formation
	Cobra Formation		Narrabeen Group		Water
	Gosford Subgroup		Newport and Garie Formation		District Boundary
	Hawkesbury Sandstone		Nowra Sandstone		Rail lines

Data Source: 1:250 000 geological series maps NSW Department of Industry - Resource & Energy
Bryan J.H., 1966, Sydney 1:250 000 Geological Sheet S1/56-05, 3rd edition, Geological Survey of New South Wales, Sydney. Rose G., 1966, Wollongong 1:250 000 Geological Sheet S1/56-09, 2nd edition, Geological Survey of New South Wales, Sydney.



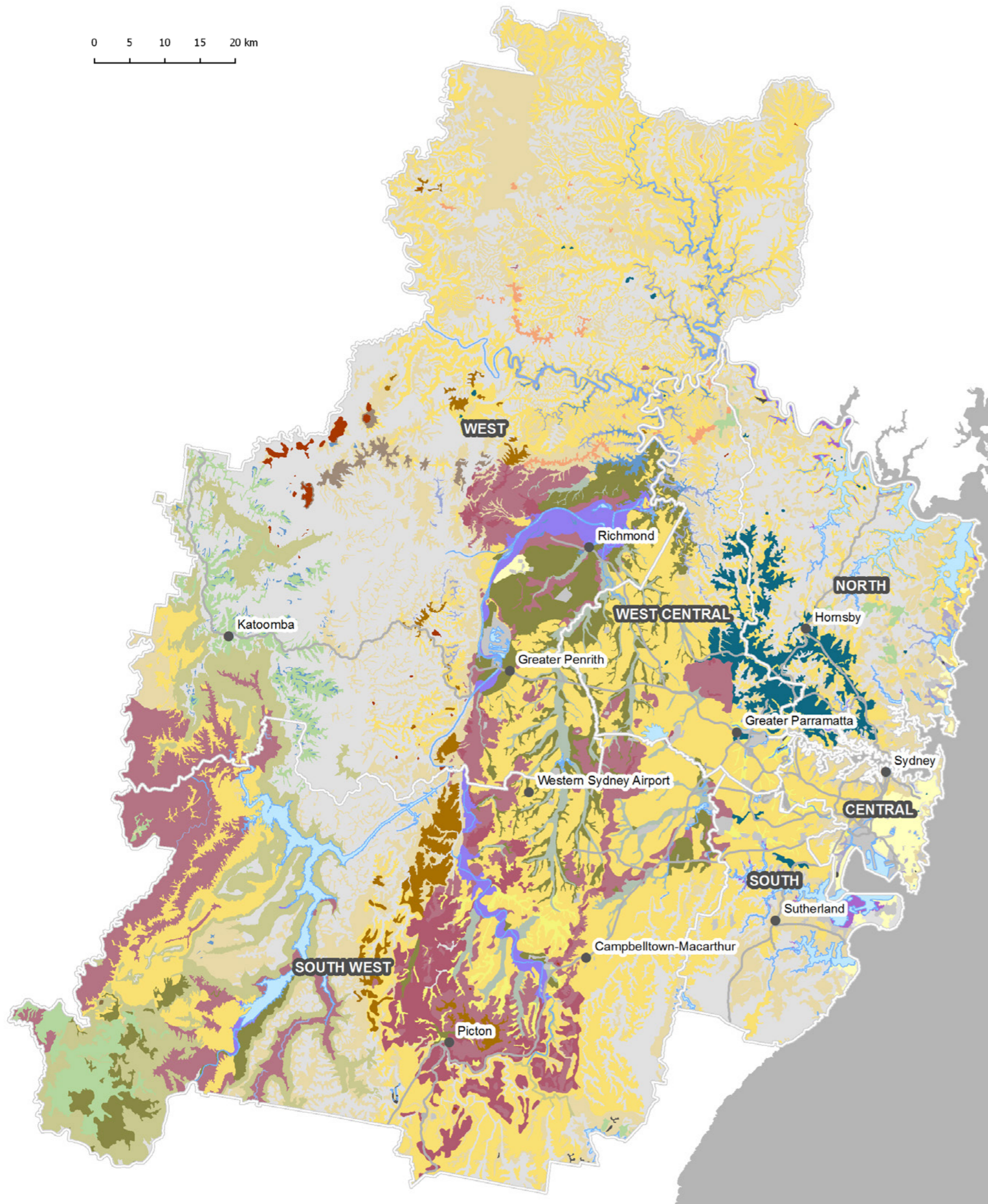
02 A city in its landscape

2.1 Geophysical

2.1.3 Soil Types

Key points

- This map identifies 25 dominant soil types within Greater Sydney using the Great Soil Group soil classification system.
- The most common soils are the highly permeable Siliceous Sands (light grey) derived mostly from the Hawkesbury Sandstone hills and texture-contrast Yellow Podzolic Soils with low fertility (dark yellow) common on rises of Wianamatta-Ashfield Shale and plateaux of Mittagong Formation shales and sandstones. There are also significant alluvial soils around the Hawkesbury-Nepean.
- Understanding the type of soil will identify soil properties that can impact the use of the land.
- The combination of soils, hydrology and slope orientation has a major influence on the distribution of vegetation types and communities.



Red Earths - more fertile (volcanics and granodiorites)	Humic Gleys	Soloths
Acid Peats	Humus Pdzols	Terra Rossa Soils
Alluvial Soils - Light Sandy Textured	Kraznozems	Yellow Earths
Alluvial Soils - Medium Textured	Lithosols	Yellow Podzolic Soils - more fertile
Brown Earths	Podzolic	Yellow Podzolic Soils - less fertile
Brown Podzolic Soils	Red Podzolic Soils - less fertile	Water
Calcareous Sands	Red Podzolic Soils - more fertile	Uncategorised
Chocolate Soils	Siliceous Sands	District Boundary
Earthy Sands	Solodic Soils	Rail Lines
Gleyed Podzolic Soils	Solonchaks	

Data Source: Great Soil Group (GSG) NSW Office of Environment and Heritage (2012)



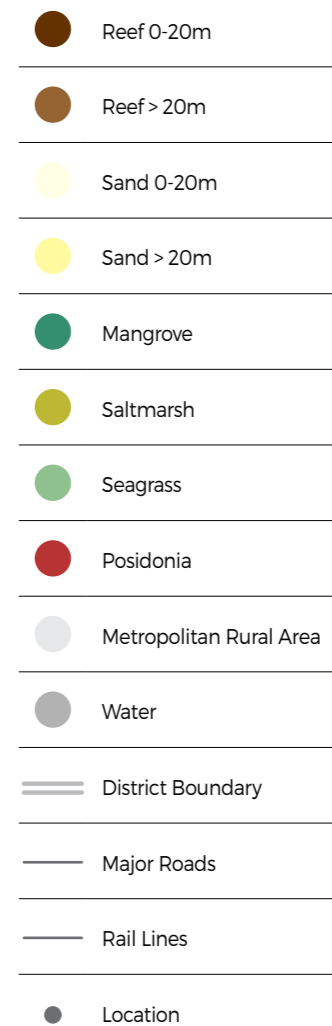
02 A city in its landscape

2.2 Blue Grid - waterways and coastline

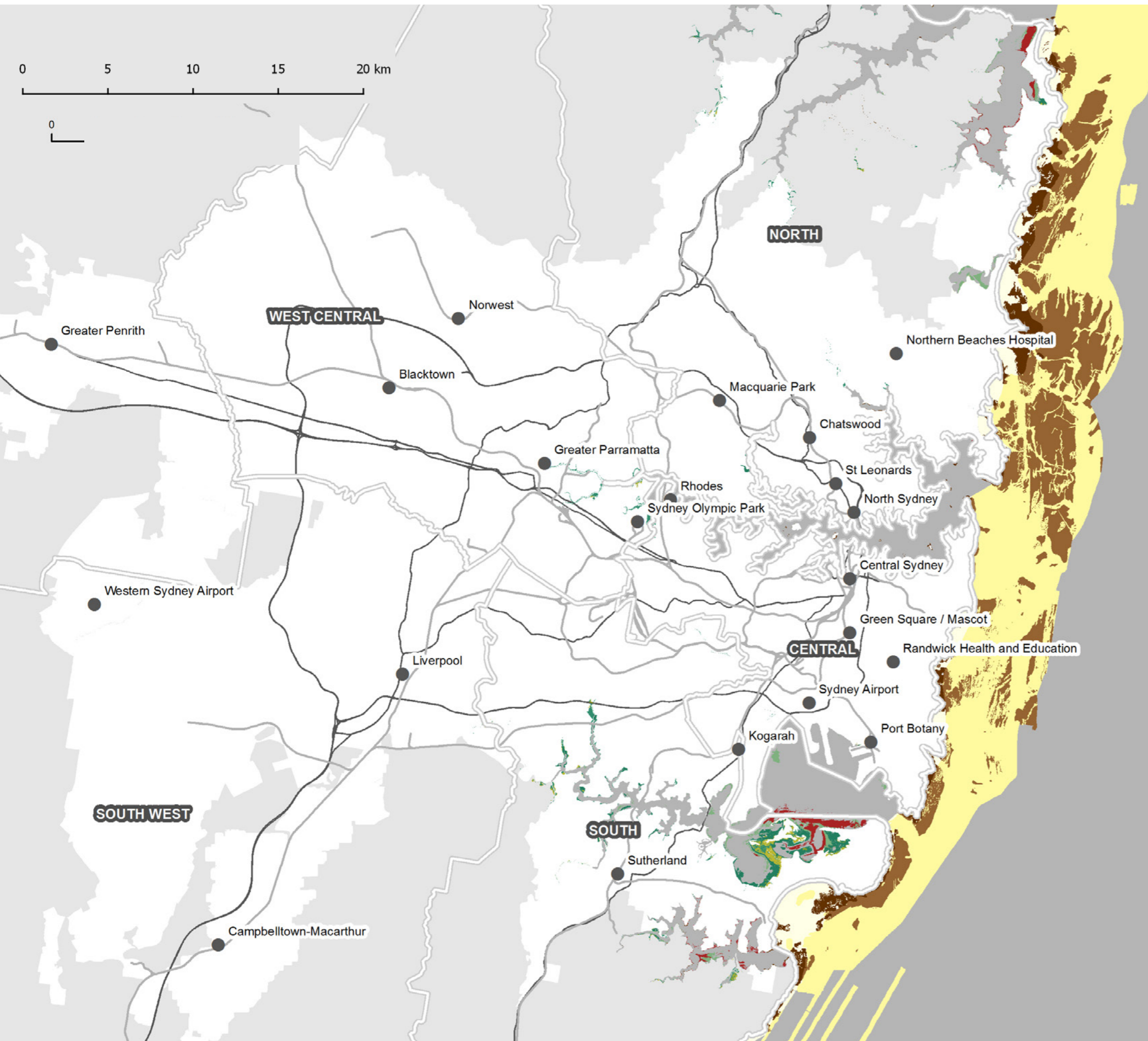
2.2.1 Key marine and estuarine habitats

Key points

- This map shows the main underwater marine habitats in estuaries and coastal waters of Greater Sydney. It highlights the areas of reef in deeper waters and seagrass, saltmarsh and mangrove in estuaries.
- Shown in magenta is the distribution of the seagrass Posidonia, which is an endangered ecological community.



Data Source: NSW Office of Environment and Heritage (2002) and NSW Department of Primary Industries (2000) NSW Estuarine Macrophytes and NSW Marine Subtidal Habitats





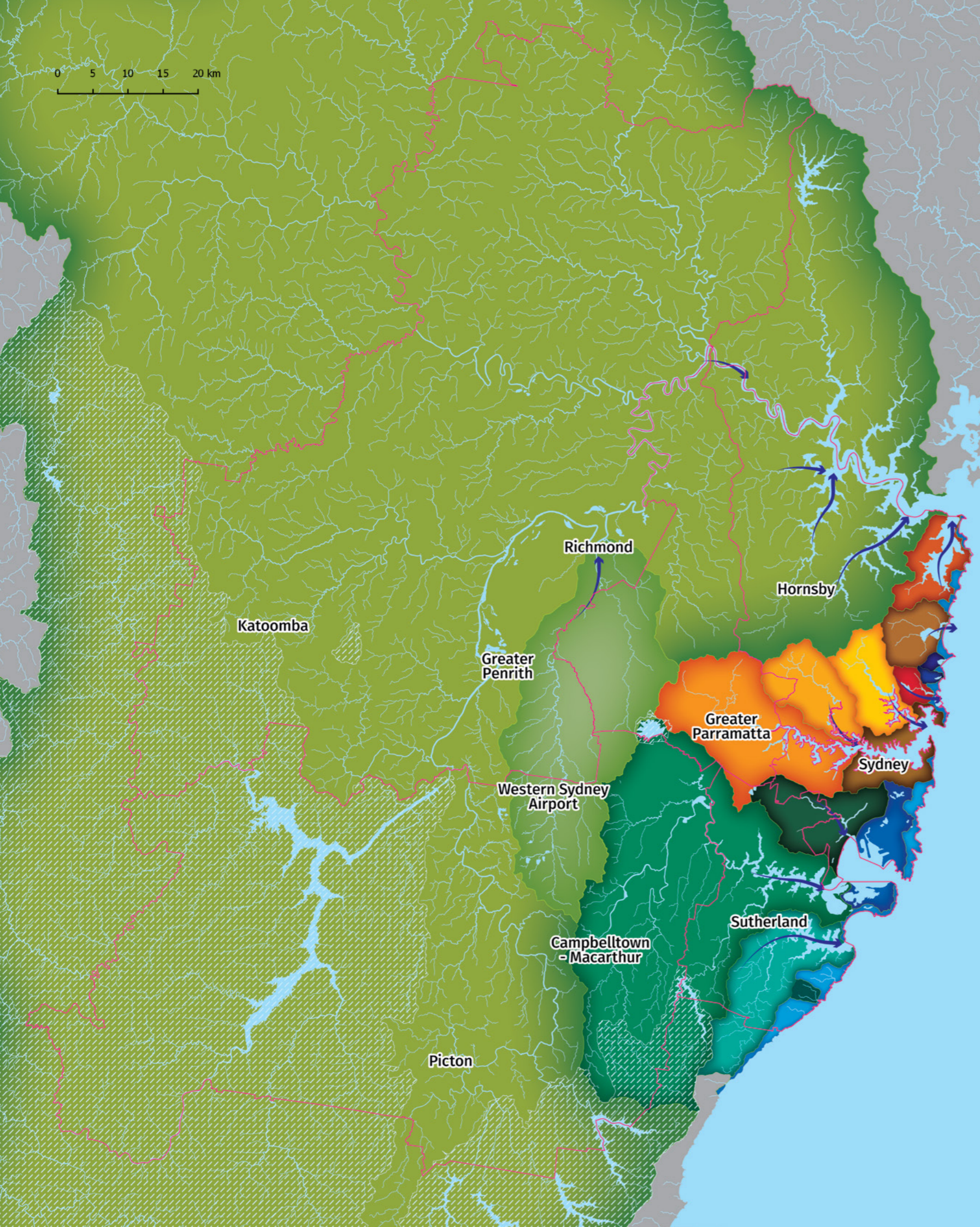
02 A city in its landscape

2.2 Blue Grid - waterways and coastline

2.2.2 Estuary drainage catchments and South Creek Catchment

Key points

- This map shows the natural boundaries of catchments that drain into the major waterways in Greater Sydney.
- Land use activities (including urban developments) within these catchments have the potential to impact on the water quality and aquatic ecosystem health of the receiving waterways.



	District Boundary		Lane Cove River Basin
	River Flow Direction		Manly Lagoon Basin
	Hawkesbury-Nepean River Basin		Narrabeen Lagoon Basin
	Parramatta River Basin		Middle Harbour Creek Basin
	Georges River Basin		Dee Why and Curl Curl Lagoon Basin
	South Creek Subcatchment		Port Hacking Basin
	Cooks River Basin		Wattamolla Creek Basin
	Port Jackson Basin		Coastal Catchment
	Botany Bay Basin		Oceans and Waterways
	Pittwater Basin		Drinking Water Catchment













02 A city in its landscape

2.2 Blue Grid - waterways and coastline

2.2.3 Wetlands and Aquatic Ecosystems

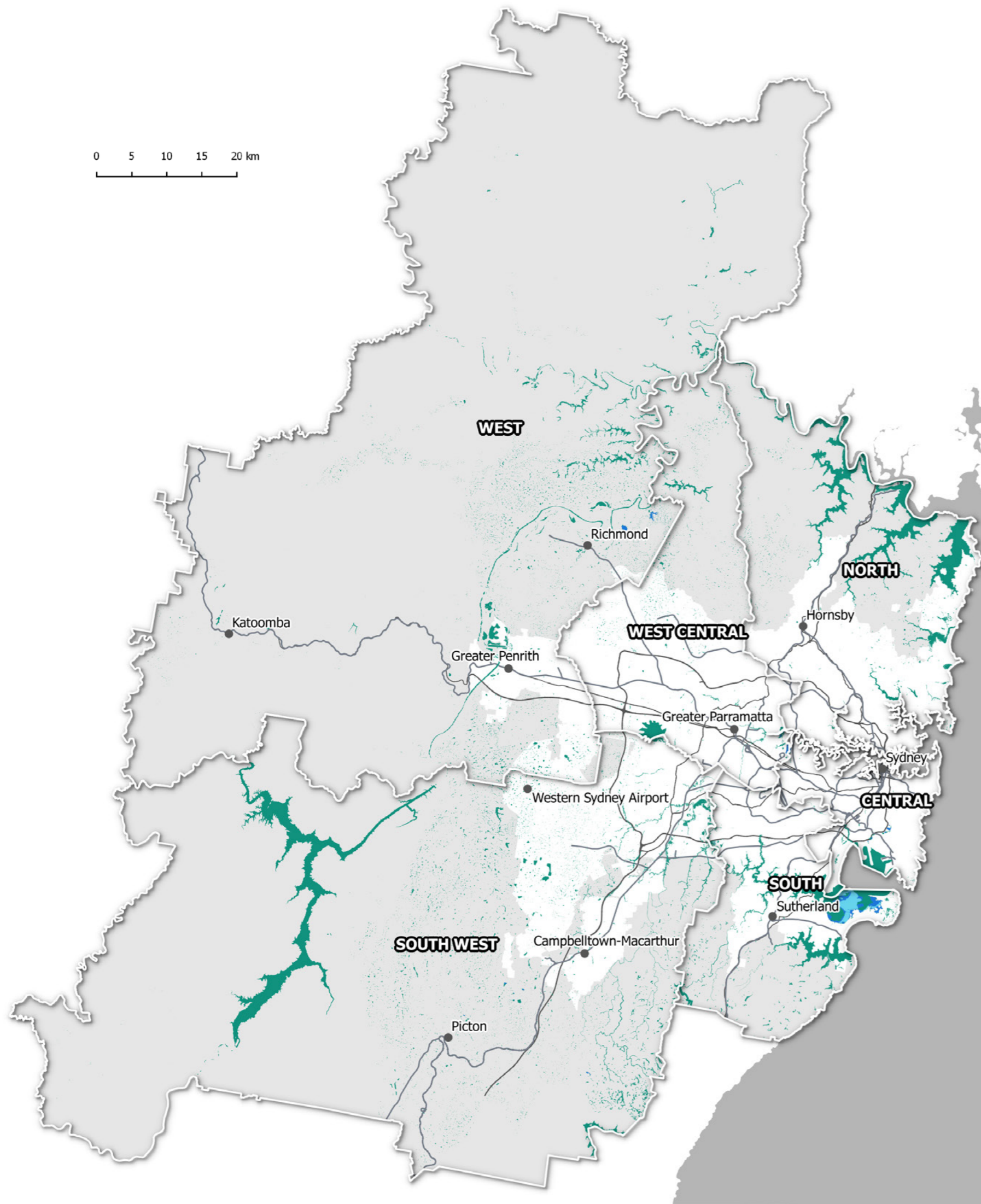
Key points

- This map identifies aquatic ecosystems that are of international, national and/or state significance and are predominantly protected. For example, the map shows the extent of wetlands in the Towra Point Nature Reserve Ramsar site on the southern shore of Botany Bay, approximately 16 kilometres from Sydney city.
- A Ramsar site is a wetland identified in the intergovernmental Convention on Wetlands of International Importance (known as the Ramsar Convention).
- The Directory of Important Wetlands identifies nationally important wetlands, as well as defining their variety, and the flora and fauna species that depend on them. The criteria for determining nationally important wetlands in Australia and their eligibility for inclusion in the Directory, are set out by the Australian and New Zealand Environment Conservation Council Wetlands Network.

-  Ramsar Wetlands
-  Important Wetlands
-  Other Wetlands and Waterbodies
-  Oceans and Waterways
-  Metropolitan Rural Area
-  Water
-  District Boundary
-  Major Roads
-  Rail Lines
-  Location

Data Source: Ramsar Wetlands of Australia - Department of Environment and Energy (Commonwealth of Australia) 2010, Directory of Important Wetlands in Australia - Department of Environment and Energy (Commonwealth of Australia) 2015, Other Wetlands - Office Environment and Heritage 2016 & Other Waterbodies - NSW Land and Property Information (2013)

0 5 10 15 20 km





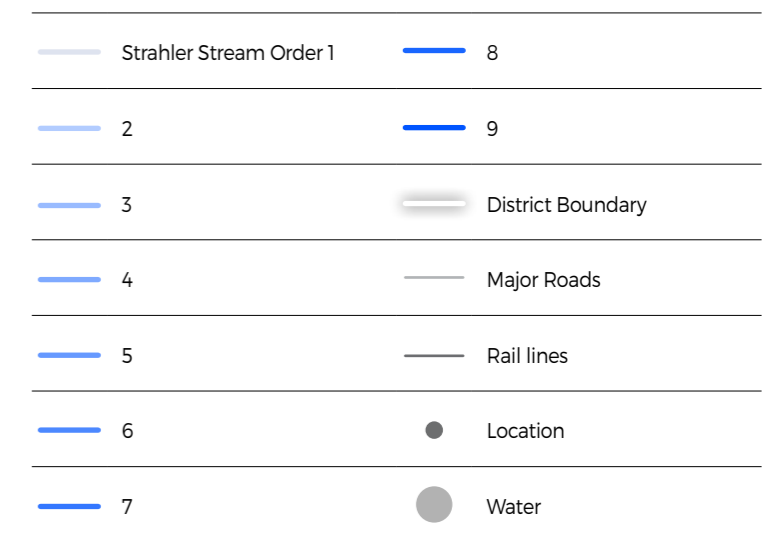
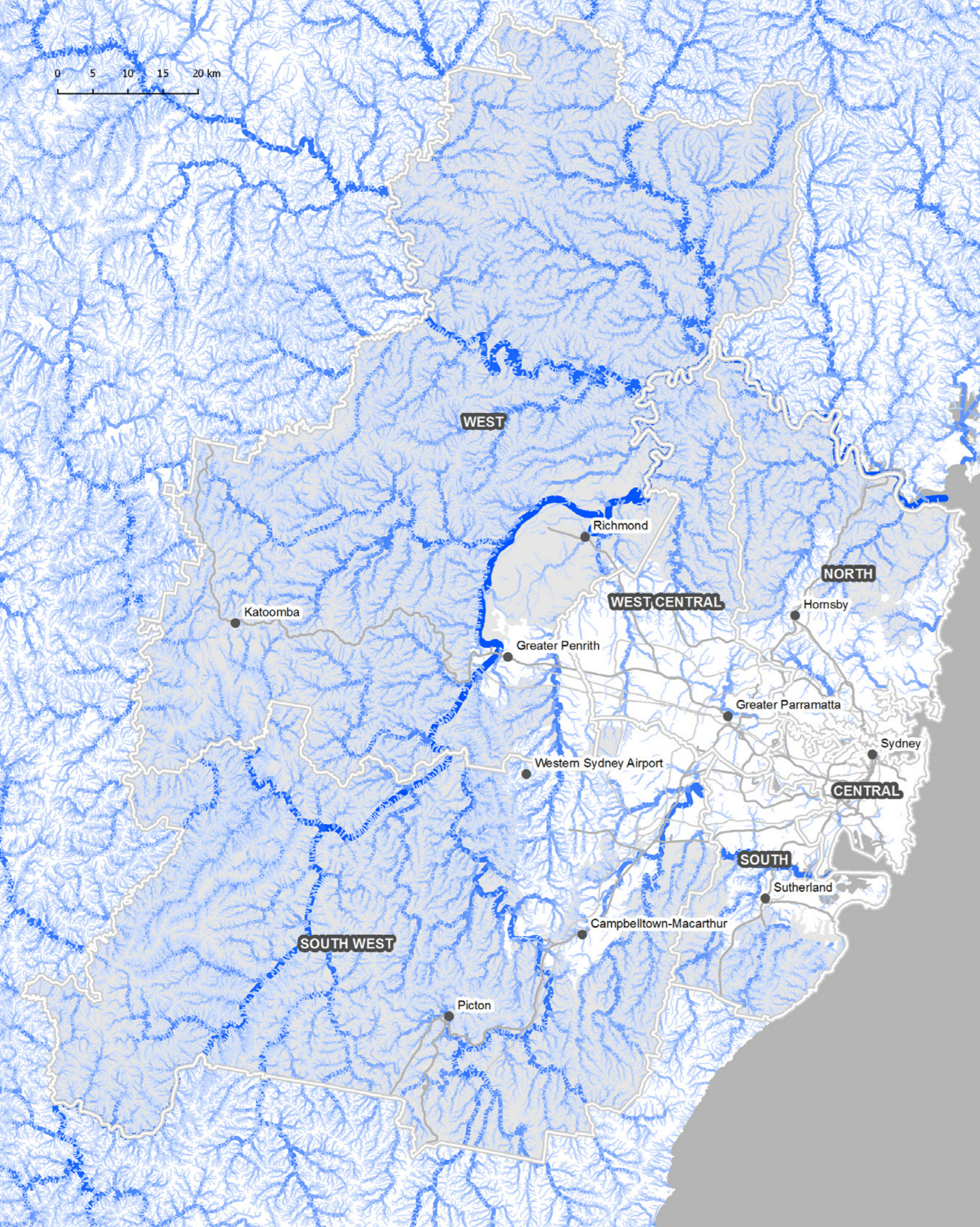
02 A city in its landscape

2.2 Blue Grid - waterways and coastline

2.2.4 Strahler streams

Key points

- This map shows the network of natural streams that form a significant part of the Blue Grid in Greater Sydney.
- Streams are identified using the Strahler stream ordering methodology, which describes stream size based on a hierarchy of tributaries. The Strahler stream ordering methodology is used to set clear, consistent riparian corridor widths for various stream types in NSW.
- The width of the riparian corridor is important for maintaining or improving the shape, stability (or geomorphic form) and ecological functions of a waterway.





02 A city in its landscape

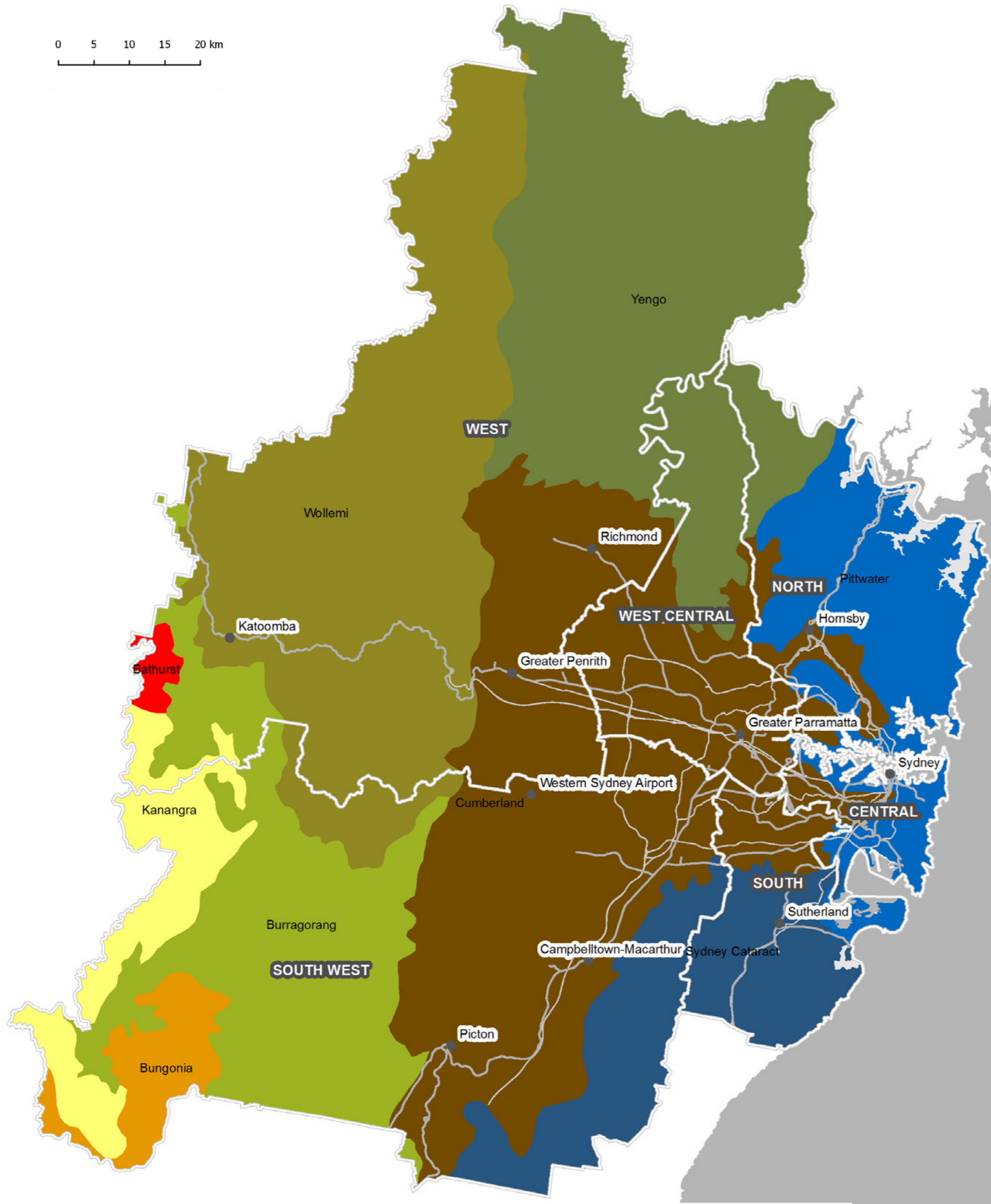
2.3 Green Grid - ecology

2.3.1 Bioregions and subregions of Greater Sydney

Key points

- This map shows the bioregions and subregions that make up Greater Sydney. It includes part of the Sydney Basin Bioregion and some of its sub-regions. It also includes a small part of the South Eastern Highlands Bioregion and some of its subregions.
- Bioregions are relatively large land areas characterised by broad, landscape-scale natural features and environmental processes that influence the functions of entire ecosystems. Each bioregion displays its own patterns in the landscape, ecosystem processes and fauna and flora. Within each bioregion, smaller subregions have been defined based on differences in geology, vegetation and other biophysical attributes and are the basis for determining the major regional ecosystems.

0 5 10 15 20 km



South Eastern Highlands Bioregion		Sydney Basin Bioregion	
●	Bathurst	●	Water
●	Bungonia	●	Burragorang
●	Kanangra	●	Cumberland
	District Boundary	●	Pittwater
	Major Roads	●	Sydney Cataract
	Rail Lines	●	Wollemi
●	Location	●	Yengo












02 A city in its landscape

2.3 Green Grid - ecology

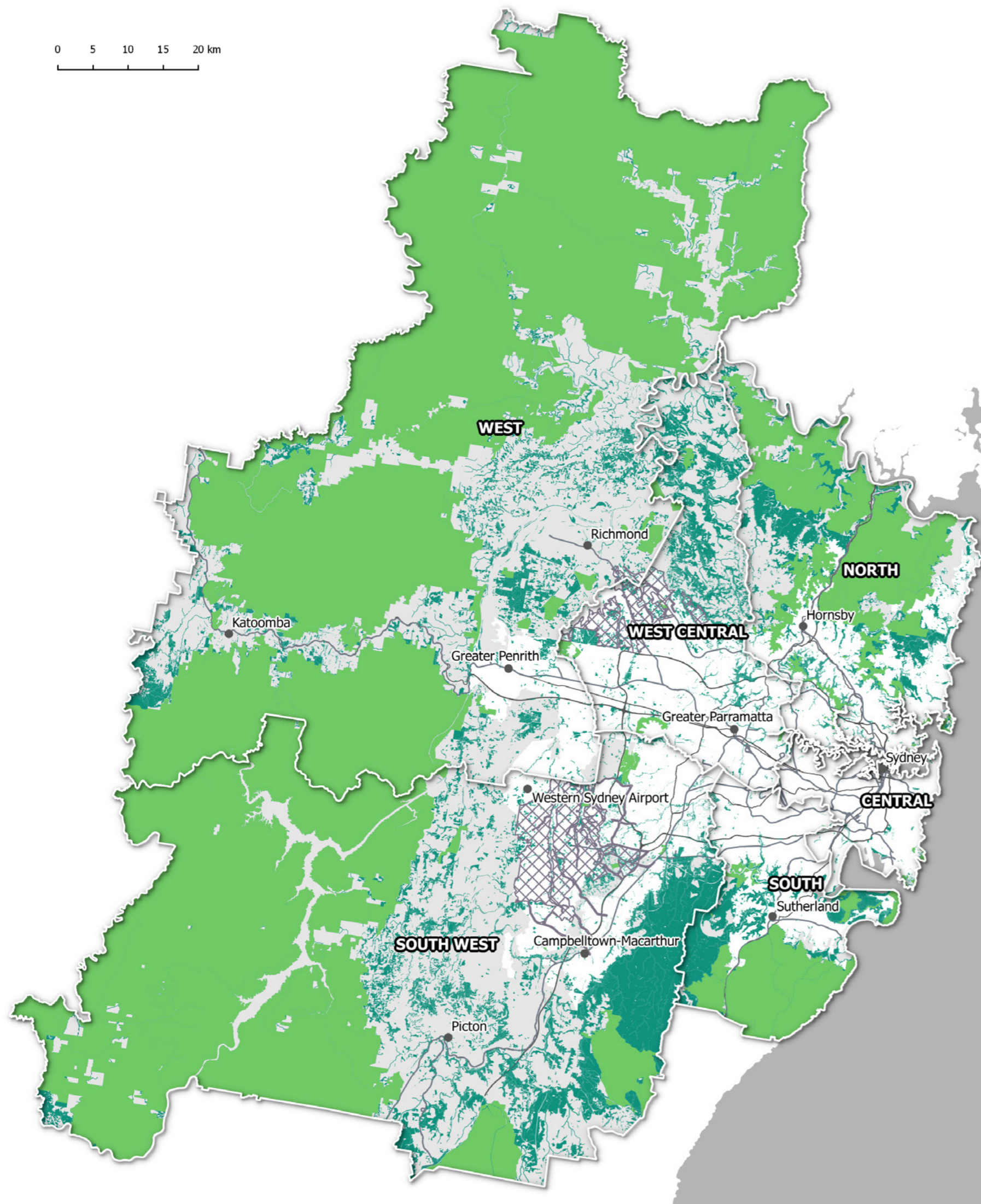
2.3.2 Greater Sydney Region High Environmental Value (HEV)

Key points

- HEV mapping is intended to provide a regional level overview of relative biodiversity values for the purposes of strategic planning.
- HEV are areas identified as environmentally significant such as national parks and reserves, areas that contain native vegetation of high conservation value including threatened ecological communities and key habitats.
- This map identifies the areas that contain HEV in Greater Sydney, based on the best available spatial data and information. All national parks and reserves are shown as containing HEV. Some areas that are not green on this map may also contain HEV.
- The North West and South West Priority Growth Areas, as well as part of the Western Sydney Priority Growth Area are biocertified via the Growth Centres State Environmental Planning Policy. For more information see the NSW Office of Environment and Heritage website <http://www.environment.nsw.gov.au/biocertification>.
- The HEV data may be subject to limitations including those of scale and positional accuracy of attributes.
- Local planning authorities should contact the Office of Environment and Heritage to obtain the most recent spatial data for their area and further information.

-  National parks and reserves
-  Other High Environmental Value
-  Priority Growth Area with biodiversity certification
-  Metropolitan Rural Area
-  Water
-  District Boundary
-  Major Roads
-  Rail lines
-  Location

0 5 10 15 20 km





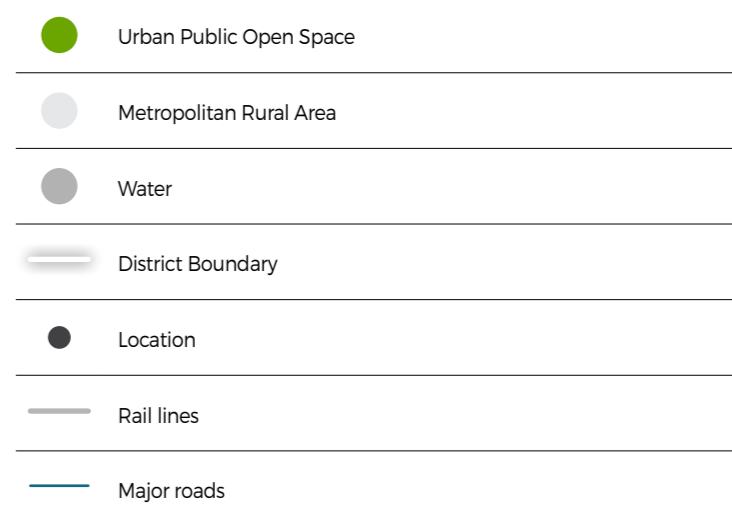
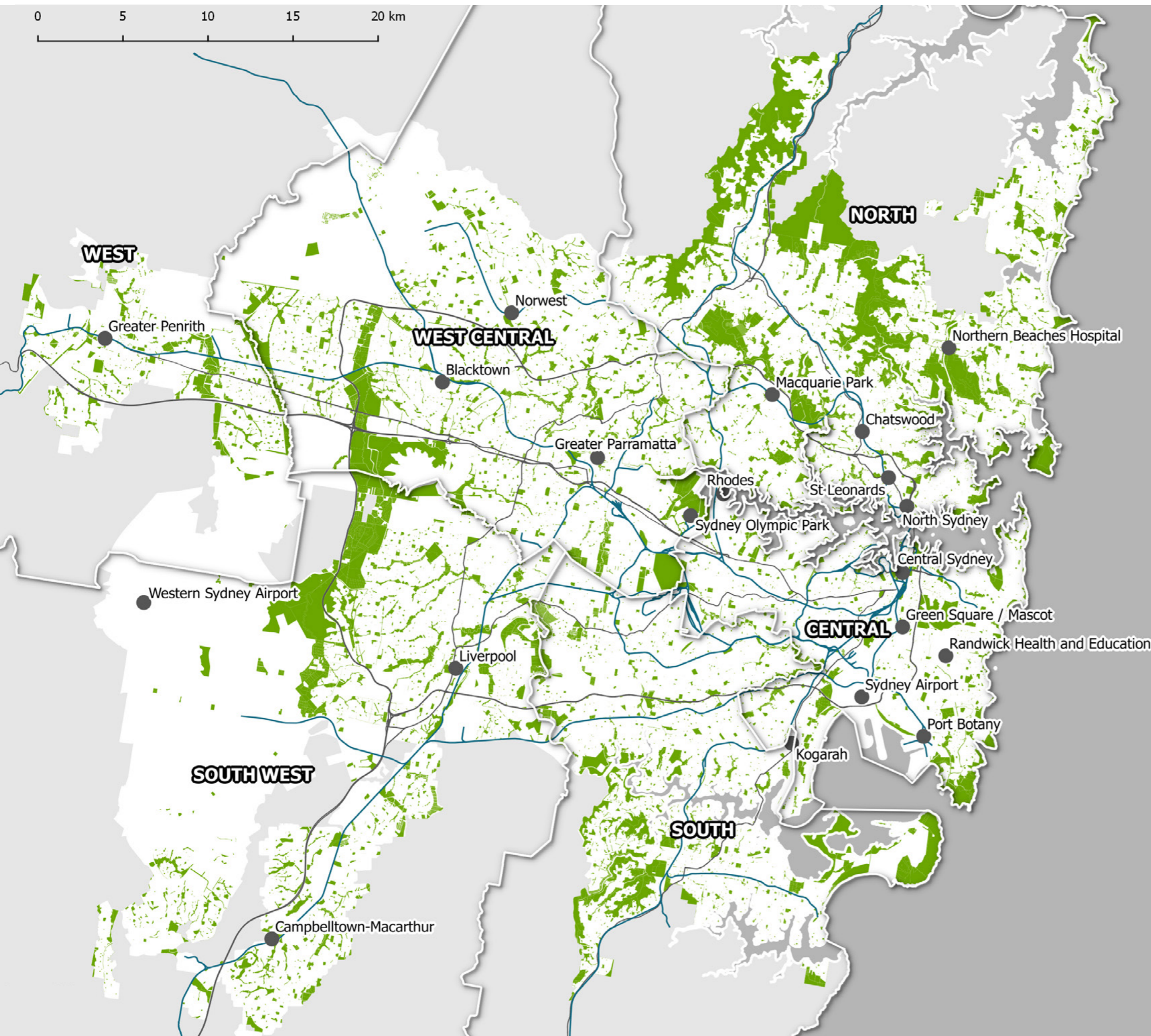
02 A city in its landscape

2.4 Green Grid - open space

2.4.1 Open Space

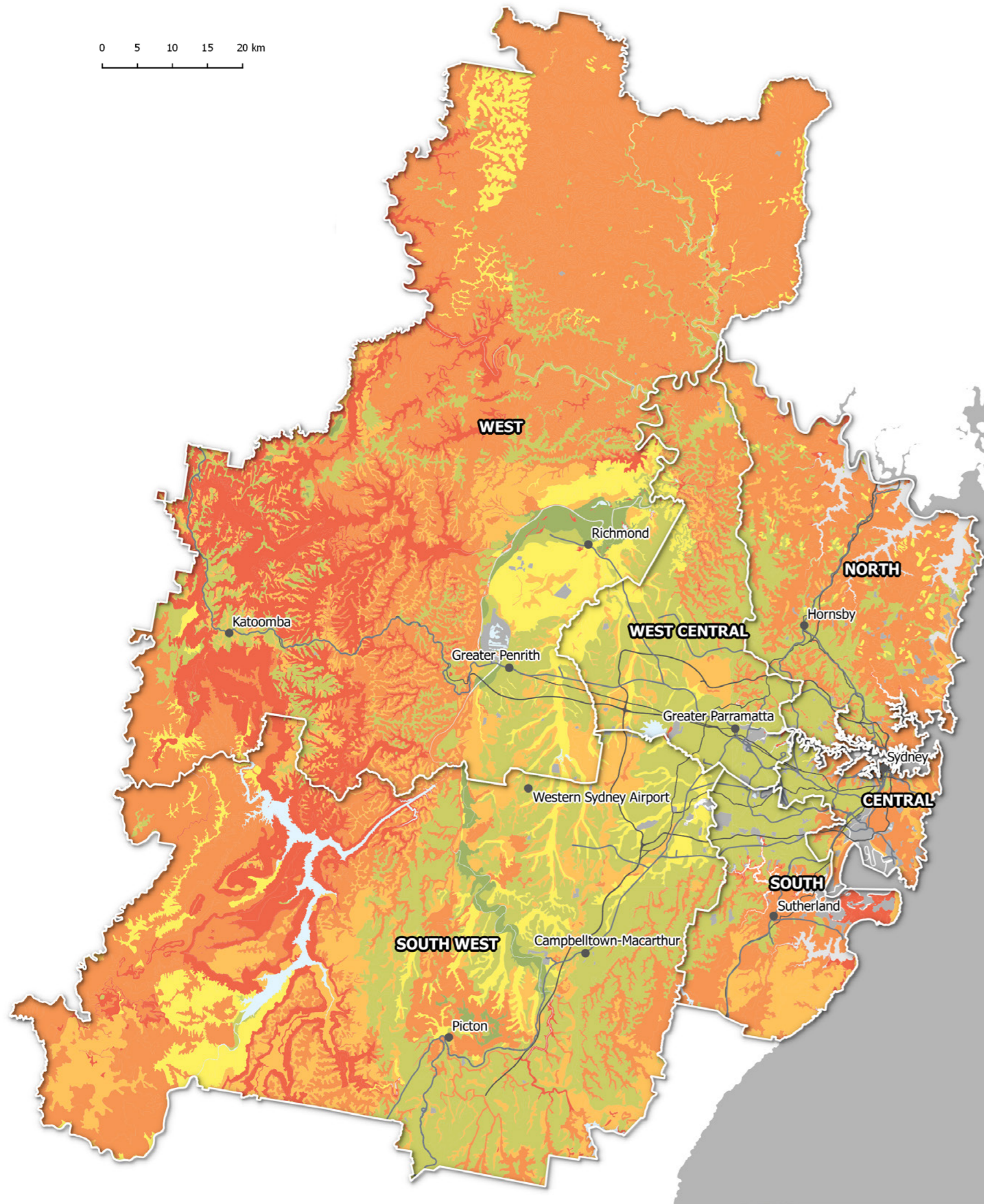
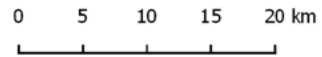
Key points

- The Open Space map shows urban local, district and regional open spaces including national parks and reserves. These areas are shown in light green.



Data Source: Open Space Audit, NSW Office of the Government Architect (2016)

Note: The accuracy of the data provided by 3rd parties underpinning the open space audit cannot be guaranteed. The data is cadastral and therefore areas shown may not be entirely public open space that is accessible to the public and may include land occupied by development.



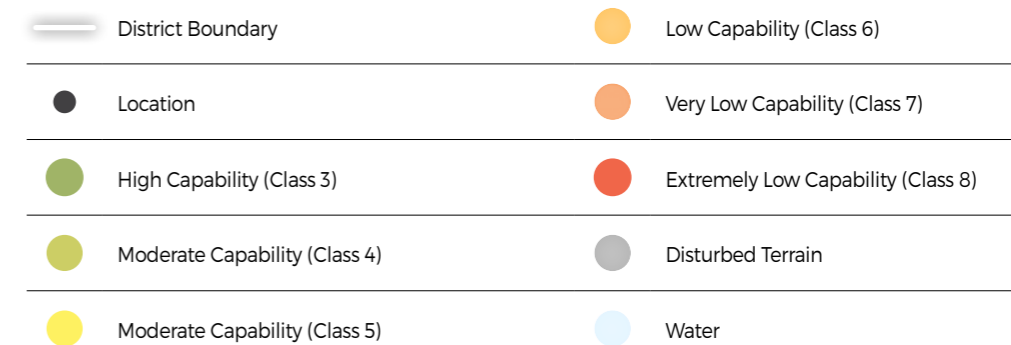
02 A city in its landscape

2.5 Peri-urban lands

2.5.1 Land and soil capability

Key points

- This map provides a regional scale view of the land and soil capability classes within Greater Sydney. It identifies the inherent physical capacity of the land to sustain a range of land uses and management practices in the long term without degradation to soil, land and water.
- Failure to manage land in accordance with its capability risks degradation of resources both on- and off-site, leading to a decline in natural ecosystem values, agricultural productivity and infrastructure functionality.
- Further information about the Land and Soil Capability Scheme can be found at the Office of Environment and Heritage website <http://data.environment.nsw.gov.au/dataset/land-and-soil-capability-mapping-for-nsw4bc12>.
- The Land and Soil Capability mapping scheme is based on an eight class system with values ranging between 1 and 8, which represent a decreasing capability of the land to sustain land use. Class 1 represents land capable of sustaining most land uses including those that have a high impact on the soil (e.g. regular cultivation), whilst class 8 represents land that can only sustain very low impact land uses (e.g. nature conservation). However, there are no Class 1 or Class 2 soils in Greater Sydney.





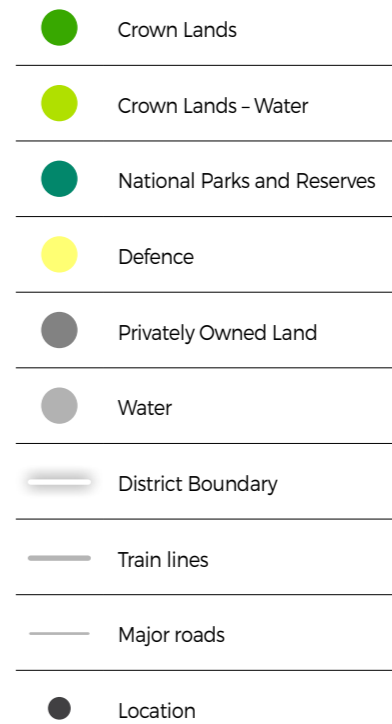
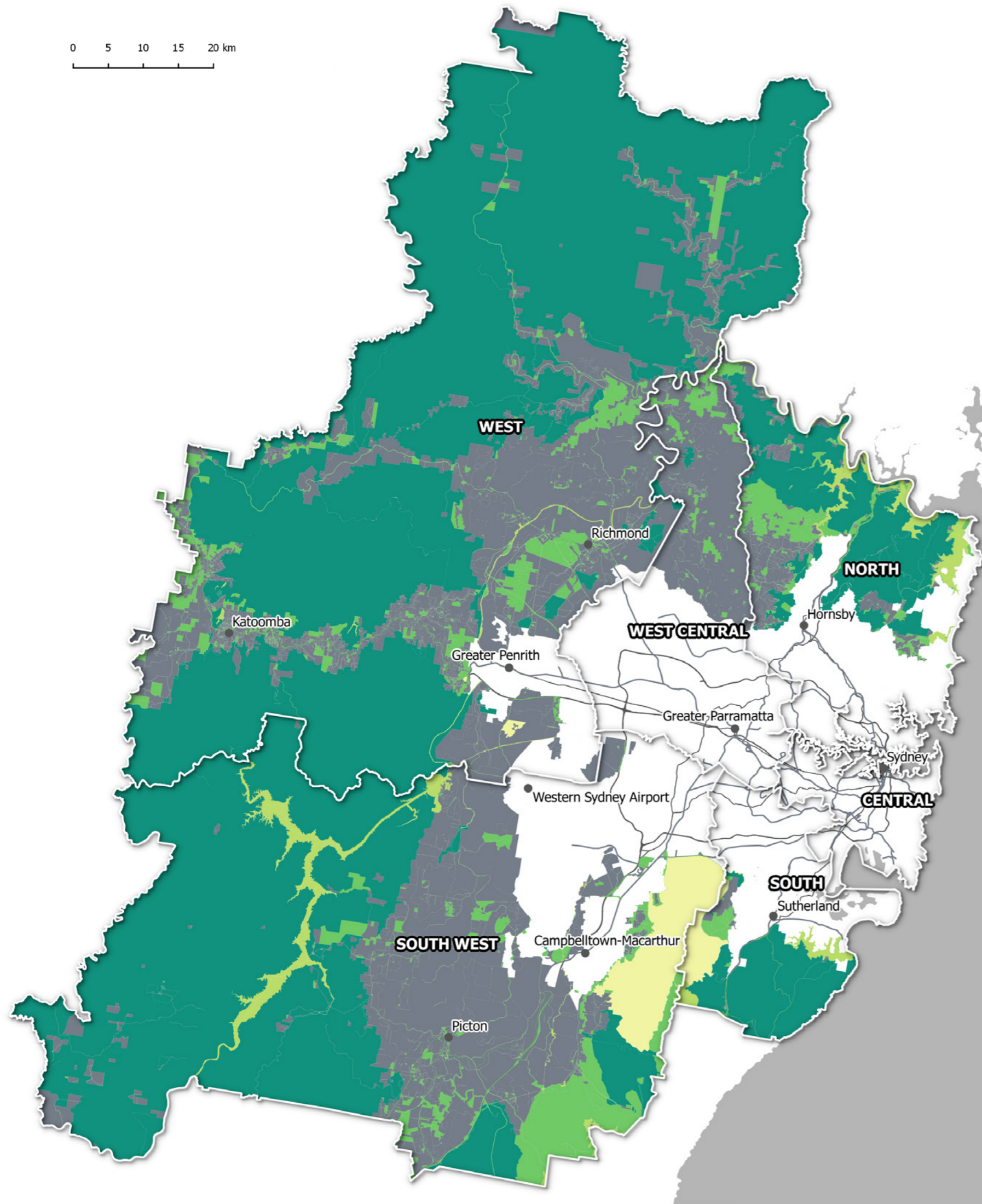
02 A city in its landscape

2.5 Peri-urban lands

2.5.2 Land Tenure

Key points

- This map shows the land ownership pattern in the Metropolitan Rural Area (MRA). Most of the land in the MRA forms part of National Parks. There is also a significant proportion of land in private ownership.





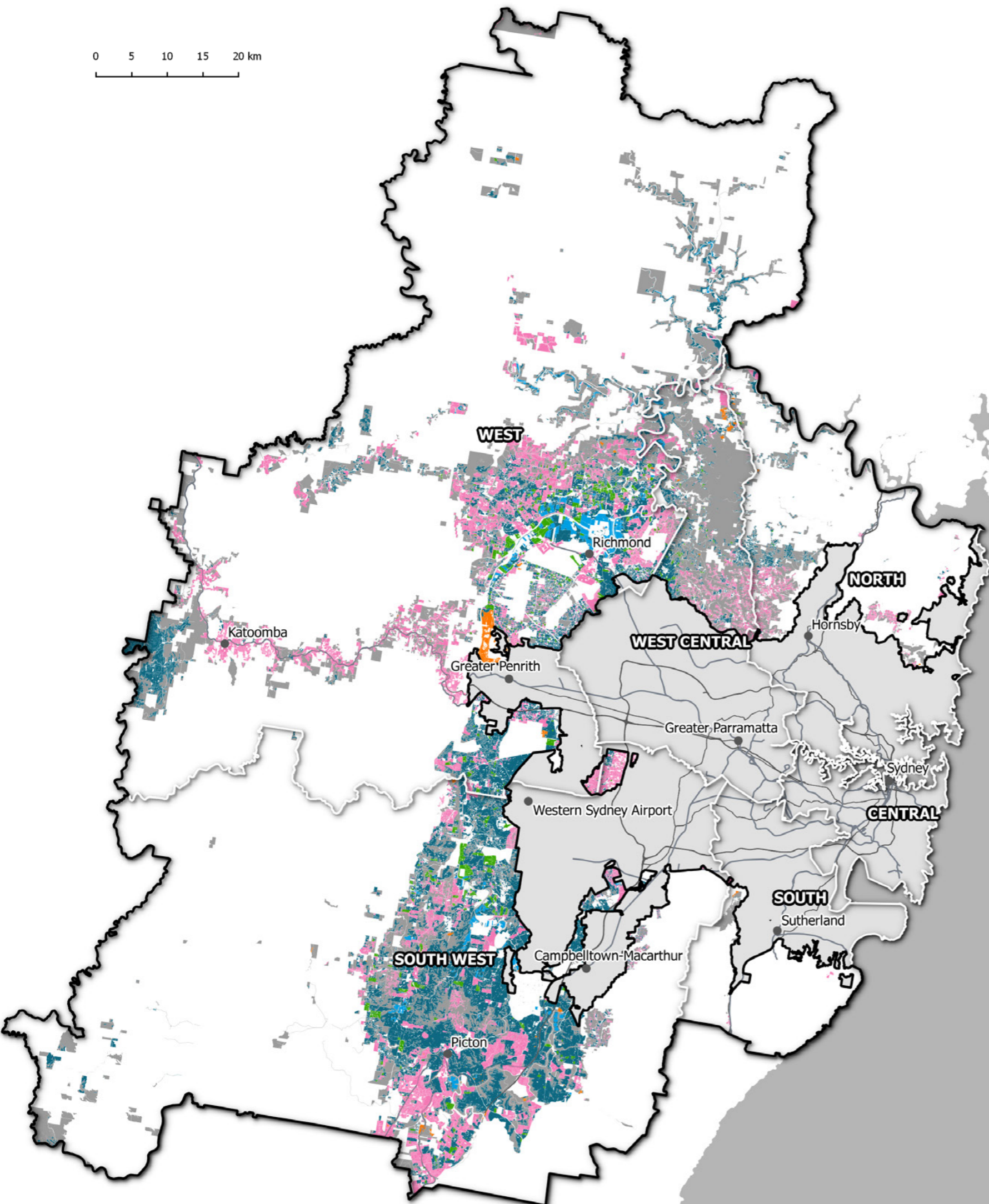
02 A city in its landscape

2.5 Peri-urban lands

2.5.3 Metropolitan Rural Area land use

Key points

- This map shows the use of privately owned land in the Metropolitan Rural Area (MRA). Residential or rural residential uses are clustered along the main roads and around rural towns and villages, including towns and villages of the Blue Mountains. Agricultural uses are distributed across these areas. There are also tracts of land which are vacant or not used.















02 A city in its landscape

2.6 Cultural landscape

2.6.1 State, National, Commonwealth and World Heritage

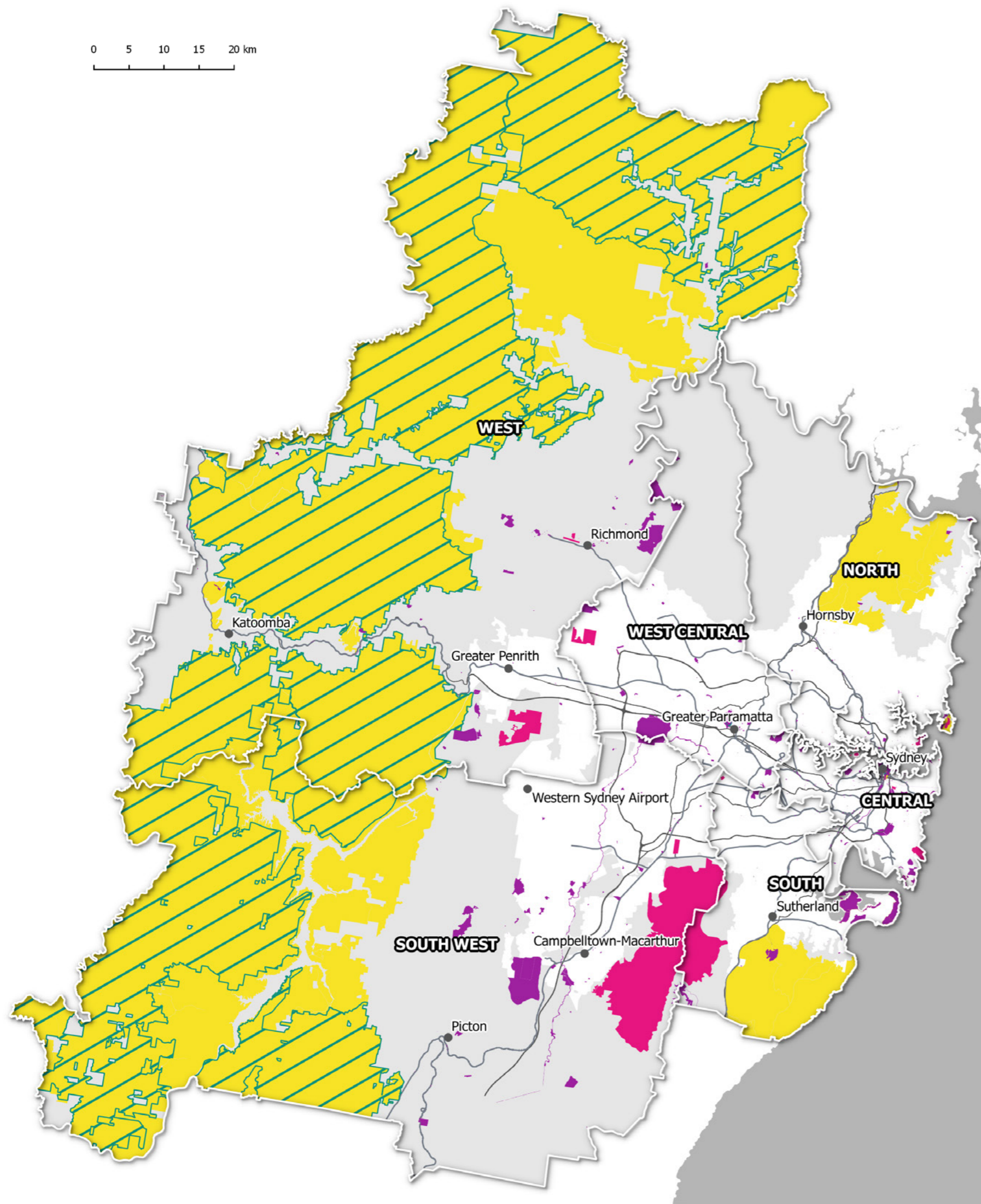
Key points

- This map shows the State Heritage Register Listed Items, National and Commonwealth Heritage Listed Places and World Heritage Sites in Greater Sydney. Planning should conserve and enhance environmental heritage.
- Further information on State Heritage is available through the State Heritage Register on the Heritage Council of NSW website www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx.
- Further information on National or World Heritage Lists is available through the website www.environment.gov.au/heritage.

-  State Heritage Register Listed Item
-  National Heritage Listed Place
-  Commonwealth Heritage Listed Place
-  World Heritage Site
-  Metropolitan Rural Area
-  Water
-  District Boundary
-  Rail lines
-  Major roads
-  Location

Data Source: NSW State Heritage Register - Curtilages, NSW Office of Environment and Heritage (2005); Australia, National Heritage List - Spatial Database, Commonwealth of Australia, Heritage Division of the Australian Government Department of the Environment and Energy (2016); Australia, Commonwealth Heritage List - Spatial Database, Commonwealth of Australia, Heritage Branch of the Australian Government Department of the Environment and Energy (2016)

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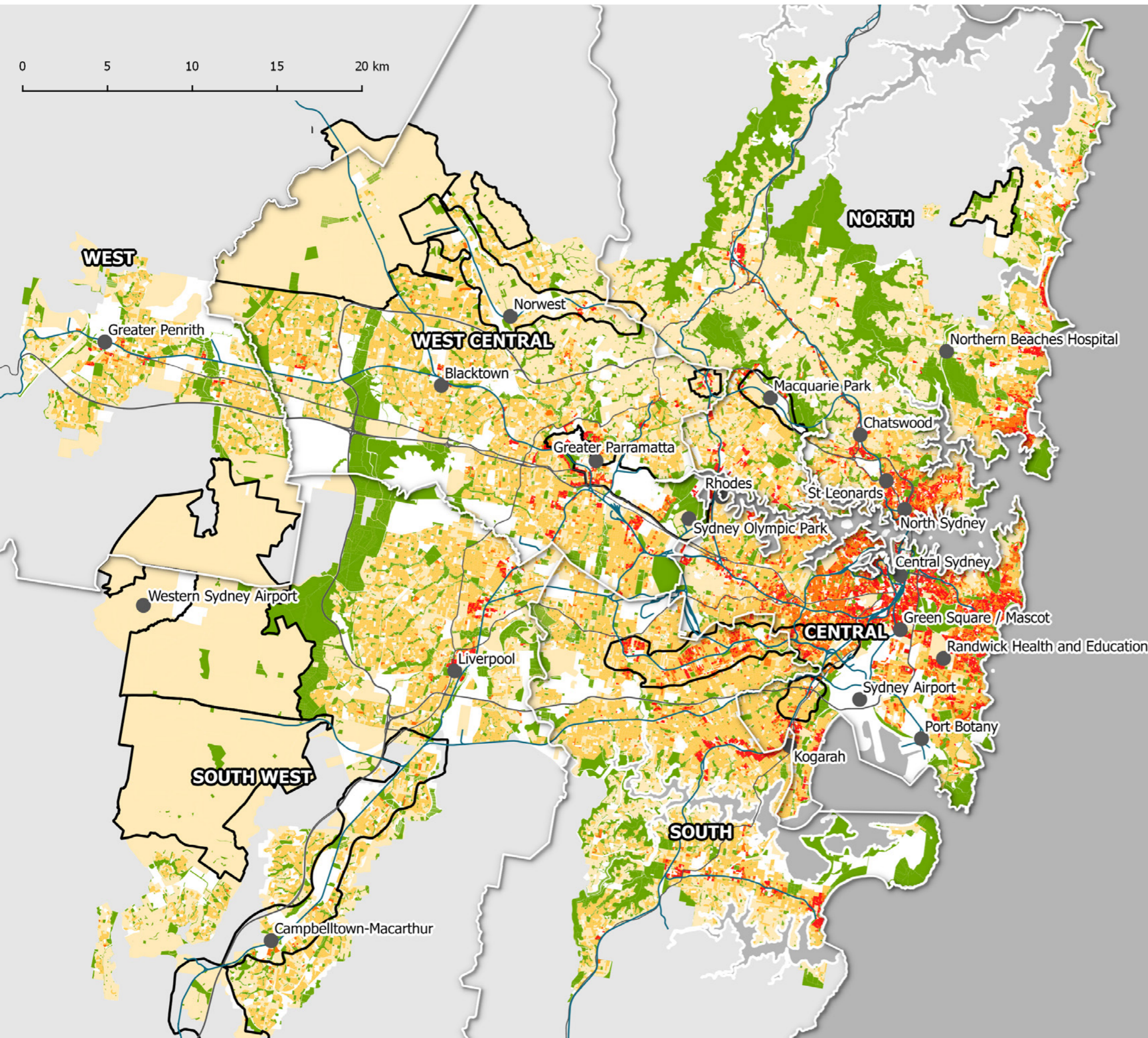
02 A city in its landscape

2.7 Urban form

2.7.1 Housing density

Key points

- Housing density for the year 2011. Housing density is shown as dwellings per hectare of estimated lot area.
- Less than 30 dwellings per hectare correlates roughly to low density housing while areas with more than 60 dwellings per hectare would be largely comprised of apartments.



— Priority Growth Area

● Public Open Space

Housing Density in 2011 (Dwellings per HA net of road reserves)

○ 0

○ 0 - 15

○ 15 - 30

○ 30 - 60

● More than 60

○ Metropolitan Rural Area

● Water

— District Boundary

— Rail lines

— Major roads

● Location



02 A city in its landscape

2.7 Urban form

2.7.2 Mix of housing across Greater Sydney

Key points

- For the primary housing structure categorisation across Sydney, dwellings are categorised into three types: separate, attached and multi-unit.
- Each area is then categorised into seven categories by what proportion of each housing type is present.
- If more than 80% of dwellings are of a single type, the area is classified as mostly that type.
- If no single type classification is possible, then the area may be classified as a mix of two types if the sum of the two types makes up more than 80% of the area.
- If an area is not dominated by a single type or pair, the area is considered a mixture of all three.

— Priority Growth Area

Housing Mix

- Mostly Separate
- Mix of Separate and Attached
- Mostly Attached
- Mixed
- Mix of Separate and Multi-Unit
- Mix of Attached and Multi-Unit
- Mostly Multi-Unit

● Metropolitan Rural Area

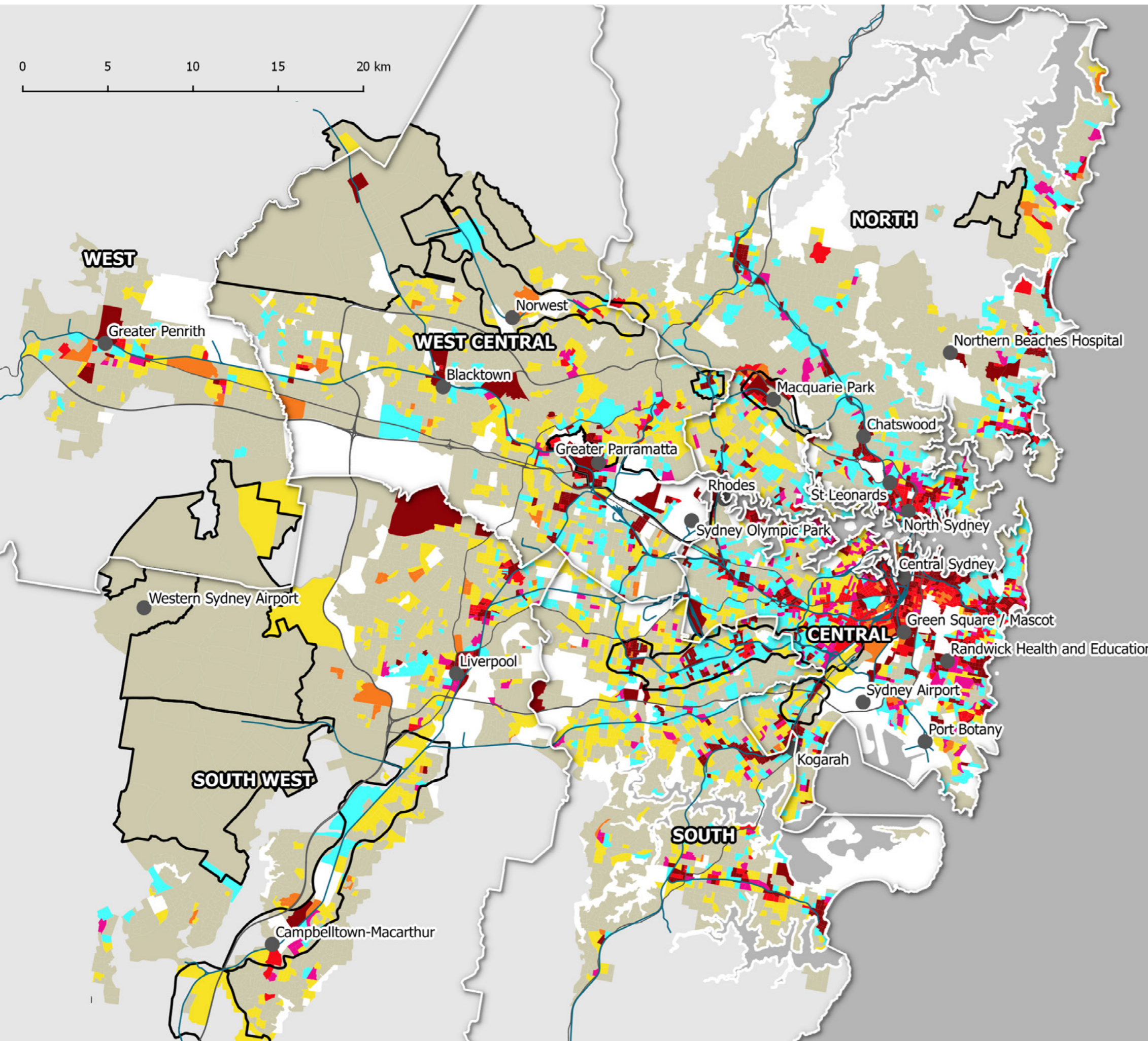
● Water

— District Boundary

— Rail lines

— Major roads

● Location



03 An efficient city

Increasing a city's efficiency reduces impacts on the environment and the city's carbon footprint while increasing productivity.



Photo: Rosie Nicolai



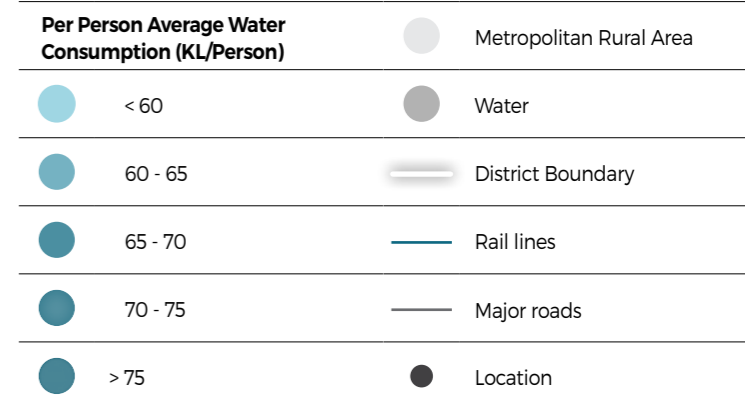
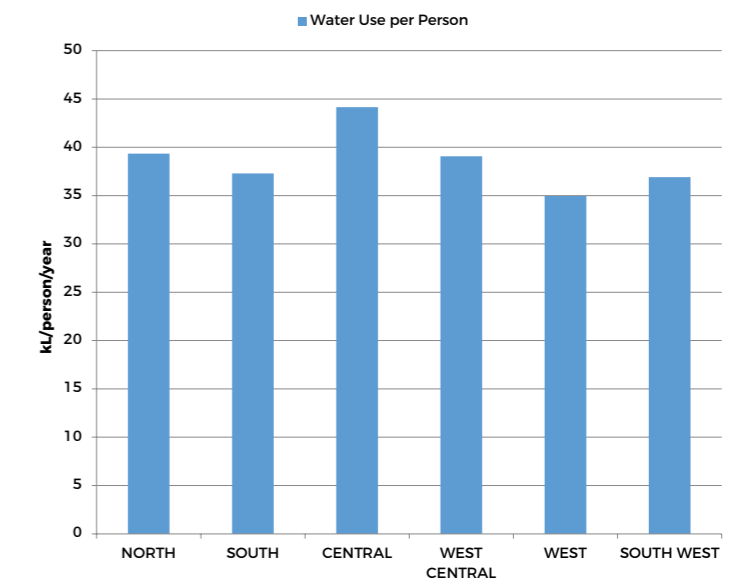
03 An efficient city

3.1 Water

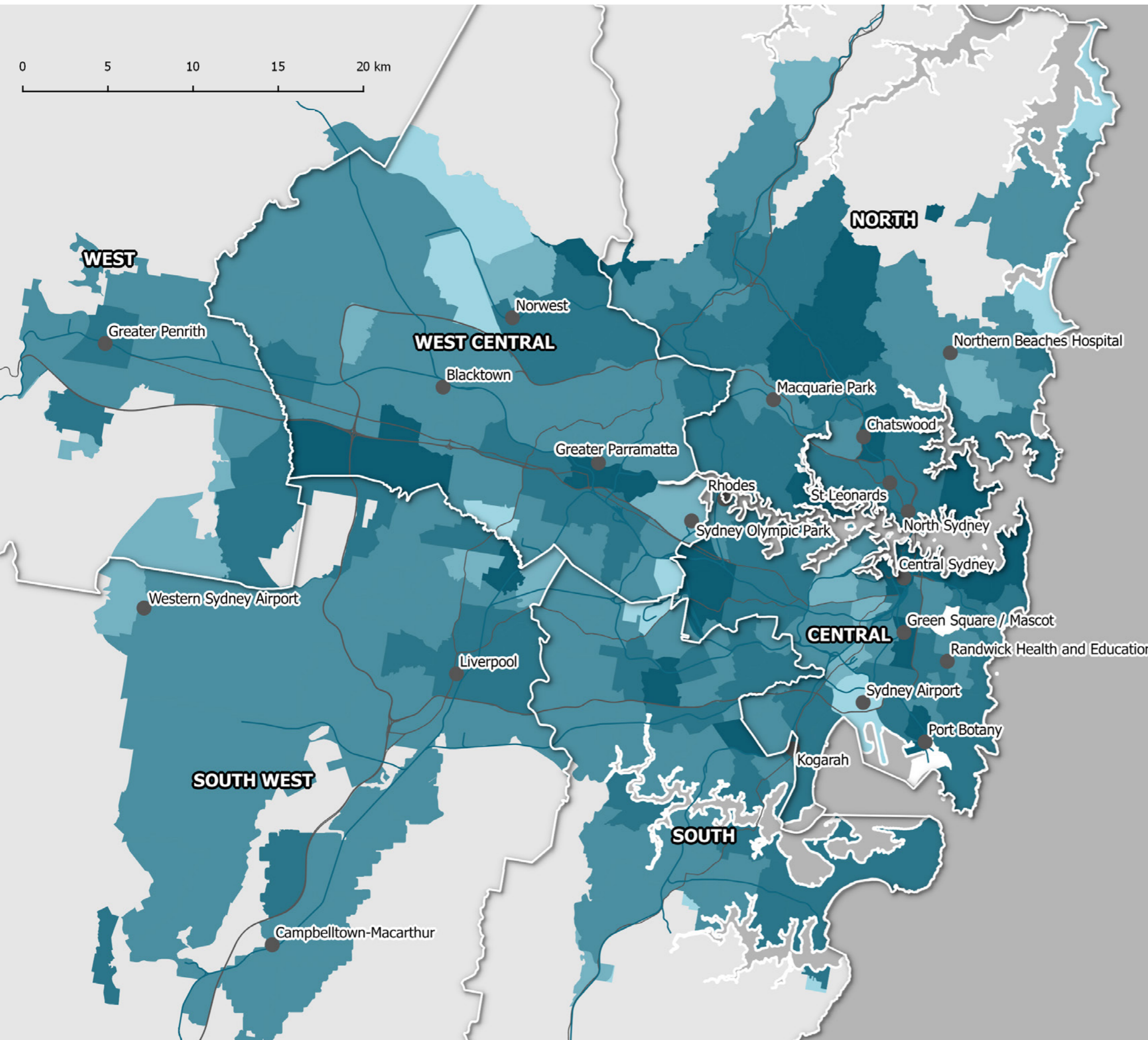
3.1.1 Average annual residential water consumption

Key points

- Per person average residential water consumption across Greater Sydney from 2014-2015.
- Per person residential water consumption is driven by factors such as local climate, garden type and size, housing typology, age of dwellings, residents water using behaviour, prevalence of rainwater tanks, household leaks and the efficiency of water using fixtures, fittings and appliances.



Data Source: 2014-2015 average water consumption data provided by Sydney Water. FY 2014-2015 population data was sourced from the Australian Bureau of Statistics Population Forecasts. Analysis to extrapolate to SA2. Note: Residential water consumption may be underestimated as it does not include use by non-private dwellings, such as nursing homes, prisons, etc





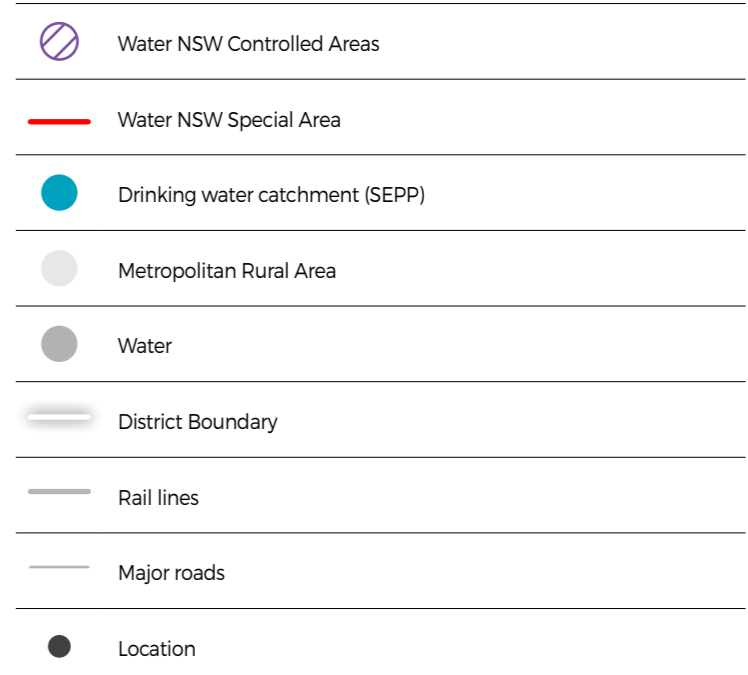
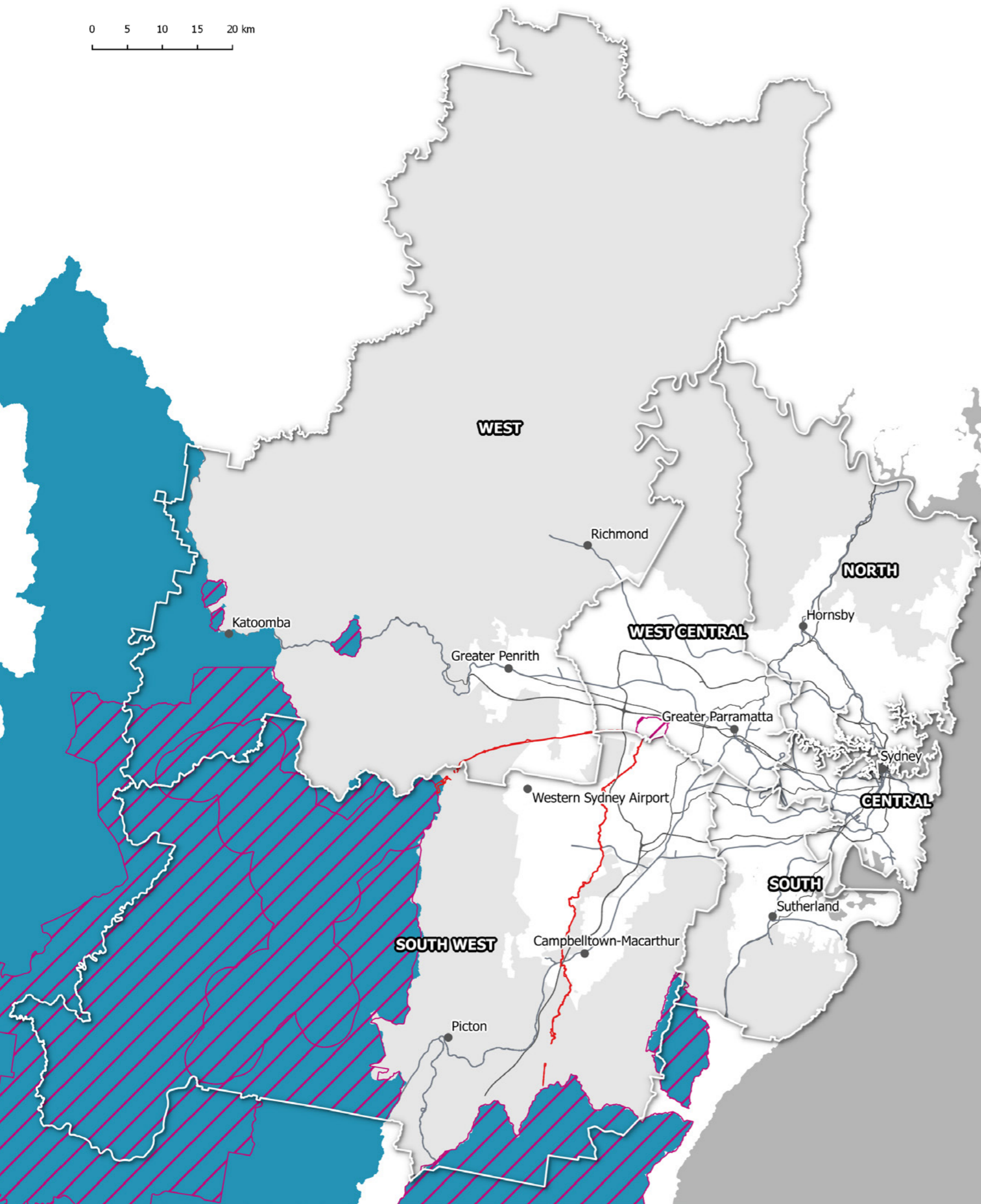
03 An efficient city

3.1 Water

3.1.2 Drinking Water Catchments and Restriction areas

Key points

- The Sydney Drinking Water Catchment is extensive, and includes parts of the Hawkesbury-Nepean, Shoalhaven and Woronora River catchments.
- A network of dams, storages and pipelines in the Sydney Drinking Water Catchment is used to collect and store water, providing fresh drinking water to people living in and around Sydney.
- The quality of drinking water in the Sydney Drinking Water Catchment is managed under the State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011, which requires consent authorities to only allow proposed developments that have a neutral or beneficial effect on water quality.
- There are also [Special and Controlled Areas](#) in the Sydney Drinking Water Catchment to protect water quality by providing buffer zones of pristine bushland around dams and immediate catchment areas.





03 An efficient city

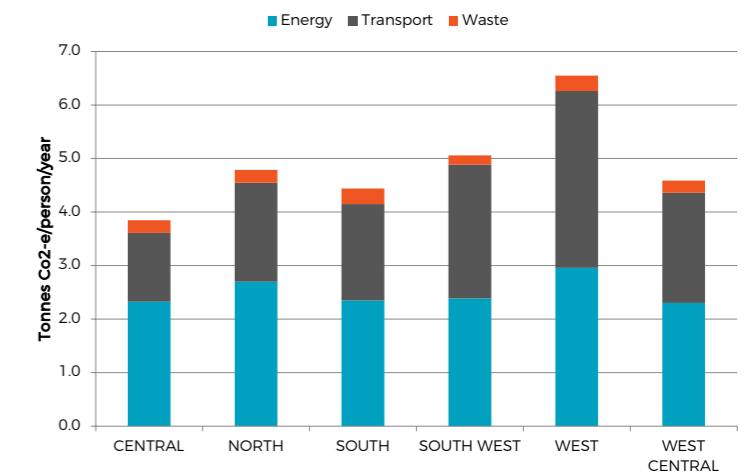
3.2 Emissions

3.2.1 Greenhouse gas emissions from residential electricity and gas consumption

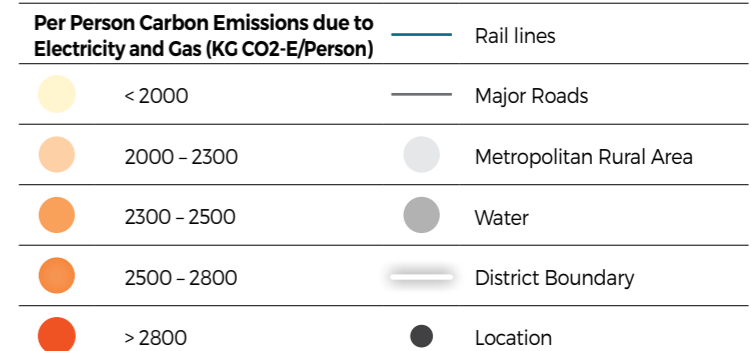
Key points

- The map shows the per person greenhouse gas emissions from the consumption of electricity and gas in 2014 - 2015. The emissions are determined from the place of usual residence.
- Many factors contribute to greenhouse gas emissions due to residential electricity and gas consumption including housing typology, dwelling size, dwelling age and fuel mix.
- Higher intensity emissions are seen in areas with larger homes, particularly around the eastern harbour and the urban fringes.

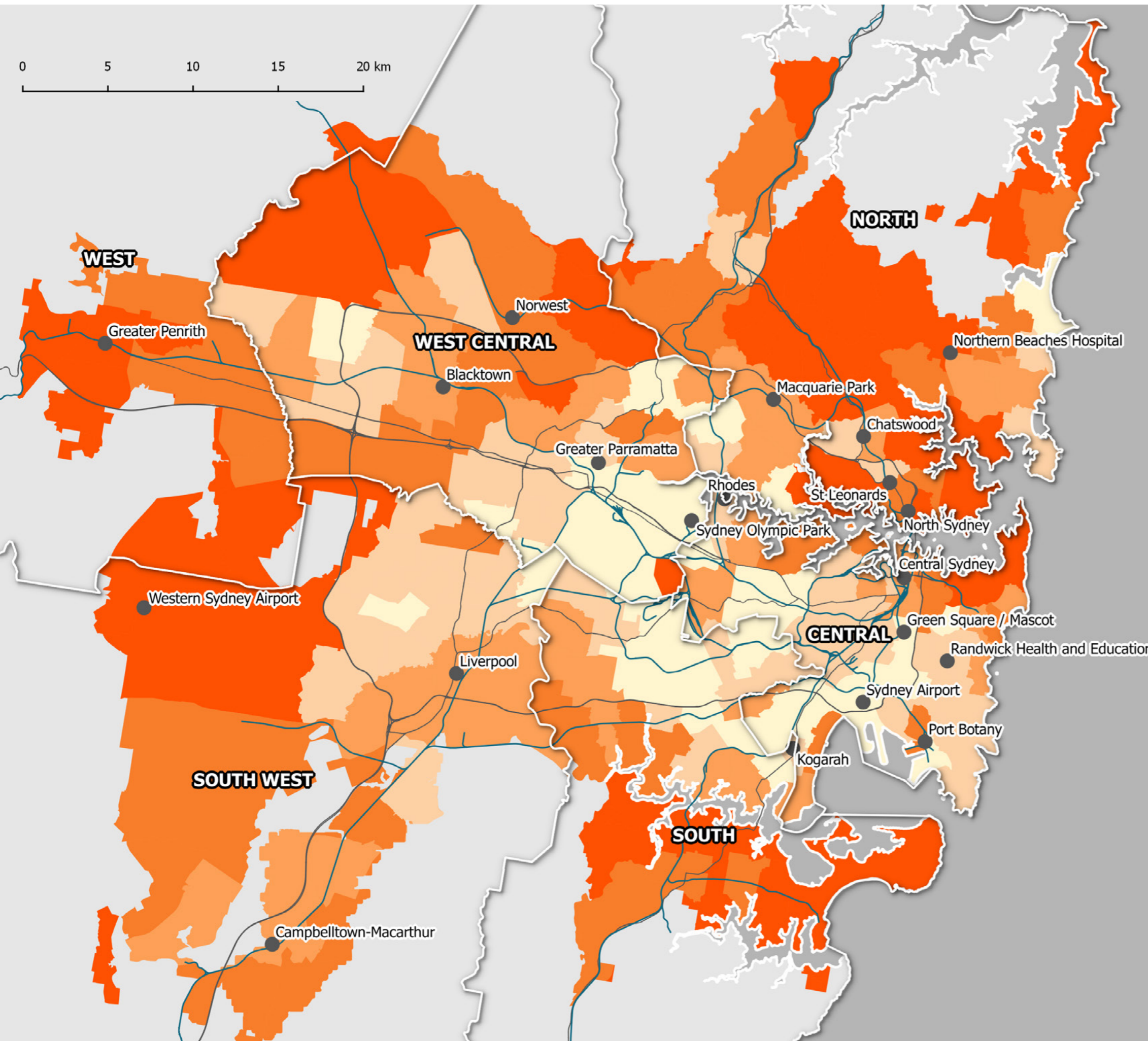
Per person combined greenhouse gas emissions for energy, transport and waste



Source: Analysis of Ausgrid, Endeavour Energy and Jemena consumption data (2014/15), Transport for NSW data (Household Travel Survey 2014/15) and NSW Environment Protection Authority (Local Government Waste and Resource Recovery Report 2012/13)



Data Source: Analysis of Ausgrid, Endeavour Energy and Jemena consumption data (2014/15)





03 An efficient city

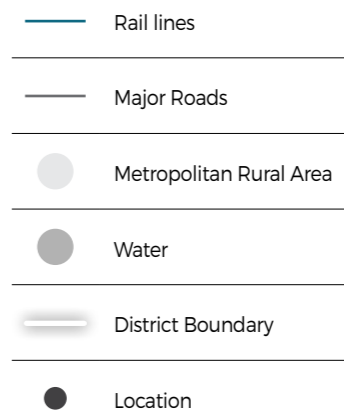
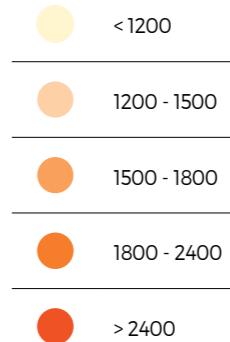
3.2 Emissions

3.2.2 Greenhouse gas emissions from residential transport use

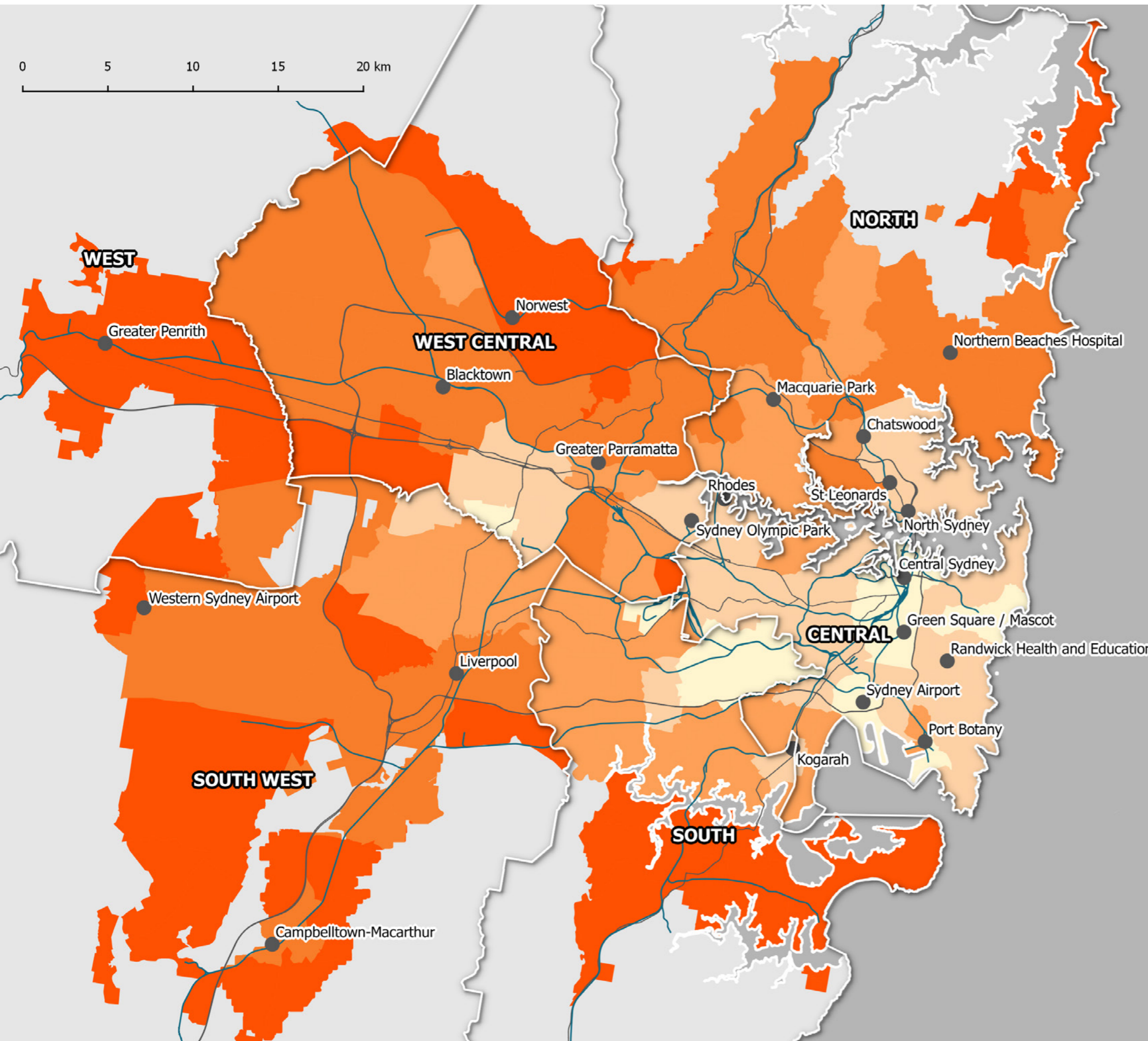
Key points

- This map shows per person greenhouse gas emissions from residential transport use in 2014-2015. Emissions are determined from the place of usual residence.
- Residential transport emissions are closely tied to car use as cars are by far the most emissions intensive mode of transport.
- Areas with lower car use tend to be denser and have greater access to jobs and services which is why transport emissions are lower throughout the Central District and around Greater Parramatta and North Sydney/ Chatswood where there is a combination of greater access to public transport and high concentration of jobs.

Per Person Carbon Emissions due to Transport (KG CO₂-E/Person)



Data Source: Analysis of Transport for NSW data (Household Travel Survey 2014/15).





03 An efficient city

3.2 Emissions

3.2.3 Greenhouse gas emissions due to the production of household waste

Key points

- This map shows the per person greenhouse gas emissions produced from household waste across Greater Sydney in 2012-2013. The emissions are determined from the place of usual residence.
- Greenhouse gas emission from waste are largely driven by the amount of waste from each council area sent to landfill. The map shows that proportionally more waste is sent to landfill in the South, North and Central Districts, which is why the map shows higher greenhouse gas emissions.
- The South-West District has the lowest amount of greenhouse gas emissions produced from household waste, which corresponds to their high recycling rate. Emissions are most effectively reduced by recycling and other alternative waste initiatives to divert waste from landfill.

Per Person Carbon Emissions due to Waste (KG CO₂-E/Person)

- < 100
- 100 - 200
- 200 - 300
- 300 - 400
- > 400

Metropolitan Rural Area

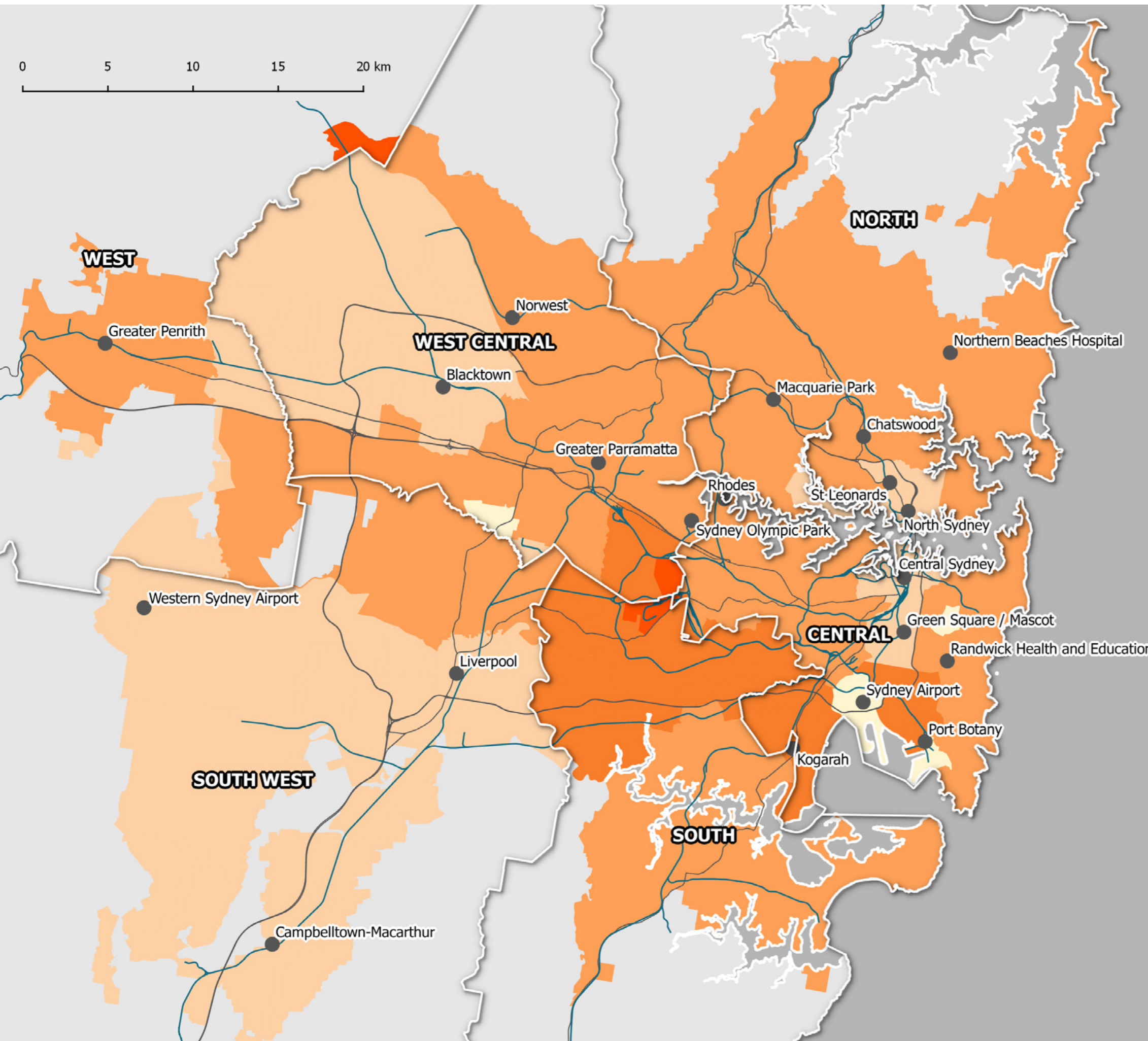
Water

District Boundary

Rail lines

Major Roads

Location



Data Source: Analysis of NSW Environment Protection Authority, 2012-13 Local Government Waste and Resource Recovery Report, Appendix 3 (2013).



03 An efficient city

3.3 Renewable Energy

3.3.1 Proportion of dwellings with solar hot water installations

Key points

- This map shows the proportion of dwellings with a solar hot water installation across the Greater Sydney.
- Solar hot water systems absorb energy from the sun to heat water for household use.
- Solar hot water installations are more prevalent in South-West, North, West Central and North Districts as these areas have a higher proportion of houses as opposed to apartments.
- This map represents solar hot water system installations registered on the Renewable Energy Certificate Registry from 2001 to 2015.

Dwellings with solar hot water

< 2%

2% - 4%

4% - 6%

6% - 8%

8% - 12%

> 12%

Metropolitan Rural Area

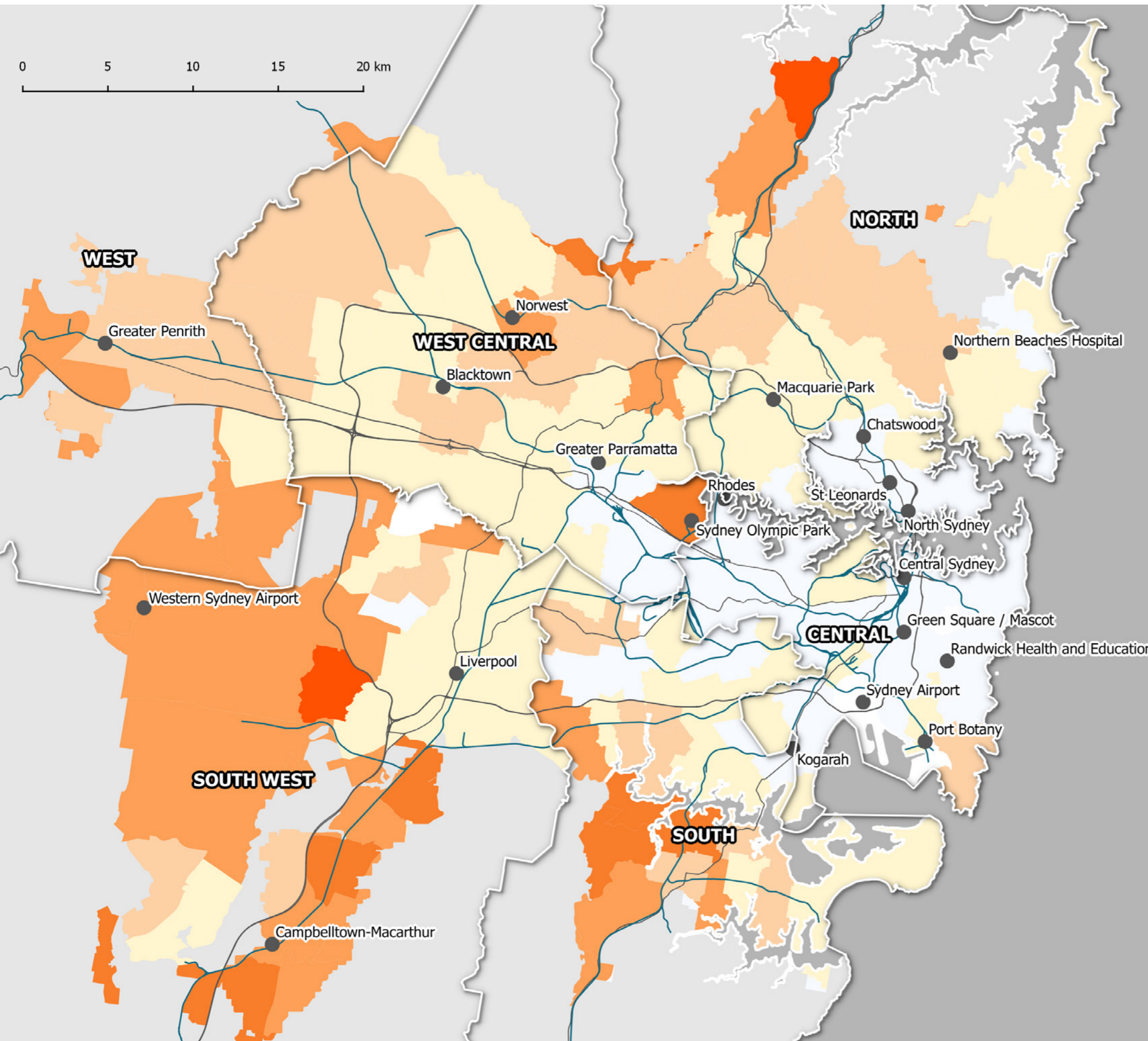
Water

District Boundary

Rail lines

Major Roads

Location





03 An efficient city

3.3 Renewable Energy

3.3.2 Installed kW of Solar Photovoltaic Panels per Dwelling

Key points

- This map shows the proportion of dwellings with solar photovoltaic (PV) panels in Greater Sydney.
- Solar PV panels convert energy from the sun into electricity for household use.
- The take up of solar PV panels is primarily driven by house type (i.e. higher for separate houses), ownership (i.e. higher among owner-occupiers) and income. BASIX has also encouraged the take up of solar PV panels in new areas.
- The highest penetration is seen in West Central, West and South West Districts where there is a higher proportion of houses as opposed to apartments.
- This map represents solar PV panel installations registered on the Renewable Energy Certificate Registry from 2001 to 2015.

Dwellings with solar panels

- < 5%
- 5% - 10%
- 10% - 15%
- 15% - 20%
- >20 - 25%
- >25%

Metropolitan Rural Area

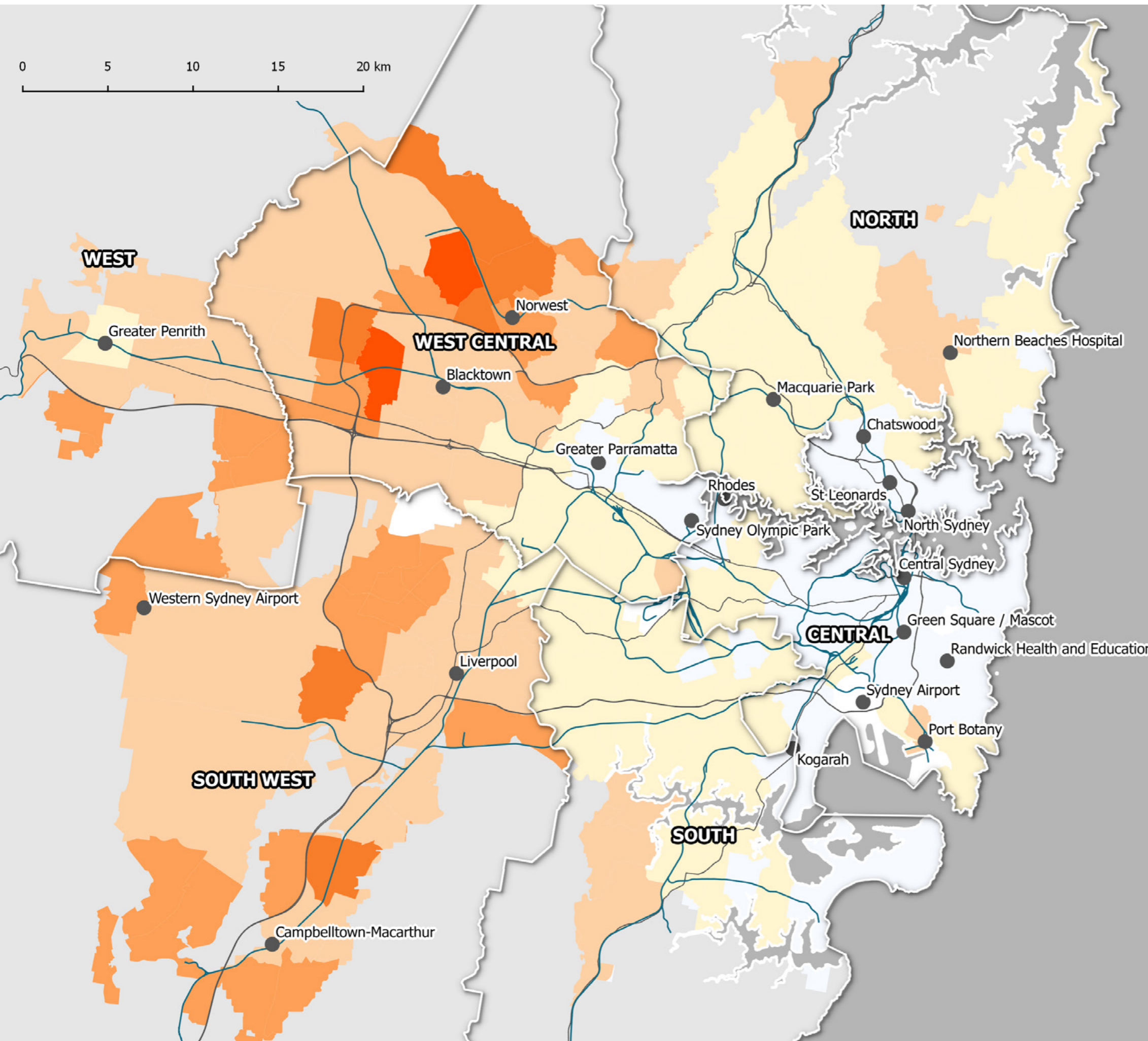
Water

District Boundary

Rail lines

Major Roads

Location



Data Source: Clean Energy Regulator Postcode data for small-scale systems (2016). Translated from postcode to SA2 (2016).



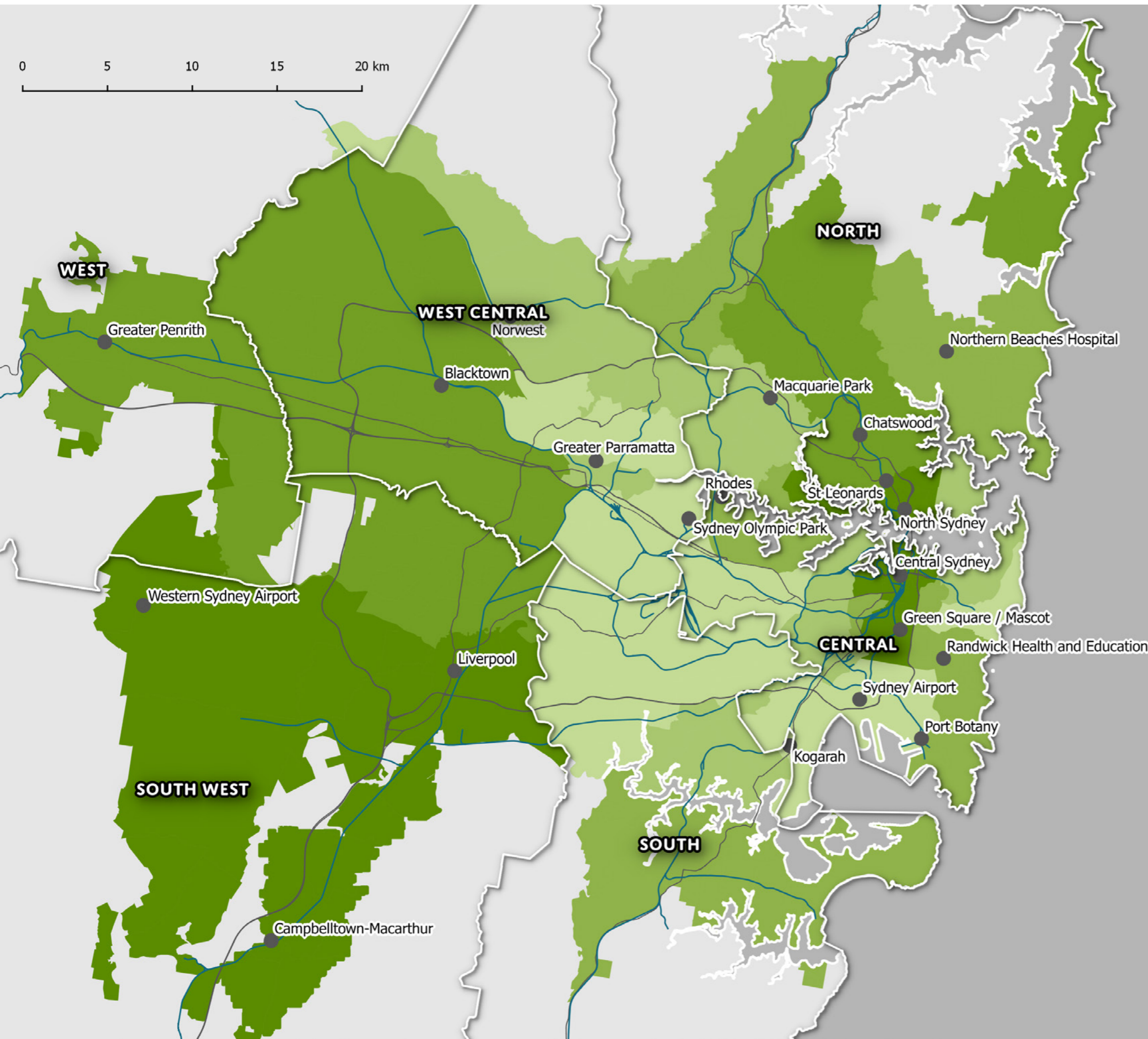
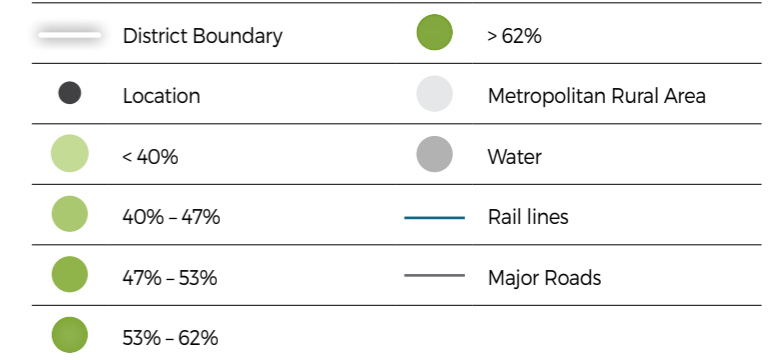
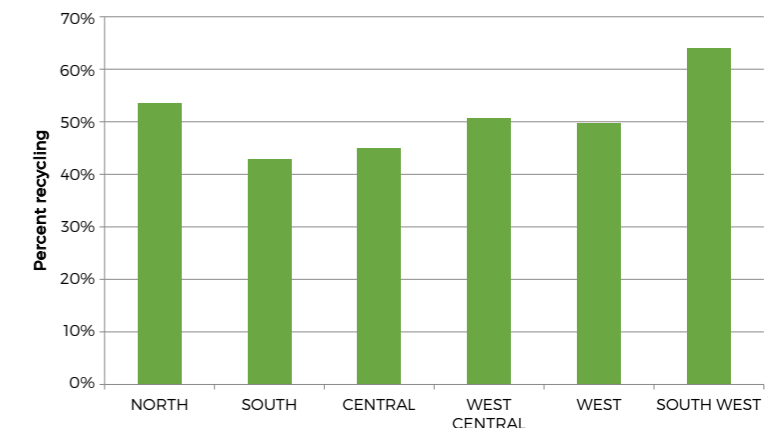
03 An efficient city

3.4 Waste

3.4.1 Proportion of waste recycled

Key points

- This map shows the proportion of waste recycled across Greater Sydney.
- The South-West District, which is made up of Camden, Campbelltown, Fairfield, Liverpool and Wollondilly council areas has the highest recycling rate. All of these council areas use alternative waste treatment, that entails the red general waste bins going through an additional process at the waste recovery facility to reprocess materials. This process helps to increase the recycling rate.
- Other alternative waste treatment systems used by a few councils in Greater Sydney that improve the recycling rate include the collection of garden waste, and some co-collect food and garden waste. These additional systems greatly reduce the amount going to landfill and bolsters the overall recycling rate.
- Recycling rate is reduced if there is high contamination in the recycling bins.



Data Source: NSW Environment Protection Authority, 2012-13 Local Government Waste and Resource Recovery Report, Appendix 3 (2013)

04 A resilient city

Urban resilience is “the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and thrive no matter what kinds of chronic stresses and acute shock they experience.” 100 Resilient Cities project.





04 A resilient city

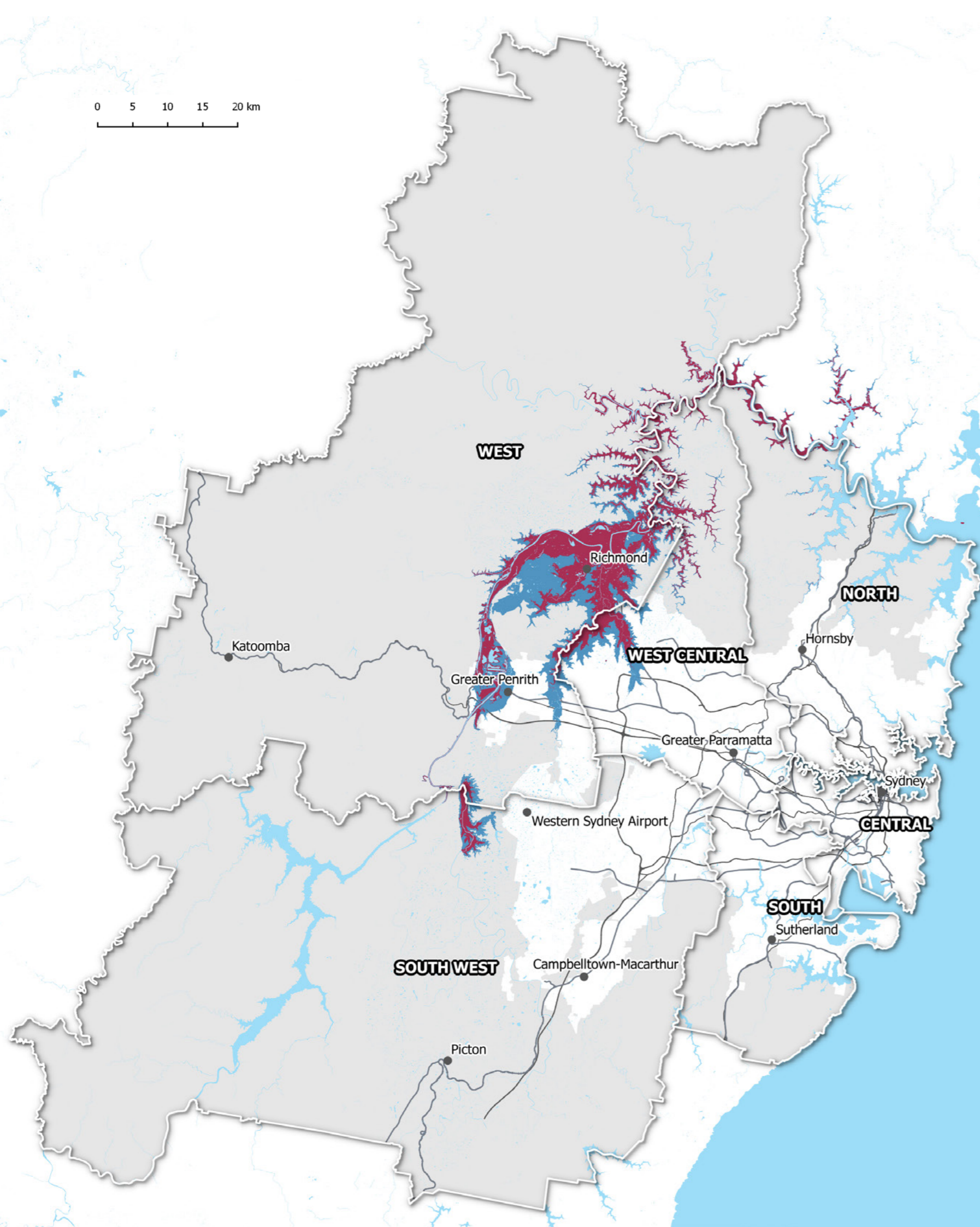
4.1 Natural hazards

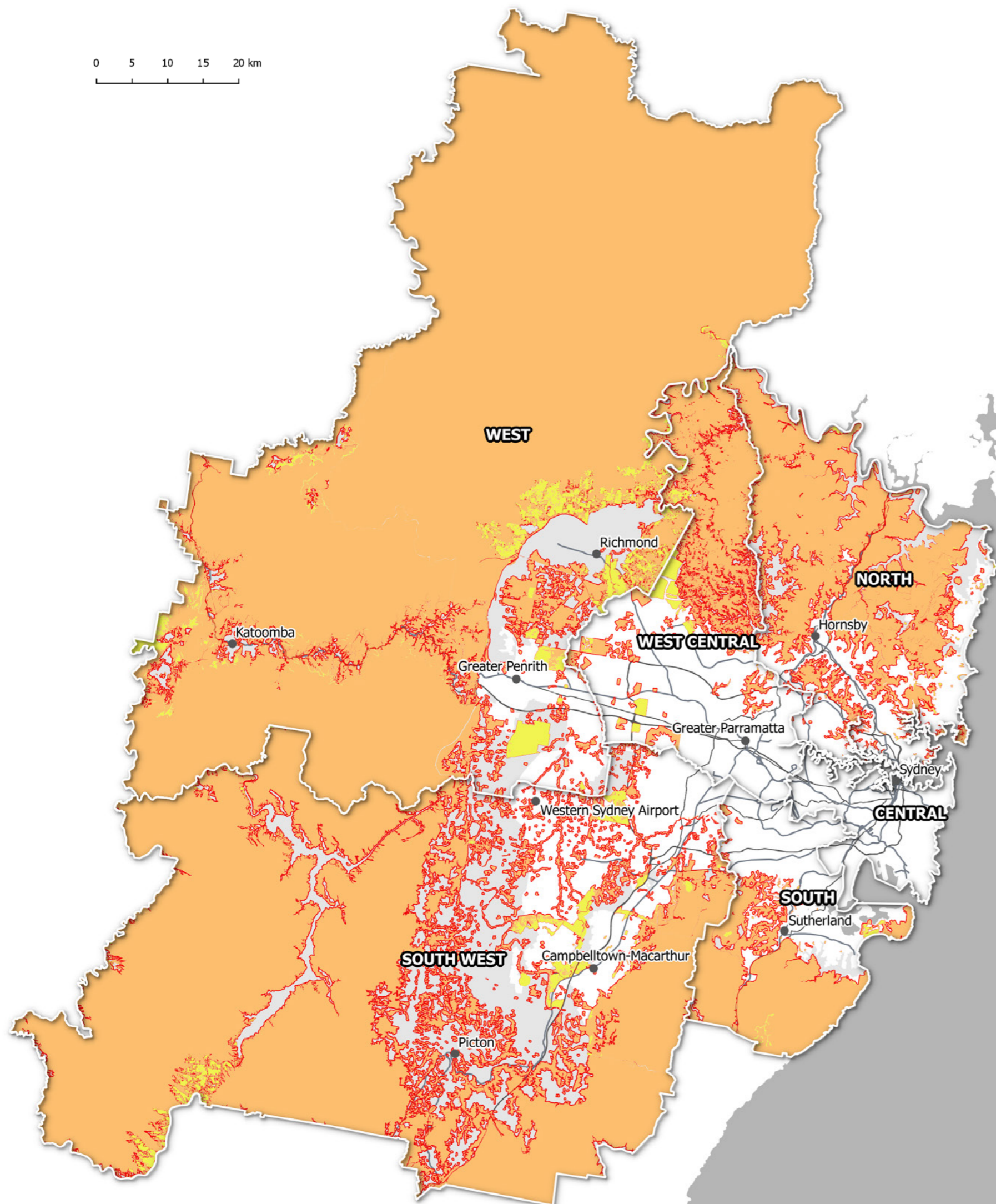
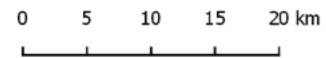
4.1.1 Hawkesbury-Nepean 1 in 100 year flood and Probable Maximum Flood

Key points

- This map shows the extent of the 1 in 100 chance per year flood together with the extent of the Probable Maximum Flood (PMF) in the Hawkesbury-Nepean Valley. The map has been sourced from the NSW Office of Water.
- The Hawkesbury-Nepean Valley PMF is defined as the worst flood that could conceivably occur. It is the PMF that defines the extent of the floodplain.
- The area depicted by the '1 in 100 Year Flood' denotes the area impacted by a 1 in 100 chance per year flood.
- This map shows that the Hawkesbury-Nepean floodplain affects a significant part of north west and western Sydney. The surrounding area may also be affected from local and overland flooding, and more detailed information on flood affected areas is available from relevant councils.

- 1 in 100 Year Flood
- Probable Maximum Flood
- Oceans and Waterways
- Metropolitan Rural Area
- District Boundary
- Rail lines
- Major roads
- Location





04 A resilient city

4.1 Natural hazards

4.1.2 Bushfire prone lands

Key points

- This map shows the land identified as bush fire prone. Vegetation Category 1 is the land with the highest risk for bush fire due to the extent and nature of the vegetation cover. Vegetation category 2 has a lower risk for bush fire. In the buffer area there is a risk of bush fire from ember attack.
- Development on bush fire prone land must be carefully located, designed and built to provide adequate protection from bush fires and meet the requirements of Planning for Bush Fire Protection 2006 and AS3959 – 2009.
- For specific information on the requirements for development in bush fire prone areas, refer the NSW Rural Fire Service website <http://www.rfs.nsw.gov.au/plan-and-prepare/building-in-a-bush-fire-area>.

Estimated number of properties in bushfire prone areas

District	Number of Properties	Percentage
NORTH	36,255	30%
SOUTH	12,738	11%
SOUTH WEST	22,221	18%
WEST	24,398	28%
WEST CENTRAL	15,151	13%
GREATER SYDNEY	120,763	

Source: NSW Rural Fire Service 2015 & NSW Land and Property Information Geocoded Urban and Rural Address System (GURAS) database

	District Boundary		Rail lines
	Location		Major Roads
	Buffer		Metropolitan Rural Area
	Vegetation Category 1		Water
	Vegetation Category 2		

Data Source: NSW Rural Fire Service 2015



04 A resilient city

4.1 Natural hazards

4.1.3 Land surface temperature during a heatwave

Key points

- This map shows the land surface temperature on a day in February 2011, in which heatwave conditions were experienced.
- The information shown in the map has been produced through satellite imagery.
- Areas close to the coast experience lower temperatures during a heatwave, as the ocean helps to regulate the temperature. Tree canopy cover also helps to mitigate higher temperatures, as it lowers the exposure of hard surfaces such as concrete and asphalt to the sun. The combination of these two effects means the urban areas in the western half of the city experience higher temperatures during a heatwave.

Landsat5 LST

- < 37 (cooler)
- 37 - 38
- 38 - 39
- 39 - 41
- 41 - 42
- 42 - 43
- > 43 (hotter)

● Metropolitan Rural Area

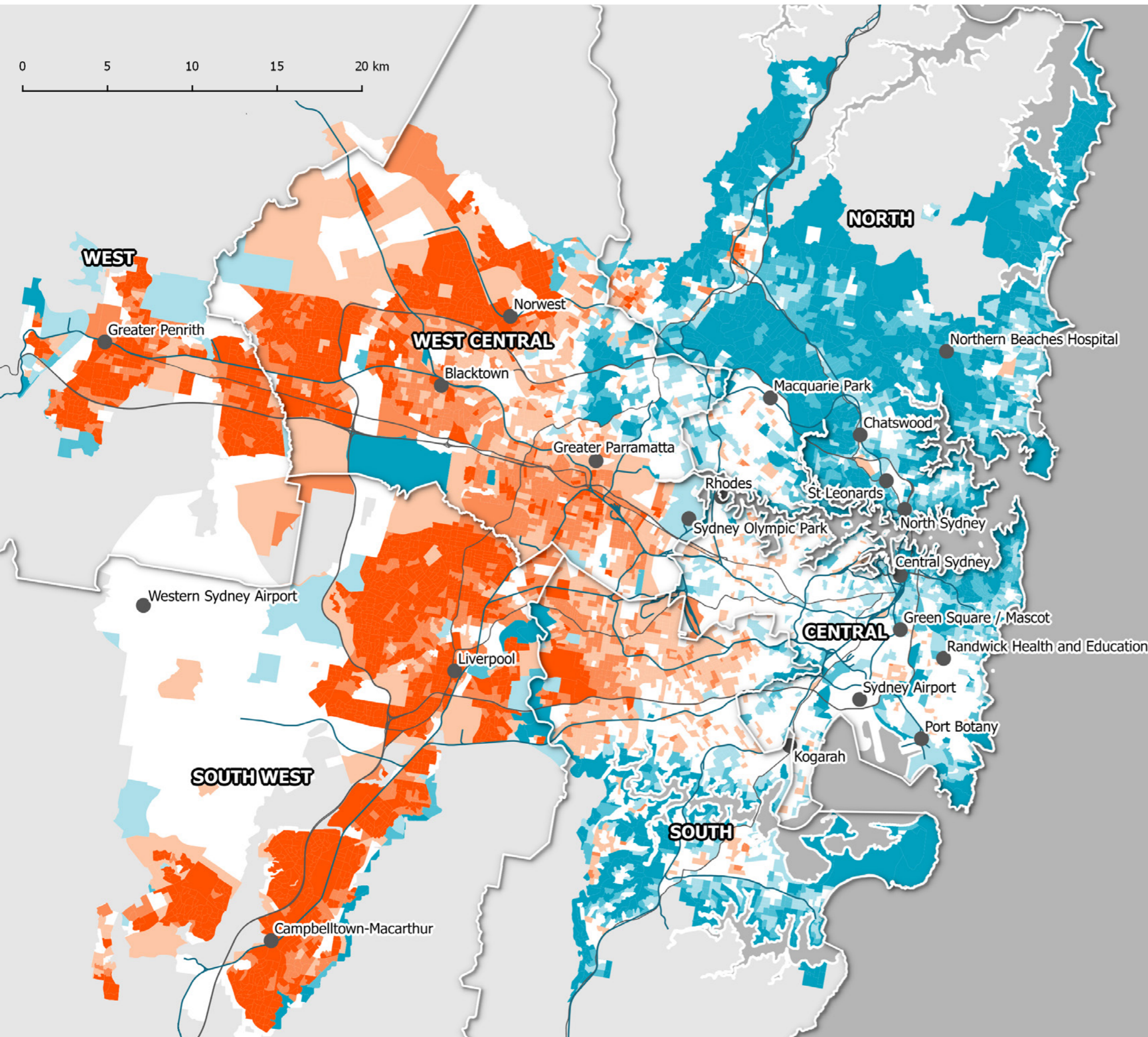
● Water

District Boundary

— Rail lines

— Major roads

● Location





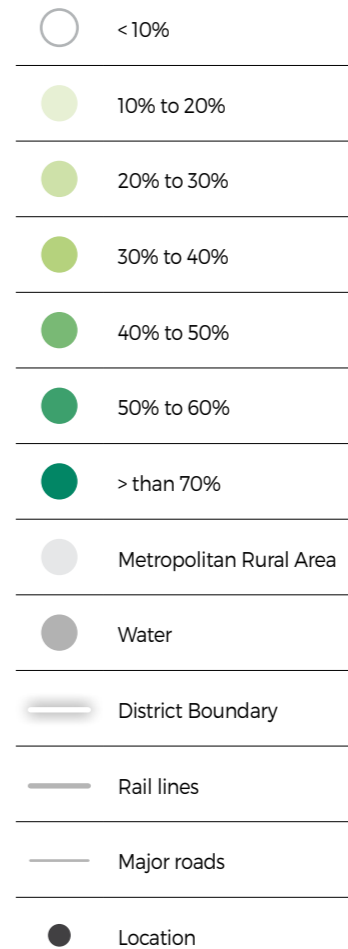
04 A resilient city

4.1 Natural hazards

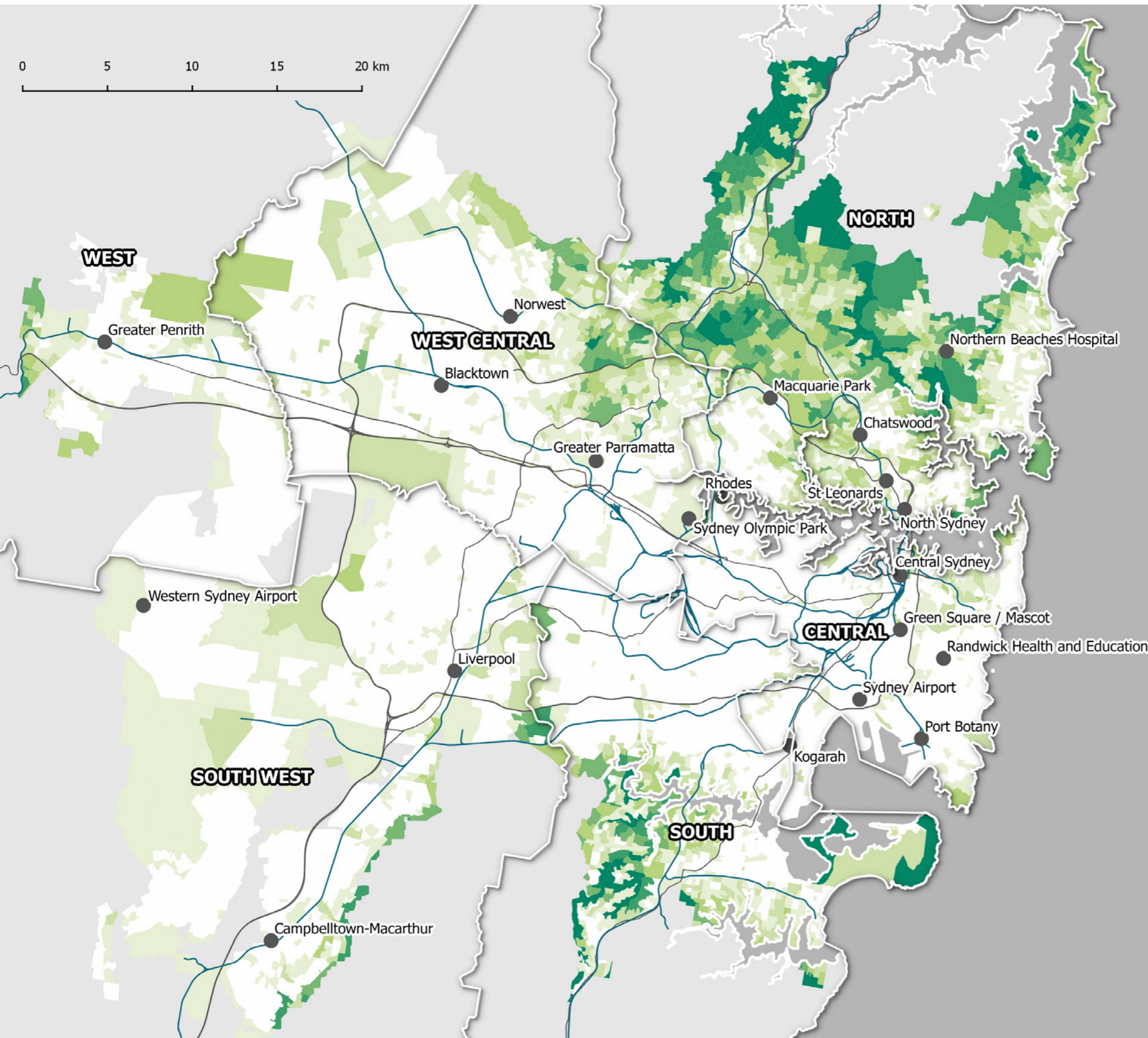
4.1.4 Canopy cover

Key points

- This map shows the amount of land covered by tree canopy in 2011.
- This information has been produced through satellite imagery.
- Tree canopy can be effective for reducing the severity of high temperatures, as it lowers the exposure of hard surfaces such as concrete and asphalt to the sun and helps reduce the urban heat island effect. However, grassy green spaces have lower surface temperatures than hard surfaces despite little to no canopy cover.



Data Source: SPOT5 Woody Extent and Foliage Projective Cover (FPH) 5-10m, 2011, NSW Office of Environment and Heritage. Averaged to SA1 (2016)





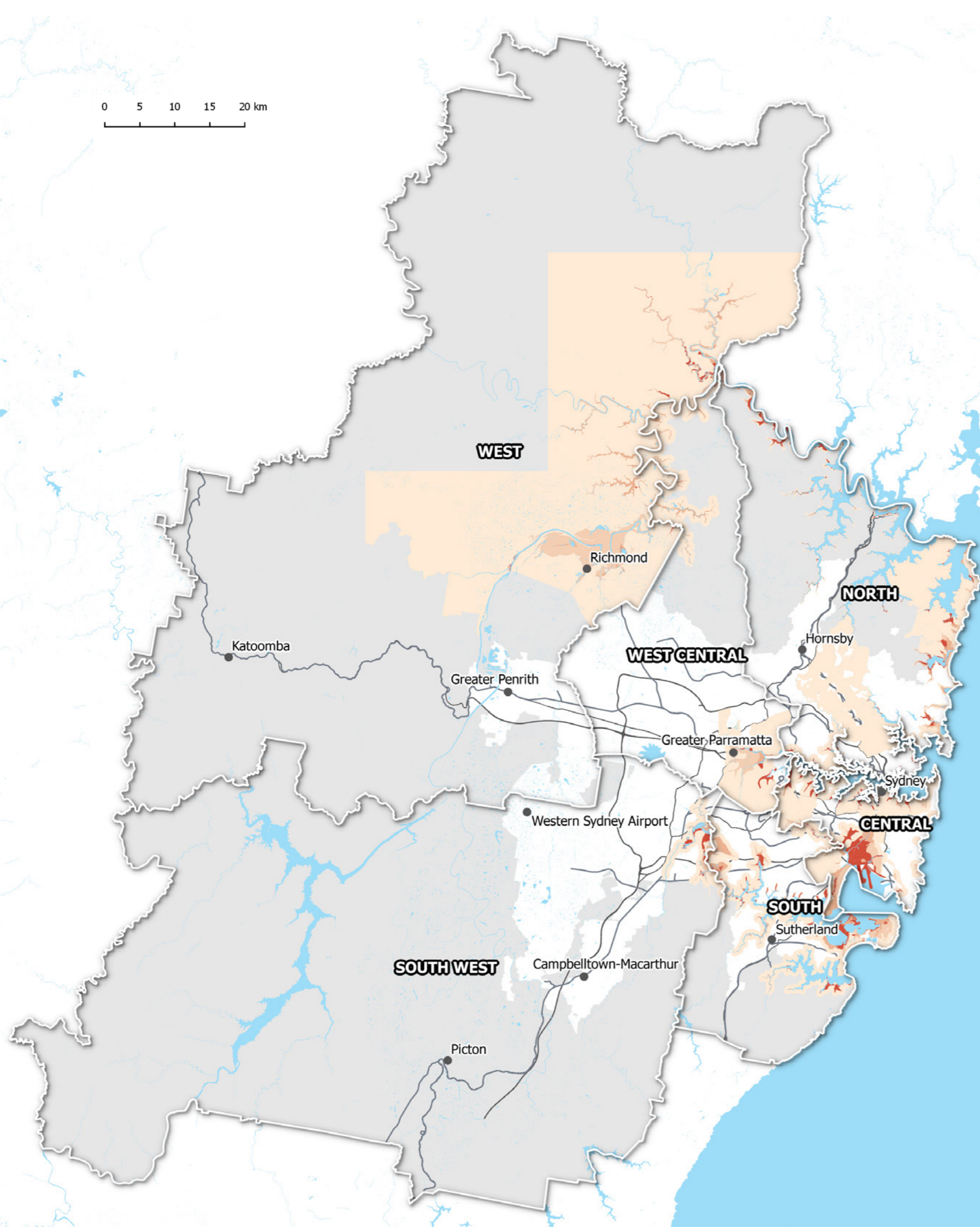
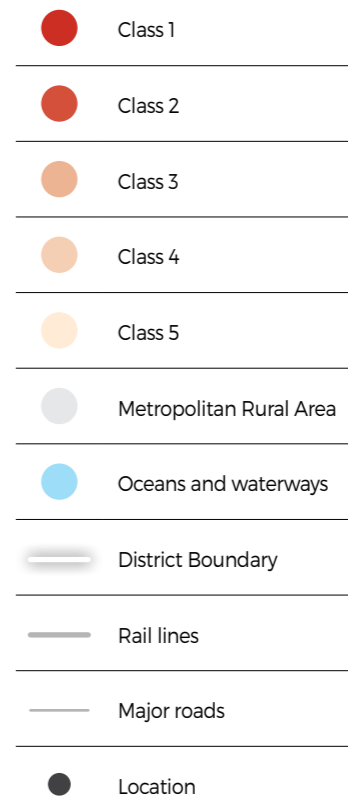
04 A resilient city

4.1 Natural hazards

4.1.5 Acid sulphate soils

Key points

- There are 5 classes of ASS included in this map. Class 1 is the most sensitive class and any works on this land require development consent, whilst Class 5 is the least sensitive class. More information about the 5 classes can be found on the NSW Department of Planning and Environment website <http://www.planning.nsw.gov.au/-/media/Files/DPE/Other/model-local-clauses-for-standard-instrument-leps-7-1-acid-sulfate-soils.ashx>
- In their natural state, ASS's are submerged and sometimes called Potential Acid Sulfate Soils (PASS). When exposed or drained, ASS become oxidised and sulphuric acid is produced. This reduces soil fertility, kills vegetation, reduces fish populations and causes damage to infrastructure.





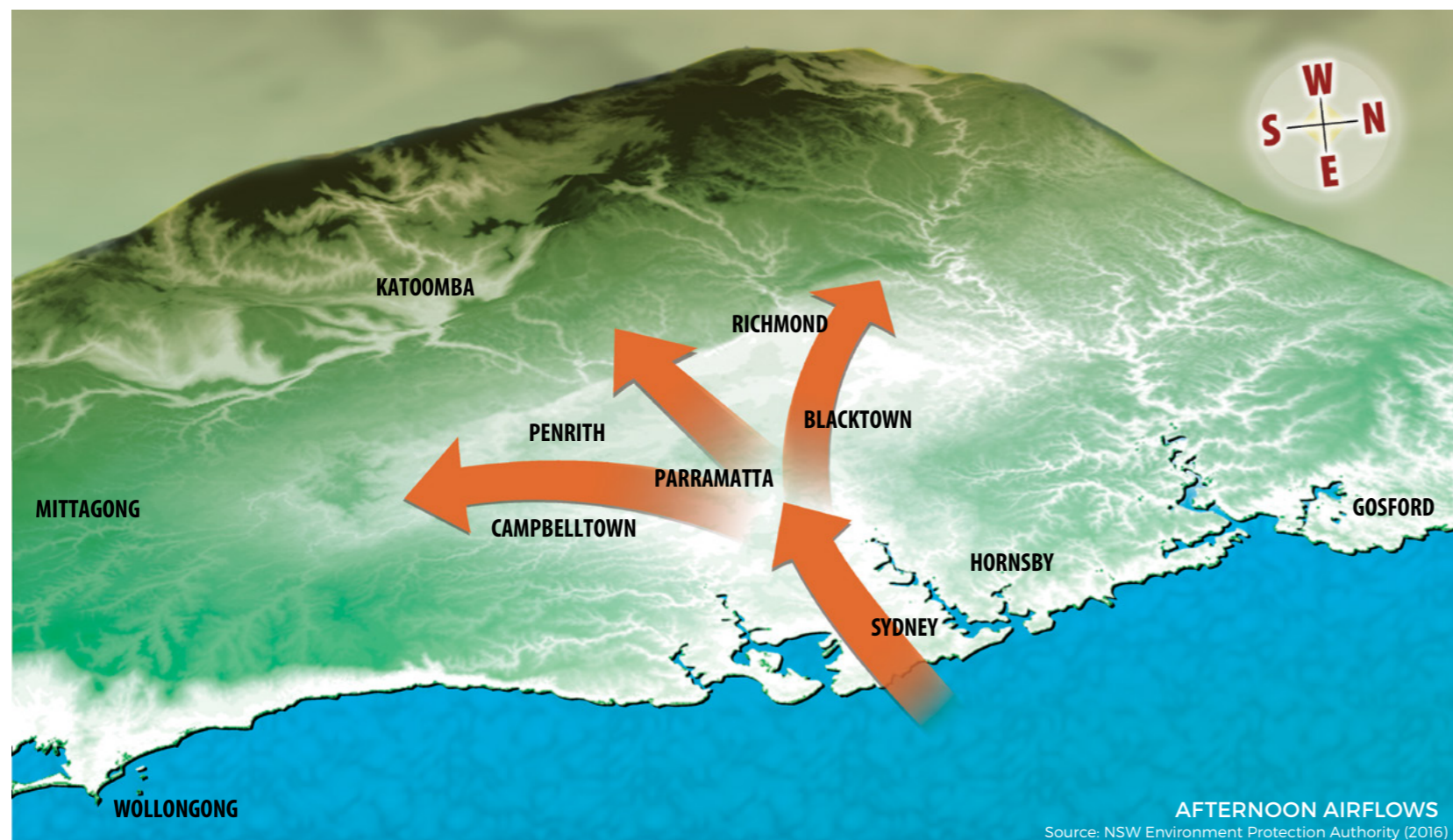
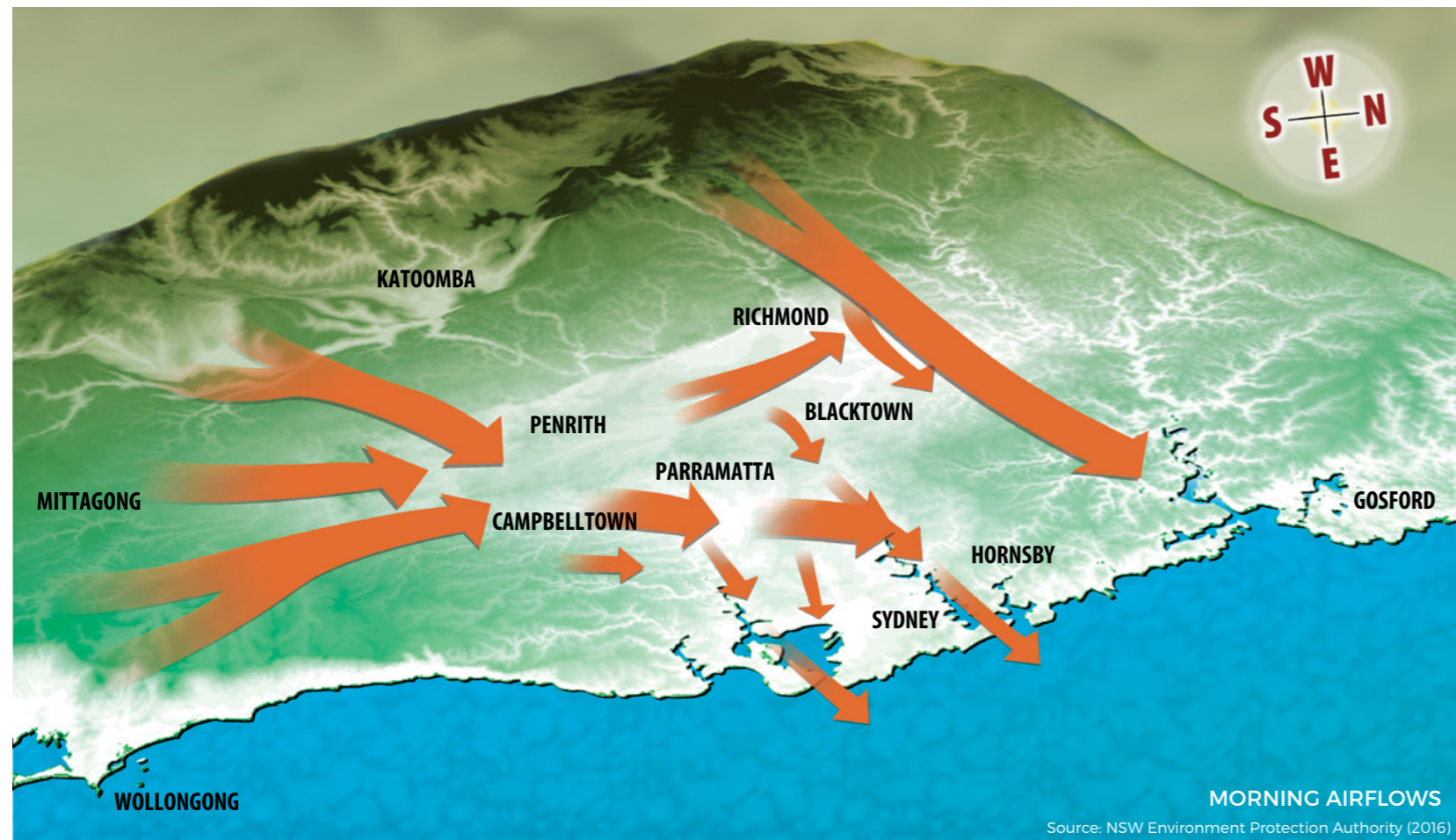
04 A resilient city

4.2 Built environment risks

4.2.1 Patterns of airflows in the Sydney Basin

Key points

- Air flow patterns in greater Sydney are influenced by a range of factors such as the mountains, the sea and other landforms in the area. The air flows distribute air pollution from any particular source across Greater Sydney.
- High pollution levels tend to occur with specific weather patterns. For example, when north-westerly winds over Sydney combine with regional drainage flows overnight, air pollution is transported eastwards in the morning. (Top image shows morning air flows).
- Afternoon easterly sea breezes then recirculate pollutants back across Sydney. (Bottom image shows afternoon air flows).
- On hot days, more ozone forms during recirculation, resulting in the highest ozone levels being recorded in western Sydney.





04 A resilient city

4.2 Built environment risks

4.2.2 Protecting key Employment and Urban Service Lands in Greater Sydney

Key points

- This map identifies key Employment and Urban Service Lands that present high or moderate potential land use conflicts in Greater Sydney. These lands have a range of activities such as sewage treatment, manufacturing and freight handling that could result in potential land use conflict from noise, odour or air quality impacts. This map only identifies potential land use conflicts where the Environment Protection Authority (EPA) regulates activities. It does not include activities regulated by Council or managed by the Commonwealth.
- The rating is based on a risk methodology developed by the EPA that considered geographical area size, number of EPA licensed premises, odour emissions, air emissions, noise, major hazard facilities, growth potential and waste management needs.
- Careful planning is required where land use conflict is or could be an issue.

- High potential for land use conflict
- Moderate potential for land use conflict
- Metropolitan Rural Area
- Water
- District Boundary
- Rail lines
- Major roads
- Location

