

8. Geographic infrastructure directions

STRATEGIC OBJECTIVE Adopt an area-based approach to infrastructure planning and investment decisions

SNAPSHOT

- The 2018 SIS adopts a geographic (or spatial) planning approach to guide infrastructure investment towards meeting the needs and supporting the potential of individual cities, towns, precincts and other locations.
- This approach recognises that infrastructure networks (such as transport, energy and water) are the foundation of a successful economy, that investment in the right infrastructure in the right places drives industry competitiveness and business and jobs growth, and that a diverse range of urban infrastructure (from schools and health services to open spaces and recreational facilities) is essential for creating productive, liveable and sustainable places.
- To prepare the 2018 SIS, Infrastructure NSW has undertaken a location-based assessment of industry strengths, labour patterns, socio-demographic trends, current infrastructure challenges and future visions for jobs and growth. This assessment draws on land use plans and economic development strategies developed by other NSW Government agencies. Infrastructure recommendations in the SIS are aligned with these spatial directions.
- In regional NSW, the focus is on infrastructure investment that enables access to markets for regional industries, along with more equitable access to key services, especially in the context of an ageing population and growing regional centres.
- Economic activity is growing in and around Newcastle and Wollongong. Infrastructure priorities in Newcastle focus on supporting the city's competitive strengths, including improved transport and digital connectivity, and maintaining access to the Hunter region and global gateways. In Wollongong, the focus is on providing jobs and housing, growing the capacity of Port Kembla and driving greater economic diversity in priority sectors.
- Infrastructure investment across Greater Sydney will support the three cities vision, protecting the strengths and attributes of the Eastern Harbour City, but shifting medium- and long-term investment priorities decisively towards the Central River City and Western Parkland City where significant population and employment growth are forecast over the next 40 years.

8.1 Defining geographic infrastructure planning

Previous State Infrastructure Strategies have focused on policy and investment priorities for infrastructure to meet demand within discrete sectors. The 2018 SIS adopts a new geographic (or spatial) planning approach to help ensure that the recommendations in the SIS reflect strategic regional and metropolitan planning priorities, support enduring economic growth across NSW and secure the State's global competitiveness.

The OECD argues that the key task in any infrastructure strategy is to identify the factors that will shape the economic, social, political and environmental quality of an area.¹⁴² To achieve this, geographic infrastructure planning seeks to identify critical relationships between overarching government plans, the current and future economy of an area, the environment and the community.

8.1.1 Geographic infrastructure directions for NSW

This chapter outlines geographic infrastructure planning directions, first for the whole state, then for regional NSW and Greater Sydney. Newcastle and Wollongong are recognised as major cities, key international gateways and significant economic activity centres.

For each location, Infrastructure NSW has completed an assessment of its competitive industry strengths, labour patterns, socio-demographics, current infrastructure challenges and future visions for jobs and growth – as set out in statewide land use plans and economic development strategies. Recommended infrastructure responses have been formed based on these spatial considerations.

While they are not discussed in this chapter, Canberra and the Gold Coast area are recognised as major centres of economic activity with important links to NSW, given their size and proximity. The NSW

Government has agreements in place with the Queensland and ACT Governments, which include actions to support future cross-border developments and key services across State and Territory boundaries.

Infrastructure NSW recognises that infrastructure is an enabler of economic growth and social wellbeing, but that investment in infrastructure must be supported by various non-infrastructure levers to achieve enduring economic growth. These include:

- removing barriers to the growth of competitive industries
- ensuring people and businesses have access to skills development to enable jobs growth
- unlocking residential land for the supply of a diverse range of housing in liveable communities
- protecting and enhancing the natural environment
- supporting a culturally and educationally rich environment that will attract people and businesses.

142 OECD 2006, p. 135

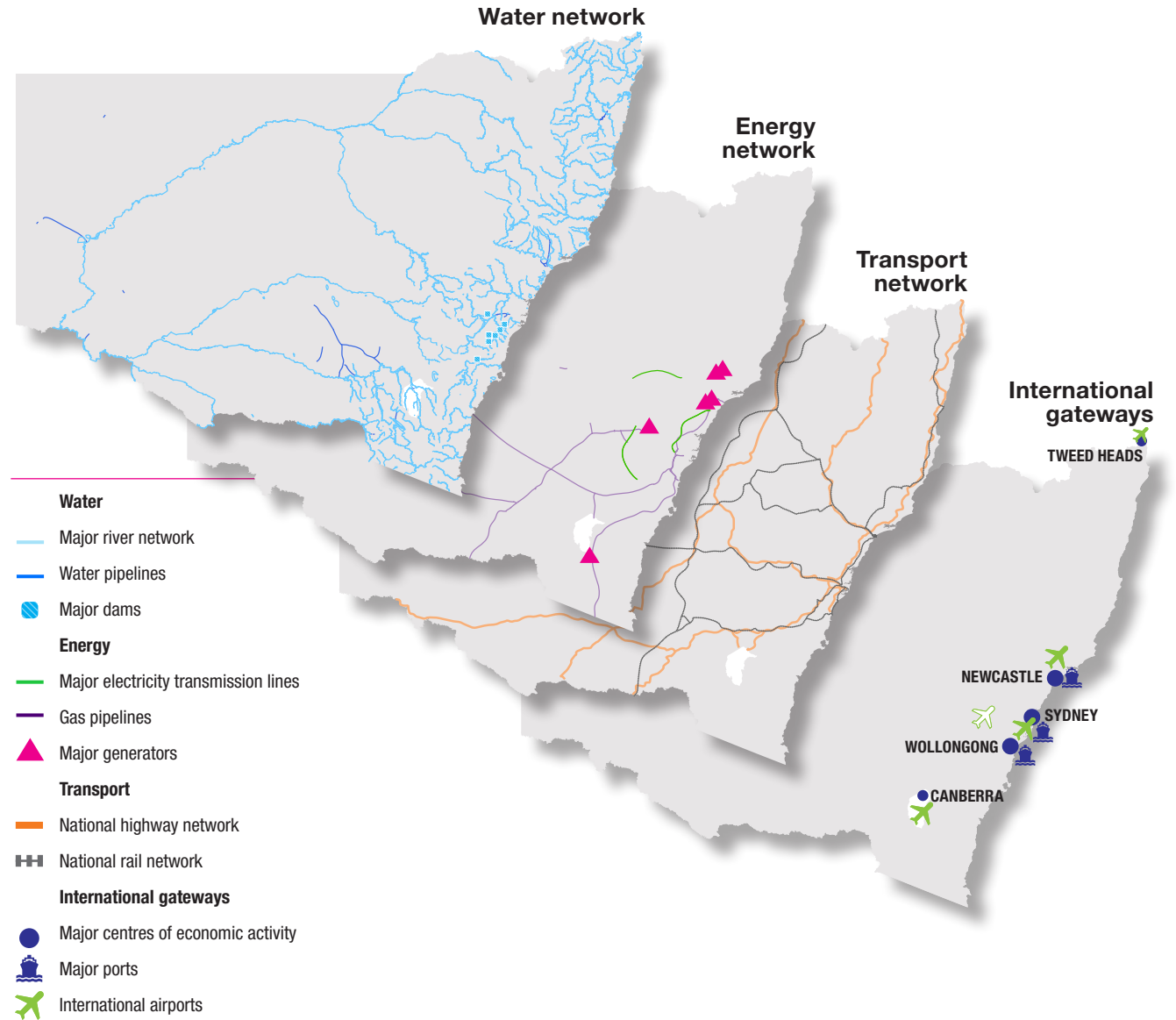
8.1.2 Infrastructure networks are the foundation of the economy

Economic infrastructure, including energy, water, telecommunications and transport networks, is the foundation of the economy and one of the keys to the State's global competitiveness.

Effective transport networks facilitate production, link businesses to their customers and support employment opportunities. If transport networks operate efficiently, they can lower input costs, deepen markets and facilitate competition. Efficient electricity, gas and water networks facilitate the reliable and economical supply of key services to businesses and households. Digital infrastructure plays a vital role in connecting citizens and business to local and global opportunities, while improving public services.

Maintaining, optimising and ensuring access to efficient major economic infrastructure networks (outlined in Figure 18) are prerequisites for economic growth.

Figure 18 – NSW major economic infrastructure networks



Source: Road, Rail, Rivers, Pipeline Network, Bioregional Assessment Programme licensed under CC BY 3.0; Transmission Lines, Power Stations, Dams Publisher Geoscience Australia licensed under CC BY 4.0

8.1.3 Infrastructure drives competitiveness and growth

Infrastructure is a direct input to the production processes of the economy – the quality, cost and reliability of infrastructure can impact the viability of production, the costs to consumers and the competitiveness of goods and services at a local and national level.

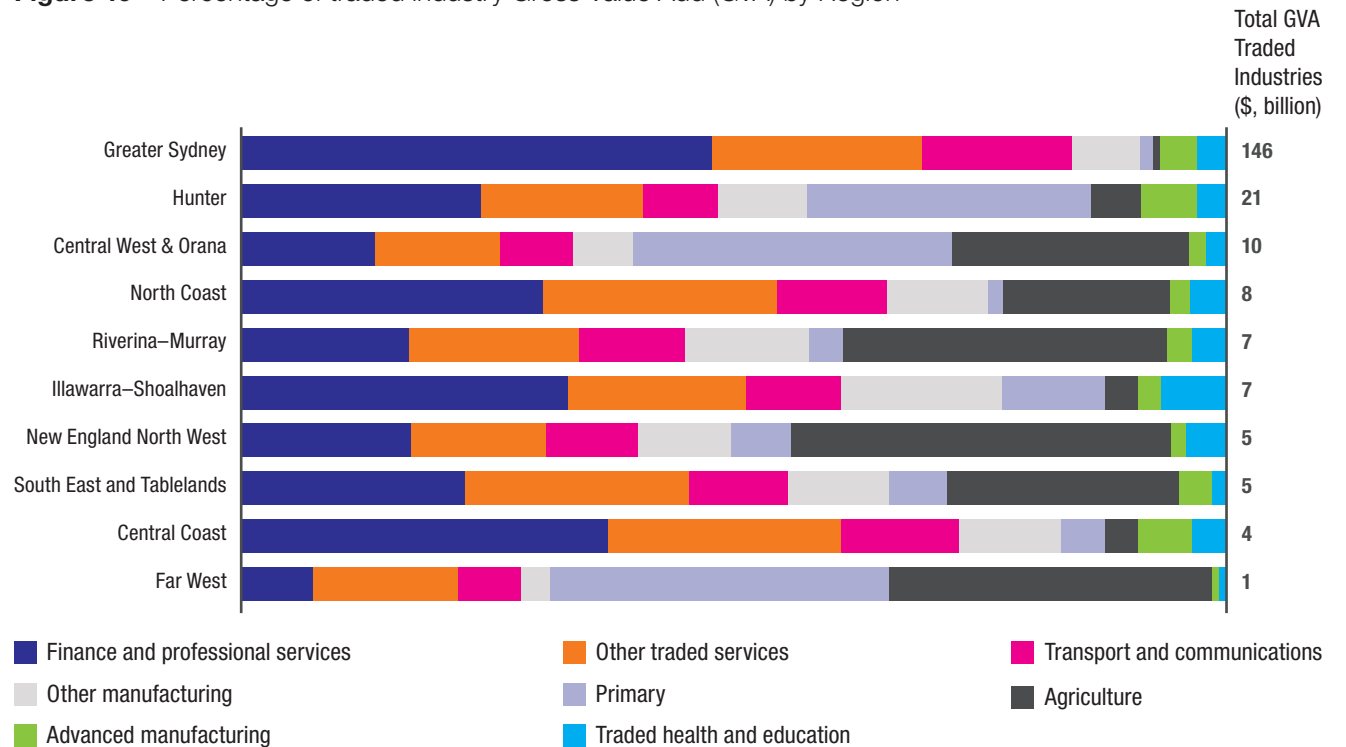
Investment in the right infrastructure can enhance industry competitiveness, efficiency, productivity and access to labour markets. Combined with non-infrastructure interventions, it can also change the way industries operate and interface with each other. In some cases, it can create new industries.¹⁴³

Investment should therefore be targeted at infrastructure that aligns with existing industries and enables new or emerging business sectors to grow. The relative strengths of traded industry sectors across NSW regions are outlined in Figure 19.

Driving growth in competitive industries will also require non-infrastructure interventions, including:

- industry policy that appropriately encourages innovation, commercialisation and internationalisation
- regulatory settings that do not unnecessarily hinder competition
- land use plans that enable industry and economic development strategies and priorities
- collaboration between industry and educational institutions to provide relevant and accessible education and training – such as on-site-learning.

Figure 19 – Percentage of traded industry Gross Value Add (GVA) by Region

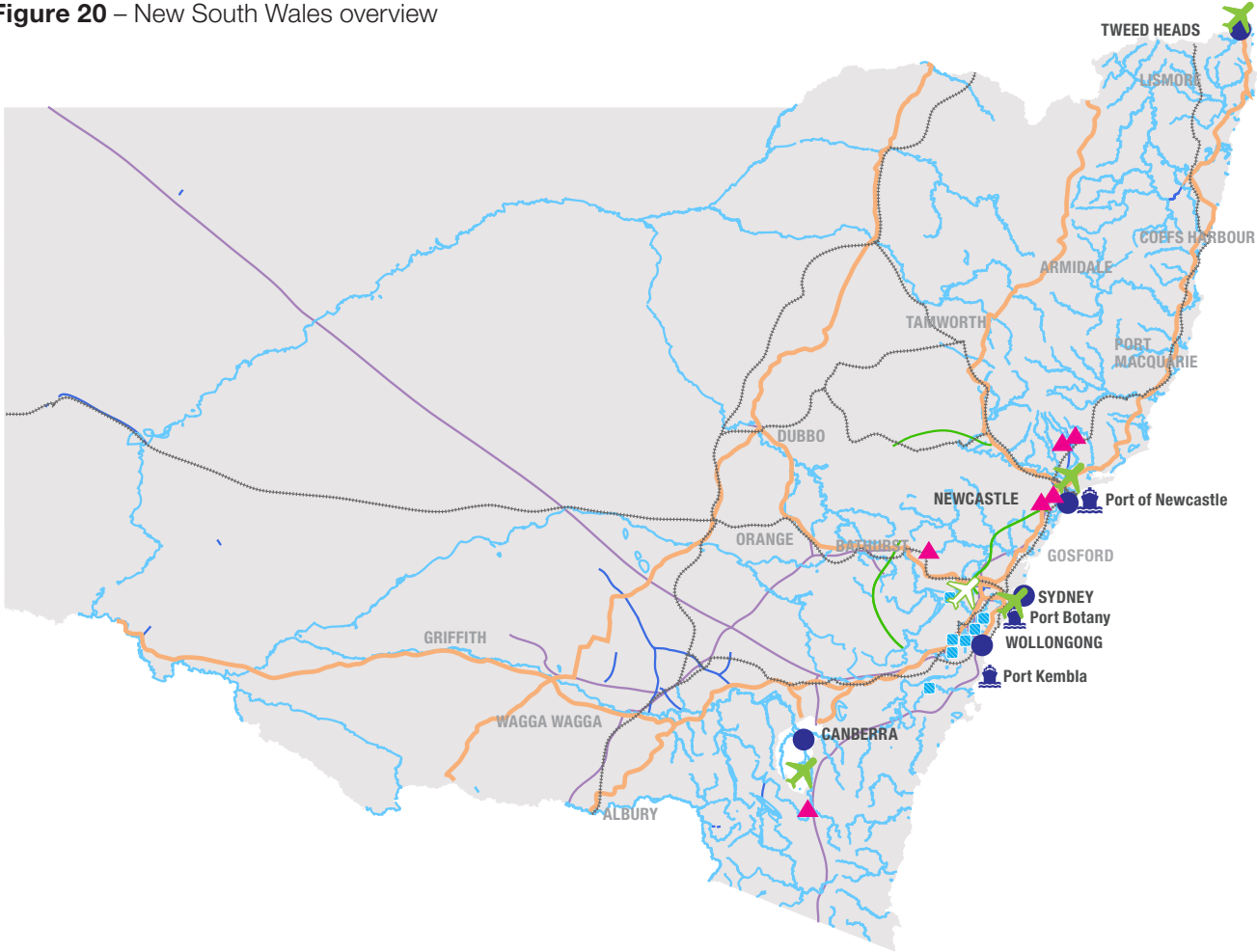


Source: Adapted by Infrastructure NSW, DPE and DPC based on NSW Industry Development and Growth, KPMG 2017, analysis of NSW Regional Plans.
 Note: Analysis is based on 2011 ABS data. Traded Industries are those that are concentrated in specific subsets of geographic areas and that sell their products or services nationally and internationally.

143 KPMG 2017, p. 33
 February 2018

8.2 New South Wales

Figure 20 – New South Wales overview



Now (2016)		Future (2036)
\$539 billion	Economy	\$ 907 billion
7.7 million	Population	9.9 million
3.3 million	Dwellings	4.3 million
3.8 million	Employment	4.8 million

Source: NSW Common Planning Assumptions 2017

- International gateways**
- Major centres of economic activity
- 🚢 Major ports
- ✈️ International airports
- Transport**
- 🛣️ National highway network
- 🚂 National rail network
- Water**
- 🌊 Major river network
- 🚰 Water pipelines
- 🏗️ Major dams
- Energy**
- ⚡ Major electricity transmission lines
- 🔴 Gas pipelines
- ⚡ Major generators

Source: Road, Rail, Rivers, Pipeline Network, Bioregional Assessment Programme licensed under CC BY 3.0; Transmission Lines, Sub Stations, Power Stations, Publisher Geoscience Australia licensed under CC BY 4.0

8.2.1 New South Wales geographic directions

NSW offers an internationally competitive and compelling location to live and do business. The State enjoys the benefits of abundant natural resources and attractions, well-established economic corridors connecting businesses to national and international markets – particularly Asia, a young, highly-skilled and multicultural workforce, and a strong pipeline of government investment.

These endowments support a strong and growing economy and globally competitive industries, including:

- finance and professional services, which has moved its international ranking from 16 in 2011 to 11 today¹⁴⁴
- mineral resources (coal), with around 163 million tonnes (Mt) exported to international markets in 2015-16¹⁴⁵
- international education, which is the State's second largest export, behind coal, contributing over \$6.7 billion in exports in 2014-15¹⁴⁶
- agriculture, with the value of NSW agribusiness exports estimated at \$5.7 billion in 2015-16¹⁴⁷
- other traded services like construction, tourism and the performing arts.

There is potential for growth in health and advanced manufacturing, with the latter driven by technology and increasing labour costs in other countries.¹⁴⁸

The State is highly urbanised, with 90 per cent of people living in cities concentrated along the coast. Over the next

144 Financial Centres Future Group 2016, p. 4

145 Transport for NSW 2017, pp. 21-22

146 Department of Premier and Cabinet 2016, p. 6

147 Department of Primary Industries 2016, p. 2

148 KPMG 2017, p. 32

20 to 40 years, continued growth in knowledge-intensive industries, and the benefits of agglomeration generally, will drive even greater concentration of economic activity around major economic centres across the State.¹⁴⁹ Jobs for NSW has set a goal of having over 2.8 million knowledge-intensive jobs by 2036 making up 60 per cent of total jobs. This compares to 48 per cent, or 1.8 million knowledge-intensive jobs, in 2016.¹⁵⁰

Historically, major infrastructure investment has been Sydney-centric, but increased regional infrastructure investment in recent times has delivered strong economic returns, including through significant investment made in north to south connections in regional NSW, such as the Hume, Pacific, Great Western and Princes Highways.

Providing equitable access to services is more challenging west of the Great Dividing Range – driven by topography and population – and in parts of Greater Sydney where growth has outpaced infrastructure investment. In turn, this has led to higher relative levels of socio-economic disadvantage in these areas.

To drive ongoing productivity and improved access to services, future investment will need to be distributed across major economic and strategic centres throughout the State to support economic growth and social inclusion.

Maintaining connectivity to and from international gateways, enhancing digital connectivity and securing access to economic infrastructure networks including energy and water, will be critical to enhancing global competitiveness. Social infrastructure, including

increased social housing supply, will also require government investment.

Infrastructure response – New South Wales

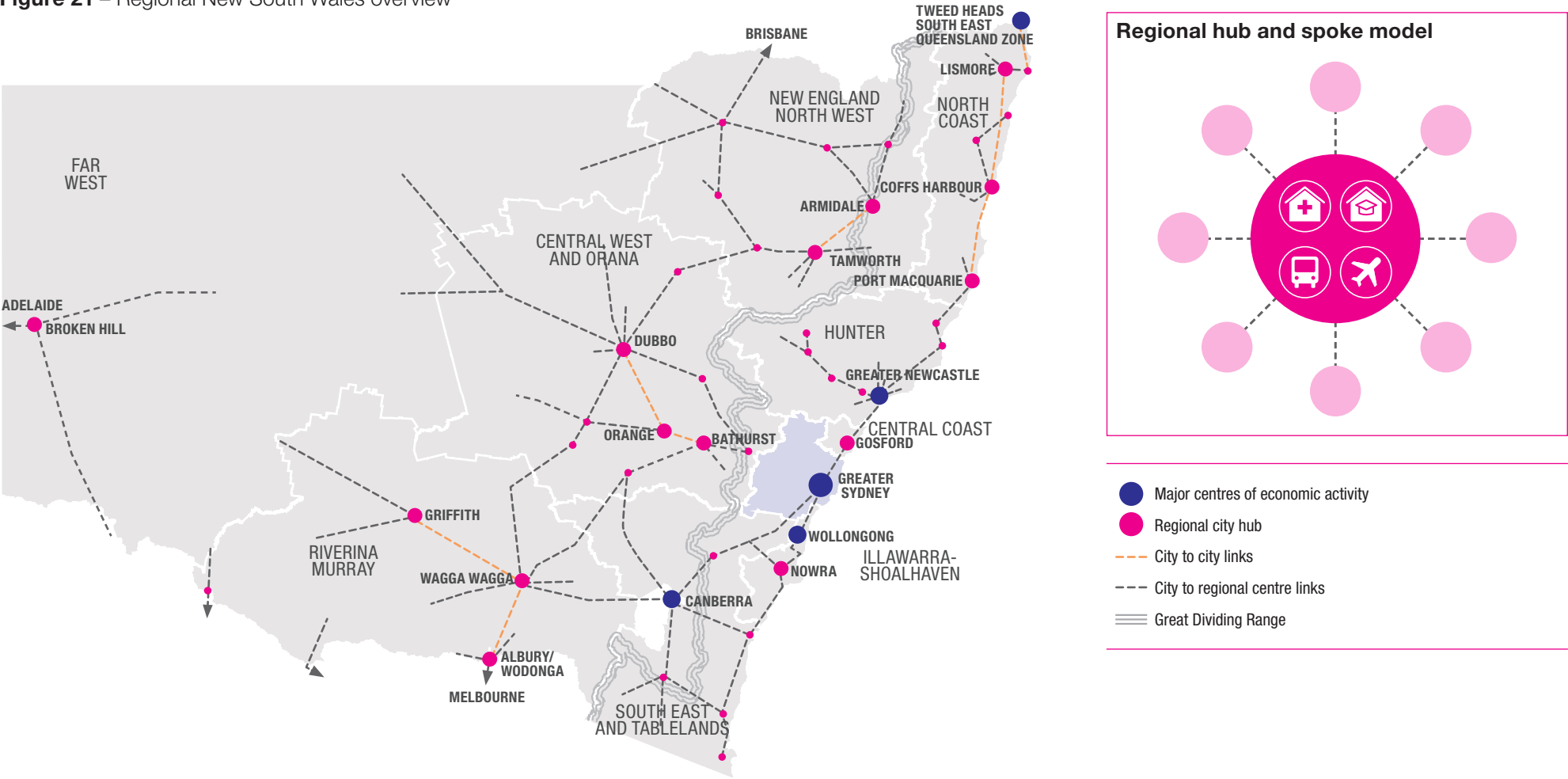
- Improve access to and prepare international gateways for growth.
- Facilitate investment in education infrastructure that supports skills development and industry growth.
- Facilitate investment in accessible high quality digital infrastructure.
- Facilitate private sector investment in secure, reliable, affordable, low-emission, energy infrastructure.
- Ensure water supply and wastewater treatment to enable growth.
- Provide necessary social infrastructure to support the population.
- Optimise existing infrastructure networks to provide greater capacity for better services.
- Provide internationally competitive cultural and sporting infrastructure to meet contemporary expectations.
- Support the visitor economy, including overseas tourism.

149 Ibid. p. 31

150 Jobs for NSW 2016, p. 27

8.3 Regional New South Wales

Figure 21 – Regional New South Wales overview



Source: Transport for NSW, adapted by Infrastructure NSW, 2017

8.3.1 Regional New South Wales geographic directions

Regional NSW has a \$157 billion economy, the second largest regional economy in Australia behind regional Queensland. It has grown strongly in the past five years, driven by primary commodity export growth and favourable seasonal conditions, as well as the investment of over \$1.9 billion in infrastructure from the Restart NSW fund.

Development patterns across regional NSW have historically been influenced by the distribution of natural and locational endowments, such as agricultural land, mineral resources, high amenity landscapes and proximity to ports and trade routes. Infrastructure investment decisions – for instance, in relation to highway alignments and the establishment of universities or major health institutions – have also tended to focus growth in particular locations.

Functional Economic Regions

The economy of regional NSW is made up of several sub-economies that do not fit neatly into land use planning or local government boundaries. Each regional sub-economy is distinct and can claim its own natural or man-made endowments. Strategic investment can increase a region's endowments and/or its ability to exploit them to drive economic growth.

In general, over time the State's regions can expect to host fewer, larger industries that are networked into global supply chains. Skills availability, infrastructure and digital connectivity will be vital to maximising regional productivity and competitiveness.

Over the next 20 years, the trend of internal migration to larger, growing centres will continue and is likely to accelerate.

To reflect the diversity of the State's regional economies, the NSW Government has identified 37 Functional Economic Regions (FERs). These economic regions, some of which extend beyond NSW's borders, typically have a large town at their centre (a 'hub') and several interconnected 'spokes' to smaller centres. Some FERs are residential satellites to large metropolitan cities, but all rely on their connections to markets and suppliers through key freight and service exchange routes. Most of these routes lead to Sydney and other port cities, with some leading to interstate capitals and regions like Canberra, Melbourne and Brisbane.

ABS data shows that 29 FERs (78 per cent) have grown in population over the last five years, with 10 experiencing growth in excess of one per cent per annum. Eight FERs (22 per cent) have experienced declining populations. While population increases generally indicate future economic growth, a stable or declining population is not always an indicator of future decline: some FERs will grow if appropriate investments and interventions are made to reinforce their strategic endowments.

To ensure that local communities and all levels of government have a detailed and consistent understanding of each regional economy, the NSW Department of Premier and Cabinet, in consultation with local councils, is developing Regional Economic Development Strategies (REDS) for each FER. Each strategy will identify the region's economic strengths

and endowments, articulate an economic vision for the future based on its competitive advantages and outline the strategies and supporting infrastructure needed to achieve the vision.

Key competitive advantages across regional NSW include:

- agriculture, which is strong in most regions, supported by productive land and a suitable climate, contributed \$10.6 billion (1.85 per cent) towards the NSW economy in 2016-17¹⁵¹
- mining, which is a key industry in several regions, including the Hunter region and around Broken Hill, Cobar, Orange and Parkes, contributed \$16.8 billion (2.91 per cent) towards the NSW economy in 2016-17¹⁵²
- manufacturing closely connected with primary resources and transport, for example, food product manufacturing in Griffith, Leeton and the Central Coast, and wood and paper product manufacturing around Albury, Bathurst, Tumut and the Clarence Valley
- recreational facilities and destinations that attract tourists; for example, at Bega, Coffs Harbour and the Snowy Mountains – regional tourism contributed \$11.4 billion towards the NSW economy in 2015-16, representing around 38 per cent of the total tourism contribution for NSW¹⁵³
- a combination of amenity and high level medical and associated institutions that attract retirees; for example, at Port Macquarie

151 Australian Bureau of Statistics 2017

152 Ibid.

153 Destination NSW 2016

- specialised freight transport in regions where major road and rail routes intersect; for example, at Dubbo and Moree
- elite training facilities for police and defence forces, such as those at Goulburn and Wagga Wagga
- education and research clusters; for example, at Armidale, Bathurst, Lismore and Wagga Wagga.

Port of Eden upgrade

At the junction of the Bega and Brogo rivers, Bega is the rural centre of the Sapphire Coast and part of the South East and Tablelands Region.

Tourism is one of the region's largest direct and indirect economic contributors, with over 400,000 people visiting the Bega Valley each year to take advantage of its proximity to surrounding natural endowments like beaches and national parks, and local amenities.¹⁵⁴

In 2017, the NSW Government confirmed its approval of a \$44 million upgrade to the Port of Eden, with funding contributions from all three levels of government.

Once complete, the new wharf will be a major tourist attraction for the area that can accommodate larger cruise ships, and is expected to attract significantly more visitors to the area, as well as providing local jobs during and after its construction.

Wagga Wagga elite defence training facilities

With a presence of the army, air force and navy, Wagga Wagga in the Riverina Murray Region is one of Australia's major Defence Force locations, and the heart of military training in NSW. Facilities include:

- the Army Recruit Training Centre Kapooka, which provides training for around 3,500 recruits and 1,750 army reservists each year
- the Royal Australian Air Force (RAAF) Base Wagga, which provides aviation training to all three military services and with around 4,500 trainees graduating each year
- the Royal Australian Navy training facilities.

Servicemen and women are all based in the city.

The presence of these facilities makes defence a core industry and economic driver for Wagga Wagga and the Murrumbidgee region, contributing around \$350 million annually in economic output.¹⁵⁵

Armidale education and research city

Armidale, located in the New England North West region, is recognised as one of regional NSW's premier education cities, providing excellence in education from kindergarten to post-graduate level.

The University of New England, located on the outskirts of the city of Armidale, was the first university established in regional NSW. It is home to six national Cooperative Research Centres (CRCs) for industry-focused research in the cotton, poultry and sheep industries, and beef genetic technologies.

The University also conducts joint research ventures with industry partners in the fields of primary industry and animal genetics, and has a range of research centres in areas as diverse as social science, management and policy, language and cognition, and agricultural law.

With more than 80,000 people holding qualifications from the university, it contributes to regional, state, national and international development through its provision of higher education opportunities, support and leadership in various intellectual and cultural issues, and access to research.¹⁵⁶

¹⁵⁴ Bega Valley Shire Council 2015, p. 21

¹⁵⁵ Regional Australia Institute 2017
¹⁵⁶ Armidale Dumaresq Council 2017

Regional Development Framework

The NSW Government's approach to regional investment is underpinned by its *Regional Development Framework*, released in 2016, which aims to:

- provide quality services and infrastructure in regional NSW – ensuring equitable service levels across the state
- align efforts to support growing regional centres, acknowledging the needs of areas with strong growth in population, jobs or both
- identify and activate economic potential by looking across regional NSW for opportunities to change the economic outlook and activate local economies.

The *Regional Development Framework* acknowledges that regional investment decisions need to be customised and that, particularly in small and/or remote localities, they may need to be based on factors other than cost-benefit analysis, including the achievement of minimum equity-based service standards.

Access to digital technology and networks is emerging as critical to business success as value chains fragment and competition becomes global in many regional industries. The benefits of improved digital connectivity for regional communities are illustrated in the following Walla Walla case study.

Walla Walla internet connectivity

In 2015, the Commonwealth and NSW governments supported investment into business-grade internet to unlock the potential of Walla Walla in southern NSW.

Kotzur Silos, a bulk handling and silo manufacturer operating in Walla Walla, is experiencing significant growth in its bulk handling projects. But this growth was being restricted by a slow and unreliable internet service that struggled to support basic online services.

Similarly, St Paul's College, a co-educational day and boarding secondary school specialising in equine and agricultural studies, was unable to deliver education using digital content, a service that is available to most other schools across NSW.

As well as supporting the continued growth of Kotzur Silos, including increased employment, the investment has improved the basic amenity of the town for students and residents by providing access to data and Voice Over Internet Protocol capabilities (such as Skype) at up to 200 megabytes per second.

Guyra tomatoes

Guyra and surrounding communities have benefited from one of the largest tomato greenhouse facilities in the Southern Hemisphere. Costa is a major Australian grower, packer and marketer of fresh produce and supplies to Australian supermarkets and wholesale markets, and exports to Asia, North America and Europe.

Costa recently expanded its existing 20-hectare facilities in Guyra, building two new five-hectare, hi-tech glasshouses, adjacent to the New England Highway north of Guyra. The State Government funded roadworks and the construction of a new entrance from the New England Highway to the new glasshouses, providing easier and safer access for employees.

The expansion created more than 170 new jobs, with Costa Group's operations at Guyra now employing over 500 people and producing around 14.5 million kilograms of tomatoes each year.

Restart NSW

Over the last six years, regional economic growth has been supported through significant infrastructure investment from the Restart NSW fund. Since the fund was established in 2011, around \$9.1 billion has been committed or reserved for programs and projects in regional NSW.

Restart NSW funds have been allocated to specific projects such as upgrades to the Pacific and Princes Highways, Grafton Bridge and various freight pinch

points across regional NSW. Funds have also been channelled into submissions-based funding programs such as Resources for Regions and Fixing Country Roads. These programs involve local councils and other organisations submitting proposals for Restart funding of local projects, which are then evaluated on a transparent, competitive basis by Infrastructure NSW.

To date, over 400 individual projects have been funded from Restart NSW, many of which are supported by co-funding from local councils or the Commonwealth Government.

Infrastructure NSW requires that, to be eligible for Restart NSW funding, a project must demonstrate a benefit cost ratio of greater than 1.0.

Where submissions-based programs have been offered, they have been consistently oversubscribed, with successful projects demonstrating benefit cost ratios significantly in excess of 1.0. This suggests there is significant scope for further, economically beneficial investment in regional NSW, particularly if it is strategically guided by the REDS.

Infrastructure response — Regional New South Wales

- Improve transport connections to key markets, especially east-west.
- Improve access to international gateways and manage them for future growth.
- Provide connections to and from proposed Inland Rail.
- Facilitate private sector investment in secure, reliable, affordable energy.
- Improve access to digital connectivity.
- Ensure water supply and wastewater treatment to enable growth.
- Upgrade hospitals and other social infrastructure in regional hubs, including social housing.
- Provide additional and improved cultural infrastructure and attractions.
- Support regional hubs to act as effective centres serving their surrounding regional populations.

Greater Newcastle

Greater Newcastle is the major centre of the Hunter region. It is home to around 560,000 people but is expected to grow to around 700,000 over the next 20 years,¹⁵⁷ generating an additional 48,000 jobs.¹⁵⁸ Newcastle Port is a key international gateway, handling over \$15 billion in (predominantly coal) trade annually.¹⁵⁹

¹⁵⁷ Department of Planning and Environment 2017, p. 9
¹⁵⁸ Department of Planning and Environment 2016a, p. 14
¹⁵⁹ Port of Newcastle 2014, p. 9

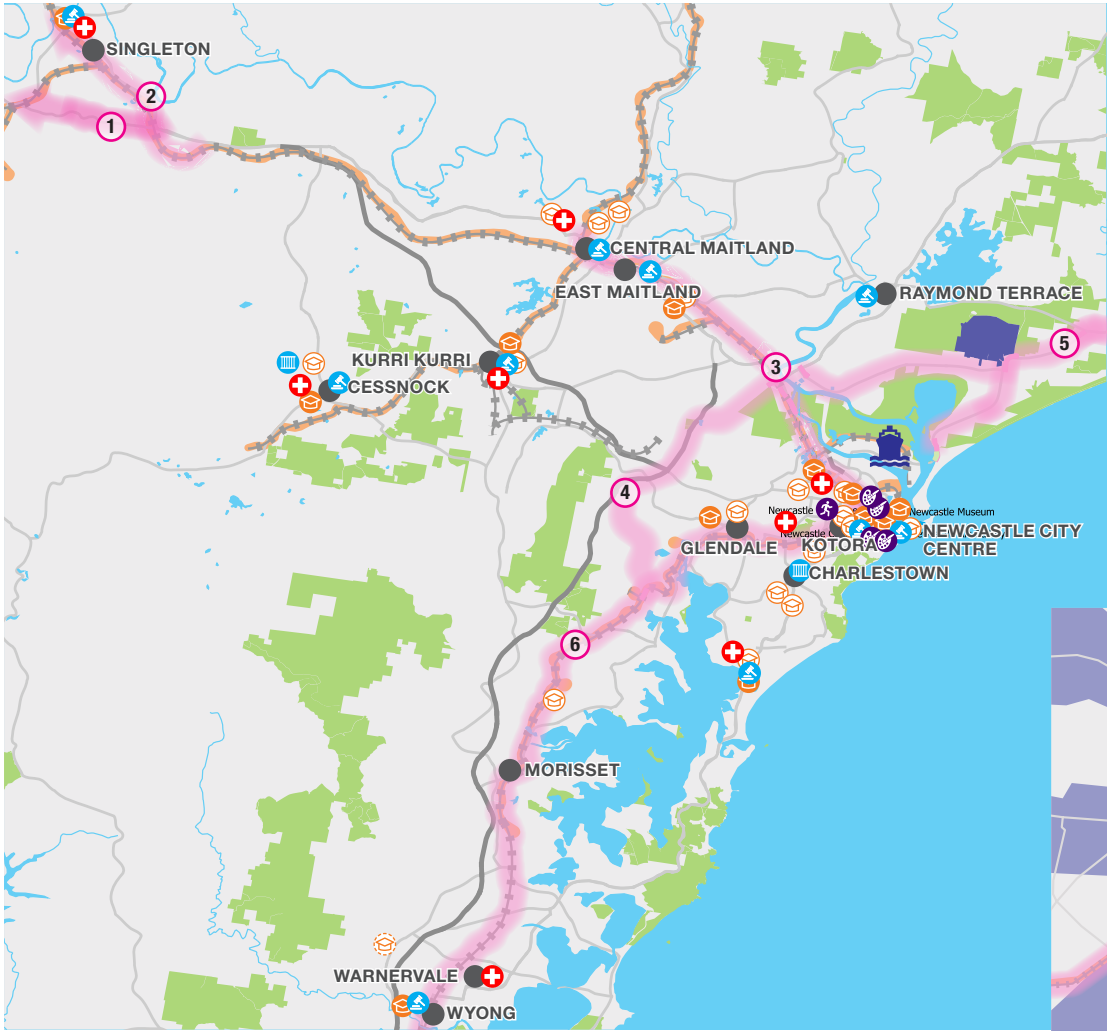
Newcastle's endowments include its port and airport, strong education, health and manufacturing sectors, strong connections to primary industry via the Hunter Valley Coal Chain and a vibrant waterfront and heritage. Drawing on these endowments, and the diverse competitive strengths and labour markets within the surrounding region, including the Central Coast, Newcastle is well positioned to grow as one of NSW's major cities.

Delivery of new infrastructure including light rail, road upgrades and an expanded port, as well as urban renewal along strategic corridors, will secure the competitiveness of Greater Newcastle and the Hunter region. Maintaining access to global gateways will be important as the city continues to grow. The Hunter Regional Plan has set a target of 95 per cent of residents living within 30 minutes of a strategic centre.¹⁶⁰ Better telecommunications infrastructure will be required to ensure that digital connectivity for residents and businesses supports continued growth.

The expanding University of Newcastle and the John Hunter Hospital will provide health and research facilities of an international standard. Targeted government investment to support these facilities will provide enhanced productivity benefits.

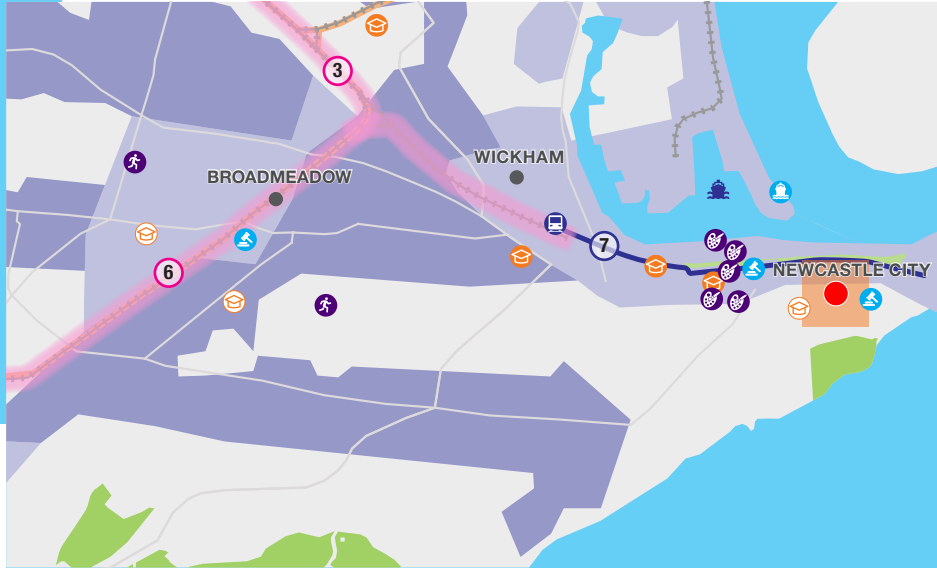
¹⁶⁰ Department of Planning and Environment 2016a, p. 8

Figure 22 – Greater Newcastle and City overview



- Newcastle City Centre
 - Strategic centres
 - Major parks and reserves
 - Waterways
 - Priority growth areas
 - Urban renewal corridors
 - Newcastle Airport
 - ⚓ Port of Newcastle
 - ⚓ Cruise ship terminal
 - 🚆 Newcastle Interchange
 - Hunter Valley Coal Chain corridor
 - + + + + Railway (existing)
 - Motorways and freeways (existing)
 - Arterial roads (existing)
 - 🏃 Selected major sports venues
 - 🎭 Selected major cultural venues
 - 🎓 New schools (proposed)
 - 🎓 Upgraded schools (proposed)
 - 🎓 Universities and TAFE NSW colleges
 - + Hospitals
 - 🏛️ Correctional facilities
 - ⚖️ Courts
 - Transport projects proposed for the future (possible alignments)
 - 1 Golden Highway improvements
 - 2 Main Northern Line improvements
 - 3 Electrification of the Hunter Line to Telarah
 - 4 Lower Hunter Freight Corridor
 - 5 Nelson Bay road improvements
 - 6 Sydney-Central Coast-Newcastle rail improvements
 - Transport projects in delivery
 - 7 Newcastle Light Rail
- (See Chapter 9 for details on transport recommendations.)

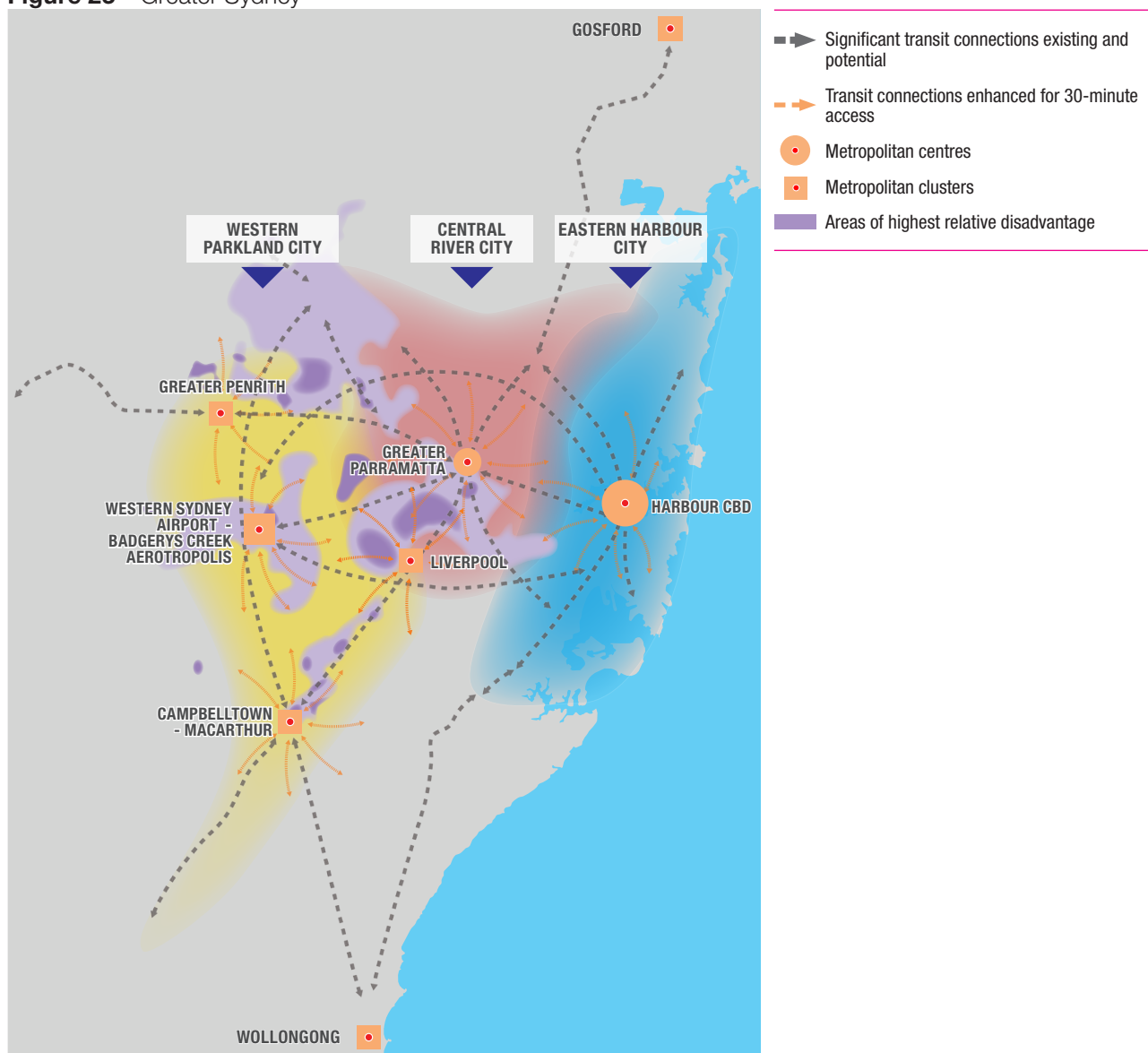
NEWCASTLE CITY INSET



Source: Road, Rail, Reservoirs, Lakes, Rivers Publisher Bioregional Assessment Programme licensed under CC BY 3.0; Openstreetmap, Publisher Open Street Map licensed under CC BY 2.0; School Infrastructure, NSW Department of Education 2018; Hospitals, NSW Health 2017; Transport projects, Transport for NSW 2017; adapted by Infrastructure NSW 2018

8.4 Greater Sydney and the outer metropolitan area

Figure 23 – Greater Sydney



Source: Transport for NSW 2017 and Greater Sydney Commission; Australian Bureau of Statistics 2011, *Index of Relative Socioeconomic Advantage and Disadvantage*, adapted by Infrastructure NSW

8.4.1 Greater Sydney geographic directions

Greater Sydney is Australia's global economic gateway and financial capital. It is a regional hub for global financial markets and hosts a majority of Australia's top 50 ASX-listed companies. It is home to 4.7 million people and has the highest concentration of managers and professionals of any capital city in Australia.¹⁶¹ The region is set to grow to 8.3 million people, with a trillion-dollar economy by 2056, up from \$382 billion in 2016.¹⁶²

Sydney's globally competitive strengths lie in financial and professional services, higher education, health, manufacturing and international tourism. Advanced electronic and medical devices, and advanced manufacturing sectors, are growing strongly.¹⁶³

Greater Sydney's main economic attractors, high-end jobs and recent infrastructure investments are skewed to the established Eastern Harbour City. To strengthen the region's competitive sectors and manage the pressures of population growth, the Greater Sydney Commission has set out a vision to reshape and rebalance the city's structure, creating a metropolis of three cities.

To achieve this vision for growth and a new economic geography for Sydney, the balance of infrastructure investment will need to shift over time. More new infrastructure will be required in the outer western, north-western and south-western areas to support

¹⁶¹ Department of Industry 2013

¹⁶² The Centre for International Economics 2017, p. 6

¹⁶³ Greater Sydney Commission 2017, p. 67

connectivity, services and amenity for the expanding Central River City and Western Parkland City.

Efficient trade gateways and freight and logistics networks within Greater Sydney will continue to be critical to NSW's global competitiveness. New gateways like the Western Sydney Airport and intermodal terminals will help to support the growing freight task across Greater Sydney.

Early identification and protection of future infrastructure corridors and space for vital social infrastructure, including public and green spaces, will be critical, particularly to ensure the success of the Western Parkland City.

Greater Sydney also benefits from people commuting from the Central Coast (particularly south of Wyong) and Illawarra to jobs in Sydney. Both Gosford and Wollongong also play significant roles in supporting the needs of their broader regions.

Eastern Harbour City

Eastern Sydney is Australia's global economic gateway and most concentrated area of economic activity, jobs and investment. The eastern economic corridor between Macquarie Park and Sydney Airport alone accounted for 24 per cent of Australia's growth in GDP in the 2015-16 financial year.¹⁶⁴

Competitive industries include finance and professional services (including FinTech), ICT, health and education, tourism and creative industries. These are boosted by endowments such as internationally renowned tourist attractions and being the global headquarters of Australia's top businesses.

The Eastern Harbour City is well established and developed, with limited space for new developments compared to other cities within Greater Sydney. The challenge is to drive and accommodate growth and density, balanced with smart infrastructure investments and the optimised use of existing assets.

Given its location on the harbour and surrounding parklands, the Harbour CBD (encompassing Sydney CBD and North Sydney CBD) is constrained in terms of opportunities for growth. Urban renewal will occur to the south and west of the city – in the Central to Eveleigh and Bays precincts – and will benefit from the clustering of businesses in the emerging innovation precinct, anchored by health and education assets, on the south-western edge of the CBD.

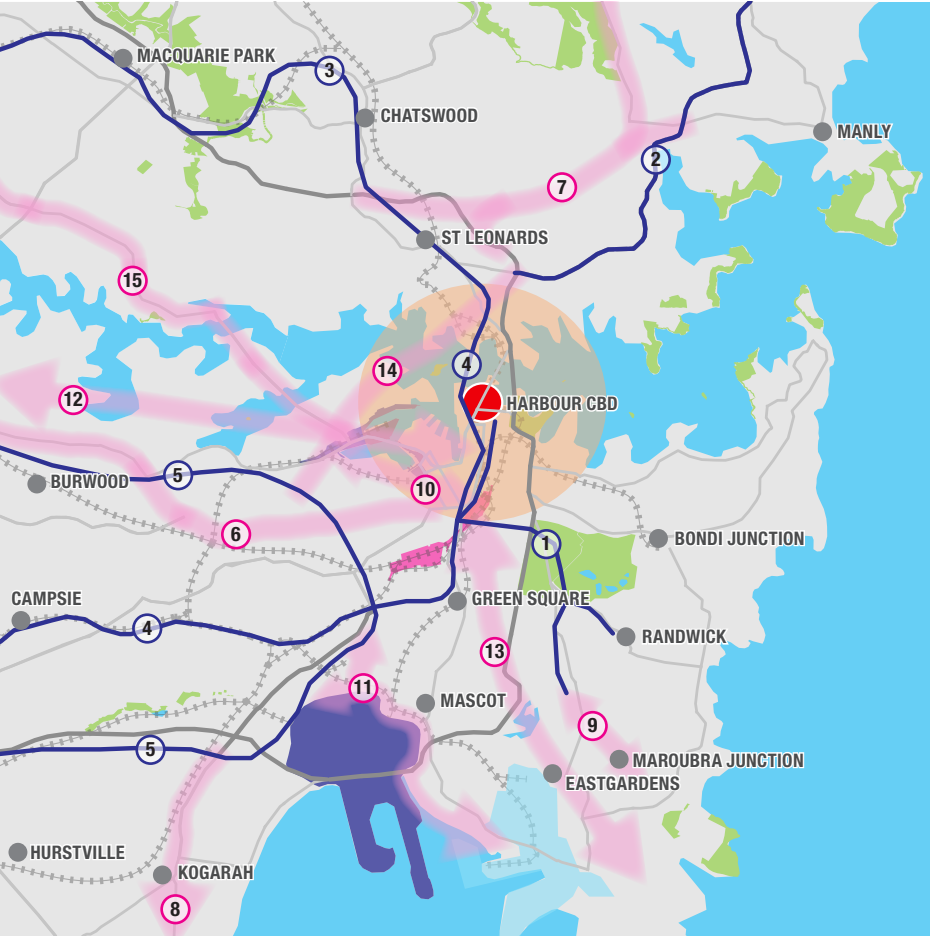
Maintaining the efficiency of infrastructure networks and access to the international trade gateways of Sydney Airport and Port Botany will be critical to support the ongoing competitiveness of the city and of NSW.

Infrastructure response — Eastern Harbour City

- Improve access to international gateways.
- Improve intercity and intracity transport connectivity.
- Improve intracity walking and cycling infrastructure.
- Improve mass transit connections to the Harbour CBD, especially from the west and south east of the Eastern Harbour City.
- Invest in improvements in cultural infrastructure and institutions.
- Support the population with social infrastructure investments.
- Provide more school education facilities, exploring joint and shared use.

¹⁶⁴ Ibid, p. 67

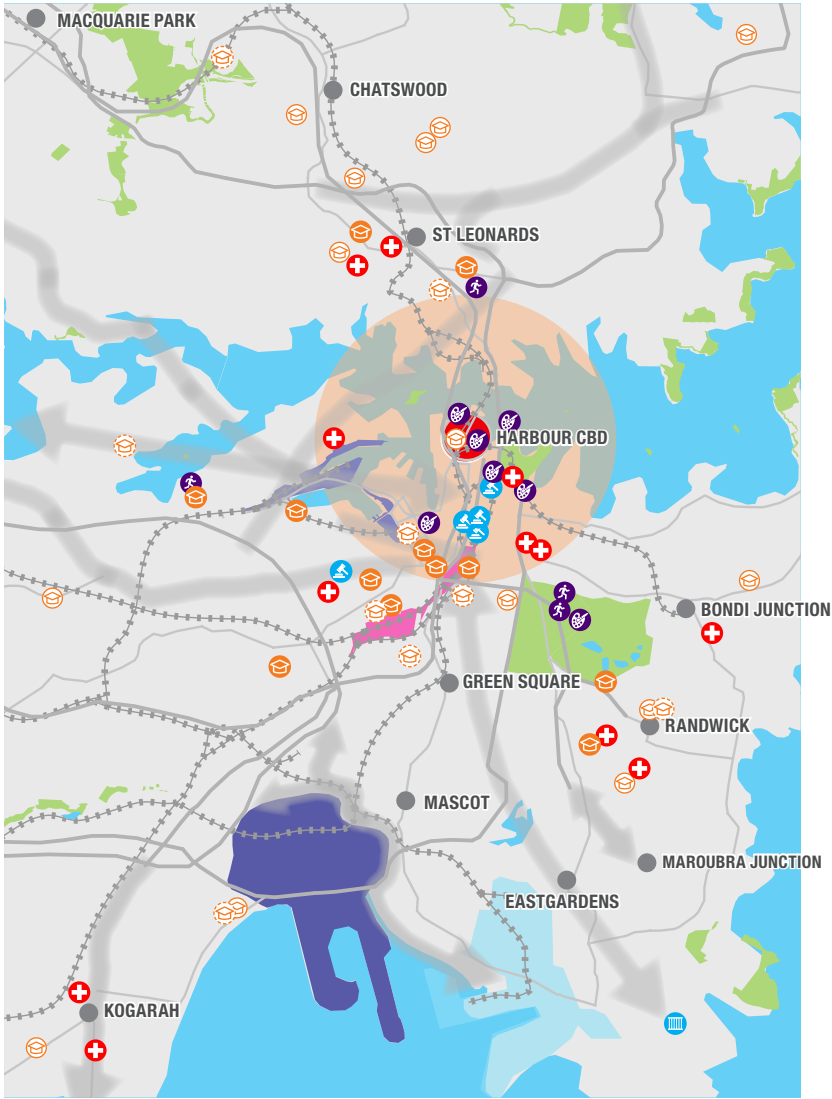
Figure 24 – Eastern Harbour City (movement)



- Metropolitan centre
 - Strategic centres
 - Major parks and reserves
 - Waterways
 - Bays Precinct
 - Central to Eveleigh Precinct
 - Sydney Airport
 - Port Botany
 - +++ Railway (existing)
 - Motorways and freeways (existing)
 - Arterial roads (existing)
 - Transport projects in delivery
 - 1 CBD & SE Light Rail
 - 2 Northern Beaches B-Line
 - 3 Sydney Metro Northwest
 - 4 Sydney Metro City & Southwest
 - 5 WestConnex
 - Transport projects proposed for the future (possible alignments)
 - 6 Parramatta Road public transport improvements
 - 7 Beaches Link
 - 8 F6 Extension
 - 9 Light Rail to Maroubra Junction
 - 10 Light Rail to Bays Precinct
 - 11 Sydney Gateway
 - 12 Sydney Metro West
 - 13 Mass transit to South East
 - 14 Western Harbour Tunnel
 - 15 Victoria Road public transport improvements
- (See Chapter 9 for details on transport recommendations.)

Source: Road, Rail, Reservoirs, Lakes, Rivers Publisher Bioregional Assessment Programme licensed under CC BY 3.0; Transport projects, Transport for NSW 2017

Figure 25 – Eastern Harbour City (place)



- Metropolitan centre
- Strategic centres
- Major parks and reserves
- Waterways
- Bays Precinct
- Central to Eveleigh Precinct
- Sydney Airport
- Port Botany
- Selected major sports venues
- Selected major cultural venues
- New schools (proposed)
- Upgraded schools (proposed)
- Selected universities and TAFE NSW
- Selected major hospitals
- Correctional facilities
- Selected major courts

Source: Road, Rail, Reservoirs, Lakes, Rivers Publisher Bioregional Assessment Programme licensed under CC BY 3.0; School Infrastructure, NSW Department of Education 2018; Hospitals, NSW Health 2017; adapted by Infrastructure NSW 2018

Central River City

The Central River City has grown strongly as a retail and service centre in the last 10 years, and now hosts 85,000 jobs in Greater Parramatta – a similar number to Macquarie Park.¹⁶⁵ Economic growth and productivity are being driven by the NSW Government's \$10 billion investments in city-scale assets in Parramatta and potential new transport connections.¹⁶⁶

Home to information technology, public administration, construction, manufacturing and logistics centres, the Central River City's competitive and growing industries include finance and professional services, health, international education and advanced manufacturing (requiring smaller, highly automated production).

While it is the geographic centre of Greater Sydney, the Greater Parramatta area and the Greater Parramatta to Olympic Park Corridor are poorly connected to areas to their north and south, and would benefit from a faster high capacity connection to the Harbour CBD. Within the central city corridor, Sydney Olympic Park is a major recreation and events destination, but is poorly connected to the rest of the city.

An innovation precinct is emerging around Westmead, driven by significant government investment in the hospital redevelopment and the presence of major universities. Good connections within the precinct, and appropriate zoning and land uses that enable cross-industry collaboration, will be prerequisites for the precinct's success.

In recognition of the strategic significance of Greater Parramatta and the Olympic Peninsula, the Greater Sydney Commission has set out a vision for renewal within the corridor in which it becomes the connected unifying heart of Greater Sydney. Work is underway on a pilot growth infrastructure compact for the area to ensure it is supported by the right infrastructure and policy settings to accommodate and drive growth in a coordinated way.

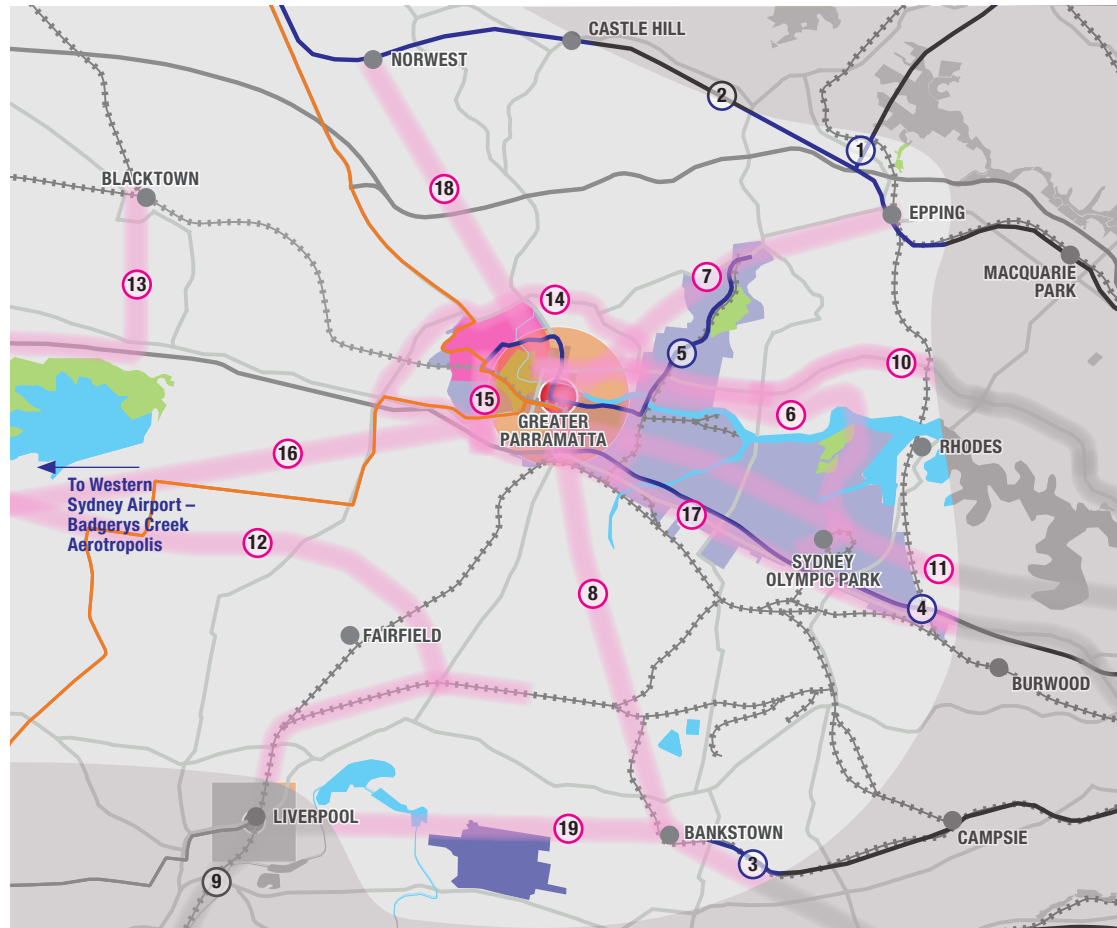
Infrastructure response – Central River City

- Improve intercity and intracity transport connections.
- Improve intracity walking and cycling connections.
- Improve north-south transport connections, for example Greater Parramatta to Epping and Greater Parramatta to Kogarah via Bankstown.
- Provide additional cultural and recreational infrastructure.
- Facilitate high quality digital connectivity infrastructure as part of all development.
- Support growth in population and housing, including social and affordable housing options.
- Provide more school education facilities, exploring joint and shared use.

¹⁶⁵ Ibid, p. 88

¹⁶⁶ Ibid, p. 70

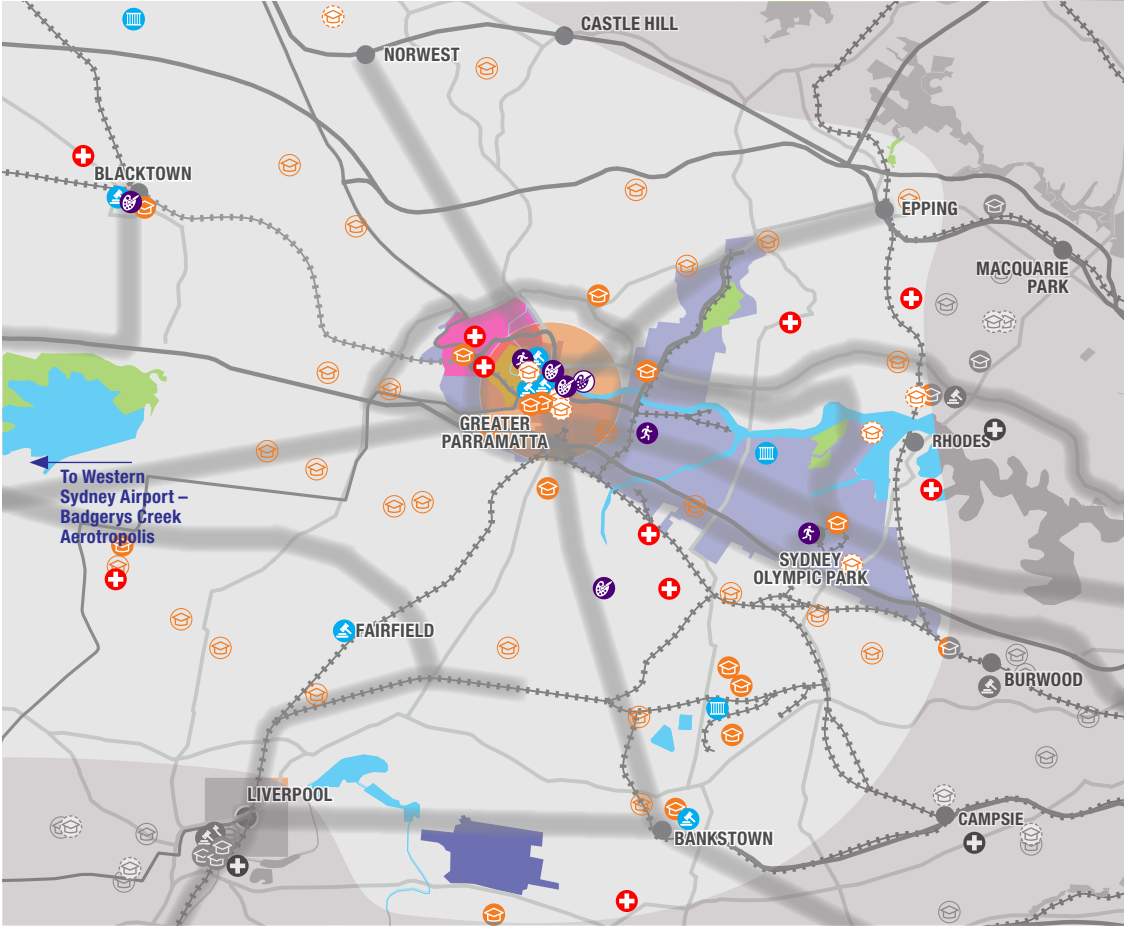
Figure 26 – Central River City (movement)



- Metropolitan centre
 - Strategic centres
 - Major parks and reserves
 - Waterways
 - Greater Parramatta and Olympic Peninsula
 - Westmead Innovation Precinct
 - Bankstown Airport
 - +++ Railway (existing)
 - Motorways and freeways (existing)
 - Arterial roads (existing)
 - Area outside of Central River City
 - T-Way (Existing Rapid Bus Network)
 - Transport projects in delivery
 - 1 NorthConnex
 - 2 Sydney Metro North West
 - 3 Sydney Metro South West
 - 4 WestConnex
 - 5 Parramatta Light Rail Stage 1
 - Transport projects proposed for the future (possible alignments)
 - 6 Parramatta Light Rail Stage 2
 - 7 Parramatta to Epping Mass Transit
 - 8 Parramatta to Kogarah Mass Transit
 - 9 Southern Sydney Freight Line (additional capacity)
 - 10 Victoria Road public transport improvements
 - 11 Sydney Metro West
 - 12 Western Sydney Freight Line corridor protection
 - 13 Rapid bus connection to Western Sydney Airport
 - 14 Parramatta Outer Ring Road
 - 15 T-way to T-way Link
 - 16 WSA to Parramatta train link
 - 17 Parramatta Road public transport improvements
 - 18 Parramatta to Norwest Mass Transit
 - 19 Sydney Metro City & Southwest extension to Liverpool corridor protection
- (See Chapter 9 for details on transport recommendations.)

Source: Road, Rail, Reservoirs, Lakes, Rivers Publisher Bioregional Assessment Programme licensed under CC BY 3.0; Transport projects, Transport for NSW 2017

Figure 27 – Central River City (place)



- Metropolitan centre
- Strategic centres
- Major parks and reserves
- Waterways
- Greater Parramatta and Olympic Peninsula
- Westmead Innovation Precinct
- Bankstown Airport
- Area outside of Central River City
- Major sports venues
- Major cultural venues
- Major cultural venues (proposed)
- New schools (proposed)
- Upgraded schools (proposed)
- Universities and TAFE NSW colleges
- + Hospitals
- Correctional facilities
- Courts

Source: Road, Rail, Reservoirs, Lakes, Rivers Publisher Bioregional Assessment Programme licensed under CC BY 3.0; School Infrastructure, NSW Department of Education 2018; Hospitals, NSW Health 2017; adapted by Infrastructure NSW 2018

Western Parkland City

By 2056, nearly two million people will live in the Western Parkland City.¹⁶⁷ Currently, the Western Parkland City comprises large areas of light industrial and urban agricultural land, as well as large developable land parcels, with greenfield development underway within the Greater Macarthur Growth Area, North West Growth Area and South West Growth Area.

South Creek is planned to be preserved and enhanced as a parkland and creek lands corridor to support the western parkland urban form, while enabling delivery of housing supply and employment opportunities through water supply and management. All infrastructure and land-use planning decisions in the Western Parkland City will need to be oriented to support this important asset.

The development of an economic city in the heart of the western corridor will be fundamental to realising the potential of the new Western Sydney Airport, accommodating population growth and providing opportunities to overcome the socio-economic disadvantage that characterises parts of south-western Sydney. Creating a lifestyle and culture that attracts people and businesses to the city will also be crucial.

The largely greenfield nature of the new city requires early action by the NSW Government to develop a strategic plan for the city that brings together infrastructure needs, identifies areas and corridors for protection, identifies the cultural infrastructure necessary to support a thriving community, balances development of industry and housing, encourages and stimulates private sector investment and maintains flexibility to accommodate future uncertainties around technology and development.

If planned and executed correctly, the city will attract defence and aerospace activities. It will also have significant warehousing, freight and logistics activity. Planning will need to include major transport connections to the north and south, and to surrounding established centres at Campbelltown-Macarthur, Greater Penrith and Liverpool, Blacktown, and Greater Parramatta in the Central River City.

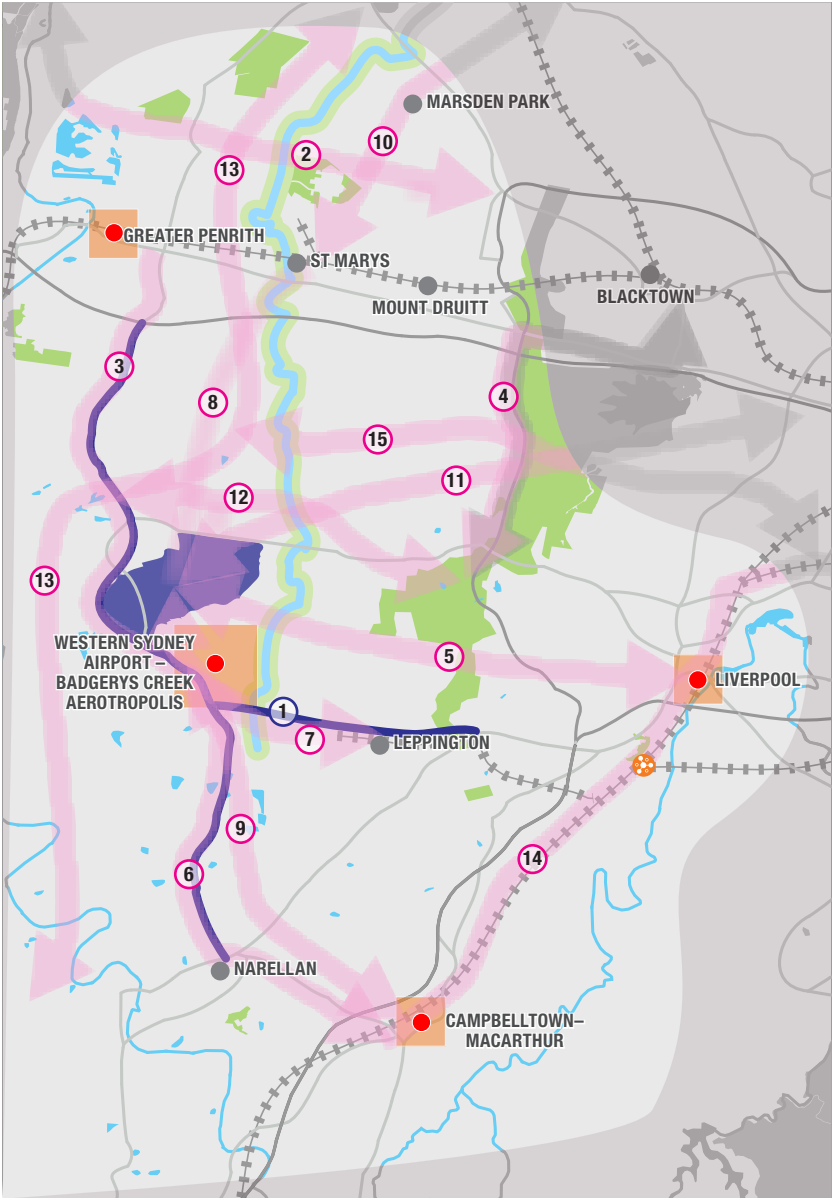
The proposed Western Sydney City Deal, a collaboration across three tiers of government to drive the delivery of the Western Sydney Airport and Badgerys Creek Aerotropolis, aims to unlock public and private investment in key infrastructure.

Infrastructure response – Western Parkland City

- Prioritise intercity road connections to support access from all directions.
- Provide a north-south mass transit connection, for example the T1 Western Line to Western Sydney Airport
- Prioritise sustainable transport connections, particularly walking and cycling infrastructure within the city.
- Facilitate high quality digital connectivity infrastructure as part of all development.
- Provide social infrastructure, such as schools, social housing and hospitals, to support population growth.
- Provide additional cultural and recreational infrastructure.
- Encourage local council and private investment in recreation infrastructure.
- Facilitate South Creek catchment to become an enabler of world class water management, urban greening and climate control.
- Deliver a freight network to support a growing city, and the next tranche of container imports into Sydney.

¹⁶⁷ The Centre for International Economics 2017, p. 6

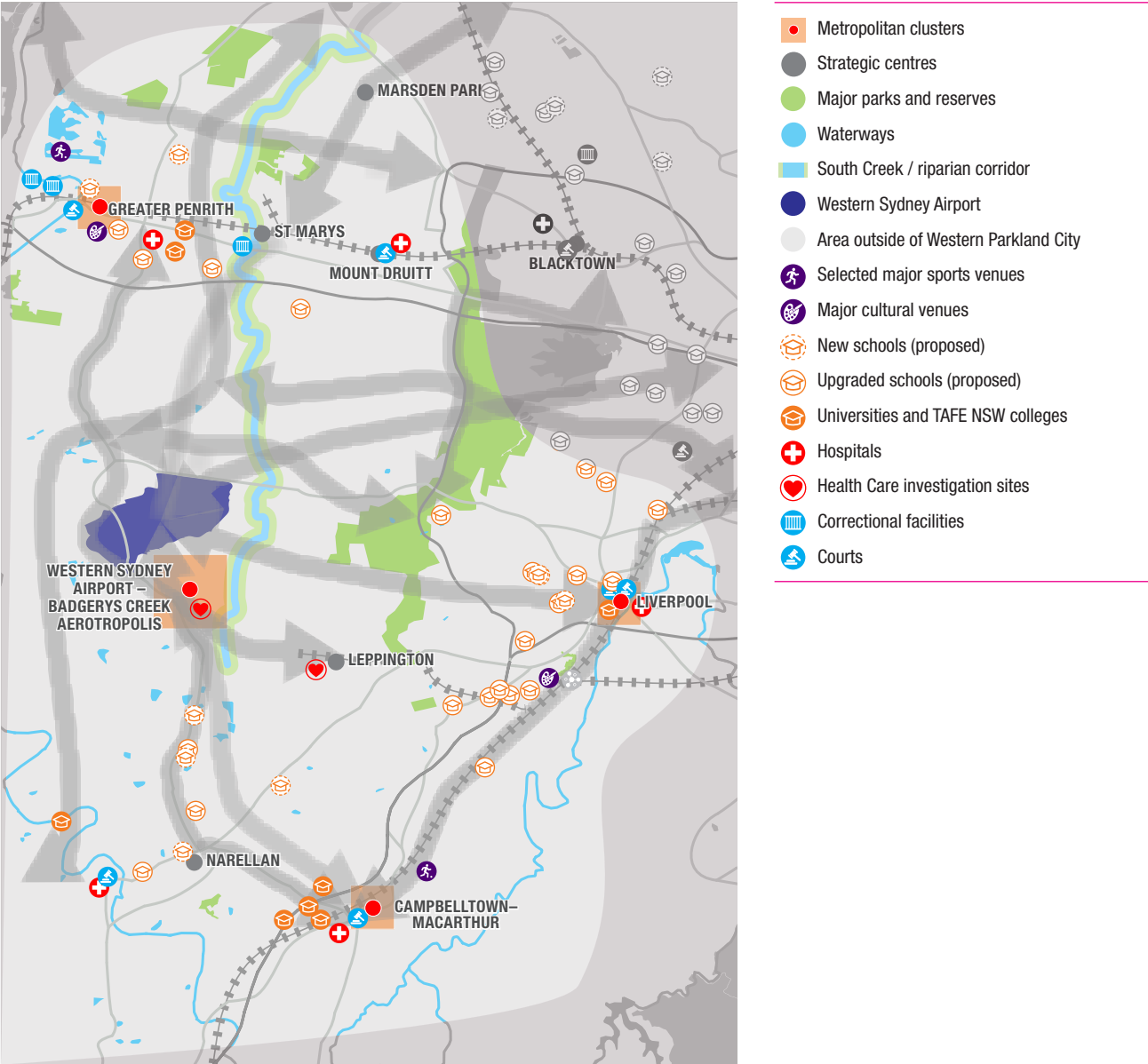
Figure 28 – Western Parkland City (movement)



- Metropolitan clusters
 - Strategic centres
 - Major parks and reserves
 - Waterways
 - South Creek / riparian corridor
 - Western Sydney Airport
 - Moorebank Intermodal Terminal
 - Railway (existing)
 - Area outside of Western Parkland City
 - Motorways and freeways (existing)
 - Arterial roads (existing)
 - Transport projects in delivery
 - 1 Western Sydney Infrastructure Plan (WSIP)
 - Transport projects proposed for the future (possible alignments)
 - 2 Bells Line of Road Castlereagh Connection corridor protection
 - 3 Penrith rapid bus connection to WSA
 - 4 Blacktown rapid bus connection to WSA
 - 5 Liverpool Rapid Bus connection to WSA
 - 6 Campbelltown rapid bus connection to WSA
 - 7 Leppington to WSA train link
 - 8 North – South train link (St Marys to WSA)
 - 9 North – South train link (WSA to Campbelltown-Macarthur)
 - 10 North – South train link (St Marys to Cudgegong Road)
 - 11 WSA to Parramatta train link
 - 12 M12 motorway (part of WSIP)
 - 13 Outer Sydney Orbital corridor protection
 - 14 Southern Sydney Freight Line (additional capacity)
 - 15 Western Sydney Freight Line corridor protection
- (See Chapter 9 for details on transport recommendations.)

Source: Road, Rail, Reservoirs, Lakes, Rivers Publisher Bioregional Assessment Programme licensed under CC BY 3.0; Transport projects, Transport for NSW 2017

Figure 29 – Western Parkland City (place)



Source: Road, Rail, Reservoirs, Lakes, Rivers Publisher Bioregional Assessment Programme licensed under CC BY 3.0; School Infrastructure, NSW Department of Education 2018; Hospitals, NSW Health 2017; adapted by Infrastructure NSW 2018

Wollongong

The Wollongong and Shellharbour area is likely to be home to more than half a million people by 2036.¹⁶⁸

The area will drive the economic growth, employment and diversification of the broader Illawarra-Shoalhaven region, while also contributing to Greater Sydney's economy and labour force.

The regional city of Wollongong will become increasingly connected to Greater Sydney by 2056, enabled by its proximity to Greater Sydney's jobs and services and improved road and rail connections. Improved connectivity between Wollongong and Port Kembla, the National Land Transport Network, the Western Sydney Airport and intermodal terminals in the Western Parkland City will also be important for the city's ongoing economic growth.

A high environmental value, as well as access to public amenities, make the Wollongong-Shoalhaven area an attractive place to live and work. Wollongong Metro supports 34,000 jobs in diverse sectors including tertiary health and education, business, the public sector, innovation and research and development.¹⁶⁹

Port Kembla's importance as an international trade gateway will increase as it progressively serves as an overflow facility for Port Botany (with Port Botany expected to reach operational capacity after 2040).

Various NSW Government and private investments will enhance Wollongong over the coming years, including an expansion of the Wollongong Hospital. Future investments should be focused on:

- growing the amenity of Wollongong by providing good transport connections and local services
- growing the capacity of the port at Port Kembla as an international trade gateway, enabled by dedicated rail connections
- strengthening links between Wollongong, Port Kembla and Greater Sydney, with extra capacity for rail services and improved road connections across the Illawarra Escarpment and to the Western Parkland City
- building on existing strengths and supporting economic diversity through growth in priority sectors including tourism, health, disability and aged care, ICT/knowledge services, education and training, and freight and logistics.¹⁷⁰

¹⁶⁸ Department of Planning and Environment 2016b

¹⁶⁹ Ibid, p. 15

¹⁷⁰ Ibid.

Figure 30 – Illawarra overview



- Metro Wollongong
 - Strategic centres
 - Major parks and reserves
 - Waterways
 - Industrial areas
 - Regionally significant release area
 - Illawarra Regional Airport
 - Port Kembla
 - Railway (Existing)
 - Motorways and freeways (existing)
 - Arterial roads (existing)
 - Transport projects proposed for the future (possible alignments)
- Major sports venues
 - Major cultural venues
 - New schools (proposed)
 - Upgraded schools (proposed)
 - Universities and TAFE NSW colleges
 - + Hospitals
 - Courts
- 1 Hume Motorway improvements
 - 2 Electrification of intercity connection to Goulburn
 - 3 Maldon-Dombarton Freight Rail Link
 - 4 Appin Road improvements
 - 5 Picton Road improvements
 - 6 Moss Vale-Unanderra-Coniston Junction rail improvements
 - 7 Electrification of intercity connection to Bombaderry /Nowra
 - 8 Sydney-Wollongong rail improvements
 - 9 Improved bus connections with South West Sydney
 - 10 Outer Sydney Orbital corridor protection
- (See Chapter 9 for details on transport recommendations.)

Source: Road, Rail, Reservoirs, Lakes, Rivers Publisher Bioregional Assessment Programme licensed under CC BY 3.0; School Infrastructure, NSW Department of Education 2018; Hospitals, NSW Health 2017; Transport projects, Transport for NSW 2017; adapted by Infrastructure NSW 2018

Central Coast

The Central Coast is located at the centre of the State's fastest growing corridor – between Sydney and Newcastle – where the population is estimated to grow to 1.1 million by 2036.¹⁷¹

The region's Southern Growth Corridor, which extends from Somersby to Erina, and the Northern Growth Corridor, which extends from Tuggerah to Warnervale, provide major infrastructure and services and contain 48 per cent of the region's jobs.¹⁷² These areas will remain priority locations for future investment, jobs, services and business growth.

Warehousing and logistics are economic strengths for the Central Coast with capacity for growth. The region benefits from its proximity to Greater Sydney and the Hunter with connections to both via the M1 Pacific Motorway, the Pacific Highway and the Main Northern rail line.

Construction of transport infrastructure outside the region, such as NorthConnex and the M2, will drive demand for accessible employment land on the Central Coast. Clustering freight and logistics businesses around interchanges at Somersby, Tuggerah and Warnervale will maximise these opportunities.

The region's unique and productive natural environment, including its coastline, will support growth in the tourism, lifestyle housing, agriculture and resource sectors.

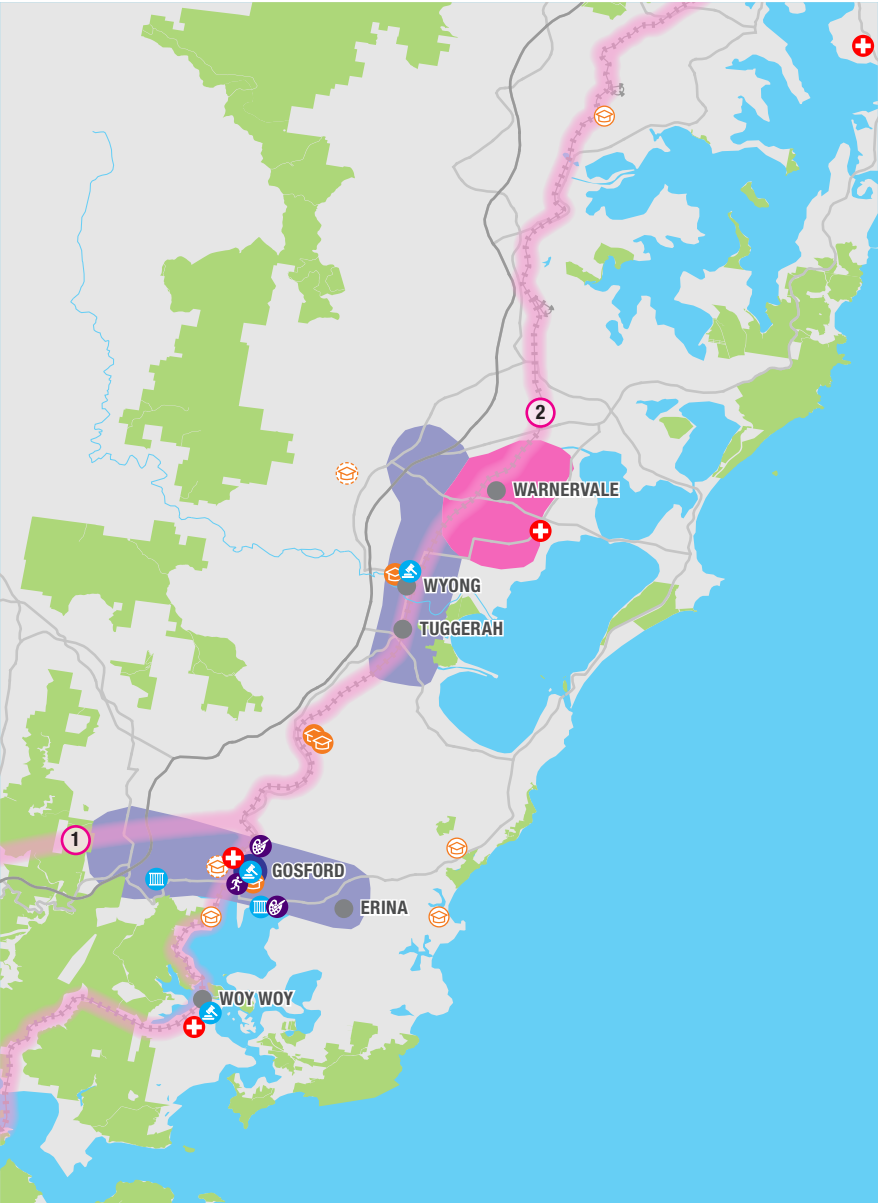
Gosford will flourish as the region's capital and centre of administrative, civic and commercial services. Improvements to health, transport, education, sporting and civic infrastructure will bolster its expanding cultural, residential and employment functions. Good building design will capitalise on its attractive waterfront setting.

Improving passenger rail services, and reliability and efficiency of the M1 between Sydney and Newcastle, will allow residents to access a wider variety of jobs and business opportunities in both cities.

¹⁷¹ Department of Planning and Environment 2016c, p. 4

¹⁷² Ibid, p. 18

Figure 31 – Central Coast overview



- Regional city
 - Strategic centres
 - Major parks and reserves
 - Waterways
 - Warrnervale Wadalba land release area
 - Regional growth corridors
 - +++ Railway (Existing)
 - Motorways and freeways (existing)
 - Arterial roads (existing)
 - Transport projects proposed for the future (possible alignments)
 - 1 Outer Sydney Orbital corridor protection
 - 2 Sydney–Central Coast–Newcastle rail improvement
 - (See Chapter 9 for details on transport recommendations.)
- Selected major sports venues
 - Selected major cultural venues
 - New schools (proposed)
 - Upgraded schools (proposed)
 - Universities and TAFE NSW colleges
 - Hospitals
 - Correctional facilities
 - Courts

Source: Road, Rail, Reservoirs, Lakes, Rivers Publisher Bioregional Assessment Programme licensed under CC BY 3.0; School Infrastructure, NSW Department of Education 2018; Hospitals, NSW Health 2017; Transport projects, Transport for NSW 2017; adapted by Infrastructure NSW 2018